
**Equipment for harvesting — Forage
harvesters —**

**Part 1:
Vocabulary**

*Matériel de récolte — Récolteuses-hacheuses-chargeuses de
fourrage —*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by ISO/Technical Committee TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 7, *Equipment for harvesting and conservation*.

This second edition cancels and replaces the first edition (ISO 8909-1:1994), which has been technically revised.

The main changes compared to the previous edition are as follows:

- adaptation of designation of some terms;
- modifications of some definitions.

A list of all parts in the ISO 8909 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Equipment for harvesting — Forage harvesters —

Part 1: Vocabulary

1 Scope

This document specifies terms and definitions related to forage harvesters and their component parts.

This document identifies dimensions and other characteristics aimed at allowing comparison of operations of the machines and to improve communication among engineers and researchers, in association with ISO 8909-2, which lays down methods of measuring characteristics and performance requirements for the term defined.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

forage harvester

agricultural machine used to harvest or gather the crop, cut the crop into short parallel lengths and to deliver the chopped crop into containers or separate vehicles

Note 1 to entry: Typical forage crops harvested are grasses, legumes, mixtures and/or row crops such as maize (corn) and sorghum. The chopped crop may be preserved in storage by ensiling or dehydrating, or it may be fed directly to livestock.

Note 2 to entry: The forage harvester may harvest the crop directly by cutting it at full width or from single or multiple rows, or by picking it up from swaths or windrows. Forage harvesters may be tractor-mounted, towed or self-propelled.

3.1.1

precision-cut forage harvester

forage harvester (3.1) which uses a feeding mechanism consisting of four or more feed rolls to partially orient and advance the crop at a consistent rate into the cutting or shearing mechanism

Note 1 to entry: This type of forage harvester is capable of producing the shortest and most uniformly cut particles.

3.1.2

semi-precision-cut forage harvester

forage harvester (3.1) which uses a feeding mechanism consisting of fewer than four feed rolls or other means such as an auger to advance the crop to the cutting or shearing mechanism

Note 1 to entry: Mean particle lengths and particle uniformity are intermediate between those obtained with precision-cut and random-cut forage harvesters. This type of forage harvester includes double-chop and multi-chop machines.

3.1.3

random-cut forage harvester

forage harvester (3.1) without a distinct feeding mechanism usually employing flails to impact-cut and chop the standing crop or pre-cut crop directly into shorter pieces

Note 1 to entry: This type of forage harvester usually produces the longest mean particle lengths, and the least uniformly cut particles.

4 Terms related to characteristics of functional components

4.1

crop-gathering header

device, usually detachable, used to gather the crop into the *forage harvester* (3.1)

4.1.1

row crop header

device used to cut off and gather row crops, usually near ground level

4.1.2

maize picker header

device used to harvest and gather only ears of maize (corn)

4.1.3

pickup header

device for picking up previously cut crop

4.1.4

direct-cut header

device capable of cutting unharvested crop across its full width and conveying the cut crop directly into the *forage harvester* (3.1)

4.2

header cutting mechanism

device used on the header to cut off the standing crop from its root system

4.2.1

cutterbar

cutting device which uses one or two reciprocating components (e.g. sickle, knife) to cut off the standing crop

4.2.2

rotary impact cutter

rotary cutting device using high-velocity knives driven about a vertical or horizontal axis to cut off the unsupported standing crop by impact alone

4.2.2.1

disc cutter

multiple disc mechanism using two or more blades per disc driven about vertical axes from below at sufficiently high rotational frequencies to achieve impact cutting

4.2.2.2

drum cutter

device using multiple large discs each with a central drum and driven about vertical axes from above or below at sufficiently high rotational frequencies to achieve impact cutting

Note 1 to entry: Each disc has at least two knife blades which protrude outwards from beneath the peripheral edge.

4.2.2.3**flail cutter**

device using multiple, radially attached blades that are mounted to pivot on a horizontal rotor

Note 1 to entry: Each blade has a transversely cutting edge to cut off crop by impact.

Note 2 to entry: The rotor is positioned transverse to the direction of travel.

4.2.3**rotary disc**

disc on the head row unit used to shear off the crop

Note 1 to entry: There are two systems: the one-disc rotary knife system requires a stationary knife against which to shear the crop, and the two-disc rotary knife system requires either a stationary knife or discs that are overlapped and rotated in opposite directions such that the crop is sheared off at the forward intersection of the two disc peripheries.

4.2.4**oscillating scissor knife**

device consisting of one pivoting knife with two stationary knives per row crop head row unit

Note 1 to entry: The knife reciprocates in a semi-circular arc and cuts the crop off against one of two stationary knives.

4.2.5**unidirectional cutterbar**

device for cutting off stalks comprising a horizontally arranged chain or belt carrying protrusions which guide and shear the stalks against spaced stationary supports

4.3**feedroll**

one or more cylindrical rolls, generally with protrusions or flutes, used to gather, compress and advance the crop into the *cutterhead* (4.4)

4.4**cutterhead****cutting rotor**

devices intended to cut the crop into short lengths with reasonable consistency within a range of optional settings

4.4.1**cylinder cutterhead**

knives on cylindrical mountings such that the cutting edges of the knives are essentially parallel to the axis of rotation

4.4.2**flywheel cutterhead**

knives mounted essentially radially with the cutting edges describing a plane perpendicular to the axis of rotation

4.5**stationary knife****shear bar**

fixed plate providing a stationary edge against which the cutterhead knives shear the crop

4.6**recutter screen**

semi-cylindrical band or plate with holes mounted concentric to a *cylinder cutterhead* (4.4.1), which starts downstream of the *stationary knife* (4.5) and continues around the discharge opening

Note 1 to entry: The chopped crop is recut by the cutterhead knives as it passes through the screen holes.

Note 2 to entry: The recutter screen is used primarily to reduce particle lengths that are substantially beyond the theoretical length of cut.

**4.7
smasher impact attachments**

protrusions attached either to the cutterhead knives or blower paddles, and/or to the cutterhead or blower housing band used primarily to break whole grains or maize (corn) kernels into smaller pieces either by impact or by shearing

**4.8
crop processor**

driven pair of opposing, counter-rotating rolls or discs placed in the chopped crop stream flow to crush whole grains or kernels into smaller pieces

**4.9
inertial chamber**

chamber with special bottom mounted in the lower part of the cutterhead housing, into which chopped material (maize) is directed and then inertially reversed to the cutterhead housing for re-chopping

**4.10
random-cut flail chopping rotor**

<cutterhead> multiple flails with transverse cutting edges at their tips, pivotably attached to a rotor positioned transversely to the direction of travel and parallel to the ground

Note 1 to entry: The swath, windrow or standing crop is cut directly by the flail blades into shorter random lengths by impact cutting or cutting against an adjustable element (stationary knife) on the chopping rotor periphery.

**4.11
crop delivery device**

mechanism used to propel the chopped crop from the forage harvester through a converging duct or chute to the transport container

**4.11.1
cylinder impeller blower**

device consisting of multiple rows of radial, fixed or free-swinging paddles mounted on a transverse rotor, where the crop is fed essentially tangentially to the rotor

**4.11.2
flywheel impeller blower**

device generally using one row of paddles mounted essentially radially to the axis of rotation, in which the crop is fed into the blower essentially parallel to the axis of rotation

5 Terms related to measurement of machine and functional component characteristics

**5.1
forage harvester mass**

mass without the crop head mounted unless it is an integral part of the machine

Note 1 to entry: Expressed in kilograms with a tolerance of ± 50 kg of the complete machine equipped for field operation.

**5.2
forage harvester length**

overall length in transport position as defined by the manufacturer, with and without crop head(s) fully raised, measured parallel to the ground and to the longitudinal centreline of the *forage harvester* (3.1)

Note 1 to entry: Expressed in millimetres with a tolerance of ± 50 mm from the foremost point to the rearmost point of the machine.

5.3**forage harvester width**

overall side-to-side width with and without crop header(s) measured parallel to the ground and to its transverse axis

Note 1 to entry: Expressed in millimetres with a tolerance of ± 10 mm.

Note 2 to entry: Account of tyres near point of contact with the ground, and connections for tyre pressure gauges is not included.

5.4**forage harvester height**

vertical height from the plane on which the machine stands to the highest point on the machine

Note 1 to entry: Expressed in metres to the nearest hundredth.

Note 2 to entry: This definition applies only to self-propelled forage harvesters.

5.5**forage harvester spout discharge height**

vertical height expressed in metres to the nearest tenth from the plane on which the machine stands to the top of the spout cap when horizontal

5.6**engine maximum power**

point or range where the engine has maximum power

Note 1 to entry: ISO 14396 provides determination and method for the measurement of engine power. Guidance can also be drawn from ECE R120 or SAE J1995

5.7**engine displacement**

sum of all the piston-swept volumes of the engine

Note 1 to entry: This volume is sometimes known as the "cylinder capacity".

[SOURCE: ISO 2710-1:2017, 3.9.1.6.4, modified — Original term was engine-swept volume.]

5.8**eco mode**

machine operation that allows for minimization of fuel consumption and engine exhaust emissions

5.9**turning diameter**

diameter of the circular path described by the centre of tire contact with the surface of the test site of the wheel describing the largest circle when the machine is executing its sharpest practicable turn

Note 1 to entry: For determination of turning diameter test conditions, see ISO 789-3:2015, Clause 5.

[SOURCE: ISO 789-3:2015, 2.4, modified — The term "tractor" has been replaced with "machine". The conditional information has been moved to a note to entry.]

5.10**clearance diameter**

diameter of the smallest circle which will enclose the outermost points of projection of the machine and its equipment while executing its sharpest practicable turn

[SOURCE: ISO 789-3:2015, 2.5, modified — The term "tractor" has been replaced with "machine".]

5.11**fuel tank capacity**

usable capacity of the fuel tank expressed in litres and rounded down to the nearest whole 10 l

5.12

crop container volume

capacity of chopped harvest expressed in cubic metres to the nearest half cubic metre of the integral crop container (if the machine is so equipped)

Note 1 to entry: This definition applies only to self-propelled forage harvesters.

5.13

forage harvester power rating

maximum and minimum rated tractor PTO (power take-off) power levels, expressed in kilowatts, at which the *forage harvester* (3.1) was designed to be operated

Note 1 to entry: This definition applies only to tractor-mounted and towed forage harvesters.

5.14 Terms related to effective header harvesting width

5.14.1

row crop and maize header width

row crop and ear corn header width

average width between the centrelines of adjacent row units multiplied by the number of row units

Note 1 to entry: Expressed in metres to the nearest hundredth.

Note 2 to entry: For a single row head, the harvesting width equals the row central line spacing.

5.14.2

pickup header width

width between the outermost crop lifting tine rows plus one tine row spacing

Note 1 to entry: Expressed in metres to the nearest hundredth.

Note 2 to entry: Where gathering wheels precede the pickup mechanism, actual harvesting width is equal to the horizontal distance between the wheel centres.

5.14.3

direct-cut header width

minimum width between the side sheets of the harvesting unit measured directly above the forward tips of the cutterbar (sickle, knife) sections

Note 1 to entry: Expressed in metres to the nearest hundredth.

Note 2 to entry: For rotary impact cutters, the cutting width is equal to the width between the extreme left-hand and right hand cutting unit's outermost points on the knife tip cutting circles.

Note 3 to entry: For unidirectional cutterbars, it is the distance between the belt-pulleys or chain sprockets centrelines.

5.15 Terms related to header vertical cutting height

5.15.1

cutterbar height

height measured at the forward tip of the cutting element above the plane on which the machine stands

Note 1 to entry: This also applies to oscillating scissor knife width, rotary impact disc or drum cutter width, and unidirectional cutterbar width.

Note 2 to entry: Provisions for determination of cutterbar height are given in ISO 8909-2.