
**Fertilizers, soil conditioners and
beneficial substances — Vocabulary**

Engrais, amendements et substances bénéfiques — Vocabulaire

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ISO 8157:2022

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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 Technical Committee ISO/TC 134, *Fertilizers, soil conditioners and beneficial substances*.

This third edition cancels and replaces the second edition (ISO 8157:2015) which has been technically revised.

The main changes are as follows:

- the scope has been modified in accordance with the name and scope of ISO/TC 134;
- terms related to beneficial substances like plant biostimulants have been added.

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.

Fertilizers, soil conditioners and beneficial substances — Vocabulary

1 Scope

This document defines terms relating to fertilizers, soil improvers, growing media, inhibitors and plant bio-stimulants.

2 Normative References

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1 General terms

3.1.1

fertilizer standards.iteh.ai/catalog/standards/sist/e6bacf6b-49c8-4838-8585-44ff34f7f074/iso-8157-2022
substance containing one or more recognized plant nutrient(s), designed for use or claimed to have value in promoting plant growth

3.1.2

plant nutrient

substance that is essential or beneficial for plant growth

3.1.3

fertilizer nutrient

plant nutrient applied in the course of fertilization

Note 1 to entry: Some countries or regions declare nutrients in their oxide forms (e.g. CaO) but also in their elementary forms.

3.1.3.1

primary nutrient element

elements nitrogen, phosphorus and potassium only

Note 1 to entry: A macronutrient is also used. These include the following plant food: nitrogen (N), available phosphate (P₂O₅) and soluble potash (K₂O).

3.1.3.2

secondary nutrient element

elements calcium, magnesium and sulfur

Note 1 to entry: Sodium (Na) and Silicon (Si) have been supported as beneficial for certain plants.

3.1.3.3

micronutrient

element such as boron, manganese, iron, zinc, copper, molybdenum, cobalt, nickel and chloride, which are essential, in relatively small quantities, for plant growth

Note 1 to entry: Cobalt is essential in relatively small quantities, for some species.

3.1.4

beneficial substance

beneficial element

substance, element or microorganism other than *primary nutrient element* (3.1.3.1), *secondary nutrient element* (3.1.3.2) or *micronutrients* (3.1.3.3) that can be demonstrated by scientific research to be beneficial to one or more species of plants or biological components of the soil ecosystem, when applied exogenously

3.1.4.1

plant biostimulant

product that contains substance(s), microorganism(s), or mixtures thereof, that, when applied to seeds, plants, the rhizosphere, soil or other growth media, act to support a plant's natural nutrition processes independently of the biostimulant's nutrient content

Note 1 to entry: The plant biostimulant thereby improves nutrient availability, uptake or use efficiency, tolerance to abiotic stress, availability of confined nutrients in the soil or rhizosphere, and consequent growth, development, quality or yield.

3.1.4.2

beneficial plant nutrient

elements, other than those defined as *primary nutrient element* (3.1.3.1), *secondary nutrient element* (3.1.3.2) or *micronutrients* (3.1.3.3), that are known to be needed for plant growth and development or for the quality attributes of the plant product, of a given plant species, grown in its natural or cultivated environment

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Note 1 to entry: These beneficial plant nutrients are not known to be generally essential and their beneficial functions can be limited to particular taxa, plant growth stage or product end use.

Note 2 to entry: Known beneficial nutrient elements include Si, Se, I, Co, Na, Al, and others as demonstrated.

3.1.5

inorganic fertilizer

fertilizer without organic material other than those defined as additives

Note 1 to entry: Calcium cyanamide, urea and its condensation products and chelated and complex micro-nutrients are, by convention, recognized as inorganic fertilizers.

3.1.6

organic fertilizer

material containing carbon or one or more elements other than hydrogen and oxygen mainly of plant and/or animal origin added either directly to the plant or to the soil

3.1.7

organic nitrogenous fertilizer

materials of biological origin in which the declarable nitrogen content is bonded directly to carbon and which can contain other elements, but which do not have declarable phosphorus or potassium contents

3.1.8

synthetic nitrogenous fertilizer

nitrogenous fertilizers in which the nitrogen is combined with carbon by organic synthesis

3.1.9**organo-mineral fertilizer**
semi-organic fertilizer

product in which declared nutrients are of both organic and inorganic origin obtained by either mixing or chemical combination, or both, of organic and inorganic fertilizers

3.1.10**organo-mineral compound fertilizer**
organic-inorganic compound fertilizer

compound fertilizer containing an amount of organic fertilizer

3.1.11**slow release fertilizer**

fertilizer whose nutrient availability is spread over a period of time, by hydrolysis and/or by biodegradation and/or by limited solubility, or any other recognized mechanism, when compared to a "reference soluble" product such as ammonium sulfate, ammonium nitrate and urea

3.1.12**controlled-release fertilizer**

fertilizer in which nutrient release is controlled, meeting the stated release rate of nutrient and the stated release time at a specified temperature

Note 1 to entry: Typical examples are coated fertilizers, such as polymer coated fertilizer, PSCU.

3.1.13**partly slow release fertilizer**

fertilizer obtained by blending a slow release fertilizer with a rapidly available fertilizer

3.1.14**partly controlled release fertilizer**

fertilizer obtained by blending a controlled release fertilizer with a rapidly available fertilizer

3.1.15 [://standards.iteh.ai/catalog/standards/sist/e6bacf6b-49c8-4838-8585-44ff34f7f074/iso-8157-2022](https://standards.iteh.ai/catalog/standards/sist/e6bacf6b-49c8-4838-8585-44ff34f7f074/iso-8157-2022)
coated fertilizer

fertilizer, of which the granules are covered with a thin layer of a different material (polymer, sulfur, or other material) in order to improve the behaviour or modify the characteristics of the fertilizer

3.1.16**stabilized fertilizer**

fertilizer product that has been amended with an additive that reduces, in comparison with its un-amended form, the rate of transformation of the nutrient(s), extending the time of nutrient(s) availability to the plant by a variety of mechanisms

Note 1 to entry: Usually referred to as nitrogen-stabilized fertilizer.

3.1.16.1**inhibitor**

substance that improves the nutrient release patterns of a product providing plants with nutrients, by delaying or stopping the activity of specific group of microorganisms or enzymes

3.1.16.2**urease inhibitor**

substance that inhibits hydrolytic action on urea by the urease enzyme

Note 1 to entry: Primarily targeted to reduce ammonia volatilization.

3.1.16.3**nitrification inhibitor**

substance that inhibits the biological oxidation of ammoniacal nitrogen to nitrite nitrogen, thus slowing the formation of nitrate nitrogen

3.1.17

enhanced efficiency reference product

soluble fertilizer product (prior to treatment by chemical reaction, coating, encapsulation, addition of inhibitors, compaction, occlusion, or by other means) or the corresponding product used for comparison to substantiate enhanced efficiency claims

3.1.18

soil conditioner

organic/inorganic material added to soils to improve the physical and/or chemical properties, and/or the biological activity of soils with or without a declarable content of nutrients

3.1.19

synthetic soil conditioner

product made by organic synthesis added to the soil to improve the physical and/or chemical properties, and/or the biological activity of soils without a declarable content of nutrients

3.1.20

inorganic soil conditioner

soil conditioner without organic matter, which improves the physical and/or chemical properties, and/or the biological activity of soils.

3.1.20.1

phosphogypsum

product produced as a by-product from the wet phosphoric acid process

Note 1 to entry: It is primarily composed of calcium sulfate and containing phosphate some of which is available. It is used as an ameliorant for chemical soil reclamation, calcium-containing fertilizer and raw material for composting.

Note 2 to entry: In this process, phosphate rock powder is reacted with concentrated sulfuric acid.

3.1.21

soil improver

organic/inorganic material that maintains, improves, or protects the physical or chemical properties, the structure or the biological activity of the soil to which it is added with the exception of liming materials

Note 1 to entry: The term "soil amendment" is synonymous with "soil conditioner" under some circumstances.

3.1.22

liming material

mineral substances and mixtures whose main function is to correct soil acidity and modify and/or improve soil physical, chemical or biological properties and contain either oxides, hydroxides, carbonates or silicates of the nutrients calcium and/or magnesium

Note 1 to entry: The terms "lime" and "liming soil amendment" are also used, but "liming material" or "agricultural lime" are preferred.

3.1.23

organic soil improver

natural organic material applied principally to improve the physical properties and biological activity of soil

3.1.24

semi-organic soil improver

soil improver containing substances and elements of both organic and inorganic origin

3.1.25

water-soluble fertilizer

fertilizers, virtually completely soluble in water and suitable for, for example, fertigation and sprinkling irrigation

3.1.25.1**water-soluble nutrient**

nutrient completely soluble in water

3.1.26**foliar fertilizer**

fertilizer designed for application to, and nutrient uptake by, the foliage of a plant

3.1.27**chelated fertilizer**

fertilizer in which one or more nutrients are bonded by chelating agents

3.1.27.1**chelated plant nutrient**

product of a chemical reaction between a metal cation that is recognized as a plant nutrient and a chelating agent

3.1.27.2**chelate**

molecular entity in which exists the presence of bonds (or attractive interactions) between two or more separate binding sites within the same organic ligand and a single central atom of a metal forming a five- or six- membered ring

3.1.27.3**chelating agent**

organic molecule having two or more sites that donate electron pairs to a central metal cation and is large enough to form a five- or six- membered ring structure

EXAMPLE EDTA, NTA (nitrile-triacetic acid) and IDHA (iminodiscuccinic acid).

3.1.27.4**coordinating complex**

molecular entity in which exists the presence of bonds (or attractive interactions) between two or more components of organic molecular entities and one central metallic atom

Note 1 to entry: When this metal complex is formed because the interaction of two or more separate binding sites within the same organic ligand and a single central atom forming a five- or six- membered ring, then it becomes a chelate.

3.1.27.5**coordinating agent****sequestering agent**

organic molecule that has two or more sites that donate electron pairs to a central metal cation, which form a product of sufficient stability with the cation that does not undergo many free metal typical reactions, for example, precipitation in basic solution

3.1.28**soil fertility**

ability of a soil to support and ensure plant growth

3.1.29**fertilization**

any or all aspects of the use of fertilizers and soil conditioners/improvers to improve crop growth and soil fertility and structure

Note 1 to entry: The English term “fertilization” has a more restricted meaning than the French term “fertilisation” which covers all the techniques of management of fertilizers and soil conditioners.

**3.1.30
application**

process of administering fertilizers, beneficial substances, liming materials and soil improvers to crop, rhizosphere, soil or all of them

Note 1 to entry: This term embraces broadcasting, drench application, drip irrigation, hydroponics, post-harvest application, pre-planting seedling immersion, root application, seed treatment, soil/substrates/growing media application, spreading, spraying or dusting, as well as more specific placement methods including injection into the soil and the combined drilling of seed and fertilizer. It includes nutrient film techniques, foliar application, and the addition of fertilizers to irrigation water (fertigation).

**3.1.31
fertigation**

application of fertilizer dissolved in irrigation water

**3.1.32
dose rate
dose**

mass or volume of fertilizer, beneficial substances, or soil conditioner or nutrient applied per unit area of cultivated land or unit mass of growth medium

**3.1.33
solubility of a fertilizer nutrient**

mass or volume of a given nutrient which is extracted by a specific medium under specified conditions

Note 1 to entry: Expressed as a percentage by mass or volume of the fertilizer.

**3.1.34
solubility of a fertilizer**

mass of a fertilizer that dissolves in a given volume of water at a given temperature (such as kg/m³ at 298 K)

**3.1.35
fertilizer unit**

unit mass of a fertilizer nutrient (in the form of the element or an oxide), generally 1 kg

**3.1.36
total primary nutrient**

sum of total nitrogen, available phosphorus (P₂O₅) and water-soluble potash (K₂O) content, expressed as mass fraction in per cent

**3.1.37
primary nutrient formula**

respective content of the total primary nutrient in a compound fertilizer expressed by numbers, in the order of N-P₂O₅-K₂O, used in some countries

Note 1 to entry: In some countries and regions, mass fraction expressed as a percentage of element or oxide, in the order of nitrogen: phosphorus: potassium: secondary nutrients and micro-nutrients, of the respective content of these nutrients in a compound fertilizer.

Note 2 to entry: A zero can be used to indicate the absence of an element.

**3.1.38
declarable content**

content of an element (or an oxide) which can be given on a label or document associated with fertilizer or soil conditioner

**3.1.39
declaration**

statement of the nutrient content or other information

3.1.40**marking**

statement, symbol, logo, picture, and/or information, that is present on the label or package

3.1.41**tolerance**

permitted deviation of the measured value of a nutrient content from its declared value

Note 1 to entry: The term "investigational allowance" is also used in some countries and regions.

3.1.42**guarantee****guarantee of composition**

either quantitative or qualitative, or both, characteristics with which a marketed product conforms to contractual or legal regulations

3.1.43**nutrient ratio**

ratio by mass of the primary nutrients in the fertilizer, expressed in the form of the element or an oxide, in the order of nitrogen, phosphorus and potassium

Note 1 to entry: The ratio can be based on nitrogen as unity or on the nutrient with the lowest proportion.

3.1.44**granular fertilizer**

solid fertilizer material in the form of particles of a predetermined size and expressed in SGN, D50, and UI, size range, or other specific methods

3.1.45**granulation**

technique using processes such as agglomeration, crushing into finer particles, accretion or compaction, to make a granular fertilizer

3.1.46**grain size**

dimension which corresponds to the smallest sieve aperture size through which a particle will pass if presented in the most favourable attitude

3.1.47**prill**

granule obtained by solidification of droplets of fertilizers or by crystallization under special conditions

3.1.48**powder**

solid substance in the form of very fine particles

3.1.49**powdered fertilizer**

fertilizer in the form of fine particles, formed by precipitation, crystallization or grinding of larger particles

3.1.50**liquid fertilizer**

fertilizers in suspension or solution

Note 1 to entry: This term is also used for liquefied ammonia.

3.1.51**solution fertilizer**

liquid fertilizer free of solid particles

3.1.52

suspension fertilizer

two-phase fertilizer in which solid particles are maintained in suspension in the liquid phase

3.1.53

additive agent

substance added to fertilizer materials to provide bulk, prevent caking, or serve some purpose other than providing essential plant nutrients

3.1.54

filler

substance added to fertilizer materials to provide bulk other than providing essential plant nutrients

3.1.55

container

closed receptacle directly in contact with a fertilizer, beneficial substance or soil conditioner whereby the fertilizer, beneficial substance or soil conditioner can be transported or stored in unit quantities

EXAMPLE Bag, bottle, tank, barrel.

3.1.56

packaging

product to be used for the containment, protection, handling, delivery, storage, transport and presentation of goods, from raw material to processed goods, from the producer to user or consumer, including processor, assembler or other intermediary

3.1.57

package

packaging ([3.1.56](#)) and its contents ([standards.iteh.ai](#))

3.1.58

big bag

flexible container, holding 250 kg to 1 500 kg [standards/sist/e6bacf6b-49c8-4838-8585-44ff34f7f074/iso-8157-2022](#)

3.1.59

label

piece of paper or plastic, or a printed area of a package or container, marked with the necessary information to identify the product and make known its essential characteristics

3.1.60

bulk

product distributed in a non-packaged form

3.1.61

availability

extent to which fertilizer nutrients can be taken up by plants

3.1.62

non-nutritive trace element

element above critical levels which is harmful to either ecological systems or human health, or both

EXAMPLE As, Cd, Cr(VI), Pb and Hg.

Note 1 to entry: In some countries, historically, a non-nutritive trace element is also referred to as a heavy metal.

Note 2 to entry: F⁻, Cl⁻ (only for sensitive plants, such as tobacco, orange), Br⁻, I⁻, NO₂⁻, SCN⁻ can also be referred to as non-nutritive trace elements.

Note 3 to entry: Cl⁻ is essential for all plants in some countries. It is the amount of chloride that makes it considered as harmful in some countries.