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

*Engrais, amendements et substances bénéfiques — Vocabulaire*

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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](http://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](http://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](http://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](http://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**

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 (P<sub>2</sub>O<sub>5</sub>) and soluble potash (K<sub>2</sub>O).

#### 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

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 micronutrients 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****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/m<sup>3</sup> 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 (P<sub>2</sub>O<sub>5</sub>) and water-soluble potash (K<sub>2</sub>O) 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-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, 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

**3.1.58**

**big bag**

flexible container, holding 250 kg to 1 500 kg

**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<sup>-</sup>, Cl<sup>-</sup> (only for sensitive plants, such as tobacco, orange), Br<sup>-</sup>, I<sup>-</sup>, NO<sub>2</sub><sup>-</sup>, SCN<sup>-</sup> can also be referred to as non-nutritive trace elements.

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

## 3.2 Terms relating to products

### 3.2.1 Nitrogen product

#### 3.2.1.1

##### **aqueous ammonia**

solution containing water and ammonia in any proportion

Note 1 to entry: This is usually qualified by a reference to nitrogen content.

#### 3.2.1.2

##### **calcium nitrate**

chemically obtained product containing calcium nitrate as its essential ingredient

#### 3.2.1.3

##### **calcium ammonium nitrate**

nitrogen fertilizer consisting of a hydrated double salt of calcium nitrate and ammonium nitrate with water of crystallization, with the chemical formula of  $5\text{Ca}(\text{NO}_3)_2 \cdot \text{NH}_4\text{NO}_3 \cdot 10\text{H}_2\text{O}$

#### 3.2.1.4

##### **calcium cyanamide**

chemically obtained product containing calcium cyanamide as its essential ingredient

#### 3.2.1.5

##### **ammonium sulfate**

##### **sulfate of ammonia**

chemically obtained product containing ammonium sulfate as its essential ingredient

#### 3.2.1.6

##### **ammonium chloride**

chemically obtained product containing ammonium chloride as its essential ingredient

#### 3.2.1.7

##### **ammonium sulfated nitrate**

chemically obtained product containing ammonium nitrate and ammonium sulfate as its essential ingredient

#### 3.2.1.8

##### **ammonium nitrate**

chemically obtained product containing ammonium nitrate as its essential ingredient, which can contain fillers such as ground limestone, calcium sulfate, ground dolomite, magnesium sulfate and kieserite

#### 3.2.1.9

##### **urea**

white crystalline, or granular, solid synthesized from ammonia and carbon dioxide by a number of processes

#### 3.2.1.10

##### **urea ammonium nitrate fertilizer solution**

##### **UAN**

solution of urea and ammonium nitrate in water used as a fertilizer

#### 3.2.1.11

##### **urea-ammonium mixed nitrogen fertilizer**

solid straight nitrogen fertilizers, containing ureic nitrogen and ammoniacal nitrogen only

**3.2.1.12**

**sulfur coated urea**

**SCU**

coated controlled release fertilizer consisting of urea particles coated with sulfur

Note 1 to entry: The product is usually further coated with a sealant and, if necessary, a conditioner to avoid tackiness from the sealant.

**3.2.1.13**

**polymer**

chemical compound or mixture of compounds consisting of repeating structural units created through polymerization

**3.2.1.14**

**polymer coated urea**

**PCU**

coated controlled-release fertilizer consisting of urea particles coated with a polymer

Note 1 to entry: It is a source of controlled release nitrogen.

**3.2.1.15**

**polymer sulfur coated urea**

**PSCU**

coated slow release fertilizer consisting of urea particles coated with a polymer and sulfur

**3.2.1.16**

**ammonium thiosulfate**

nitrogen fertilizer chemically obtained product containing ammonium thiosulfate  $[(\text{NH}_4)_2\text{S}_2\text{O}_3]$

**3.2.2 phosphorus product**

**3.2.2.1**

**single superphosphate**

product obtained by reaction of ground mineral phosphate (< 1 % of organic carbon) with sulfuric acid and containing monocalcium phosphate as an essential ingredient, as well as calcium sulfate

**3.2.2.2**

**dicalcium phosphate**

product obtained by precipitation of solubilized phosphoric acid from mineral phosphates or bones and containing dicalcium phosphate dihydrate as its essential ingredient

**3.2.2.3**

**triple superphosphate**

product obtained by reaction of ground mineral phosphate (< 1 % of organic carbon) with phosphoric acid and containing monocalcium phosphate as its essential ingredient

**3.2.2.4**

**fused calcium-magnesium phosphate**

**fused calcium-magnesium phosphate fertilizer**

vitreous aluminosilicate containing phosphate, which is formed by phosphate rock and rock containing magnesium and silicon through hot melting, quenching, drying and grinding in a blast or electric furnace

### 3.2.3 Potash product

#### 3.2.3.1

##### **potassium magnesium sulfate sulfate of potash magnesia**

potassium salt containing water-soluble potash principally as sulfates and sulfate of magnesium

Note 1 to entry: Typically, a naturally occurring soluble mineral that is a double salt of potassium sulfate and magnesium sulfate.

#### 3.2.3.2

##### **potassium chloride muriate of potash**

product obtained from crude potassium salts or brines containing potassium chloride as its essential ingredient

#### 3.2.3.3

##### **potassium sulfate sulfate of potash**

product obtained chemically from sulfuric acid, sulfates and potassium salts or from naturally occurring minerals containing potassium sulfate as its essential ingredient

#### 3.2.3.4

##### **potassium thiosulfate**

chemically obtained product containing potassium thiosulfate  $[K_2S_2O_3]$

### 3.2.4 NP product

#### 3.2.4.1

##### **monoammonium phosphate MAP**

product composed of ammonium phosphates, principally monoammonium phosphate, resulting from the ammoniation of phosphoric acid

#### 3.2.4.2

##### **diammonium phosphate DAP**

product composed of ammonium phosphates, principally diammonium phosphate, resulting from the ammoniation of phosphoric acid

#### 3.2.4.3

##### **nitrophosphates**

compound fertilizer derived from the digestion of phosphate rock with nitric acid

### 3.2.5 NK product

#### 3.2.5.1

##### **potassium nitrate nitrate of potash**

product obtained chemically or naturally from nitric acid, nitrates and potassium chloride

### 3.2.6 PK product

#### 3.2.6.1

##### **monopotassium phosphate**

monopotassium salt of phosphoric acid

#### 3.2.6.2

##### **dipotassium phosphate**

dipotassium salt of phosphoric acid

### 3.2.7 NPK product

#### 3.2.7.1

##### **compound fertilizer**

fertilizer that has a declarable content of at least two of the primary plant nutrients (nitrogen, phosphorus and potassium), obtained either chemically or by blending, or both, including NP, NK, PK and NPK products

#### 3.2.7.2

##### **complex fertilizer**

compound fertilizer, obtained by chemical reaction, having a declarable content of at least two of the primary nutrients, including NP, NK, PK and NPK products

#### 3.2.7.3

##### **blend fertilizer**

fertilizer obtained by dry or liquid mixing of several components, with no chemical reaction

#### 3.2.7.4

##### **bulk blend**

blended fertilizer transported or supplied in bulk

#### 3.2.7.5

##### **potassium nitrophosphate**

fertilizer obtained by adding potassium salt after the reaction of ground mineral phosphate with nitric acid

### 3.2.8 Miscellaneous products

#### 3.2.8.1

##### **ash**

mineral residue remaining after the destruction of organic material by burning

Note 1 to entry: Such residues may be used as fertilizers, for example plant ash and animal ash, containing mainly potassium salts and phosphates.

#### 3.2.8.2

##### **blood**

##### **dried blood**

##### **blood meal**

blood which has been dried and to which no other material has been added

#### 3.2.8.3

##### **bone**

hard tissue forming the skeletal structure of animals and containing salts of calcium, chiefly phosphate and carbonate

#### 3.2.8.4

##### **bone meal**

degreased bone which can be degelatinized and has been ground or crushed to pass a sieve of specified aperture size

#### 3.2.8.5

##### **clay**

group of hydrated aluminium silicates of microcrystalline structure

Note 1 to entry: It is most often in parallel plates.

Note 2 to entry: This group of minerals has colloidal properties.

**3.2.8.6****compost**

material obtained by decomposition of a mixture consisting principally of various vegetable residues, occasionally with organic materials of animal origin, and having a limited mineral content

**3.2.8.7****dung**

semi-solid excrements of animals used as fertilizers and/or soil conditioners

**3.2.8.8****fish hydrolysate**

material consisting essentially of fresh by-products of the fishing industry and produced by chemical or enzymatic hydrolysis

**3.2.8.9****fish guano****fish compost**

material consisting essentially of fresh by-products of the fishing industry and produced by grinding and composting

**3.2.8.10****fish-meal**

product obtained by drying and grinding, or otherwise treating, fish or fish waste and to which no addition has been made

**3.2.8.11****growing medium**

material, other than soils in situ, in which plants are grown

**3.2.8.12****bat guano****bird guano**

excrements and remains of any bats or birds, except poultry, containing nitrogen, phosphorus and potassium, and to which no addition has been made

**3.2.8.13****humus**

material that is derived primarily from the decomposition of plant and animal matter in such manner that origin of the material is not recognizable

**3.2.8.14****humic acids**

alkali extracted humic substances that are insoluble in strongly acidic solution and that precipitate from the alkali extract in acid solutions of pH 1

**3.2.8.15****humic substance**

major organic constituent of natural organic matter consisting of complex heterogeneous mixtures of carbon-based substances formed by biochemical reactions during the decay and transformation of plant and microbial remains

**3.2.8.16****fulvic fraction**

alkali extracted fractions of humic substances, which are soluble in both alkali and acid aqueous solution

**3.2.8.17****liquid animal waste from abattoir**

liquid that could contain blood

Note 1 to entry: As opposed to *slurry* ([3.2.8.24](#)) and *liquid manure* ([3.2.8.18](#)) which do not contain blood.

**3.2.8.18**

**liquid manure**

liquid arising from animal urine and litter fluids or from a dung heap

**3.2.8.19**

**manure**

mixture of litter and dung in process of biological change

**3.2.8.20**

**marl**

soft, natural deposit containing varying amounts of calcium carbonate mixed with clay

**3.2.8.21**

**meat meal**

product obtained by drying and grinding, or otherwise treating, flesh or flesh fibre and to which no addition has been made

**3.2.8.22**

**oil cake**

residue remaining after the removal of the oil from oil seeds

**3.2.8.23**

**peat**

residual matter from plants grown and decayed in almost permanently waterlogged conditions and which can contain a limited quantity of naturally occurring mineral material

**3.2.8.24**

**slurry**

semi-liquid effluent from livestock, consisting of urine and faeces, possibly diluted with water

**3.2.8.25**

**urea condensate**

product of reaction between urea and aldehyde(s) that produce a slow release nitrogenous fertilizer

EXAMPLE Urea formaldehyde (UF), methylene urea (MU), crotonylidene diurea (CDU), isobutylidene diurea (IBDU), triazone.

**3.2.8.26**

**urea formaldehyde**

**UF**

slow release nitrogenous fertilizer obtained by the reaction between urea and formaldehyde to produce molecular chains of general formula  $\text{NH}_2\text{-CO-NH}(\text{CH}_2\text{NHCONH})_n\text{H}$

**3.2.8.26.1**

**methylene urea**

**MU**

**polymethylene urea**

slow release nitrogenous fertilizer obtained by the reaction between urea and formaldehyde to produce oligomers or adducts of urea and formaldehyde

Note 1 to entry: It is chiefly composed of cold water-soluble fraction from methylenediurea (MDU) and dimethylenetriurea (DMTU) hot water-soluble fraction from trimethylenetetraurea (TMTU) and tetramethylenepentaurea (TMPU) and hot water-insoluble fractions from longer chain oligomers. It is generally free of methylolureas and methylol ethers. It is a source of slowly available nitrogen.

**3.2.8.26.2**

**isobutylidene diurea**

**IBDU**

slow release nitrogenous fertilizer obtained by the reaction between urea and isobutyraldehyde

Note 1 to entry: It is a source of slowly available nitrogen by virtue of particle size, solubility decreasing with increase in particle size.

**3.2.8.26.3****crotonylidene diurea****CDU**

slow release nitrogenous fertilizer obtained by the reaction between urea and crotonaldehyde

Note 1 to entry: It is a source of slowly available nitrogen.

**3.2.8.26.4****cold water-insoluble nitrogen****CWIN**

insoluble nitrogen fractions in urea formaldehyde or methylene urea products that are insoluble in phosphate buffer solution (pH 7,5) or distilled water at 25 degrees Celsius during a 15-min period

**3.2.8.26.5****cold water-soluble nitrogen****CWSN**

soluble nitrogen fraction in urea formaldehyde or methylene urea products that is soluble in phosphate buffer solution (pH 7,5) or distilled water at 25 °C during a 15-min period

Note 1 to entry: CWSN equals to total nitrogen minus CWIN.

**3.2.8.26.6****hot water-insoluble nitrogen****HWIN**

insoluble nitrogen fraction in urea formaldehyde or methylene urea products that is insoluble in phosphate buffer solution (pH 7,5) at 100 °C during a 30-min period

**3.2.8.26.7****hot water-soluble nitrogen****HWSN**

soluble nitrogen fraction in urea formaldehyde or methylene urea products that is soluble in phosphate buffer solution (pH 7,5) at 100 °C during a 30-min period

Note 1 to entry: HWSN equals to the total nitrogen minus HWIN.

**3.2.8.26.8****hot water-soluble nitrogen only****HWSN only**

soluble nitrogen fractions in urea formaldehyde or methylene urea products that are soluble in phosphate buffer solution (pH 7,5) at 100 °C during a 30-min period and insoluble in phosphate buffer solution (pH 7,5) or at 25 °C during a 15-min period

Note 1 to entry: HWSN Only = HWSN - CWSN = CWIN - HWIN.

**3.2.8.26.9****triazone**

water-soluble compound of formula  $C_5H_{11}N_5O_2$  [5-(N-methyl)-urea-1,3,5-triazin-2-one or 5-methyleneureido-2-oxohexahydro-s triazine], produced by reaction of urea, formaldehyde, and ammonia

Note 1 to entry: It is a source of slowly available nitrogen.

**3.3 Terms relating to physical properties****3.3.1****density**

mass per unit volume, applicable to both liquid and solid

Note 1 to entry: For a solid material, density can be various depending on the method of measurement.

**3.3.2**

**bulk density**

**loose bulk density**

mass per unit volume of a solid material after it has been tipped freely into a container under clearly specified conditions

**3.3.3**

**bulk density**

**tapped bulk density**

mass per unit volume of a solid material tipped into a container and then compacted under clearly specified conditions

**3.3.4**

**particle size analysis granulometry by sieving**

division of a sample into size fractions

Note 1 to entry: SGN, UI and GSI are used in some countries and regions.

Note 2 to entry: It can be accomplished by a sieve and particle distribution analyser.

**3.3.5**

**sieving**

process of separating a mixture of particles according to their sizes by one or more sieves

**3.3.5.1**

**test sieving**

sieving with one or more test sieves

**3.3.5.2**

**undersize**

portion of the charge which passes through a sieve of specified aperture size

**3.3.5.3**

**oversize**

portion of the charge which does not pass through a sieve of a specified aperture size

**3.3.6**

**crushing strength**

minimum force required to crush individual particles retained between designated sieve sizes

**3.3.7**

**caking**

formation of a coherent mass from individual particles

**3.3.7.1**

**anti-caking**

measure to prevent caking

**3.3.7.2**

**anti-caking agent**

substance incorporated in or applied as a surface treatment to a fertilizer to prevent caking

**3.3.8**

**pourability**

extent to which a fertilizer can be drained from its container by gravity as determined by an empirical procedure

**3.3.9**

**sedimentation**

process of particles settling in a fluid medium as a result of gravitational or other applied force

**3.3.10****flow rate**

mass flow of a material flowing freely through the outlet of a specified calibrated funnel

**3.3.11****free flowing**

fertilizer which flows easily without applying any additional force other than gravity

**3.3.12****segregation**

differential movement of particles within a mixture due to differences in their size, shape or density

**3.3.13****porosity**

volume fraction of the pores in a fertilizer

**3.3.14****static angle of repose**

angle at the base of the cone of fertilizer obtained by allowing a sample to fall onto a horizontal base-plate under specified conditions

**3.3.15****size guide number****SGN**

number that represents the typical particle size

Note 1 to entry: To calculate SGN, the opening in millimetres that retains or passes 50 % by weight is determined and then multiplied by 100.

Note 2 to entry: The typical particle size is also called the mass median diameter (D50).

**3.3.16****uniformity index****UI**

ratio of the size of small particles (R95) to large particles (R10) times 100

Note 1 to entry: A lower UI indicates a broad particle size distribution and a higher UI indicates a narrow distribution.

**3.3.17****granulometric spread index****GSI**

ratio of granulometric spread based on the spread over two standard deviations around the mass median particle diameter to mass median particle diameter

**3.4 Terms relating to physico-chemical properties****3.4.1****moisture**

water extractable from a fertilizer by using a specified method appropriate to that fertilizer

**3.4.1.1****essential water**

water in stoichiometric quantities that forms an integral part of the molecular or crystal structure

**3.4.1.2****water of crystallisation**

essential water present in a stable solid hydrate

**3.4.1.3**

**water of constitution**

essential water that is released when the solid decomposes

**3.4.2**

**ammoniacal nitrogen**

portion of the inorganic nitrogen contained in fertilizer that exists in ammonium form

**3.4.3**

**nitric nitrogen**

portion of the inorganic nitrogen contained in a fertilizer that exists in nitrate form

**3.4.4**

**ureic nitrogen**

portion of nitrogen contained in a fertilizer that exists in ureic form

**3.4.5**

**water-soluble phosphate**

portion of the phosphate contained in a fertilizer that is soluble in water

**3.4.6**

**ammonium citrate soluble phosphate**

phosphate content of a fertilizer that is soluble in a solution of ammonium citrate and ammonia of a stated standardized concentration

Note 1 to entry: Water-soluble phosphorus is not included.

Note 2 to entry: Neutral and base ammonium citrate are both included.

**3.4.6.1**

**neutral ammonium citrate soluble phosphate**

phosphate content of a fertilizer that is soluble in a neutral solution of ammonium citrate and ammonia (pH 7,0)

**3.4.7**

**citrate soluble phosphate**

part of the total phosphate in a fertilizer that is insoluble in water but soluble in a solution of citrated of ammonium citrate

**3.4.8**

**EDTA soluble phosphate**

part of the total phosphate in a fertilizer that is insoluble in water but soluble in a solution of EDTA of a stated standardized concentration

**3.4.9**

**EDTA extracted phosphate**

phosphate extracted by a solution of EDTA (0,1 mol/l) at 60 °C

Note 1 to entry: In some regions, it is referred to as available phosphate.

**3.4.10**

**available phosphate**

sum of water-soluble and the citrated or EDTA soluble phosphate as based on regional or national regulation or in the absence of such regulations to be considered as the sum of water-soluble and citrated soluble phosphate or EDTA soluble phosphate

**3.4.11**

**water-soluble potash**

portion of the potash contained in fertilizer that is soluble in water

**3.4.12****free acidity**

sum of all acidic components in an un-neutralized state

**3.4.13****neutralizing value**

potential neutralizing capacities of 100 kg of product, measured through the reaction with a strong acid such as hydrochloric acid

Note 1 to entry: Several units may be used (CaO equivalent, CaCO<sub>3</sub> equivalent or HO<sup>-</sup> equivalent).

**3.4.14****saturation temperature**

temperature below which crystallization of dissolved constituents begins and above which the last crystals dissolve

**3.4.15****disintegrable rate**

rate at which a granulated product is disintegrated and dispersed in water during a specified time period

Note 1 to entry: This rate is expressed in mass fraction.

Note 2 to entry: This rate varies in function of the sieve size used and the mass fraction is obtained by the materials getting across the sieve compared with all materials.

Note 3 to entry: The disintegrated and dispersed process is also called “the breakdown of granulated fertilizer”.

**3.4.16****longevity**

time period over which slowly available plant nutrients from a fertilizer are released and made available for plants

**3.4.17****reactivity**

rate of reaction of a liming material with acid under specified conditions measured with a specific standard

**3.4.18****liming effect**

effect of a liming material on a pH increase and soil physical, chemical or biological properties

**3.4.19****salt out temperature****SOT**

temperature of a liquid fertilizer at which the salt content of the liquid exceeds its solubility

Note 1 to entry: At this temperature, a solid phase begins to form.

**3.5 Terms relating to safety****3.5.1****resistance to detonation**

not capable of explosion concerning ammonium nitrate fertilizers of high nitrogen content under the circumstances of a specific test

**3.5.2****oxidizing solid**

solid which can contribute and intensify the combustion of other material by supplying oxygen

Note 1 to entry: For fertilizers, generally these products contain a high amount of nitrates.

### 3.5.3

#### **oxidizing liquid**

liquid which can contribute and intensify the combustion of other material by supplying oxygen

Note 1 to entry: For fertilizers, generally these products contain a high amount of nitrates.

### 3.5.4

#### **GHS label**

#### **globally harmonized system label**

appropriate group of written, printed or graphic information elements concerning a hazardous product, selected as relevant to the target sector(s), which is affixed to, printed on, or attached to the immediate container of a hazardous product, or to the outside packaging of a hazardous product

Note 1 to entry: GHS means the "Globally Harmonized System of Classification and Labelling of Chemicals".

### 3.5.5

#### **seedling emergence and growth**

index which assesses the potential effect of fertilizer on seedling emergence and growth compared with control group

Note 1 to entry: It can be used for evaluating the harmful effects of fertilizers.

### 3.5.6

#### **vegetative vigour**

index which assesses the effect of fertilizer on plant growth compared to a control group

Note 1 to entry: It can be used for evaluating the various effects of fertilizers.

### 3.5.7

#### **self-sustaining decomposition**

oxidation process of a fertilizer which, after ignition sustains this oxidation without the availability of external oxygen

Note 1 to entry: The oxygen is generally present in the form of nitrates.

## 3.6 Terms relating to sampling

### 3.6.1

#### **sampling unit**

defined quantity of material having a boundary which may be physical (e.g. a container) or hypothetical (e.g. particular time or time interval in the case of a flow of material)

Note 1 to entry: A number of sampling units may be gathered together, for example in a package or box.

### 3.6.2

#### **partial sample partial increment**

quantity of material taken at a point from a sampling unit

Note 1 to entry: This is also referred to as a sub sample.

### 3.6.3

#### **increment**

quantity of material taken from a sampling unit

Note 1 to entry: This may be constituted from a number of partial samples.