



SLOVENSKI STANDARD
oSIST prEN 17700-5:2023

01-maj-2023

Rastlinski biostimulanti - Navedbe - 5. del: Določanje razpoložljivosti hranil v tleh in rizosferi

Plant biostimulants - Claims - Part 5: Determination of availability of confined nutrients in the soil or rhizosphere

Pflanzen-Biostimulanzien - Auslobungen - Teil 5: Bestimmung der Verfügbarkeit von gebundenen Nährstoffen im Boden oder in der Rhizosphäre

Biostimulants des végétaux - Allégations - Partie 5 : Détermination de la disponibilité des éléments nutritifs confinés dans le sol ou la rhizosphère

Ta slovenski standard je istoveten z: prEN 17700-5

ICS:

65.080

Gnojila

Fertilizers

oSIST prEN 17700-5:2023

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 17700-5

March 2023

ICS 65.080

Will supersede CEN/TS 17700-5:2022

English Version

Plant biostimulants - Claims - Part 5: Determination of availability of confined nutrients in the soil or rhizosphere

Biostimulants des végétaux - Allégations - Partie 5 :
Détermination de la disponibilité des éléments nutritifs
confinés dans le sol ou la rhizosphère

Pflanzen-Biostimulanzien - Auslobungen - Teil 5:
Bestimmung der Verfügbarkeit von gebundenen
Nährstoffen im Boden oder in der Rhizosphäre

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 455.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 17700-5:2023) has been prepared by Technical Committee CEN/TC 455 “Plant biostimulants”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede CEN/TS 17700-5:2022.

prEN 17700-5:2023 includes the following significant technical changes with respect to CEN/TS 17700-5:2022:

- Update of Annex A and C.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

The EN 17700 series, *Plant biostimulants — Claims*, consists of the following parts:

- *Part 1: General principles;*
- *Part 2: Nutrient use efficiency resulting from the use of a plant biostimulant;*
- *Part 3: Tolerance to abiotic stress resulting from the use of a plant biostimulant;*
- *Part 4: Determination of quality traits, resulting from the use of a plant biostimulant;*
- *Part 5: Determination of availability of confined nutrients in the soil or rhizosphere.*

prEN 17700-5:2023 (E)

Introduction

This document has been developed to provide guidance for a consistent approach to justify the claims associated with the use of plant biostimulants in agriculture.

The definition of plant biostimulants to be used in the regulation on fertilizing materials is claims-based. For this reason, demonstrating that a product is indeed a *bona fide* plant biostimulant depends on a demonstration of its effect.

The placing of a plant biostimulant on the market should never be considered to guarantee effectiveness under all conditions, as many factors may influence the performance of a plant biostimulant in the field.

Plant biostimulants used in agriculture can be applied in multiple ways: on soil, on plant, as seed treatment, etc. This document is applicable to all application types of plant biostimulants in agriculture.

WARNING — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

IMPORTANT — It is absolutely essential that tests conducted in accordance with this document be carried out by suitably trained staff.

ITEH STANDARD PREVIEW
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[oSIST prEN 17700-5:2023](https://standards.iteh.ai/catalog/standards/sist/13013001-fbf9-4ca7-9b65-dabc47aeb62a/osist-pren-17700-5-2023)

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1 Scope

The claim described in this document concerns the improvement of availability of confined nutrients in the soil or rhizosphere by a plant biostimulant.

This document is aimed primarily at manufacturers, laboratories, researchers, technical centres, companies that will put the products on the market, notifying authorities, notified bodies, and market surveillance authorities.

To be in compliance with this standard, it is important also to follow the Recommendations and Quality Criteria described in the Standard of General Principles EN 17700-1:—¹.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 17700-1:—¹, *Plant biostimulants — Claims — Part 1: General principles*

EN 17724:—², *Plant biostimulants — Terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 17700-1:—¹, EN 17724:—², and the following 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

available nutrient

element either present in the soil solution or exchangeable on soil colloids

3.2

confined nutrient

element present in the solid and gaseous phase of the soil, except on soil colloids

3.3

improvement of availability of confined nutrients in the soil or rhizosphere

moving soil nutrients from the pool of confined nutrients to the pool of available nutrients

3.4

rhizosphere

volume of soil around living roots that is influenced by root activities

¹ Under preparation

² Under preparation

prEN 17700-5:2023 (E)**3.5****soil**

layer of unconsolidated material consisting of weathered material particles, dead and living organic matter, air space, and soil solution

3.6**soil solution**

liquid phase of the soil and its solutes

3.7**soil colloid**

finer size fraction of the soil (clay and organic matter), being also considered as the most chemically active portion of the soil because of its large surface area and the chemical structure of the materials involved

4 Terminology of the claims**4.1 Claims**

Claimed improvement of availability of confined nutrients shall be completed with one or more nutrient(s) which is/are concerned by this effect (e.g. nitrogen (N), phosphorus (P), nitrogen and phosphorus (N and P), potassium (K), zinc (Zn), microelements, ...).

Moreover, it is possible to specify in the claim if it is applied to soil or rhizosphere or both.

Soil types and pH categories shall be indicated according to the validated claims (see 6.2.1).

Some examples of claims which can be mentioned on the label are presented hereunder:

- “Improves availability of microelements confined in the soil and the rhizosphere”,
- “Improves availability of phosphorus in the rhizosphere”,
- “Improves availability of nitrogen in the soil”.

5 Assessment markers to validate the claim**5.1 General considerations for markers measurements**

Improvement of the availability of nutrients confined in the soil shall be evaluated by comparing the concentration or quantity of the available nutrient element (in the soil, soil and rhizosphere or plants) in the control treatment (without plant biostimulant application) and in the plant biostimulant treatment (applied plant biostimulant).

Markers shall be determined with the same methods and same equipment on both control treatment and plant biostimulant treatment.

Markers to evaluate the improvement of the availability of nutrient confined in the soil or rhizosphere, noted as markers in the text, could be determined on **3 different matrixes** (soil, soil and rhizosphere or plants). For each matrix, markers shall be determined on representative samples.

NOTE Growing medium is not considered as soil or soil rhizosphere in this document.

5.2 Soil or rhizosphere markers

5.2.1 Soil sample preparation

Soil or rhizosphere samples should be processed according to EN 16179.

After sampling, the soil or rhizosphere samples should be kept cool and processed as soon as possible (ISO 18512 may be used for the preservation and storage of soil samples).

Prior to analysis, the soil or rhizosphere samples can be air-dried, or dried in an oven at temperatures not exceeding 0 °C for at least 72h, or freeze-dried or cool stored (4 °C) according to the recommended methodology for the measured markers.

5.2.2 Available soil nutrient determination

Available nutrient concentration in the soil or rhizosphere shall be determined after extraction and analytical determination methods.

Extraction and determination methods shall be carried out following different National, European, International standards or by scientific methods, excluding methods elaborated to determine total element in the soil (e.g. ISO 11466, ISO 22036 and EN ISO 11885 methods are excluded).

Annex A gives examples of methods that should be used to determine nutrient content in soil and rhizosphere for each nutrient. This list is not exhaustive and can be extended as long as the same method is applied to all soil and rhizosphere samples.

Available nutrient content in soil and rhizosphere shall be expressed in milligrams of the element per kilogram of soil dry matter.

5.3 Plant markers

5.3.1 Plant sample preparation

Parts of the plant which are targeted by the plant biostimulant effect shall be sampled (e.g. shoots and roots individually or pooled together).

Plant samples should be washed prior drying if the plant biostimulant was applied by foliar application.

After sampling, the plant samples should be dried in an air-forced oven at temperatures not exceeding 40 °C to reduce the risk of volatilization (as described in EN ISO 16198:2015, see Annex B).

When steady biomass is achieved (usually after ca. three days), the plant samples shall be removed from the oven and be weighed with an accuracy of ± 1 mg for biomass determination. Plant samples shall then be conserved under dry conditions in their container until analysis.

5.3.2 Plant nutrient determination

In trials with plants, the improvement of availability of confined nutrients in soil or rhizosphere should be demonstrated by the increase of nutrient exports (NE) by the plant.

Prior to the determination of nutrient concentration, plant samples should be prepared according to the information given in the adequate methods. An example of a procedure for the digestion of plant samples and a plant analysis review article are given in Annex B.

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The nutrient export (NE) in plants during the test culture period shall be calculated according to the formula:

$$NE = C \times Y$$

where

NE is the nutrient export of the nutrient into the plant (shoot or root or both), in g/ha or g/plant;

C is the concentration of the plant nutrient in the part of interest, in g/g;

Y is the crop yield. This can be interpreted in different manners: harvested part or total biomass, in g/ha or g/plant.

6 Specifications for the performance of the trials

6.1 General specifications

Trials intended to demonstrate the efficacy of a plant biostimulant claiming the “improvement of the availability of confined nutrients in the soil or rhizosphere” shall comply with the requirements of this clause:

- The experimental trials can be carried out under controlled conditions or at the field.
- Trials can be implemented on bare soil or on planted soil.

6.2 Trial design

6.2.1 General

Trial design shall comply with the *General principles* standard (EN 17700-1:—1).

For trial design, it is necessary to take into account pH and the texture of soils described below and the minimum number of trials defined in Table 1:

Table 1 — Minimum number of trials required

Effect claimed for one specific type of soil type and for all pH categories	2 trials in total from 2 different pH categories in one specific type of soil Product is successfully demonstrated on the soil chosen during the same year or different years
Effect claimed for one specific pH category and for all soil types	3 trials in total from 3 different soil texture categories in one specific pH category Product is successfully demonstrated on the soil chosen during the same year or different years
Effect claimed for all soil types of soil and all pH categories	6 trials in total from 2 different pH categories and 3 different soil texture categories Product is successfully demonstrated on the soil chosen during the same year or different years