SLOVENSKI STANDARD
SIST-TS CEN/TS 17700-1:2023

01-januar-2023

Rastlinski biostimulanti - Navedbe - 1. del: Splošna načela

Plant biostimulants - Claims - Part 1: General principles

Pflanzen-Biostimulanzien - Auslobungen - Teil 1: Allgemeine Grundsätze

Biostimulants des végétaux - Allégations - Partie 1 : Principes généraux

Ta slovenski standard je istoveten z: **CEN/TS 17700-1:2022**

ICS:

65.080 Gnojila Fertilizers

SIST-TS CEN/TS 17700-1:2023 **en,fr,de**

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 17700-1

March 2022

ICS 65.080

English Version

Plant biostimulants - Claims - Part 1: General principles

Biostimulants des végétaux - Allégations - Partie 1 : Principes généraux

Biostimulanzien für die pflanzliche Anwendung - Angaben - Teil 1: Allgemeine Grundsätze

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Ref. No. CEN/TS 17700-1:2022 E

Contents

Page

European foreword

This document (CEN/TS 17700-1:2022) has been prepared by Technical Committee CEN/TC 455 “Plant biostimulants”, the secretariat of which is held by AFNOR.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association.

The CEN/TS 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 nutrient in the soil or rhizosphere*.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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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 can 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.

1 Scope

This document specifies the general principles for justifying the product claims for plant biostimulants.

General principles consist of and define all general parameters, requirements and quality criteria, and are intended to be applied in order to assess the efficacy of trials used for claim(s) validation as a result of the use of 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.

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.

CEN/TS 17700-5:2022, *Plant biostimulants — Claims — Part 5: Determination of availability of confined nutrients in the soil or rhizosphere*

CEN/TS 17724:2022, *Plant biostimulants — Terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 17724:2022 and the following apply.

3.1
plant biostimulant
product stimulating plant nutrition processes independently of the product's nutrient content with the sole aim of improving one or more of the following characteristics of the plant or the plant rhizosphere:

- nutrient use efficiency,
- tolerance to abiotic stress,
- quality traits,
- availability of confined nutrient in soil or rhizosphere

3.2
claim
effect(s) of the product that can be asserted on the product label of a plant biostimulant after the conformity assessment procedure

3.3
general principle
rule defining the crops and quality criteria applicable to all plant biostimulants for carrying out the tests necessary to justify the claim

3.4
crop
cultivated plant including all components of the plant (above ground parts and below ground parts), mushrooms, microalgae and macroalgae

3.5
plant nutrient
chemical element used by the plant for growth and development, usually classified as a Primary Macronutrient, Secondary Macronutrient or Micronutrient in the quantity required by the plant

Note 1 to entry: Carbon, hydrogen, and oxygen are also essential elements for plant growth.

Note 2 to entry: Primary Macronutrients – Nitrogen (N), Phosphorus (P), Potassium (K),

Secondary Macronutrients – Calcium (Ca), Magnesium (Mg), Sodium (Na), Sulphur (S).

Micronutrients – Boron (B), Cobalt (Co), Copper (Cu), Iron (Fe), Manganese (Mn), Molybdenum (Mo), Zinc (Zn).

3.6
protected crop
crop cultivation in greenhouses or plastic tunnels with or without specific control of climate conditions according to the farming practice

EXAMPLE cucumber or tomato cultivation

4 Type of information that can be used to demonstrate efficacy of a claim

4.1 Field and/or protected crop experimental data

Field trials are essential to justify plant biostimulant claims. For some claims, however, the appropriate field conditions cannot always be easily reached (for example, salt stress or cold stress) in the field.

4.2 Under controlled conditions (e.g.: laboratory data, greenhouse, growth chamber…)

Plant biostimulant claims can be proven (depending on the claim defined in the dedicated Technical Specification) by data generated under controlled conditions (e.g. greenhouses, growth room, growth chamber, laboratory data).

4.3 Literature review

Scientific literature can be used as given in Technical Specifications CEN/TS 17700-2:2022 , CEN/TS 17700-3:2022 , CEN/TS 17700-4:2022 and CEN/TS 17700-5:2022 to describe analytical methods and methods used to measure the effect of a product.

Only peer review literature (e.g. referenced by the Scopus/Web of science databases) shall be accepted.

5 General guideline for trials/assays of plant biostimulants

5.1 General

All experiments/trials shall be performed according to the Quality Criteria defined in this document.

5.2 Crop groupings for the performance of plant biostimulant trials

The crop groupings for conduction of plant biostimulant trials are defined in Table 1, except for the availability of confined nutrients in a soil claim. If the crop is not listed in Table 1, refer to the definition below to determine the appropriate crop group. Moreover, if the crop does not fit one of these definitions below, the "a specific crop" rule described in Table 2 will be followed.

- Broadacre crops (combinable and processing products): annual and non-annual crops usually characterized by being grown in large extensions, harvested via combiners or industrial harvesters, with the aim of obtaining vegetative organs, Roots, Tubers and/or seeds/grains,
- Woody perennials: non-annual crops with the ability to cover their stems with suberized cork,
- Vegetables, ornamental and AMP (Aromatic and Medicinal Plant) crops: annual and non-annual crops usually correlated with seasonality and not included in the broadacre and woody perennial crops.

Table 1 — Crop groupings

Broadacre: Combinable and Processing Products	**Woody Perennials**	**Vegetables, ornamental and AMP** [a] **crops**
BARLEY	ALMOND	ANGELICA
BEAN	APPLE	ANISE
BEET	APRICOT	ASPARAGUS
BORAGE	AVOCADO	AUBERGINE
BUCKWHEAT	BAY	BALM
CHICKPEA	BILBERRY	BANANA
CLOVER	BLACK CURRANT	BASIL
COTTON	BLACKBERRY	BROCCOLI and CALABRESE
DURUM WHEAT	BLUEBERRY	BRUSSELS SPROUT
EVENING PRIMROSE	CAPERS	BULB ONION
GRASSLAND	CHERIMOYA	CABBAGE
HEMP	CHERRY	CARDOON
LENTIL	CHESTNUT	CARROT
LINSEED	CITRUS FRUITS	CAULIFLOWER
LUCERNE	COCOA TREE	CELERIAC
LUPIN	COFFEE TREE	CELERY
MAIZE	CRANBERRY	CELERY LEAVES (Caraway and Salad Burnet)
MUSTARD (for seed)	CURRY LEAVES	CHERVIL
OAT	DATE	CHICORY (Witloof)
PEA	ELDERBERRY	CHILLI
POPPY	FIG	CHINESE CABBAGE

Broadacre: Combinable and Processing Products	Woody Perennials	Vegetables, ornamental and AMP [a] crops
POTATO	GRAPE	CHIVES
QUINOA	GUAVA	CHOI SUM
RAPE	HAZELNUT	COLLARD
RICE	HOPS	CORIANDER
RYE	JUNIPER	COURGETTE and SUMMER SQUASH
SAFFLOWER	KAFFIR LIME	CRESS
SAINFOIN	KIWI	CUCUMBER
SESAME	LIQUORICE	DILL
SORGHUM	LOGANBERRY	EDIBLE FLOWERS
SOYBEAN	MANGO	EDIBLE LEAF MUSTARD
SPELT	MEDLAR	ENDIVE
SUGAR BEET	MULBERRY	FENNEL
SUGARCANE	NECTARINE	FLOWERS and FILLERS
SUNFLOWER	OLIVE	GARLIC
SWEET POTATO	PAPAYA	GHERKIN
SWEETCORN	PASSION FRUIT	GLOBE ARTICHOKE
TOBACCO	PEACH	HORSERADISH
TRITICALE	PEAR	JERUSALEM ARTICHOKE
TURF	PERSIMMON	KALE and CAVOLO NERO
VETCH	PISTACHIO	KOHLRABI
WHEAT	PLUM	LAMB'S LETTUCE
	POMEGRANATE	LAND CRESS
	QUINCE	LEEK
	RASPBERRY	LETTUCE
	RED CURRANT	LOVAGE
	ROSEHIP	MAJORAM
	TEA TREE	MELON
	WALNUT	MINT
		MUSHROOM
		OREGANO
		OTHERS AMP
		PARSLEY
		PARSNIP
		PEANUT

Broadacre: Combinable and Processing Products	Woody Perennials	Vegetables, ornamental and AMP [a] crops
		PEPPER
		PINEAPPLE
		PUMPKIN and WINTER SQUASH
		PURSLANE
		RADISH
		RED BEET
		RHUBARB
		ROCKET
		ROSEMARY
		SAFFRON
		SAGE
		SALAD ONION
		SALSIFY
		SAVORY
		SEA KALE
		SHALLOT
		SPINACH
		STRAWBERRY
		SWEDE
		SWEET CICELY
		SWISS CHARD (Spinach Beet)
		TARRAGON
		THYME
		TOMATO
		TURNIP
		VANILLA
		WATERCRESS
		WATERMELON

[a] Aromatic and Medicinal Plant

5.3 Minimum number of trials to be provided

To justify a claim, a minimum number of trials shall be performed with the same protocol and methods per claim according to the criteria described in the Table 2.

When trials are carried out without crops, three pH categories (pH < 6,2 /6,2 < pH < 7,5 /pH > 7,5) and four type of textures categories (Silt, Sand, Clay, Loam) have to be considered, as described in Table 2.