

# PHILIPPINE NATIONAL STANDARD

PNS/BAFS 183:2020  
ICS 65.080

---

---

## Organic soil amendments



**BUREAU OF AGRICULTURE AND FISHERIES STANDARDS**  
BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines  
Phone (632) 920-6131; (632) 455-2856; (632) 467-9039; Telefax (632) 455-2858  
E-mail: [bafpsda@yahoo.com.ph](mailto:bafpsda@yahoo.com.ph)  
Website: [www.bafps.da.gov.ph](http://www.bafps.da.gov.ph)

## Foreword

The Philippine National Standard (PNS) on Organic Soil Amendments (OSA) was established and adopted last 2016 by the Bureau of Agriculture and Fisheries Standards with the guidance of the Technical Working Group.

In 2017, a call for the revision of the PNS/BAFS 183:2016 was made during the development of the PNS on the Code of Practice for the Production of Organic Soil Amendment (PNS/BAFS 291:2019). The revision is recommended to ensure that the standard is consistent with the provisions specified in PNS/BAFS 291:2019.

This edition includes the following significant changes compared to the previous edition:

- Inclusion of the PNS/BAFS 291:2019 in the Scope;
- Removal of the specifications for consistency and color of organic fertilizer and organic soil conditioner;
- Modification on the specification for moisture content of organic fertilizer and organic soil conditioner;
- Inclusion of a recommended level for total N- P<sub>2</sub>O<sub>5</sub> - K<sub>2</sub>O of solid and liquid organic plant supplement;
- Inclusion of a provision for the verification process of OSA with total N- P<sub>2</sub>O<sub>5</sub> - K<sub>2</sub>O content exceeding the required limit;
- Modification on the specifications for microbial inoculants;
- Modification on the required number of samples for solid products and weight of composite solid sample needed to be submitted to the laboratory;
- Inclusion of the Methods of Analysis for OSA;
- Amendment on the Labelling requirements; and
- Removal of the Annex for the List of Permitted Raw Materials for the Production of Organic Soil Amendment.

This Standard has been approved by the Secretary of the Department of Agriculture in 2020.

This Standard cancels and replaces PNS/BAFS 183:2016.

This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2.

**Organic soil amendments**

<b>Table of Contents</b>	<b>Page</b>
Foreword	i
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Product description.....	1
4.1 Organic fertilizer.....	1
4.2 Organic soil conditioner.....	2
4.3 Microbial inoculant.....	2
4.4 Organic plant supplement.....	2
5 Minimum requirements.....	2
5.1 Raw materials.....	2
5.2 Specifications.....	2
5.3 Contaminants.....	5
5.4 Absence of foreign materials .....	5
6 Sampling methods.....	6
6.1 For composite sampling of solid products.....	6
6.2 For composite sampling of liquid products.....	6
7 Methods of analysis.....	7
8 Labeling.....	7
 Annex	
A Methods of analysis for organic fertilizer, organic soil conditioner..... and organic plant supplement	9
B Methods of analysis for the presence of contaminants in microbial .....	
inoculants	10

## 1 Scope

This Standard applies to organic fertilizers, organic soil conditioners, microbial inoculants, and organic plant supplements. The emphasis on how to minimize contamination from microbiological, physical, and chemical hazards is in accordance with the relevant provisions under the Philippine National Standard (PNS) on the Code of Practice for the Production of Organic Soil Amendments (PNS/BAFS 291:2019).

## 2 Normative references

There are no normative references used in this document.

## 3 Terms and definitions

For the purpose of this Standard, the following definitions apply:

### 3.1 batch

organic soil amendment that is produced from the same type of organic materials, at the same time and location, by the same manufacturer/producer, or made during the same cycle or period of manufacture

### 3.2 contaminant

any substance that can come in contact with organic soil amendment and compromise its organic integrity

### 3.3 labeling

display of any written, printed, or graphic representation on the label of a product for the purpose of promoting its sale or disposal. Information on the label provides the sellers and the buyers with the safe and effective use of the product for which it is registered

### 3.4 organic soil amendments

include all the products within the scope of the Standard, i.e. organic fertilizer, organic soil conditioner, microbial inoculant, and organic plant supplement

### 3.5 pathogens

organisms that can cause negative effects on human health

### 3.6 raw materials

naturally-occurring materials used in the production of organic soil amendments

## 4 Product description

**4.1 Organic Fertilizer** - any product in solid or liquid form, derived from plants or animals that has undergone substantial decomposition that can supply available nutrients to plants with a total Nitrogen (N) - Phosphorus (P<sub>2</sub>O<sub>5</sub>) - Potassium (K<sub>2</sub>O) content of five to ten percent (5-10%).

**4.2 Organic Soil Conditioner** - any product in solid or liquid form, derived from plants or animals that has undergone substantial decomposition that can supply

available nutrients to plants with a total N- P<sub>2</sub>O<sub>5</sub> - K<sub>2</sub>O content of 2.5 to less than five percent (2.5 - < 5%).

**4.3 Microbial Inoculant** – biologically-active product containing optimum population of one or a combination of active strains of bacteria, algae, and fungi that are useful in different biological activities, such as, but not limited to: N<sub>2</sub>-fixation, decomposition of organic residues, and enhancement of nutrient availability.

**4.4 Organic Plant Supplement** - any compound of organic origin in liquid or solid form that has a total N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O content of not less than 0.5% to not more than 10% for solid and to less than 5% for liquid. These include but are not limited to: FPJ (Fermented Plant Juice), FFJ (Fermented Fruit Juice), FAA (Fish Amino Acid), FE (Fish Emulsion), Seaweed Extracts, Vermi Tea, Compost Tea, and the like.

## 5 Minimum requirements

### 5.1 Raw materials

Raw materials to be used for the production of organic soil amendments should be in accordance with the list of permitted raw materials for the production of organic soil amendments as listed in the National List of Permitted Substances for Organic Agriculture.

### 5.2 Specifications

**5.2.1** Solid and liquid organic fertilizer, organic soil conditioner, and organic plant supplement should be in accordance to the specifications shown in Table 1.

**Table 1- Specifications for organic fertilizer, organic soil conditioner, and organic plant supplement**

Specifications	Organic Fertilizer (Solid)	Organic Fertilizer (Liquid)	Organic Soil Conditioner (Solid and Liquid)	Organic Plant Supplement (Solid and Liquid)
Total N-P <sub>2</sub> O <sub>5</sub> -K <sub>2</sub> O, %	5 - 10%	5 - 10%	2.5 - <5%	0.5 - 10% for Solid  0.5 - < 5% for Liquid
C:N ratio	10:1 - 20:1	---	10:1- 20:1	---
Organic Matter (OM), %	≥ 20	---	≥20	---
Actual Moisture Content (MC), %	≤ 35	---	Solid: ≤ 35 Liquid: none	---
Odor	No foul odor: (ammonia, rotting or fermentation)	---	No foul odor: (ammonia, rotting or fermentation)	---

**5.2.1.1** Verification should be done on the raw materials and process if the total N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O content of the product exceeds the specified limit in Table 1. Confirmatory

test should be conducted on the product based on the methods of test for the total N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O specified in Annex A.

**5.2.1.2** For solid organic fertilizer, all specifications in Table 1, except actual MC, should be in dry weight basis

**5.2.1.3** For solid and liquid organic fertilizer, organic soil conditioner, and organic plant supplement containing microbial inoculants, the Genus should be verifiable and stated in the label.

**5.2.3** Microbial inoculants depending on its category or genus should be in accordance with the specifications shown in Table 2 to Table 10.

**5.2.3** For multi-strain inoculants or inoculants containing a consortium of microorganisms, claims should be verifiable.

**Table 2 - Minimum requirements for rhizobia**

Base	Solid
Viable Cell Count, minimum	10 <sup>8</sup> cfu/g
Contaminants	At least no contaminants at 10 <sup>-5</sup> dilution
Particle size	At least 50% of materials should pass through 200 mesh sieves
pH	6.0-7.5
Moisture content by weight (solid inoculants)	30-40%
Distinguishing characteristic(s)	Should show effective nodulation on all legume species listed in the packet using plant infection technique under axenic/ gnotobiotic condition

**Table 3- Minimum requirements for *Azospirillum***

Base	Solid
Viable Cell Count, minimum	10 <sup>8</sup> cfu/g
Contaminants	At least no contaminants at 10 <sup>-5</sup> dilution
Particle size	At least 50% of materials should pass through 200 mesh sieves
pH	6.0-7.5
Moisture content by weight	25-40%
Distinguishing characteristic(s)	Formation of white pellicle in semi-solid nitrogen-free media

**Table 4 - Minimum requirements for Phosphate Solubilizer (Bacteria)**

Base	Solid
Viable Cell Count, minimum	10 <sup>8</sup> cfu/g
Contaminants	No contaminants at 10 <sup>-5</sup> dilution
pH	6.0-7.5
Moisture content by weight	25-40%

Distinguishing characteristic(s), minimum	5 mm solubilization zone in prescribed media
---	--

**Table 5 - Minimum requirements for Phosphate Solubilizer (Fungi) – Spore forming**

Base	Solid
Spore Count, minimum	10 <sup>5</sup>
Contaminants	No contaminants at 10 <sup>-5</sup> dilution
pH	4.5-6.0
Moisture content by weight	30-40%
Distinguishing characteristic(s), minimum	At least 5 mm solubilization zone in prescribed media

**Table 6 - Minimum requirements for Endophytic Bacteria**

Base	Solid
Viable Cell Count, minimum	10 <sup>6</sup> cfu/g
Contaminants	No contaminants at 10 <sup>-5</sup> dilution
pH	6.0-7.0
Moisture content by weight	30-40%

**Table 7 - Minimum requirements for *Trichoderma***

Base	Solid
Viable Spore Count, minimum	10 <sup>8</sup> cfu of <i>Trichoderma</i> /g
Contaminants	No contaminants at 10 <sup>-5</sup> dilution
pH	5.0-6.5
Moisture content by weight	5-10%

**Table 8- Minimum requirements for Vesicular Arbuscular Mycorrhizal (VAM) Fungi**

Base	Solid
Most probable number (MPN) Solid inoculant Root inoculant	10 spores/g 2,300 Infective Propagules (IP)/g
Contamination level	Nematode-free
pH	4.5 - 8.0
Moisture content by weight, minimum	Solid - <10% Root Inoculant - 15-20%

**Table 9- Minimum requirements for Ectomycorrhizae**

Base	Solid (Tablet/Powder)
Spore Count, minimum	10 <sup>8</sup> spores/g

**Table 10 - Minimum requirements for *Azotobacter***

Base	Solid
Viable Cell Count, minimum	10 <sup>8</sup> cfu/g
Contaminants	No contaminants at 10 <sup>-5</sup> dilution
pH	6.0-7.0
Moisture content by weight	25-30%
Distinguishing characteristic(s)	Watery colonies on Burks medium

### 5.3 Contaminants

**5.3.1** The pathogens in solid and liquid organic fertilizers, organic soil conditioners, and organic plant supplements should be in accordance with the allowable levels shown in Table 11.

**Table 11 - Allowable level of pathogens for solid and liquid organic fertilizer, organic soil conditioner, and organic plant supplement**

Pathogens	Allowable Level
Fecal <i>Streptococci</i>	<5 x 10 <sup>2</sup> cfu/g <2 MPN/g
Total coliforms	<5 x 10 <sup>2</sup> cfu/g <2 MPN/g
<i>Salmonella</i>	Absent in 25 g

**5.3.2** The heavy metals in solid and liquid organic fertilizers, organic soil conditioners, and organic plant supplements should be in accordance with the levels shown in Table 12.

**Table 12 - Maximum allowable level of heavy metals for solid and liquid organic fertilizer, organic soil conditioner, and organic plant supplement**

Heavy Metals	Maximum Allowable Level (mg/kg dry wt.)
Arsenic (As)	20
Lead (Pb)	50
Chromium (Cr)	150
Mercury (Hg)	2
Cadmium (Cd)	5

### 5.4 Absence of foreign materials

Plastics, aluminum, wrappers, stones, and other materials shall be totally removed from the product.

## 6 Sampling methods for laboratory analysis

All finished products should be subjected to a lot sampling for laboratory analysis using the following procedures:



**6.1 For composite sampling of solid products**

- 6.1.1 The production documents containing the number of bags per batch number and bag number should be presented to the inspector.
- 6.1.2 The inspector should randomly select the bag number.
- 6.1.3 The selected bags should be emptied into a clean area. All contents of the selected bags should be thoroughly mixed.
- 6.1.4 Three kilograms (3 kg) of the composite sample should be submitted to the laboratory.
- 6.1.5 Information relative to the sample taken shall be accurate and complete to allow traceability of the sample back to the lot from which it was sampled.

**Table 13 - Required number of samples for solid products**

Number of bags per batch	Bags to be sampled
≤50	2
51 to 100	3
101 to 300	8
301 to 500	15
501 to 1000	20
More than 1000	20 per 1000

**6.2 For composite sampling of liquid products:**

- 6.2.1. The production documents containing the number of containers per batch number and container number should be presented to the inspector.
- 6.2.2. The inspector should randomly select the container number and subject the selected containers for analysis.
- 6.2.3. Information relative to the sample taken shall be accurate and complete to allow traceability of the sample back to the lot from which it was sampled.

**Table 14- Required number of samples for liquid products**

Number of containers <sup>a</sup> per batch	Containers to be sampled
≤50	1
51 to 100	2
101 to 300	3
301 to 500	4
More than 500	5

<sup>a</sup> 1 container should be at least 1 L

**7 Methods of Analysis**

- 7.1 The methods of analysis to test the organic fertilizer, organic soil conditioner and organic plant supplement should be in accordance with the methods listed in

Annex A.

**7.2** The methods of analysis for the presence of contaminants in microbials should be in accordance with the methods listed in Annex B.

## **8 Labeling**

**8.1** Label should be of such design and material that does not deteriorate easily, become illegible, or get separated from the container under the rigors of transport, storage, and use. It should withstand extreme weather conditions.

**8.2** The minimum information on the label of organic soil amendments are the following:

**8.2.1** Name of product

**8.2.2** Name of distributor/ manufacturer

**8.2.3** Address and Contact number of distributor/ manufacturers

**8.2.4** Date manufactured

**8.2.5** Net content

**8.2.6** Product information

a. Raw materials (optional)

b. Nutrient content (Total N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O content)

c. Product description and type

**8.2.7** Lot/ Batch No.

**8.2.8** Expiry date (for liquid fertilizers)

**8.2.9** Compatibility with Bio- pesticides (optional)

**8.2.10** Directions for use

**8.2.11** Storage and disposal

**8.2.12** Warning/ precautions

**8.2.13** List of microbial inoculants used for enrichment (as applicable)

**Bibliography**

PNS/BAFS 07:2016 – Organic Agriculture

PNS/BAFS 183: 2016- Organic Soil Amendments

PNS/BAFS 291:2019 – Code of Practice on the Production of Organic Soil Amendments

USDA. USDA National Organic Program Standards for Organic Agriculture

**Annex A**  
(normative)

**Methods of analysis for organic fertilizer, organic soil conditioner and organic plant supplement**

**Table A.1- Methods of analysis for the specifications of solid and liquid organic fertilizers, organic soil conditioner, and organic plant supplements**

Specifications	Methods of Analysis
Total Nitrogen	Kjeldahl Method
Phosphorus	Molybdovanado Phosphoric Acid
Potassium	Spectrophotometry Ammonium Acetate Method
Total Organic Carbon	Modified Walkley-Black Method
Organic Matter	Modified Walkley-Black Method
Moisture content	Gravimetric Method

**Table A.2 – Methods of analysis for the level of pathogens for solid and liquid organic fertilizers, organic soil conditioner, and organic plant supplements**

Pathogens	Methods of Analysis
<i>Fecal Streptococci</i>	MPN Method/ Pour Plate/ Viable plate count
Total coliforms	MPN Method/ Pour Plate/ Viable plate count
<i>Salmonella</i>	Conventional/ Selective enrichment method

**Table A.3 – Methods of analysis for the level of heavy metals for solid and liquid organic fertilizers, organic soil conditioner, and organic plant supplements**

Heavy Metals	Methods of Analysis
Arsenic (As)	Acid Digestion and Quantitation by HG-AAS or Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES)
Lead (Pb)	
Chromium (Cr)	
Mercury (Hg)	
Cadmium (Cd)	

*Note: HG- Hydride Generator; GF- Graphite Furnace; CV- Cold Vapor*

**Annex B**  
(informative)

**Methods of analysis for the microbial inoculants**

**Table B.1– Methods of analysis for the microbial inoculants**

<b>Microbial inoculant</b>	<b>Methods of Analysis</b>
Rhizobia	Viable plate count and determination of phenotypic characteristics/ Glucose-peptone test
<i>Azospirillum</i>	Viable plate count and determination of phenotypic characteristics /Plating on nitrogen-free medium and Gram stain
Phosphate solubilizer (Bacteria)	Viable plate count and determination of phenotypic characteristics / Plating on Pikovskaya medium and Gram Stain
Phosphate solubilizer (Fungi)- Spore forming	Viable plate count and determination of phenotypic characteristics
Endophytic bacteria	Plating on the medium specific for the isolate and Gram Stain
Decomposer and Microbial Inoculant ( <i>Trichoderma</i> )	Viable plate count and determination of phenotypic characteristics
Vesicular Arbuscular Mycorrhizal (VAM) Fungi	Wet sieving, decanting method and microscopic determination
Azotobacter	Viable plate count and determination of phenotypic characteristics/ Plating on Burks medium and Gram Stain

**Department of Agriculture  
Bureau of Agriculture and Fisheries Standards**

**Technical Working Group (TWG) for the Development of the Philippine National  
Standard (PNS) Organic Soil Amendments**

**Chairperson**

Gerald E. Cammagay  
Bureau of Agriculture and Fisheries Standards  
Department of Agriculture

**Members**

- |   |   |    |   |
|---|---|----|---|
| 1 | Jacqueline S. Rojas<br>Bureau of Soils and Water<br>Management<br>Department of Agriculture                       | 6  | Erlinda S. Paterno  |
|   |   | 7  | Gina V. Pangga  |
|   |   | 8  | Blesilda M. Calub   |
|   |   | 9  | Nolissa D. Organo<br>Agricultural Systems Institute<br>University of the Philippines – Los<br>Baños                           |
| 2 | Nora B. Inciong<br>Professional Regulation<br>Commission  |    |   |
| 3 | Virginia C. Cuevas<br>Institute of Biological Sciences<br>University of the Philippines – Los<br>Baños            | 10 | Veronica P. Migo<br>College of Engineering and Agro-<br>Industrial Technology<br>University of the Philippines – Los<br>Baños |
| 4 | Nenita Dela Cruz<br>Central Luzon State University  |    |   |
| 5 | Marilyn Brown<br>National Institute of Microbiology<br>And Biology<br>University of the Philippines-<br>Los Baños | 11 | Leilani Ramona K. Limpin<br>Julie Ann M. Gepielago<br>OCCP Inspection and Certification<br>Services, Inc.                     |

**Project Manager**

Farlash D. Pancho  
Krisha Marie L. Mecija

**Adviser**

Vivencio R. Mamaril

Bureau of Agriculture and Fisheries Standards