

DRAFT TANZANIA STANDARD

Foliar-Fertilizers-Specification

PUBLIC COMMENTS ONLY

TANZANIA BUREAU OF STANDARDS

Foliar-fertilizer — Specification

0 FOREWORD

Foliar fertilizers are formulated specifically for foliar feeding, optimizing nutrient uptake through stomata (plant pore in the leaves). Their popularity has stemmed from the fact that they can be used as a quick measure to correct nutrient deficiencies in plants. They also stimulate the plant to absorb more nutrients from the soil. Foliar feeds are formulated to cater for specific plant needs and mainly for specific stages of crop growth.

This method of application is best suited for relatively low mobile elements such as calcium and the micronutrients. It also avoids the problems of nutrient interactions and unfavorable soil pH which results in nutrient unavailability as may be the case in soil applied fertilizers.

This standard has been prepared to encourage safe use of foliar fertilizers, promote fair trade practices and ensure safety of consumers.

In the preparation of this Tanzania Standard, considerable assistance was derived from the following standard;

- KS 2228: 2014 Foliar fertilizer (inorganic) — Specification
- US 1660:2017 Inorganic foliar fertilizer — Specification

In reporting the results of a test or analysis made in accordance with this Tanzania Standard, if the final value observed or calculated, is to be rounded off, it shall be done in accordance with TZS 4

1 Scope

This Tanzania standard specifies requirements and methods of sampling and test for foliar fertilizers

2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

TZS 4 Rounding off numerical values

AOAC 928.02, Chlorine (water-soluble) in fertilizers

AOAC 965.11, Cobalt in fertilizers

AOAC 975.01, Copper in fertilizers

AOAC 975.02, Zinc in fertilizers

AOAC 980.01, Iron in fertilizers

AOAC 980.02, Sulfur in fertilizers

AOAC 982.01, Boron (acid- and water-soluble) in fertilizers

AOAC 983.04, Sodium in fertilizers

AOAC 984.01, Magnesium (acid-soluble) in fertilizers

AOAC 2006.03, Arsenic, cadmium, cobalt, chromium, lead, molybdenum, nickel, and selenium in fertilizers — Microwave digestion and inductively coupled plasma-optical emission spectrometry

ISO 7888, Water quality—Determination of electrical conductivity

TZS 156, Fertilizers and soil conditioners—Vocabulary

TZS 1173, Solid fertilizers — Simple sampling method for small lots

3 Terms and definitions

For the purpose of this standard, the terms and definitions given in TZS 156 and the following apply;

3.1 Foliar

Of or relating to a leaf or leaves

3.2

foliar fertilizer

a liquid or water soluble-fertilizer applied to a plant's foliage in a fine spray so that the plant can absorb the nutrients through its leaves.

3.3

electrical conductivity

a measure of the total soluble salts, or the soluble nutrients (or ions) present in a fertilizer

3.4

Chelating compounds

specific kind of chemical compound that is more easily dissolved and absorbed than other types of molecules and chemical compounds. It is made up of a metal ion and a chelating agent that creates multiple soluble bonds to the ion. Chelating compounds are sometimes added to fertilizers to enhance a plant's ability to absorb nutrients.

4 Requirements

General requirements

4.1 Physical

The material shall be an aqueous solution or if in solid form it shall be completely soluble in water.

4.2 Specific requirements

4.2.1 Nutrient guarantees

Foliar fertilizers shall conform to the minimum limits for the following elements, if declared.

Table 1 — Minimum concentration for micro nutrients

SN	Element	Minimum conc.%	Test method
i)	Boron (B)	0.02	AOAC 982.01
ii)	Calcium (Ca)	1.00	AOAC 945.04
iii)	Cobalt (Co)	0.0005	AOAC 965.11
iv)	Copper (Cu)	0.05	AOAC 975.01
v)	Iron (Fe)	0.10	AOAC 980.01
vi)	Magnesium (Mg)	0.60	AOAC 984.01
vii)	Manganese (Mn)	0.05	AOAC 940.02
viii)	Molybdenum (Mo)	0.0005	AOAC 2006.03
ix)	Sulphur (S)	1.00	AOAC 980.02
x)	Zinc (Zn)	0.05	AOAC 928.02
Xi)	Nickel (Ni)	0.0010	AOAC 975.02
Xii)	Sodium (Na)	0.1000	AOAC 983.04

4.2.2 Electrical conductivity

Inorganic foliar fertilizers shall conform to the Maximum limit of 10 ms/cm for Electrical Conductivity (0.1% solution, 25 °C), when tested in accordance with ISO 7888

4.3 Chelating compounds

If chelating agents such as EDTA, NTA and IDHA are used, they shall be stated.

5 Heavy metal contaminants

Heavy metal contaminants in the fertilizers shall conform to the limits given in Table 2 when tested with the method specified therein.

Table 2 — Heavy metal contaminants limits

Sn	Parameter	Limits in mg/kg	Test method
i)	Arsenic, As, max.	20.0	AOAC 2006.03
ii)	Cadmium, Cd, max.	30.0	AOAC 2006.03
iii)	Mercury, Hg, max.	0.1	AOAC 2006.03
iv)	Lead, Pb, max.	30.0	AOAC 2006.03

6 Sampling and Testing

6.1 Sampling

Sampling shall be carried out in accordance with ISO 14820-1.

6.2 Testing

Testing of the fertilizer shall be done as prescribed in the methods of analysis indicated in respective standards.

7 Packaging, marking and labelling

7.1 Packaging

The fertilizer shall be packaged in materials that are clean and non-defective that protects the product from physical, chemical and moisture (for solid) contamination and withstand multiple stages of handling, transportation and storage.

7.2 Marking and Labelling

7.2.1 The package shall be indelibly labeled in either Kiswahili or Kiswahili and English with the following information:

- a) name of product as "Foliar fertilizer";
- b) name, address and physical location of manufacturer/packer/importer;
- c) guaranteed percentage by weight of each of the nutrients;

- d) date of manufacture;
- e) expiry date;
- f) batch/lot number;
- g) the form in which nutrient is present;
- h) Stage of crop growth to be applied;
- i) name of the chelating material used in case of trace elements;
- j) storage instructions;
- k) the net weight or volume of the fertilizer in the package;
- l) country of origin;
- m) disposal instructions and
- n) Instructions for use which should include but not limited to the following:
 - i) not to be applied during periods of water stress unless when under irrigation,
 - ii) Timing and frequency of application
 - iii) recommended weather for spraying.
 - iv) application rates.
 - v) information on compatibility with fungicides, insecticides or herbicides.

7.2.2 Marking

The containers/bags may also be marked with the TBS Standards Mark of Quality.

NOTE – The TBS Standards Mark of Quality may be used by the manufacturers only under license from TBS. Particulars of conditions under which the licenses are granted, may be obtained from TBS.