

COMPENDIUM OF INDIAN STANDARDS

ON

EFFICIENT WATER AND SOIL HEALTH MANAGEMENT

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INTRODUCTION

Water and soil are fundamental to India's agricultural productivity and ecological balance. As the nation faces challenges such as water scarcity, soil degradation, and the impacts of climate change, adopting sustainable practices in water and soil management has become imperative. The Bureau of Indian Standards (BIS) has developed a comprehensive set of standards to guide and standardize practices in these critical areas.

This compendium consolidates the relevant Indian Standards (IS) pertaining to efficient water use and soil health management.

INDIAN STANDARDS FOR SOIL QUALITY AND FERTILIZERS

A) FERTILIZER STANDARDS

1. IS 3029 : 1964 - SPECIFICATION FOR CASTORSEED CAKE FOR FERTILIZER PURPOSES

This specification pertains to castor seed cake used for fertilizer purposes. Castor seed cake is rich in nutrients and serves as an organic fertilizer, improving soil health and promoting sustainable agriculture.

2. IS 5406 : 2024 - UREA, FERTILIZER GRADE - SPECIFICATION (SECOND REVISION)

This specification for urea, fertilizer grade, outlines the quality parameters for urea used in agriculture. It ensures that the urea supplied meets the necessary standards for effective fertilization, promoting healthy crop growth.

3. IS 6046 : 2023 - GYPSUM FOR AGRICULTURAL USE - SPECIFICATION (SECOND REVISION)

Specifying the requirements for gypsum used in agriculture, this standard ensures that gypsum meets the necessary quality parameters for use as a soil amendment, improving soil structure and fertility.

4. **IS 7863 : 2025 - FERTILIZER PHYSICAL MIXTURES - SPECIFICATION (FIRST REVISION)**

   Addressing fertilizer physical mixtures, this standard outlines the specifications for mixtures of different fertilizers. It ensures that such mixtures are effective and safe for agricultural use.

5. **IS 8359 : 2018 - UREA AMMONIUM PHOSPHATE BASED FERTILIZERS – SPECIFICATION**

   Specifying the requirements for urea ammonium phosphate-based fertilizers, this standard ensures that such fertilizers provide balanced nutrition to plants, enhancing soil fertility and crop yield.

6. **IS 16702 : 2018 - VERMICOMPOST – SPECIFICATION**

   Focusing on vermicompost, this standard specifies the quality parameters for compost produced through the decomposition of organic matter by earthworms. Vermicompost enhances soil structure and fertility, supporting sustainable farming.

B) SOIL QUALITY ASSESSMENT STANDARDS

1. **IS 15109 (PART 1) : 2021 - DETERMINATION OF THE EFFECTS OF POLLUTANTS ON SOIL FLORA - PART 1: METHOD FOR THE MEASUREMENT OF INHIBITION OF ROOT GROWTH (FIRST REVISION)**

   This standard outlines a method for measuring the inhibition of root growth to assess the effects of pollutants on soil flora. It provides a standardized approach to evaluate how contaminants impact soil health, which is crucial for maintaining soil fertility and ecosystem balance.

2. **15109 (PART 2) : 2013 - SOIL QUALITY - DETERMINATION OF THE EFFECTS OF POLLUTANTS ON SOIL FLORA: PART 2 EFFECTS OF CONTAMINATED SOIL ON THE EMERGENCE AND EARLY GROWTH OF HIGHER PLANTS (FIRST REVISION)**

Focusing on the effects of contaminated soil on the emergence and early growth of higher plants, this standard offers guidelines to determine how pollutants influence plant development. Such assessments are vital for understanding the broader ecological impacts of soil contamination.

3. **IS 18238 : 2023 - SOIL QUALITY DETERMINATION OF CADMIUM CHROMIUM COBALT COPPER LEAD MANGANESE NICKEL AND ZINC IN AQUA REGIA EXTRACTS OF SOIL FLAME AND ELECTROTHERMAL ATOMIC ABSORPTION SPECTROMETRIC METHODS**

   This standard specifies methods for determining the presence of heavy metals like cadmium, chromium, cobalt, copper, lead, manganese, nickel, and zinc in soil extracts. It employs flame and electrothermal atomic absorption spectrometry techniques, aiding in the detection of toxic elements that can affect soil and plant health.

4. **IS 18239 : 2023 - SOIL QUALITY DETERMINATION OF MERCURY IN AQUA REGIA SOIL EXTRACTS WITH COLD-VAPOUR ATOMIC SPECTROMETRY OR COLD-VAPOUR ATOMIC FLUORESCENCE SPECTROMETRY**

   Providing a method for determining mercury levels in soil extracts using cold-vapour atomic spectrometry or cold-vapour atomic fluorescence spectrometry, this standard is crucial for monitoring mercury contamination in soils, which can have detrimental effects on plant and human health.

5. **IS 18241 : 2023 - SOIL QUALITY DETERMINATION OF ARSENIC ANTIMONY AND SELENIUM IN AQUA REGIA SOIL EXTRACTS WITH ELECTROTHERMAL OR HYDRIDE-GENERATION ATOMIC ABSORPTION SPECTROMETRY**

   This standard details the determination of arsenic, antimony, and selenium in soil extracts using electrothermal or hydride-generation atomic absorption spectrometry. These elements are toxic in nature, and their presence in soil can pose significant environmental and health risks.

6. **IS 18242 : 2023 - SOIL QUALITY DETERMINATION OF TRACE ELEMENTS IN EXTRACTS OF SOIL BY INDUCTIVELY COUPLED PLASMA-ATOMIC EMISSION SPECTROMETRY ICP-AES**

Focusing on the determination of trace elements in soil extracts by inductively coupled plasma-atomic emission spectrometry (ICP-AES), this standard facilitates the detection of various trace metals, aiding in comprehensive soil health assessments.

C) INDIAN STANDARDS OF AGROTEXTILE FOR SOIL MANAGEMENT

1. **IS 16089 : 2013 - JUTE AGRO-TEXTILE – SAPLING BAGS FOR GROWTH OF SEEDLING/ SAPLING – SPECIFICATION**

   This standard specifies the requirements for jute-based sapling bags designed to support the growth of seedlings and saplings. These biodegradable bags facilitate root development and are environmentally friendly alternatives to plastic containers. They are particularly beneficial for afforestation projects and nurseries.

2. **IS 15907 : 2010 - AGRO TEXTILES – HIGH DENSITY POLYETHYLENE (HDPE) WOVEN BEDS FOR VERMICULTURE – SPECIFICATION**

   This standard outlines the specifications for high-density polyethylene (HDPE) woven beds used in vermiculture. These beds are designed to house earthworms for composting organic waste, producing nutrient-rich vermicompost that enhances soil fertility and structure.

3. **IS 16202 : 2014 - AGRO TEXTILES - WOVEN GROUND COVERS FOR HORTICULTURE APPLICATION – SPECIFICATION**

   This standard covers the specifications for woven ground covers used in horticulture applications. These covers help suppress weed growth, conserve soil moisture, and regulate soil temperature, thereby promoting healthy plant growth and reducing the need for chemical herbicides.

4. **IS 17070 : 2019 - JUTE AGROTEXTILES FOR GROWTH OF PLANT AND SUPPRESSION OF WEEDS – SPECIFICATION**

   This standard specifies the requirements for jute-based agro-textiles that support plant growth and suppress weed proliferation. These textiles are biodegradable and serve as eco-friendly alternatives to synthetic materials, contributing to sustainable agricultural practices.

5. **IS 17355 : 2020 - AGRO TEXTILES – PROPYLENE SPUN BONDED NON-WOVEN MULCH MAT FOR AGRICULTURAL AND HORTICULTURAL APPLICATIONS – SPECIFICATION**

This standard outlines the specifications for propylene spun-bonded non-woven mulch mats used in agricultural and horticultural applications. These mats help conserve soil moisture, regulate temperature, and suppress weed growth, leading to improved crop yields and reduced water usage.

D) INDIAN STANDARDS OF AGROTEXTILE FOR WATER MANAGEMENT

1. IS 15351 : 2015 - AGRO TEXTILES – LAMINATED HIGH DENSITY POLYETHYLENE (HDPE) WOVEN GEOMEMBRANE FOR WATERPROOF LINING – SPECIFICATION

This standard specifies the requirements for HDPE woven geomembranes laminated with Low-Density Polyethylene (LDPE) or a combination of LDPE and Linear Low-Density Polyethylene (LLDPE). Designed for waterproof lining applications in canals, ponds, and reservoirs, it effectively controls seepage. The standard outlines four types based on thickness and mass, ensuring suitability for various applications. However, it is not recommended for roof or terrace linings or the disposal of industrial effluents.

2. IS 16190 : 2014 - AGRO TEXTILES - HIGH DENSITY POLYETHYLENE (HDPE) LAMINATED WOVEN LAY FLAT TUBE FOR IRRIGATION PURPOSE – SPECIFICATION

This standard covers the specifications for HDPE laminated woven lay-flat tubes intended for irrigation applications. These tubes are designed to convey water efficiently, offering flexibility and durability. The lamination enhances resistance to environmental factors, ensuring longevity and reliability in irrigation systems.

3. IS 16627 : 2017 - AGRO TEXTILES – HIGH DENSITY POLYETHYLENE (HDPE) LAMINATED WOVEN LAY FLAT TUBE FOR USE IN MAINS AND SUBMAINS OF DRIP IRRIGATION SYSTEM

This standard specifies the requirements for HDPE laminated woven lay-flat tubes used in the mains and submains of drip irrigation systems. These tubes are designed to withstand the pressures and environmental conditions typical in irrigation systems, ensuring efficient water distribution. They are lightweight, flexible, and resistant to UV rays and chemicals, making them suitable for sustainable agricultural practices.

4. **IS 17728 : 2021 - AGRO TEXTILES - HIGH DENSITY POLYETHYLENE (HDPE) LAMINATED WOVEN LAY FLAT TUBE AND FITTINGS FOR USE IN RAIN IRRIGATION SYSTEM – SPECIFICATION**

   This standard outlines the specifications for HDPE laminated woven lay-flat tubes and their fittings used in rain irrigation systems. These systems are designed to simulate natural rainfall, providing uniform water distribution to crops. The tubes and fittings are engineered for durability and efficiency, contributing to water conservation and improved crop yields.

5. **IS 17729 : 2021 - AGRO-TEXTILES FLEXIBLE WATER STORAGE TANK FOR AGRICULTURE AND HORTICULTURE PURPOSES SPECIFICATION**

   This standard specifies the requirements for flexible water storage tanks used in agriculture and horticulture. These tanks are designed to store water efficiently, providing a reliable water source for irrigation and other agricultural needs. Their flexibility allows for easy transportation and installation, making them suitable for various farming environments.