Soil quality - Determination of soil microbial biomass - Part 2: Fumigation-extraction method (ISO 14240-2:1997)

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Qualité du sol - Détermination de la biomasse microbienne du sol - Partie 2 : Méthode par fumigation-extraction (ISO 14240-2:1997)

Bodenbeschaffenheit - Bestimmung der mikrobiellen Biomasse von Böden - Teil 2: Fumigations-Extraktionsverfahren (ISO 14240-2:1997)

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Foreword

The text of ISO 14240-2:1997 has been prepared by Technical Committee ISO/TC 190 “Soil quality” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 14240-2:2011 by Technical Committee CEN/TC 345 “Characterization of soils” the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

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Endorsement notice

The text of ISO 14240-2:1997 has been approved by CEN as a EN ISO 14240-2:2011 without any modification.

Introduction

Soil consists of both living and nonliving components which exist in a complex and heterogeneous environment. Soil microflora is responsible for the degradation of organic matter, stability of aggregates and most nutrient cycling which occurs in soils. The purpose of determining the microbial biomass of soils is to allow assessment of the continued maintenance of soil fertility, the potential ability to degrade added organic materials, and the effects of added materials on the natural microbial population.

Soil quality — Determination of soil microbial biomass —

Part 2:
Fumigation-extraction method

1 Scope

This part of ISO 14240 specifies a method for the estimation of microbial biomass of soils by measurement of total extractable organic biomass material mainly from freshly killed microorganisms. The method is also applicable to the estimation of microbial nitrogen and microbial ninhydrin-reactive nitrogen in soil, but this part of ISO 14240 describes only the measurement of extractable organic carbon. The fumigation-extraction (FE) method is applicable to aerobic and anaerobic (water-logged, paddy) soils over the whole range of soil pH. Biomass can be also measured in soils containing actively decomposing substrates and soils supersaturated with potassium sulfate solution.

NOTE — Chloroform fumigation also affects soil fauna. The contribution of carbon from these organisms is generally small (< 5 %) and can usually be neglected.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 14240. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 14240 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 10381-6:1993, *Soil quality — Sampling — Part 6: Guidance on the collection, handling and storage of soil for the assessment of aerobic microbial processes in the laboratory.*

ISO 10694:1995, *Soil quality — Determination of organic and total carbon after dry combustion (elementary analysis).*

ISO 11465:1993, *Soil quality — Determination of dry matter and water content on a mass basis — Gravimetric method.*

3 Definition

For the purposes of this part of ISO 14240, the following definition applies.

3.1 soil microbial biomass
mass of intact microbial cells in a given soil

NOTE — This parameter can be estimated from the measurement of the carbon or nitrogen content of these cells or by the measurement of their ability to mineralize an added carbon source. Dead cells and cell fragments may be detected when carbon or nitrogen analysis is used but only intact cells will be detected when respiration is measured.