Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

Training Workshop on Monitoring and Controlling Microplastics Contamination in Food and Agriculture

Virtual Event
Via Microsoft Teams

25 - 28 November 2025

Ref. No.: EVT2404989

Information Sheet

Introduction

Plastic is present in almost every corner of the earth, including the most remote areas. Microplastics are defined as plastic smaller than 5 mm, which are formed through degradation and fragmentation of plastic materials with a wide range of composition, including biodegradable plastics. Their widespread use in agriculture, industry, and other anthropogenic activities results in their accumulation in soil ecosystems and water bodies. Microplastic particles are ubiquitous and long-lasting in such ecosystems. In agricultural land, microplastics have the potential to be taken up by plants and animals and transferred between food web trophic levels. Microplastics may contain toxic additives but also serve as vectors for persistent environmental contaminants, such as dioxins, polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), additives used in plastic production such as bisphenol A and phthalates, and heavy metals, that tend to be adsorbed onto microplastic particle surfaces.

Exposure through the dietary route is a major source of human exposure to microplastics. Microplastic occurrence in food is attributed to their uptake by plants and animals, as well as to food processing (industrial or domestic) and packaging. Studies have shown that, upon digestion, microplastics may cause effects on human gastrointestinal tract, eventually leading to cell damage and reproductive and endocrine disruption. Microplastics have also been implicated in increased oxidative stress, immunological and metabolic alterations, as well as neurotoxicity, arterial plaque formation and heart disease. Therefore, there is an increasing need to obtain reliable toxicological and dietary intake data for robust human risk assessment studies. Human exposure studies shall be based on occurrence data from reliable analytical methodologies to

identify and quantify microplastics in a diverse spectrum of food commodities. Research should also consider an assessment of the sources of microplastics and related additives and other contaminants in the food chain, along with soil-plant transfer factors, and food processing and packaging aspects. Targeted studies are imperative to close significant knowledge gaps, elucidate the role of microplastics in human intake and provide valid datasets that can be used for the establishment of relevant food safety standards and legislation. The datasets will assist in devising strategies to mitigate exposure and risks and supporting Member States across the globe to acquire and strengthen relevant analytical and monitoring capacities for appropriate risk assessment studies.

The Food Safety and Control Laboratory (FSCL) and the Soil and Water Management and Crop Nutrition Laboratory (SWMCNL) of the Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture work jointly since early 2025 on the Peaceful Uses Initiative project "*Enhancing R&D capabilities to monitor and control microplastics contamination in food and agriculture*". This virtual training course will focus on nuclear and complementary technologies that can be applied to better address and mitigate the impact of microplastics on food and agriculture.

Objectives

The objective of this virtual training course is to raise awareness and enhance capabilities in the use of nuclear and complementary tools and techniques for investigating microplastic occurrence in agricultural soil and food commodities, along with better understanding of the uptake mechanisms of microplastics from the environment into crops and of the role of microplastics as vectors of toxic additives and contaminants, thus supporting exposure and risk assessment studies. The course will focus on how advancements in laboratory analysis and field experiments can enable Member States to effectively respond to the global challenge of the pervasive presence of microplastics in ecosystems and food webs.

Working Language

English.

Expected Outcome

The expected outcome of the course is well informed, trained personnel in the application of nuclear and complementary technologies for detecting, identifying and quantifying microplastics in food and agriculture, as well as in analytical tools for the determination of toxic contaminants and additives that are carried by microplastics into food and agricultural soil.

Structure

The training programme will comprise four modules: (1) Introduction to the nexus between microplastics and food safety and sustainable agriculture; (2) Analytical approaches and considerations for monitoring microplastics and related additives and contaminants in soil, plant and food; (3) Isotopic and complementary techniques to understand the fate of microplastics and related additives and contaminants in agricultural environment and food; (4) Sustainable management and mitigation solutions for microplastics to enhance environment and food security.

The training will employ recorded lectures, video presentations of laboratory procedures and 'live' online question and answer sessions. Selected applications will be presented to provide the participants with basic to intermediate knowledge of techniques.

Topics

Module 1. Introduction to the nexus between microplastics and food safety and sustainable agriculture.

Module 2. Analytical approaches and considerations for monitoring microplastics and related additives and contaminants in soil, plant and food:

- Sampling and sample preparation techniques
- Analysis of microplastics using μFT-IR, Raman, GC-MS and other techniques
- Analysis of related hazardous additives and contaminants using GC-MS, LC-MS and other techniques

Module 3. Isotopic and complementary techniques to understand the fate of microplastics and related additives and contaminants in agricultural environment and food:

- Nuclear and complementary techniques for evaluating effects and risk of microplastics on soil, water, food and human health
- Isotopic techniques to understand the fate and dynamics of microplastics and additives from soil and water to food chain
- The nexus between microplastic pollution and climate change
- Challenges and opportunities in experimental design in microplastics research on soil, water and food management

Module 4. Sustainable management and mitigation solutions for microplastics to enhance environment and food security:

- Source reduction techniques for mitigation solutions for microplastics
- Environmental remediation for microplastic pollution
- Policy management and public awareness

Participation and Registration

This training course will be open for remote access **from 25 to 28 November 2025** using the virtual platform Microsoft Teams. All persons wishing to participate in the event must be designated by an IAEA Member State or should be members of organizations that have been invited to participate.

Each country is entitled to nominate up to **eight (8) candidates,** in line with the requirements described in the Participants Qualification and Experience.

Participants' Qualifications and Experience: Countries are invited to nominate candidates in the fields of expertise below for the consideration of the Joint FAO/IAEA Centre's selection committee. (Please note: A total of maximum eight candidates per country can be nominated, with two candidates per field of expertise).

Field of Expertise 1 – Soil and Water Management and Resource Use Efficiency

Eligible candidates are scientists and technicians with a background in soil science, agricultural water management or any related discipline and experience in sustainable agriculture, especially mitigation of plastics impacts on agriculture.

Field of Expertise 2 - Food Safety Laboratory Analysis

Eligible candidates are representatives of analytical laboratories (laboratory managers/analysts) in charge of national food safety monitoring plans, or from research laboratories in the field of testing for food safety.

Registration through the InTouch+ platform:

In order to be designated by an IAEA Member State or invited organization, participants are requested to submit their application via the InTouch+ platform (https://intouchplus.iaea.org) to the competent national authority (Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or organization for onward transmission to the IAEA by **10 October 2025**, following the registration procedure in InTouch+:

1. Access the InTouch+ platform (https://intouchplus.iaea.org):
    - Persons with an existing NUCLEUS account can sign in here with their username and password;
    - Persons without an existing NUCLEUS account can register here.

2. Once signed in, prospective participants can use the InTouch+ platform to:

    - Complete or update their personal details under 'Basic Profile' and upload supporting documents;
    - Search for the relevant event (EVT2404747) under the 'My Eligible Events' tab;
    - Select the Member State or invited organization they want to represent from the drop-down menu entitled 'Designating Authority' (if an invited organization is not listed, please contact InTouchPlus.Contact-Point@iaea.org);
    - Based on the data input, the InTouch+ platform will automatically generate Participation Form (Form A).
    - Submit their application.

Once submitted through the InTouch+ platform, the application, together with the auto-generated Form A, will be transmitted automatically to the required authority for approval. If approved, the application, together with the Form A, will automatically be sent to the IAEA through the online platform.

For additional information on how to apply for an event, please refer to the InTouch+ Help page. Any other issues or queries related to InTouch+ can be sent to InTouchPlus.Contact-Point@iaea.org.

Selected participants will be informed in due course on the procedures to be followed to access the course.

Candidates who successfully complete the virtual training course will receive a certificate.

No registration fee is charged to participants.

Participants are hereby informed that the personal data they submit will be processed in line with the Agency's Personal Data and Privacy Policy and is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required. The IAEA may also use the contact details of Applicants to inform them of the IAEA's scientific and technical publications, or the latest employment opportunities and current open vacancies at the IAEA. These secondary purposes are consistent with the IAEA's mandate.

IAEA Contacts

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Subsequent correspondence on scientific matters should be sent to the Scientific Secretaries and correspondence on other matters related to the event to the Administrative Secretary.