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FAO's Plant Production and Protection Division



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Contents

→	<i>Foreword</i>	v
→	Highlights on Plant Production and Protection	1
→	Contribution of Plant Production and Protection to Sustainable Development Goals	2
→	Contribution of Plant Production and Protection to FAO Strategic Framework 2022-2031	4
→	Overview of Plant Production and Protection at FAO	5
→	Thematic Areas	8
→	Governance and Normative Work	14
→	Communication and Partnerships	16
→	Contact Information	18





Foreword



Welcome to the first edition of FAO's Plant Production and Protection Division's (NSP) Booklet.

The FAO Strategic Framework 2022–2031 seeks to support the 2030 Agenda through the transformation to MORE efficient, inclusive, resilient and sustainable agrifood systems, for better production, better nutrition, a better environment and a better life, leaving no one behind. NSP and its wider global community have a fundamental role to play in achieving these four betters. One area in which NSP's work will specifically deliver is “better production”, contributing to its mission of enabling the transition to more efficient, inclusive, resilient and sustainable plant production and protection through optimization and minimization.

The global demand for food, feed, fuel and fibre is increasing, with estimates that the world will need 50 percent more food by 2050 to feed the increasing global population in the context of natural resource constraints, environmental pollution, ecological degradation and climate change. This means we have to produce more with less by increasing productivity and healthy diets, reducing crop and food loss, saving natural resources,

minimizing agricultural chemical inputs, and mitigating the impact of climate change.

In this context, plant production and protection should focus on sustainable seed system management, sustainable plant production systems management, sustainable plant pest management, sustainable pesticide management, and sustainable technology innovation and transformation. These sustainable production and protection technologies can greatly contribute to ensuring food security and nutrition; promoting food quality and safety; supporting farmers' livelihoods; protecting the environment and biodiversity; and facilitating safe trade and economic growth.

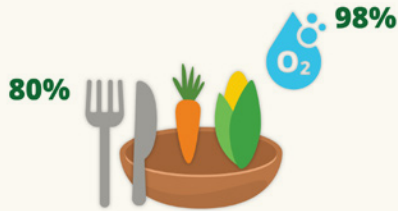
I am confident that FAO's work with partners will contribute significantly to addressing the ongoing challenges for agrifood systems and contribute to realizing the vision of a world free of hunger and malnutrition.

A handwritten signature in black ink, reading "Jingyuan Xia". The signature is fluid and cursive.

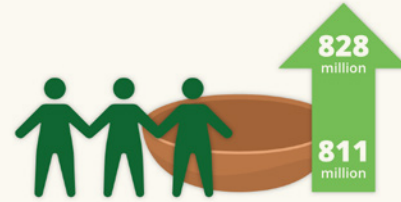
Jingyuan Xia
Director, FAO Plant Production and Protection Division (NSP)



Highlights on Plant Production and Protection



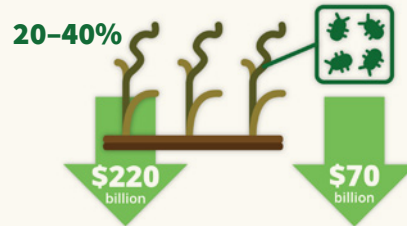
Plants make up 80 percent of our daily calories and are responsible for 98 percent of the oxygen we breathe. However, plant health is at risk due to biotic and abiotic threats, and plant production requires a transformation to sustain the increasing demand for food, feed, fiber and fuel.



The number of people effected by hunger increased from 811 million in 2020 to 828 million in 2021 (FAO/IFAD/ UNICEF/WFP/WHO, 2022).



By 2050, the global food production will need to increase by 50 percent to meet the needs of the growing population – predicted to reach almost 10 billion by 2050. It is estimated that 80 percent of the projected additional food demand by 2050 will need to come from plant products (OECD/FAO, 2021).



Every year, up to 40 percent of global crop production is lost due to plant pests and diseases. Each year, these losses cost the global economy over USD 220 billion, and invasive insects at least USD 70 billion.

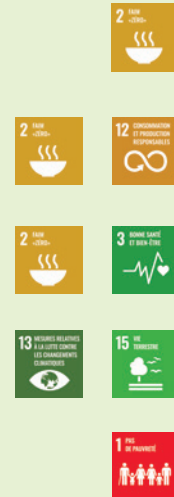
Contribution of Plant Production and Protection to the Sustainable Development Goals



NSP developed a five-year communication strategy focused on annual themes that are directly linked to Sustainable Development Goals (SDGs).

ANNUAL THEMES

- 2021** Ensuring food security and nutrition through sustainable plant production and protection (SDG 2)
- 2022** Promoting sustainable plant production through optimization and minimization (SDGs 2 and 12)
- 2023** Enhancing sustainable plant protection through optimization and minimization (SDGs 2 and 3)
- 2024** Enabling sustainable environmental protection through optimization and minimization (SDGs 13 and 15)
- 2025** Supporting poverty reduction through sustainable plant production and protection (SDG 1)



By promoting these themes, NSP wishes to highlight the links between the 2030 Agenda for Sustainable Development and FAO's work on plant production and protection.



Contribution of Plant Production and Protection to the FAO Strategic Framework 2022–2031



Achieving an environmentally sustainable increase of production and access to affordable healthy diets, while protecting and enhancing the livelihoods of the world's small-scale agricultural producers and other agrifood system actors, is a global challenge. Moreover, agricultural production systems still lack integration, optimization, diversification, and innovation, while relying on the intensive use of chemical inputs and of natural resources. Additionally, global food supplies today rely increasingly on just a few crops and animal species, increasing the vulnerability to biotic stresses.

In response to the current and emerging challenges, **FAO developed a Strategic Framework 2022–31** endorsed by the 42nd Session of

the FAO Conference in June 2021. This framework aims to transform to **MORE** efficient, inclusive, resilient and sustainable agrifood systems for *better production, better nutrition, a better environment and a better life*, leaving no one behind.

It serves as a guiding principle and an innovative business model for FAO support to achieving the Sustainable Development Goals (SDGs) of the 2030 Agenda.

The Strategic Framework foresees the implementation of 20 Programme Priority Areas (PPAs) – five PPAs under better production and better nutrition, four under better environment and six under better life.

NSP is leading the implementation of the **PPA on Better Production (BP) 1: Innovation for sustainable**

agriculture production to be **MORE** productive, diversified, profitable, and sustainable in order to enhance resilience to shocks and to mitigate climate change. The Coordination Team for implementation of BP1 includes the focal points from 11 divisions/offices at headquarters and five FAO regions.

NSP also co-leads the implementation of the PPAs on Better Nutrition 5: Transparent market and trade and the Better Environment 4: Achieving sustainable urban food systems. Moreover, NSP contributes to another 12 PPAs through the implementation of field programme activities and normative work, three of which under better production, three under better nutrition, three under a better environment, and three under a better life.

Overview of Plant Production and Protection at FAO



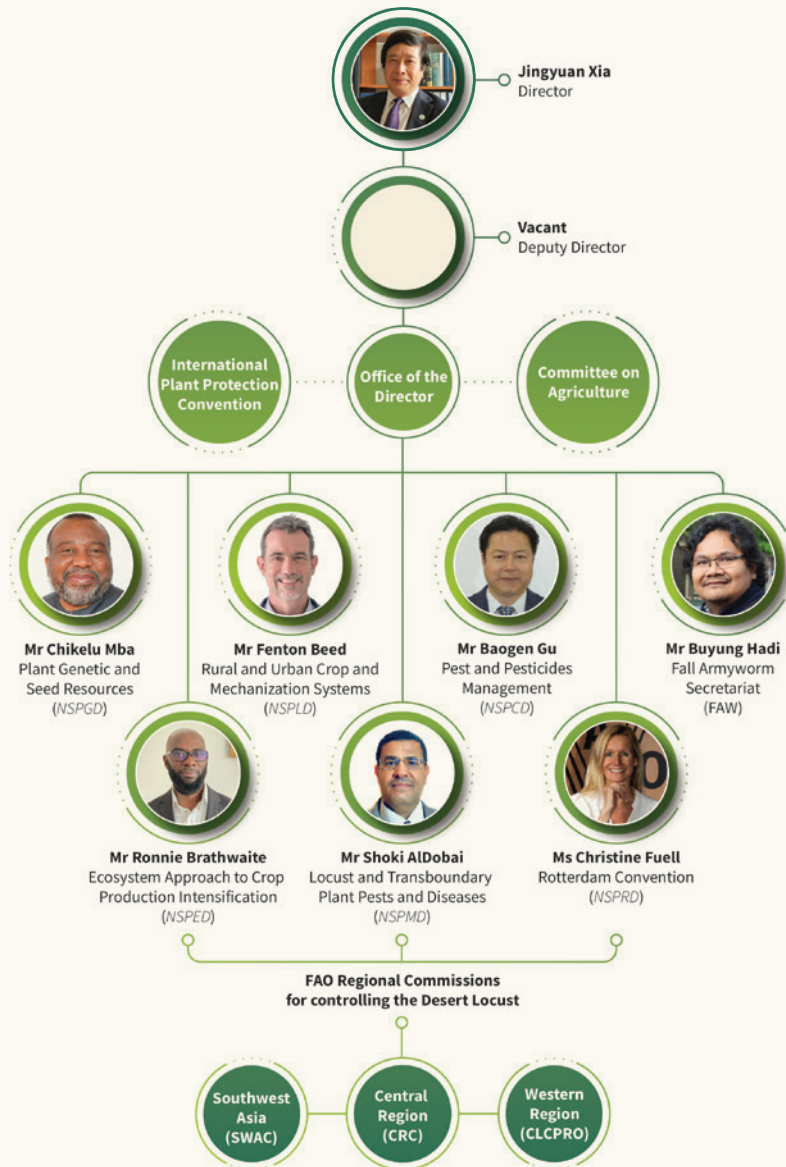
HISTORICAL DEVELOPMENT

FAO's Plant Production and Protection Division is almost as old as FAO itself! First established on 22 June 1947 as the Plant Industry Branch, by 1959 it was a full division focusing on crop production, improvement and protection. During the 1960–1980, the Division was broadly structured on crop and grasslands production services, plant protection services, and crop ecology and genetic resources. In 1980–2000, there was an increased emphasis on fruits and vegetables. And, in 2020, the division acronym changed from AGP (Agriculture and Consumer Protection Department, Plant Production and Protection) to NSP (Natural Resources Stream, Plant Production and Protection), with a renewed focus on sustainable production and protection through optimization and minimization.

CURRENT STRUCTURE

As of 30 September 2022, 164 NSP employees were working to promote sustainable plant production and protection, of which 142 in FAO headquarters and 22 in decentralized offices across five FAO regions and 11 sub-regions. NSP is composed of the Director's Office and six teams specialized in various areas of plant production (Plant Genetic Resources and Seeds - NSPGD, Ecosystem approach to crop production intensification - NSPED and Rural and Urban Crop and Mechanization Systems - NSPLD) and protection (Locusts and Transboundary Plant Pests and Diseases - NSPMD, Pest and Pesticide Management - NSPCD and the Rotterdam Convention - NSPRD), as well as the secretariats of the International Plant Protection Convention (IPPC), and the Committee on Agriculture (COAG).





VISION, MISSION AND STRATEGIC OBJECTIVES

→ Vision

Developing sustainable crop production systems for a world free from hunger.

→ Mission

Enabling the transition to more efficient, inclusive, resilient and sustainable crop production and protection through optimization and minimization.

→ Strategic objectives

- ensuring food security and nutrition;
- enhancing food quality and safety;
- protecting the environment and biodiversity; and
- facilitating safe trade and economic growth.



CORE ACTIVITIES

- sustainable plant genetic resource and seed system management;
- sustainable plant production systems management;
- sustainable plant pest management;
- sustainable pesticide management; and
- sustainable technology innovation and transformation.





Thematic areas



Sustainable Plant Genetic Resources Management and Seed Systems

Farmers require the quality **seeds** and planting materials of well-adapted improved crop varieties that are productive, nutritious, resistant to biotic and abiotic stresses and, in general, meet end-users' preferences. This is because the cultivation of an improved crop variety can result in 50 to 90 percent increase in

productivity. Yet, in many food-insecure parts of the world, where crop productivities are extremely low, and countries do not appear on track to attain most of the Sustainable Development Goals, the rates of the adoption of improved crop varieties and the use of their quality seeds are extremely low.



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NSP therefore supports countries to:

- safeguard plant genetic resources for food and agriculture (PGRFA), the raw materials for crop improvement
- breed a diverse suite of progressively superior crop varieties
- enhance farmer's timely access to affordable quality seeds and planting materials



Sustainable Plant Production

Plant production is the foundation of food and agriculture. Upon this foundation humanity has supported livelihoods and built civilizations in a more food secure world. Plant production is a catalyst for economic and social development but must keep pace with the demand for safe and nutritious food that is produced without negative environmental impacts. In a global economy, sustainable plant production faces multidimensional and complex challenges, such as population growth,

urbanization, and climate change. By harnessing the power of knowledge, nature, technology and innovation, NSP promotes the transformation of agrifood food systems to be MORE efficient, inclusive, resilient, and sustainable. Through optimization and diversification of production systems while harnessing ecosystems interactions, NSP works with farmers to create sustainable cropping systems with improved soil health and reduced reliance on agri-inputs. NSP works with diverse value chains

including cacti, cereals, legumes, cover crops, horticultural, neglected and underutilized species, as well as in complex systems dealing with perennial production, agroforestry, protected cultivation and peri-urban and urban systems.



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Key approaches and initiatives:

- agroecology
- resilient and efficient cropping systems
- integrated soil fertility management
- urban food systems



Sustainable Plant Pest and Disease Management

Pests and diseases are a severe threat to food security, trade and livelihoods globally. Every year, up to 40 percent of crops are lost due to plant pests and diseases.

FAO promotes sustainable and ecological approaches including integrated pest management to prevent and control the potential impact of pests and diseases through continuous monitoring, early warning, prompt response, innovative and environmentally friendly preventive control strategies to sustainably manage pests and diseases.

This includes coordinating **desert**

locust monitoring, early warning, and forecasting. FAO's current role in desert locust monitoring and control role dates to 1945 and to the establishment of FAO the Global Desert Locust Control Committee (DLCC) in 1955.

In 2019, FAO also established a **Global Action for Fall Armyworm** control spanning over Africa, Asia and the Near East. FAO established a partnership with all stakeholders to provide all available support to the affected countries.

NSP also hosts the International Plant Protection Convention (IPPC),

dealing with quarantine pests, and actively coordinates and provides support to a multitude of projects covering transboundary plant pests and diseases.

FAO also works on implementing projects on plant diseases like **Banana Fusarium tropical race 4 (TR4)** and **wheat rust**.



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Key areas:

- quarantine plant pest and disease management
- transboundary plant pest and disease management
- integrated crop pest and disease management



Sustainable Pest and Pesticide Management

Sustainable pesticide management is imperative for better environment and health protection. The inappropriate use of pesticides may lead to increased risks to human health and the environment.

Main challenges of global pesticide management include:

- Weak capacity of sound lifecycle management of pesticides in low- and low-middle-income countries.
- Insufficient elimination of harms caused by highly hazardous pesticides.
- Lack of sufficient policies, instruments, good practices and incentives for promoting

alternatives to toxic pesticides and mainstreaming biodiversity.

An integrated approach would be applied to address all aspects of pesticide management throughout lifecycle of pesticides with multisector collaboration and engagement of all relevant stakeholders.



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Key areas:

- pesticides life cycle management
- risk management (pesticide residues)
- highly hazardous pesticides



Sustainable Technology Innovation and Transformation

With climate change advancing fast, technologies and practices need more than ever to be locally adapted to meet the needs of producers of different ages and gender, for this and future generations. Research and science need to work alongside farmers to test new tools and approaches and co-create innovations. To do this, farmers should integrate locally adapted sustainable technologies into their farming systems and communities, to improve livelihoods while regenerating local ecosystems. NSP works with agricultural mechanization technologies and related suitable and tested business models to ease and reduce hard labour, relieve labour

shortages, improve productivity and timeliness of agricultural operations, improve efficient use of inputs and resources, enhance market access and contribute to mitigating climate-related hazards. These technologies, including conservation, digital, and precision agriculture are applied in open fields and protected cultivation systems along the value chain, covering all levels of production and processing operations. Mechanization makes agriculture more appealing to youth and allows building micro- and small business in rural communities (e.g. hire mechanization services, or value addition of food products). NSP promotes the scaling of the farmer field school (FFS) approach to

help farmers make better decisions about sustainable technologies and innovations suitable to their needs. Over the past 30 years, FFS improved the livelihoods of over 12 million farmers globally. The Global FFS Platform produces reference tools and documents; facilitates global exchange of knowledge and expertise; supports capacity development to harness digital and market innovations; and helps integrate FFS and participatory approaches in policies.



© ACT

Key areas:

- sustainable agricultural mechanization (SAM)
- digital agriculture
- farmer field schools





Governance and Normative Work



COMMITTEE ON AGRICULTURE



The **Committee on Agriculture (COAG)** is one of **FAO's Governing Bodies** providing overall policy and regulatory guidance on issues relating to agriculture, livestock, food safety, nutrition, rural development and natural resource management. Established in 1971, the committee

has over **130 Member Nations** and generally meets every two years but may hold additional sessions if needed.

Its secretariat is hosted by the FAO Plant Production and Protection Division. As FAO's main technical advisory committee on agriculture, COAG is responsible for reviewing major agricultural and nutritional problems and proposing concerted action by FAO's Member Nations;

advising the FAO Council and the Director-General on activities relating to agriculture, livestock, food, nutrition and natural resource management, with particular emphasis on all the social, technical, economic, institutional and structural aspects relating to agricultural and rural development in general; reviewing specific matters relating to agriculture, food and nutrition referred to the committee.

INTERNATIONAL PLANT PROTECTION CONVENTION



International Plant Protection Convention

The International Plant Protection Convention (IPPC) is an **intergovernmental treaty** signed by 184 countries, aiming to protecting the world's plant resources from the spread and introduction of pests, and promoting safe trade. The convention

introduced **International Standards for Phytosanitary Measures (ISPMs)** as its main tool to achieve its goals, making it the sole global standard setting organization for plant health. The **IPPC secretariat**, established in 1992 and hosted within NSP at FAO headquarters in Rome, coordinates the work of IPPC contracting parties to achieve the

Convention's goals. It develops a variety of resources to provide technical guidelines, it implements plant health related projects and organizes the Commission on Phytosanitary Measures (CPM) and other major committee meetings, and is responsible for the communication and external cooperation programmes.



ROTTERDAM CONVENTION



The **Rotterdam Convention** is a multilateral environmental agreement. It promotes shared

responsibility and open exchange of information based on a prior informed consent (PIC) procedure. The Convention covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by Parties and which have been notified by Parties for inclusion in the PIC procedure.

The Rotterdam Convention secretariat is composed of staff from the United Nations Environment Programme (UNEP) and FAO. The secretariat organizes Conferences of its Parties (165 as of Sept 2022) as well as technical meetings for the Convention's subsidiary bodies, the Chemical Review Committee and the Compliance Committee.



SECRETARIAT OF INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON PLANT GENETIC RESOURCES

The **Intergovernmental Technical Working Group on Plant Genetic Resources** was established by the Commission on Genetic Resources for Food and Agriculture at its **Seventh Session** in 1997, to address

issues specific to plant genetic resources for food and agriculture.

The secretariat of the ITWG-PGRFA lies with the NSP Division in FAO Headquarters.

Communication and Partnerships



COMMUNICATION AND ADVOCACY

Communication plays a crucial role in gaining public support and building trust, and helps ensuring transparency, accountability, coherence, and visibility. Through communication and advocacy, FAO's Plant Production and Protection Division aims at highlighting its contribution to FAO's programmes and initiatives, while promoting their impact and contributing to attain the UN Sustainable Development Goals (SDGs).

International Years and Days

To achieve these goals, NSP promotes the organization of International Days:

- **World Pulses Day** (10 February)
- **International Day of Plant Health** (12 May)
- **World Bee Day** (20 May)

and International Years:

- **International Year of Plant Health** (2020)
- **International Year of Fruits and Vegetables** (2021)
- **International Year of Millets** (2023)

Digital communication

The NSP website is the central repository of information and linkage to thematic web pages on plant production and protection.

The Division also distributes a regular newsletter and actively contributes to FAO corporate social media with the main hashtags **#PlantProduction** and **#PlantProtection**.

Publications

Divisional publications are coordinated by the NSP Editorial Committee. Among the key publications:

- The Plant Production and Protection Annual Report;
- Brochures and factsheets;
- Books and technical reports on plant production and protection issues.





PARTNERSHIPS AND NETWORKS

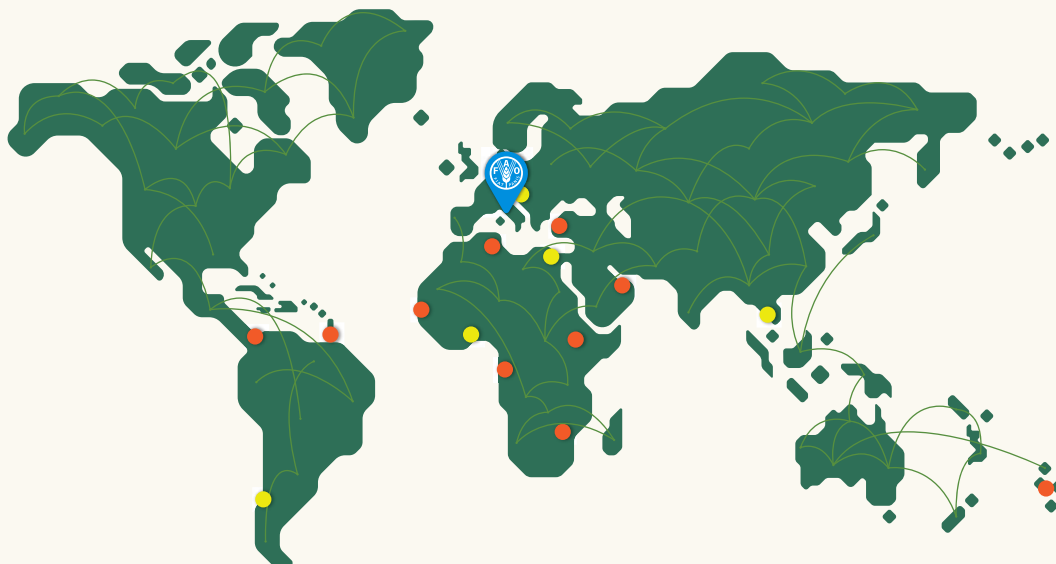
NSP is partnering with over 200 organizations worldwide to create synergies and achieve common goals. This includes both formal and informal cooperation with other United Nations entities, academia and research, non-governmental organisations, and the private sector. Numbers of organization types (12 for UN, 28 for international and

regional organization, 63 for industry and NGOs, 91 for academia and research, 22 resource partners).

Among the formalized cooperations are the memoranda of understanding (MoU) with several organizations, including the European Agricultural Machinery Industry Association (CEMA), the Comité de Liaison Europe

Afrique Caraïbe Pacifique (COLEACP), the International Fertilizer Association (IFA), and the International Society for Horticultural Science (ISHS).

The global NSP community can also count on strong links between FAO headquarters and **plant production and protection officers** located in the FAO regions and subregions.



Contact Information



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