

# INTERNATIONAL SEED TRADE: A PILLAR OF GLOBAL FOOD SECURITY

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**A STATEMENT PREPARED BY THE  
INTERNATIONAL SEED FEDERATION**



## Introduction

Seeds are the starting point of the world’s food system, and the efficiency of the global seed supply chain directly influences food security. The global seed market is valued at around USD 90 billion (Kynetec, 2023), and approximately 7 million tons of seeds are exported worldwide each year (ISF statistics, 2022). This chain—linking plant breeding, seed production, quality assurance, and distribution—moves innovation from research fields to farmers across conti-

nents. As seeds are living organisms, they must be handled, regulated, and delivered with precision. Disruptions—from climate extremes to trade bottlenecks—can limit farmers’ access to quality seed, reducing yields and threatening the availability and affordability of food. Strengthening this supply chain and seed trade is therefore a pillar for food security and is essential to building resilient, productive, and sustainable seed and food systems worldwide.



## Importance of Global Seed Trade

The global nature of seed breeding, production and supply chains is essential to enable local access to diverse and innovative seed varieties, which in turn supports food security. As the foundation of all agricultural and food production, seeds play a vital role in guaranteeing a stable and sustainable food supply.

The seed supply chain typically involves four key stages (Figure 1):

- 1) Research & development: breeding & testing
- 2) Seed production
- 3) Seed conditioning
- 4) Seed distribution

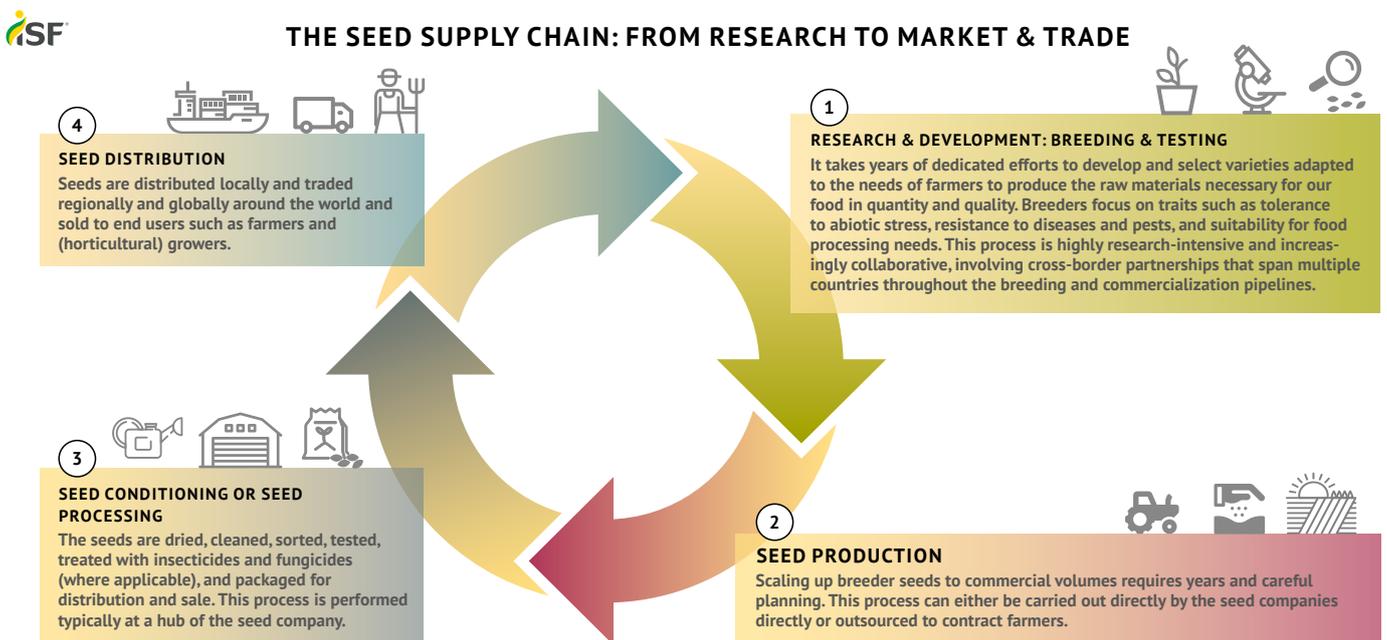


FIGURE 1

The processes involved in these four stages often take place in multiple countries to ensure reliable supply of high-quality seeds to farmers worldwide (Figure 2). The international regulatory framework for seed multiplication and international seed trade is well acknowledged and supported by several international bodies such as the OECD

Seed Schemes (for Agricultural crops), International Seed Testing Association (ISTA), International Plant Protection Commission's (IPPC), International Standards for Phytosanitary Measures (ISPMs) and The World Trade Organization (WTO) (Figure 3).

**THE JOURNEY OF A SEED: FROM BREEDING INNOVATION TO GLOBAL MARKETS AND TRADE**

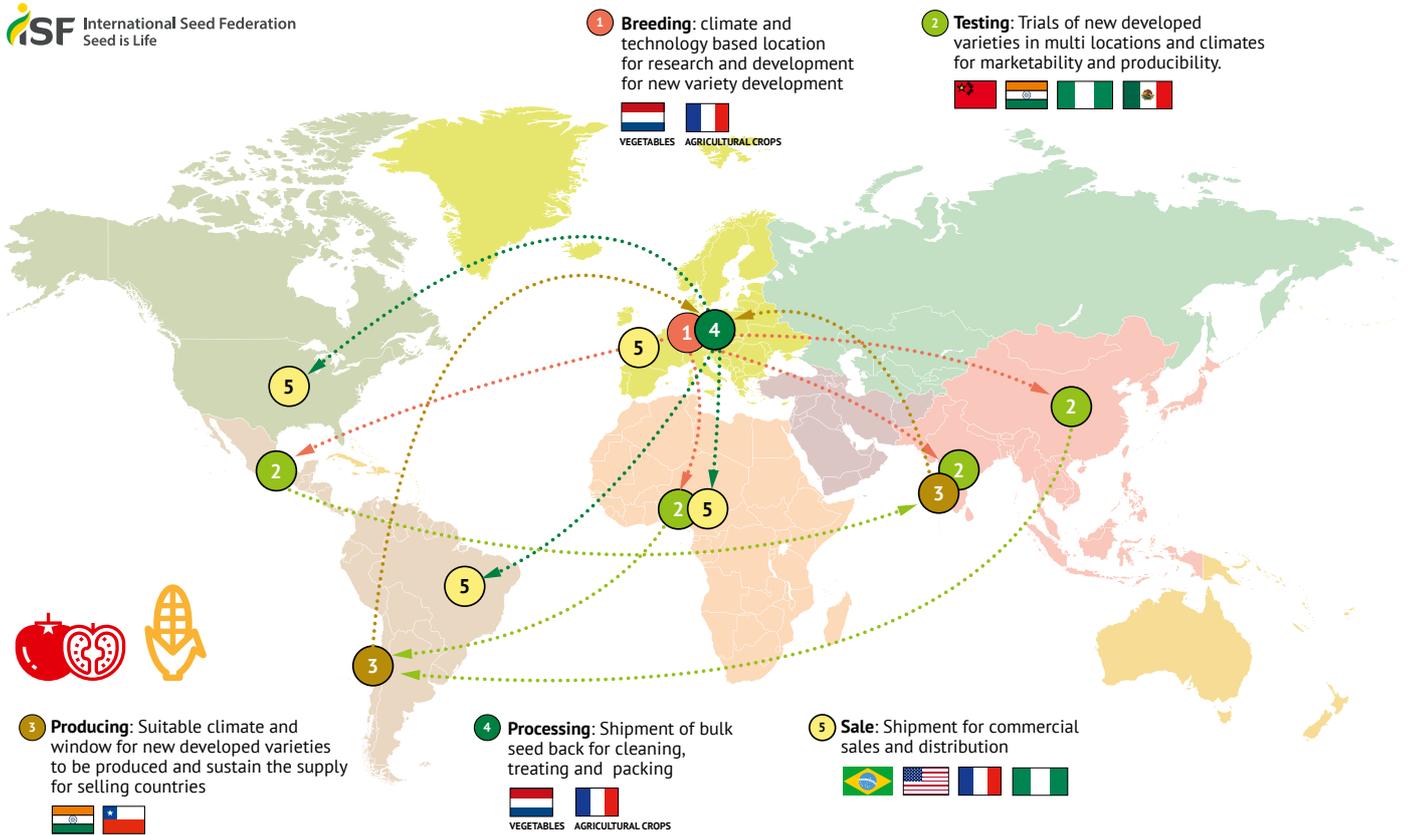
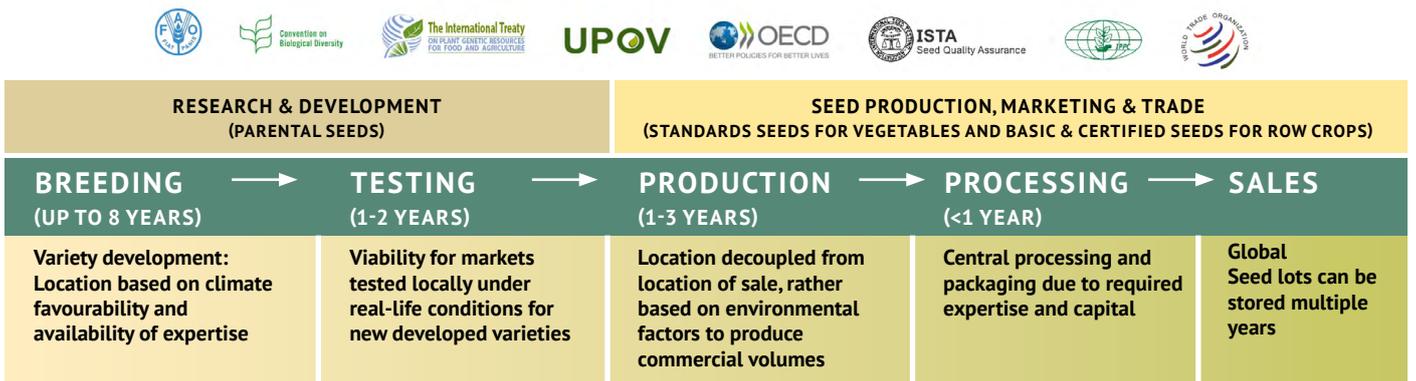


FIGURE 2

Requiring seed production in specific countries contradicts the principles upheld by the World Trade Organization (WTO), which advocates for free and fair trade across international borders. Such restrictions risk creating trade barriers, seed supply shortages, and could grant undue advantage to specific nations, undermining the collaborative nature of global agriculture. Therefore, it is widely recog-

nized that ensuring international seed movement and access to diverse seed crops across all countries by farmers and breeders is crucial for global agricultural sustainability. Equally important, however, is the recognition that the development and production of innovative seed varieties are inherently global endeavors (Figures 2 and 3).

**THE INTERNATIONAL REGULATORY FRAMEWORK FOR SEEDS**



The international regulatory framework for seeds varies according to geographies and to the type of seeds (e.g. OECD Seed Schemes are not implemented for trading of vegetable seeds as they are for agricultural crops).

FIGURE 3

## Key Factors to Secure Global Seed Production and Seed Supply

Securing global seed supply and production depends on a combination of biological, logistical, and regulatory factors. Reliable access to diverse and resilient production sites across multiple climatic zones helps mitigate risks from extreme weather, pests, and diseases. There are several important factors to be considered for when and where to produce seeds, ensuring the security of the seed supply chain.

### SPECIALISATION IS ESSENTIAL

Seed production is a complex process that demands specialised knowledge, skilled labour, and purpose-built equipment at various stages. Producing high-quality seeds requires expertise in tasks such as hand seeding, grafting, hand pollination, pest scouting, pest management, and manual harvesting especially for crops that involve intensive handling. In addition, seed processing requires technical

knowledge of quality standards, chemical treatment protocols, and packaging procedures. Specialised facilities and equipment are also needed for planting, spraying, harvesting, processing, and packaging -- tailored to each crop and whether it is grown in open fields or under protected conditions like greenhouses.

### OPTIMAL PRODUCTION LOCATIONS.

To maximise efficiency and quality, seed companies strategically select countries for production based on several key factors: favourable environmental conditions (Table 1), low pest and disease pressure, ease of importing parental seed material, and ability to export the final product.

Production sites are often chosen to reduce risk and accelerate timelines. For instance, producing parental lines in the Northern Hemisphere and then growing hybrid seeds in the Southern Hemisphere within the same year allows for two generations of seed in a single calendar year. This approach helps ensure a reliable supply of high-quality seeds in the necessary quantities.

CROP STAGE	ENVIRONMENTAL CONSIDERATIONS
Planting	Temperature, soil moisture and structure
Early emergence	Temperature, soil moisture, rainfall, pest pressure
Flowering & Pollination	Temperature, daylight, wind, pollinator presence, pest pressure, rainfall
Seed Set	Temperature, daylight, rainfall
Harvesting	Soil moisture, rainfall, and pest pressure



## Benefits of Diversifying Global Seed Production for a Global Seed Supply

Seed production in specific countries that are strategically chosen by industry to support global supply results in local and global benefits for several key reasons:

### EFFICIENCY

Concentrating on seed production and processing in selected, well-equipped locations ensures efficiency in labor, time, and costs. Centralized expertise and infrastructure allow for

streamlined operations and more consistent production outcomes.

### MITIGATING CLIMATE RISKS THROUGH GLOBAL SEED PRODUCTION

Climate change introduces greater uncertainty into agricultural production, including shifting weather patterns, increased frequency of extreme events, and the emergence of new pests and diseases. Diversifying seed production across multiple countries acts as a risk management strategy,

reducing the likelihood that a single climatic event will disrupt the entire supply chain. By spreading production geographically, the industry can better adapt to localized climate impacts, safeguard seed availability, and maintain stability in global food systems.

## INCENTIVE FOR INVESTMENT AND INNOVATION

High-quality seed production demands substantial investment in plant breeding, specialised equipment, skilled labour, expertise, land, and dedicated facilities. By decentralising production across strategically chosen regions, the industry can justify and sustain these investments. Applying

region-specific agronomic practices helps maintain varietal purity and genetic stability, ultimately increasing seed yield and quality. This ensures a steady global supply of diverse, high-performing seed varieties.

## SEED RESILIENCE

Global seed production enhances the resilience of the seed supply chain by diversifying sources and expanding the availability of high-quality seeds with characteristics such as high yield potential and disease resistance. Supportive

and inclusive policies further promote access to specialised and niche crops and varieties, benefitting both farmers and consumers by broadening choices and promoting ongoing innovation within the agricultural sector.

## FOOD SECURITY

Seed security is a cornerstone of food security. A globally distributed seed production system helps mitigate risks of uncertainties in seed supply from pest outbreaks, climate variability, and natural disasters such as floods or droughts. Because seed production and processing require long-term planning—often two to four years in advance—any disruption can jeopardize timely seed availability. If production fails in one region, the ability to shift to alternative locations is critical. Without this flexibility, farmers may face shortages, limiting access to the quality seeds needed to secure future harvests.

In this context, five UN agencies have underscored the critical role of trade in enhancing global food security, accord-

ing to their latest flagship report. The 2024 edition of *The State of Food Security and Nutrition in the World*, released on 28 July by FAO, IFAD, UNICEF, WFP, and WHO, reveals a notable decline in global hunger levels ([State of Food Security and Nutrition in the World, 2025](#)). The report estimates that approximately 673 million people or 8.2% of the global population faced hunger in 2024. This marks a reduction of 15 million people compared to 2023 (8.5%) and 22 million compared to 2022 (8.7%). To sustain and accelerate this progress, the agencies call on governments to prioritise structural reforms and trade-related policies that can deliver long-term solutions to food insecurity.



## Call to Action

Seed companies play a vital role in supporting farmers by delivering high-quality seeds of suitable varieties – on time, in sufficient quantities, and at reasonable prices. Beyond this, they are crucial partners in efforts to sustain and improve crop yields, addressing the urgent challenges posed by climate change and environmental challenges while meeting the world's rising global food demand.

The International Seed Federation calls on policy makers to champion open international trade and global access to quality seeds. While national policies that emphasize local seed production aim to ensure self-sufficiency and support local farmers, it is important to recognize the unintended negative effects they may have on farmers' capacities, food security, and the sustainability of the entire food, feed, and fiber value chains globally. Allowing global seed production is essential to strengthen food security, foster innovation, and ensure farmers everywhere have reliable access to the diverse, high-quality seeds needed to meet current and future agricultural challenges.

To build a stronger, more resilient seed supply system that truly contributes to global food security, policymakers must foster frameworks that encourage cross-border collaboration and the free flow of quality seeds.