International Seed Federation
Seed is Life

Results Analysis

SEED SECTOR SURVEY

Overview

The following document summarises the results of a survey of the global seed sector, coordinated by the International Seed Federation (ISF) from June to August 2024. In total, 216 responses were collected.

Overall, the survey produced the following findings:

- **Achievements**:
    - The International Union for the Protection of New Varieties of Plants (UPOV) and the Green Revolution were highlighted as the most important achievements of the seed sector over the last century.
- **Challenges/Threats**:
    - Almost 45% of respondents ranked climate change as the most challenging issue facing the sector.
    - Issues around international trade, the movement of seeds, and regulations were also frequently cited as challenges both now and in the future.
- **Opportunities/Impact**:
    - Nearly all of those surveyed felt new breeding breakthroughs to accelerate the development of improved seeds were very likely (49%) or somewhat likely (42%).
    - Around a third of the global seed sector called for more private and public investment, and for predictable and science-based regulations to have the most impact for unlocking more innovation in the sector.
- **Calls to action**:
    - Respondents made calls to action that around nine themes: innovation and R&D; sustainability; collaboration; regulation and policy; awareness and public perception; quality and accessibility of seeds; biodiversity and genetic resources; finance; and regional focus.
    - Respondents generally called for a seed sector that is collaborative, sustainable, and science-based, and that offers high-quality, resilient, and accessible seeds, especially for low- and middle-income countries.
    - They also called for unified regulation and improved public awareness and perception around GM crops and seed innovation more widely.
- **Crops**:
    - The largest proportion of respondents work with vegetables (38%, 158 respondents), followed by field crops (36%, 149 respondents), and forage and turf (20%, 84 respondents).*
- **Regions:**

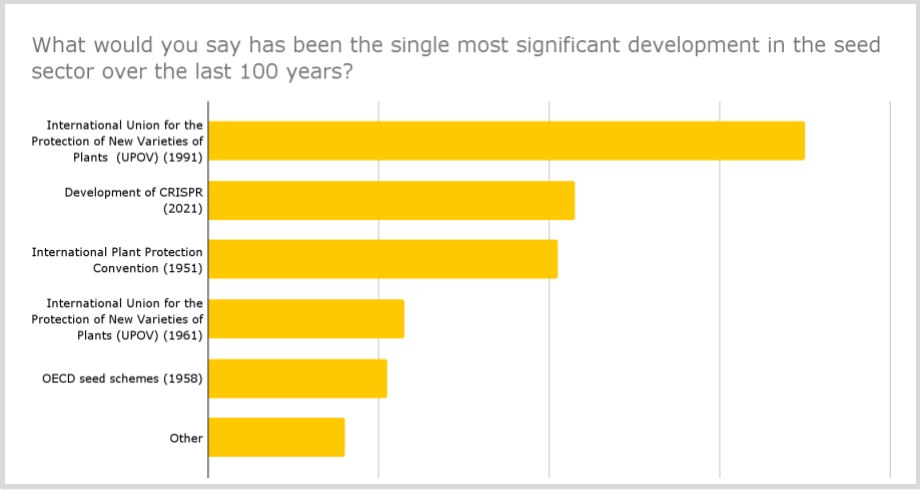
    - The largest proportion of respondents' work is based in Europe (28.2%, 61 respondents), followed by those with a global scope (23.1%, 50 respondents), and South/Southeast/East Asia (20.8%, 45 respondents).
- **Sectors:**
    - The largest proportion of respondents work in research and development (18%, 96 respondents), followed by production/manufacturing (17%, 92 respondents), and leadership/management (15%, 83 respondents).*

Analysis

Achievements

When asked to identify the most significant development in the seed sector over the last 100 years, the largest proportion of respondents chose the **Convention of the International Union for the Protection of New Varieties of Plants (UPOV) (1991)**, which updated plant breeders' rights, with 32% of respondents (70 total). The original convention (1961) was cited as the most significant development by 10% of respondents (23 total).

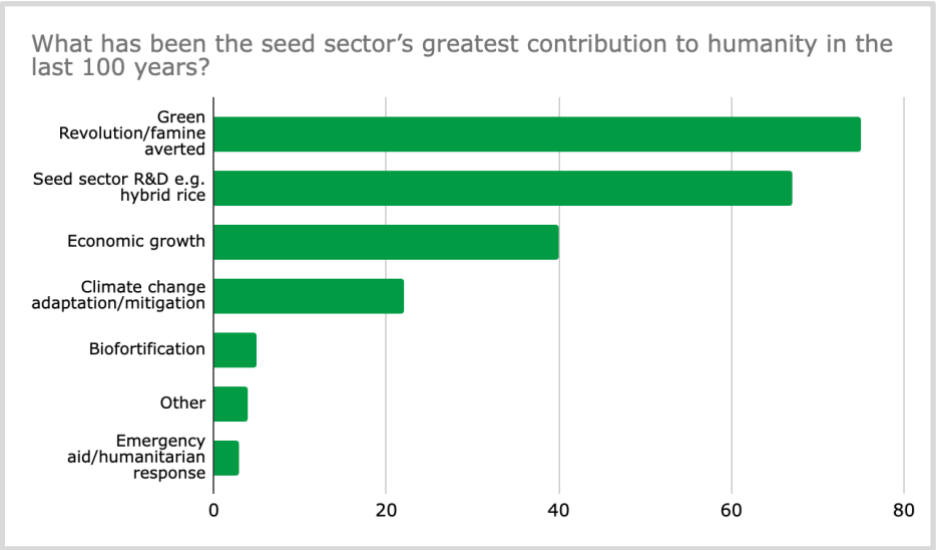
This was followed by the **development of CRISPR** (20%, 43 respondents) and the **International Plant Protection Convention (IPPC)** (19%, 41 respondents).



Those responding 'Other' (7.5%, 16 respondents total) highlighted the **Green Revolution**, **hybrid breeding/GMO technology**, and **improved sustainability/circularity**.

When asked what the seed sector's greatest contribution to humanity has been in the last 100 years, the largest proportion of respondents chose the **Green Revolution/famine averted**, with 34.7% of respondents (75 total).

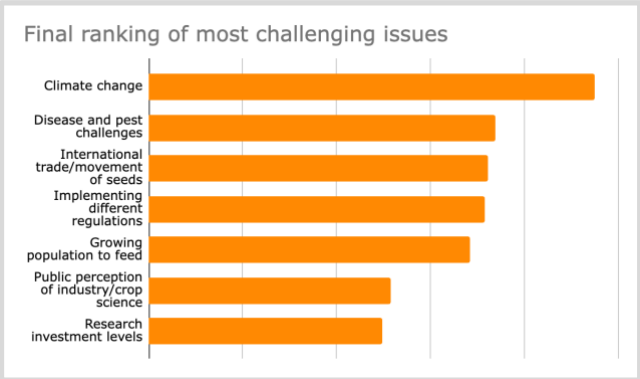
This was followed by **seed sector research and development (R&D)** (31%, 67 respondents) and **economic growth** (18.5%, 40 respondents).

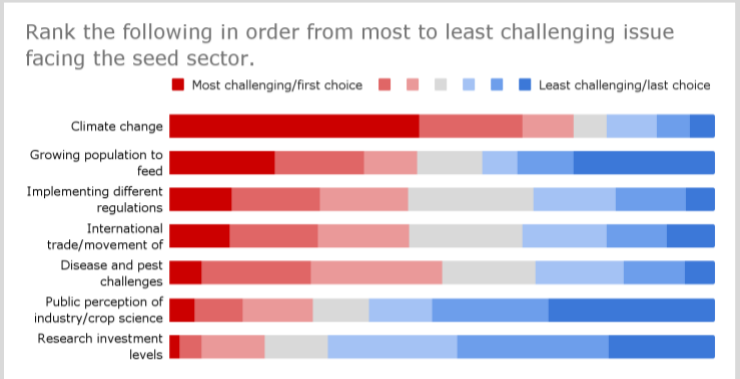


Those responding 'Other' (1.85%, 4 respondents total) all highlighted the sector's contributions to food security generally.

Challenges to the sector

When asked to rank the most challenging issues facing the seed sector, **climate change** was ranked top by 44% of respondents. Other highly ranked challenges included **disease and pest challenges** – which is also [increasingly linked to climate change] – and **international trade/movement of seeds**.

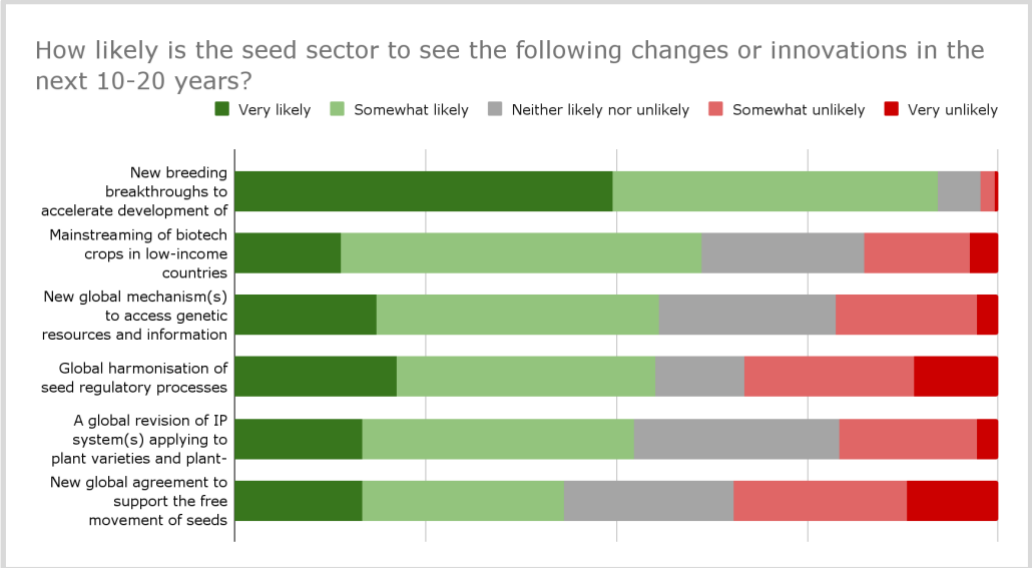




Biodiversity loss, **intellectual property management/infringement**, and **environmental challenges** (conversion of arable land, water availability, concentration of seed companies in colder climates) were also cited as challenges facing the sector.

Opportunities

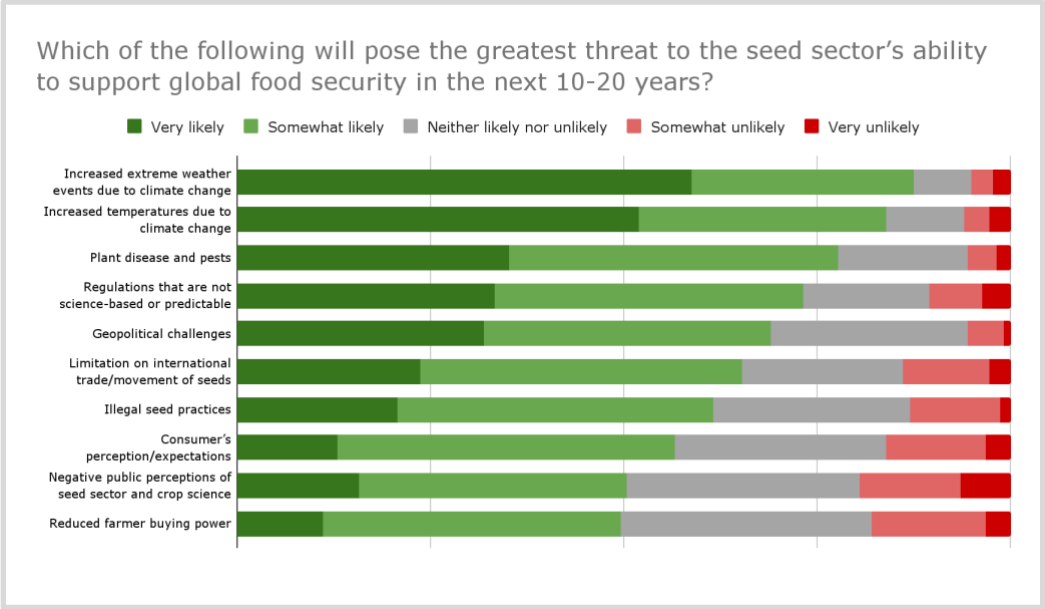
When asked how likely the seed sector is to see a series of changes or innovations in the next 10-20 years, **new breeding breakthroughs to accelerate the development of improved seeds** was ranked most likely. Other changes or innovations ranked likely included **mainstreaming of biotech crops in low-income countries** and **new global mechanism(s) to access genetic resources and information and share benefits**.



Other changes/innovations anticipated by participants included **advances in breeding**, **increased focus on developing countries** and **improved knowledge-sharing**.

Threats

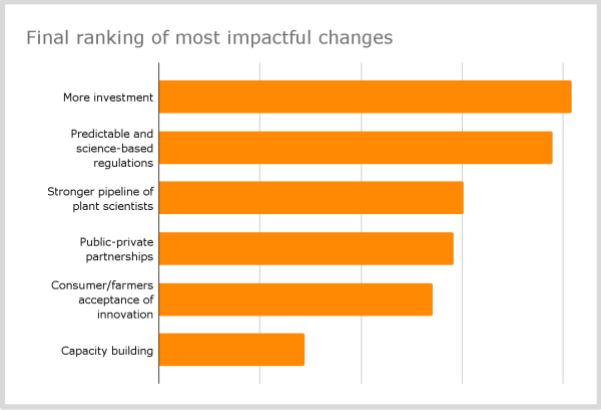
When asked which challenges will pose the greatest threat to the seed sector's ability to support global food security in the next 10-20 years, the top three threats were all closely connected to the impact of climate change. The top challenge cited was **increased extreme weather events due to climate change**, followed by **increased temperatures due to climate change** and **plant disease and pests**, the spread of which is exacerbated by rising temperatures.

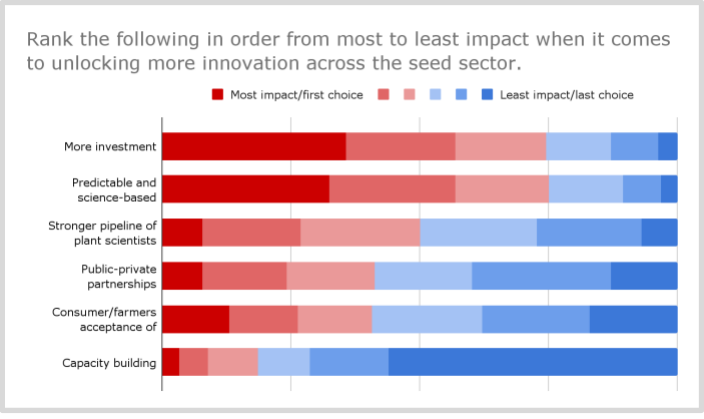


Additional answers included **short-term profit focuses of the private sector** and **biodiversity loss**.

Impact

When asked to rank the most impactful changes for driving progress in the seed sector, **more investment** was ranked most highly by 36% of respondents. (Note: this includes private and public investment.) Other highly ranked changes included **predictable and science-based regulations** and **a stronger pipeline of plant scientists**.





Additional answers included **ethical approaches** and **mutual acceptance of regulations/streamlining bureaucracy**.

Calls to action

When asked what their call to action for the seed sector for the next 100 years, respondents answered largely around nine themes:

Theme	Selection of responses
Innovation and research development	*"Embrace innovation in plant breeding through trust in science."* *"Increase research and innovation on crops and seed improvement, mainly regarding resistance and resilience of crops in front of growing climate change challenges, all around the world."* *"Invest in research and development: Allocate resources for research to develop climate-resilient and high-yielding seed varieties that can withstand changing environmental conditions."*
Sustainability	*"My call to action for the seed sector for the next 100 years is to prioritize sustainable and resilient agricultural practices that address the challenges of climate change, biodiversity loss, and global food security."* *"High biology producing plants promoting healthier soils and foods, using less chemicals."* *"Climate protection and sustainability, microplastics-free, reduction of hazardous active ingredients in the environment."*
Collaboration	*"Build stronger collaborations between the farmers, seed companies, and the enablers (regulators, financial and crop insurance institutions, researchers, etc.)"* *"Seed sector must work together with the ag value chain toward sustainable agriculture. Sustainable means 'not depriving future generations of Genetic resources, land, environment.'"* *"Continue to work with regulators and consumers and continue to cooperate with fellow seed industry participants."*
Regulation and policy	*"Focus on science-based regulations and IP protection, investment will follow."* *"Harmonize regulations for the movement of seeds."*
Awareness and public perception	*"Raise consumer awareness and understanding of improved seeds."* *"build science acceptance in public opinion ... then, stakeholders, third parties, and politics will obviously support that seed and genetic are the most efficient solutions providers to most of humanity's challenges."*

	"Be transparent and reach out to your (end) consumers."
Quality and accessibility of seeds	*"Improve access to quality seed in time at an affordable price."* *"Access to quality seeds across all geographies - at the right price, right time, and right quality."* *"Improve seed quality – Extend seed treatment and introduce quality standards for treated seed in most countries."*
Biodiversity and genetic resources	*"Preserve biodiversity, invest more in research in order to maintain the biological potential of the variety in the face of climate change."* *"Support a wider diversity of genetic resources (cultivars) in order to distribute risks. Promote open access to genetic resources."*
Finance	*"Breeding will follow the money, and new economic developments can change our markets."* *"Reward innovators and allow access of new technologies to all."*
Regional focus	*"Seed technology transfer to less developed countries to ensure food security. Farmers who are growing crops should be encouraged to grow more food for growing population."* *"Promote the seed production in the countries/regions where it could be produced in the long term (South America, Africa), the other regions grow seeds and other agricultural products based on subsidies and this must be eliminated."*

Crops

The largest proportion of respondents work with **vegetables** (38%, 158 respondents), followed by **field crops** (36%, 149 respondents), **forage and turf** (19%, 80 respondents), **tree and shrub** (4%, 20 respondents), and **flowers/ornamentals** (1%, 4 respondents).*

Region

The largest proportion of respondents' work is based in **Europe** (28.2%, 61 respondents), followed by those with a **global scope** (23.1%, 50 respondents), and **South/Southeast/East Asia** (20.8%, 45 respondents).

Sector

The largest proportion of respondents work in **research and development** (18%, 96 respondents), followed by **production/manufacturing** (17%, 92 respondents), and leadership/management (15%, 83 respondents).*

**This question allowed for multiple responses.*

About the International Seed Federation (ISF)

ISF is the voice of the global seed industry. It has represented the interests of its members since 1924 and represents 96% of the international seed trade today. With a global reach extending to members around the world and official observer status in intergovernmental and international organizations, ISF is uniquely positioned to assist in the development of government policy and business strategy.

www.worldseed.org