



◀ WCR's breeding team and staff at the WCR research farm Flor Amarilla in Santa Ana, El Salvador. Image: Jody Johnston.

Mind the gap

As extreme weather events threaten global coffee supplies, the industry is banding together to fund the next generation of climate-proof coffee varieties amid a colossal funding gap.

A MID GLOBAL supply shortages and the coffee market climbing to historical highs, with green coffee hitting US\$4 for the first time in February 2025, nonprofit research organisation World Coffee Research (WCR) is rallying the global coffee industry to drive science-based solutions to address the sector's climate challenges.

With more than 200 members across 30 countries, WCR is urging support for agricultural initiatives and the development of climate-resilient coffee varieties to future-proof the sector.

According to data from WCR, the global coffee industry could face a supply shortage of millions of bags as early as 2030, as demand for coffee steadily increases amid the impacts of climate change. WCR says the recent price hikes reflect an urgent need for new technologies and innovations

that help farmers tackle the combined challenges of extreme weather, pests, and disease.

What's more, it is estimated that nearly three quarters of the world's coffee is produced in only five countries, leaving the supply chain vulnerable to climate change and other risks.

"It can and will reduce origin diversity and increase supply shocks like the one we are seeing right now," says Hanna Neuschwander, Senior Advisor, Communications at WCR.

"When we are highly dependent on just two origins to produce most of the world's coffee, and those two origins experience climate events at the same time, supply is highly affected. But we are so reliant on Brazil and Vietnam because they have far outpaced other countries in productivity and they produce coffee very efficiently. In

order for coffee to continue to be a viable crop in other countries, they must increase productivity to effectively compete."

She says there are many ways to achieve this, but agricultural innovation such as creating better varieties to help farmers produce more with less is an essential driver. Yet, WCR says agricultural research and development (R&D) to address this issue is lacking, with an estimated annual underfunding of US\$452 million.

Neuschwander explains this problem is multifaceted, but in short, is a market failure. Since coffee is a tree crop, and trees take a while to grow, any new innovations take a long time to show a return on investment. This makes it harder for businesses to justify spending a lot of money on R&D.

"Public coffee research institutions are

located in mostly lower-income economies with many competing economic priorities and are deeply underfunded. Because coffee is a tree crop that doesn't need to be replaced every year, there is a difficult – though not impossible – business case for a private company to build a breeding-and-seed-sales business. Coffee has languished in this grey area for far too long," says Neuschwander.

To close this funding gap, multi-year commitments from WCR's member companies have helped launch two global coffee breeding networks for Arabica and Robusta that together include the participation and collaboration of 11 producing countries, which export 43 per cent of the world's coffee.

This includes the global industry making a renewed US\$10 million commitment (a small component of this total is contingent on green coffee volumes and is calculated with historical averages, which may result in fluctuations to future revenue) to its worldwide coffee breeding and seed sector strengthening programs.

"These networks are creating the next generation of coffee varieties that will ensure stable supplies from diverse origins.

"Without the foundational investments made by the private sector such as WCR member companies, these tools would not exist."

Hanna Neuschwander
SENIOR ADVISOR,
COMMUNICATIONS, WCR

WCR is on track to deliver 100 improved Arabica varieties by 2030, with Robusta to follow. On top of that, the 11 countries participating in WCR's collaborative breeding networks will also release their own varieties developed from materials shared via the networks. WCR's member funding goes directly to support and operate our global breeding networks and connected programs," says Neuschwander. According to WCR CEO Dr Jennifer

'Vern' Long, 2024 was a "milestone" year in the organisation's breeding networks and its global journey to create the next generation of varieties.

She explains that WCR's Arabica and Robusta breeding programs, along with its trials and nursery and seed system initiatives, have entered new phases that are expected to bring greater stability and resilience to the sector in 2025 and beyond.

"I see the transformational impact these efforts will have – not only on our industry – but also the social impacts delivered from stable coffee export revenues and, most especially, the economic and environmental benefits that coffee farmers around the world will experience firsthand," says Dr Long.

"This journey, on which we've embarked together, is absolutely the course that will get us where we need to be as a global coffee community."

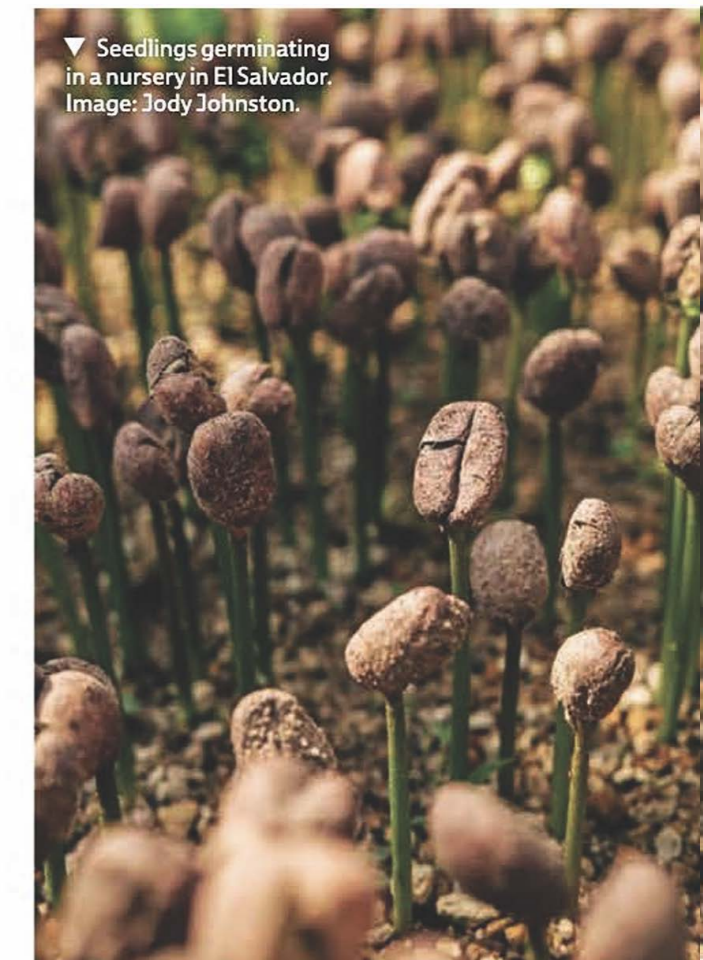
Neuschwander believes public-private partnerships are essential to help close coffee's long-standing innovation investment gap. She explains when co-investment happens, everyone benefits: the companies investing to secure access to the volumes of green coffee they need for their



▶ At the Chirinos cooperative in San Ignacio, Peru, technicians are growing baby coffee trees that will become mother trees for seed production. Image: Yober Rivera.



▼ A nursery in El Salvador producing trees for coffee farm renovation. Image: Jody Johnston.



▼ Seedlings germinating in a nursery in El Salvador. Image: Jody Johnston.

businesses; farmers that can now access better trees, earning more and creating resilience; and coffee-producing nations that earn significant amounts of export revenue from coffee that helps them build roads and schools.

An example of a successful public-private collaboration comes from El Salvador. In 2021, its Government initiated an ambitious project to renovate approximately 35,000 hectares of land with 150 million new coffee trees to revitalise the country's sector after a major decline in national production over the past 15 years.

"They were particularly focused on planting high-yielding, high-quality, coffee-leaf-rust resistant plants. Additionally, to ensure farmers receive plants that are truly rust-resistant and high quality, the Government implemented new regulations regarding seed and seedling production," she says.

Any seed lot contracted to produce seeds was required to comply with criteria related to genetic conformity and seed health. Neuschwander says this level of quality control is not the norm in coffee.

"WCR worked with a panel organised

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Dr Jennifer 'Vern' Long
CEO,
WORLD COFFEE RESEARCH

by the government to advise on these regulations, and El Salvador is using DNA fingerprinting tools and seed health protocols developed by WCR to ensure high quality seed production," she says.

This approach is said to ensure farmers will receive the maximum benefit from these plants, and decreases the risk for El Salvador of this multi-million dollar investment in their coffee sector.

"Without the foundational investments made by the private sector such as WCR member companies, these tools would not exist and this kind of partnership would not be possible," says Neuschwander.

In 2024, WCR also activated seed sector partnerships between public and private actors to boost access to high-performing planting material. In collaboration with eight Peruvian partners, WCR established 10 new seed lots of improved varieties across three major regions, generating enough seed to grow approximately four million plants annually, supported by investment from international coffee companies JDE Peet's and Keurig Dr Pepper.

Additionally, in partnership with the Uganda Coffee Development Authority (UCDA), WCR distributed 100,000 disease-resistant plants to farmers, backed by investment from Strauss Coffee B.V. and core funding from WCR members, while training more than 100 nursery operators and seed producers in three regions with additional support from United Kingdom brand Taylors of Harrogate. Ten new farmer-led Robusta nurseries have also

been established, which together will be able to deliver 100,000 high-quality trees each year.

Throughout the industry and outside of the WCR network, there has been a rising tide of public commitments in support of closing the coffee R&D gap, and other investments to enhance agricultural productivity in coffee and support smallholder livelihoods. In 2024, G7 countries endorsed the importance of public sector involvement for "activating investments in public goods like research and development, policy reforms, and support to smallholder farmers".

WCR members are also calling on governments to join the industry and invest in agricultural R&D investment and coffee seed systems to enhance productivity and prosperity for farmers, reduce the environmental footprint of coffee agriculture, and sustain choice for consumers.

The first waves of new WCR coffee varieties are expected to arrive at farms across the globe as early as 2036 as the organisation races to accelerate timelines in

plant breeding. From there, WCR plans to deliver new varieties every three years.

"We aim to change the culture and norms around coffee agriculture from a poverty mindset to an innovation mindset," says Neuschwander.

"Coffee needs to move on from 'one and done' breeding efforts where farmers might get access to one new variety every 20 years – if that. Most farmers in most places are still growing varieties that are 50 to 100 years old and 50 per cent of the world's coffee trees need to be replaced in the next 10 years – but farmers don't have great choices for what to replace their current trees with."

She explains that climate change requires the industry to move towards a new norm of cyclical variety development and variety replacement.

"Of course, the most fundamental aspect of this has to be that new varieties really are better than older ones," she says.

"We are confident the future is arriving. We aim to deliver 100 new Arabica varieties by 2030, with Robusta to follow. And that will only be the beginning." **GCR**



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