Science

Lab-grown plants to 'sow wealth' for poorer coffee producers

Boosting hardiness and yield through science is helping farmers

September 25, 2017

NSIP laboratory in the southern Mexican state of Chiapas © Jude Webber

YESTERDAY by Jude Webber

They look for all the world like giant trays of mustard and cress, except that the curly green tendrils could provide your next caffeine fix. Welcome to the high-tech world of coffee cloning.

Forget shade grown. Coffee plants at the Nature Source Improved Plants (NSIP) laboratory in the southern Mexican state of Chiapas start life under the brilliant glare of lamps, as white-suited technicians cut minuscule leaf fragments and lay them in Petri dishes.

NSIP's parent, Agromod, based in the northern Mexican city of Monterrey, is working on improving the genetic profile of tropical crops — including coffee — to boost yields and "sow wealth" in poor areas. It has a partnership with Swiss food giant Nestlé.

Agromod's plants supply about half the beans Nestlé needs to make Nescafé at the world's biggest instant coffee factory in central Mexico. The sterile conditions may sound unromantic but farmers love the yields that are three times higher than normal plants. That is vital in Chiapas, Mexico's poorest state and the nation's biggest coffee producer, where output has fallen to its lowest level in 20 years as coffee rust has ravaged harvests.

"We're like a *maquiladora*," says Cuauhtémoc Navarro, director of operations in NSIP's vitro division, referring to Mexican manufacturing factories that pump out goods en masse.

This is science applied to farming, but not genetic modification. At NSIP, leaf fragments are cut from carefully tended hybrid "mother" coffee plants. After a couple of months, these produce calluses, whose tissue is harvested to grow embryos in a liquid solution before being transferred to the large trays to germinate. "We can make 8m to 10m embryos a year that produce 4m to 5m plants," says Dr Navarro.

Cuauhtémoc Navarro, head of operations, NSIP vitro division: 'We can make 8m-10m embryos a year'

Outside the laboratory, the baby clones are planted in peat moss. They spend six months in greenhouses before dispatch to Nestlé's nurseries, where farmers taking part in a Nestlé sustainable agriculture plan buy them and sell the coffee they produce to the company.

As well as to coffee, Agromod applies its proprietary technology in cloning to boosting yields of banana, plantain, papaya, cacao and, for the tequila industry, agave plants. It is looking at propagating vegetables and berries next.

"We tell farmers: 'We're giving you a Ferrari but you need to look after it'," says Rogelio Trinidad, who oversees a Nestlé nursery in the Chiapas city of Tapachula, where a green army of 140,000 coffee clones is assembled in rows. They are robusta, the variety grown mainly in Vietnam and Brazil for use in making instant coffee and that traditionally has been the ugly sister to the more mellow arabica variety of coffee. Then again, it is more resistant to coffee rust, has a stable price and better margins, Mr Trinidad says.

The improved plants can yield up to four tonnes of coffee cherries — of which the coffee bean is the stone or seed — per hectare within a couple of years, or two to three kilos per plant.

This is the first year farmers will have to pay for the plants in full but they stand to recoup their investment swiftly. "A producer who gets two or three tonnes more a year of coffee cherries is boosting his income by 50,000 to 75,000 Mexican pesos (about $2,800 to $4,200) per hectare per year," says Dr Navarro.

Nestlé's thirst is outstripping the clone supply. "We had 7m plants this year," says Mr Trinidad. "We want 10m next year. Our aim is to have 50m plants by 2025."

Technology is giving hope to producers in Chiapas such as Bruno Giesemann, a fourth-generation farmer who grows coffee for Nestlé. Fed up with "waiting for crises to pass" — including low prices, Hurricane Stan in 2005 and coffee rust — Mr Giesemann ripped up some of his coffee acreage.

"I'd have reduced even more if it hadn't been for this [improved] coffee," he says. "I think this is the way forward."