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Can Jack slay the giant?

IT IS the story of Jack and the Beanstalk: the Christmas pantomime tale of a boy with a handful of magic beans that overnight grow to the sky. The beanstalk helps Jack to defeat the wicked giant, make his fortune, and save his family from starvation.

This week the fairy story has come to life. The role of Jack is played by the Consultative Group on International Agricultural Research, whose research centres around the world hold a collection of seeds for half a million or more traditional crop varieties. The sequencing of the genome of thale cress, *Arabidopsis thaliana*, has given plant scientists the key to creating improved crop strains (see p 14), making Jack's seeds more precious than ever.

Yet, far from being cock-a-hoop, CGIAR researchers are glum. Talks aimed at creating a binding international agreement for sharing the world's plant genetic resources collapsed last month (see p 16). This little-noticed diplomatic catastrophe means that few countries will send their seeds to the CGIAR's banks. Many will demand the return of what they have sent. Corporations may buy up the rest, egged on by nations including the US, Canada, Australia and New Zealand. This grouping is the giant who wants to hoard the gold. The world faces, in effect, the wholesale privatisation of plants that feed us all. Jack's family - the world's poor - face starvation. The chairman of the talks says that only a major political breakthrough can keep the seeds in public hands. That must be achieved. Anything less would be a victory for the greedy giant. And the world demands a happy ending.

This Week

Sold to the highest bidder

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If the world's plant genetic resources fall into private hands, people in the poor South could face famine and starvation

IN THE well-fed surroundings of a Swiss lakeside resort late last month, Mammon reared its ugly head-and the result could be millions more starving in the Third World.

With the world's media fixated on the hot air coming from The Hague, events passed unnoticed. But what happened in Switzerland may lead to one of the world's most precious public possessions being sold off piecemeal to the highest bidder. Half a million crop varieties, the genetic foundation of world food production, could be asset-stripped from their guardians-the publicly owned international seed banks that brought the world the Green Revolution and saved billions from starvation.

At Neuchâtel near Bern, international talks intended to keep the world's plant resources in common ownership collapsed. Unless they can be revived within the next few months, both the seeds and the scientists who tend them look likely to fall into private hands-the latest victims of the globalisation of property rights unleashed by the World Trade Organization (WTO), egged on by the US and its allies.

The debacle could sow the seed of famines to come, says one long-time observer of the negotiations, Patrick Mulvany of the Intermediate Technology Development Group, a British-based development charity. "This is a real disaster. The bedrock of world food security is now in jeopardy," he says.

The meeting was intended to be the culmination of six years of negotiations to produce an International Undertaking on Plant Genetic Resources for Food and Agriculture. It promised a historic compromise between the plant breeders of the industrialised world and farmers from developing countries who have nurtured their traditional strains of crop plants over the generations.

It is these crop varieties that contain most of the genetic raw materials from which breeders work. The deal would have guaranteed scientists free access to the seed varieties, while ensuring that a levy on any resulting commercial breeds gave the farmers some financial return. Supporters of the deal hoped it would also slow the catastrophic disappearance of plant varieties, now estimated to be running at around 2 per cent a year, probably twice the rate at which rainforest species are disappearing.

But four nations vetoed the agreement: the US, Canada, Australia and New Zealand. If this group looks familiar, it's because these same countries last month led the opposition at The Hague to Europe's plans for curtailing greenhouse emissions.

Food production survives as one of the few major industries not based on a rigid system of patents. Innovation has traditionally taken place on farms and in public research centres rather than private labs. A system of open access to the world's plant resources has persisted, thanks to a global network of 16 international agricultural research centres, funded by the World Bank, governments and charities, which have stored and bred seeds for the common good.

Today, the centres hold more than half a million plant varieties. Their collections provided the genetic feedstock for the high yield varieties of staple foods such as rice, wheat and maize that have kept the world fed while its population has doubled in the past 35 years. They hold out the promise of new varieties to cope with global warming and the unremitting threats from evolving pests and diseases.

The open-access system has relied on a voluntary agreement among national governments - excluding, predictably, the US and a few others. Now this consensus is breaking down. The failure of the Neuchâtel talks to create a permanent, legally binding system involving all countries threatens to be the final blow. Soon, cooperation could be replaced by a system of rigid proprietary control of the world's food crops as countries seek to claim ownership of their native seed varieties. Private companies are also scenting big bucks.

The research centres, starved of funds, would have to sell off the "common heritage". Already some cash-strapped research centres are scaling down plant collections to save money, says Theo van Hintum of the Dutch government's Centre for Genetic Resources in Wageningen, the Netherlands, which recently cut its collection of cabbage varieties from 273 to 54 (New Scientist, 24 June, p 18). Keeping hundreds of varieties alive usually means continuously farming them, and is a costly business.

The first assault on the open-access system came from some plant-breeding companies who felt that their right to patent key resources should be paramount. That desire is redoubled now that biotechnology offers the prospect of turning the genes of humble plants in seed banks across the world into billion-dollar magic bullets.

A second assault has come from some developing countries, who see their genetic resources being plundered by Western corporations. These countries, notably the rainforest nations of Brazil, Colombia and Malaysia, "have come to see vast fortunes locked up in biodiversity", says Clive Stannard, assistant secretary of the UN's Commission for Genetic Resources in Food and Agriculture. They want to claim sovereign rights and to sell their biological resources to the highest bidder.

Ironically, a conservation law has encouraged this view. The 1992 Convention on Biological Diversity holds that countries with rich biological resources will conserve them better if they can make money out of them. Almost as soon as it was agreed, "governments from the Andes to the Horn of Africa began closing their borders, halting national and international seed exchanges", says Silvia Ribeiro of the Rural Advance-

ment Foundation International (RAFI), the only non-government body allowed into last month's talks. Since then, she says, "the bot-tom has fallen out of scientific exchange of the very stuff that keeps food on the table".

Back in 1993, as the biodiversity convention became law, the UN's Food and Agriculture Organization decided to begin talks on replacing the existing voluntary agreement with a legally binding frame-work on open access to plant varieties. Its aim was to ensure that ownership of major international food crops such as wheat, rice and potatoes, plus key crops from poor countries, such as cassava and yams, remained in the public sector.

At talks in Tehran in August, a deal appeared to take shape. Biotechnology companies and plant breeders, who had previously stonewalled the process, joined with negotiators from the industrialised countries to back the plan. They agreed that in return for continued access to seeds they would help to fund seed conservation by stumping up a small percentage of royalties from products created using publicly owned seeds. Governments agreed to contribute to the annual $350 million seeds conservation-fund by channelling money through bodies such as the World Bank.

The developing countries made concessions too, by agreeing to concede sovereignty over their food plants. As the leader of the African group at the negotiations, Tewolde Debre Egziabher from Ethiopia, put it: "The understanding is crucial for us because it will ensure that nobody can register intellectual property rights on our farmers' crop varieties. It will facilitate continued access to crop varieties the world over."

It seemed like a great day for pragmatic cooperation. But once the meeting was over, trade officials started saying that the planned levy on products might conflict with the WTO's rules on free trade. In Neuchâtel, negotiators desperate for a deal brought in WTO lawyers in the hope that they would explain the rules. But the lawyers merely said that there are no rules until a disputed case is heard before the WTO courts.

The US, Canada, Australia and New Zealand, rather than the WTO, were largely seen as responsible for the backtracking on the Tehran deal and the collapse of the talks. According to Mulvany, "I think governments such as the US are hiding behind the WTO. Most legal advice is that the Under-taking would not infringe the trade rules." An exasperated European delegate is reported to have muttered: "Those people think a plant is some kind of industrial manufacturing facility. They haven't any idea about the impact they are having on food security."

A week later the chairman of the negotiations, Venezuelan ambassador Fernando Gerbasi, pleaded at the FAO in Rome for political leaders to overrule trade officials and broker a deal. Talks are set to resume in February. But already the atmosphere among the seed research centres is profoundly depressed. "It's anybody's guess what will happen," says Ruth Raymond of the Rome-based International Plant Genetic Resources Institute, one of the hubs of the research network. "We might be asked to send all the seeds back to their country of origin. But for most of them there is no single country of origin. The task would be impossible."

Jan Borring, a Norwegian negotiator, foresees seed wars between the providers of genetic resources and industries using these resources to create new products. The research centres would end their days locked in endless legal disputes, rather than doing science. The network of public research centres “will gradually shut down”, forecasts Ribeiro. “Consumers in the North will notice food prices going up. People in the South will face malnutrition.”

One further result, says Mulvany, is likely to be a dramatic reduction in the bio-diversity of vital crops as research centres close and private companies rationalise their assets. One straw in the wind came earlier this year, when the world’s largest vegetable seed company, Seminis, removed some 2000 seed varieties from its catalogue, a quarter of the total, as part of a “global restructuring and optimisation plan”.

“The upshot of failure in the talks would be enormous,” says Stannard. “World food security would be seriously damaged.” And, with world grain harvests falling for the past two years, the wolves are already at the door.

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