

# Saving Seeds for Future Generations

*A new international effort, costing an estimated \$300 million a year, has been proposed to preserve plant germ plasm*

IT WOULD BE HARD TO ENVISION A LESS fertile environment than the depths of a coal mine the Norwegians scooped out of the barren, permafrost-covered Arctic island of Spitsbergen, in the Svalbard islands. But the Norwegian government has chosen this remote, all-but-lifeless abandoned mine as the unique site for the motherlode of protolife—a storehouse where diverse plant seeds will be kept in a deep freeze in case of catastrophic plant extinctions. “The Svalbard International Seedbank,” as the Norwegians have named their project, which is to open for deposits beginning next year, “would be no different from a Swiss bank,” says Yawooz Adham, a geneticist at the International Board for Plant Genetic Resources (IBPGR) in Rome. Any nation could store precious genetic material free as a hedge against skyrocketing food demand—and especially against the possibility that habitat destruction, climate changes, agricultural practices, or neglect could lead to a sharp decline in the variety of the national flora. And as at Swiss banks, depositors would be assured complete privacy, making “deposits” and “withdrawals” without anyone else knowing about it.

Swiss-style banks for seeds are just one element of a broad—and newly sophisticated—program to save the germ plasm of the earth’s plants. Last week a key international agricultural research organization, the Consultative Group on International Agricultural Research (CGIAR) became the latest group to back an initiative calling for a new international structure for preserving plant germ plasm (following endorsements by the Nordic nations). According to the new proposal, an entity would be created that would boast a projected annual budget of \$300 million, and would be funded by private and public donors, including many nations. “That’s a threefold to fourfold increase over the total money now spent on protecting plant germ plasm,” says Geoffrey Hawtin, the director of the IBPGR in Rome, one of CGIAR’s 16 international agricultural research centers (which also have been putting more resources into preserving germ plasm).

The recent international push is a far cry from the early days of the campaign to save plants’ genetic diversity. In the early 1970s,

there were only a half-dozen plant gene banks holding samples from about 200,000 different plants in total, says IBPGR geneticist Adham. That was far more than the 150 species that are the staples of modern agriculture, but there are millions of species of plants on the earth today. Many nations have come to realize that, lacking a centralized facility with guarantees that deposits would be protected against agricultural espionage, they have to create their own to protect this natural diversity of plant species. Which is why there are already more than 100 seedbanks (ranging from rudimentary rooms to sophisticated cold storage facilities serving several nations) that hold at least 3 million samples. But that’s still viewed as far too little—partly because most developing nations store seeds at temperatures above zero where they are subject to spoilage. Says Hawtin: “Gene banks are grossly, inadequately funded in many, many countries. Even if they were (funded adequately), gene banks alone are not the answer.”

The new initiative, intended to address these problems, came out of the Keystone Center in Colorado, which invited researchers, environmentalists, agriculture industry representatives, and policy-makers to a series of meetings in Colorado, India, and Norway. The result was a global initiative that called for the establishment of a nonprofit organization to fund and support research to preserve plant germ plasm. As envisioned, it would provide money to operate and improve the existing banks and develop better ways to store germ plasm. It would also send funds and experts to the source of the seeds—the fields—to encourage farmers to set aside part of their land to grow diverse varieties of plants, to keep their own local seedbanks, and, perhaps, to encourage developing nations to use an international facility like the one being built by the Norwegians.

Perhaps the most egregious problem needing attention is described by University of Massachusetts biologist Garrison Wilkes, who wrote in 1989, “Unfortunately, germ plasm is being lost in some holding institutions and they have become, sadly, germ plasm morgues.”

The obvious answer might be establish-



**Cold potato.** Researchers store a wide variety of potato plantlets in an *in vitro* genebank in Toluca, Mexico.

ing high-tech banks that serve several nations—like the Norwegian one or a regional bank being built in Zambia to serve 10 southern Africa nations. But there are two difficulties with that route. First, developing nations worry that scientists from other lands might get access to their seeds and patent them or use them to develop transgenic plants with special traits. Further, they are suspicious of laws granting intellectual property rights for development of new plant varieties. The fear: that industrial countries might secure intellectual property rights to the plant genes before native scientists could capitalize on them.

This is why the Keystone proposal would earmark money simply to try to improve the worst failings of national banks—such as the widespread loss of plant samples (including their original name and location). In addition, the proposed body would pay local farmers both to set aside portions of their fields to grow diverse varieties of a crop and to form their own local seed or tissue culture bank (especially for plants such as fruit and coconut trees whose seeds cannot be stored easily). Research also would be funded to improve methods of storing seeds, plant tissues, and even pollen—and to investigate which varieties are most important to store. “What we’re sponsoring is an integrated approach,” says Hawtin. “You don’t put all of your eggs in one basket.”

But that kind of organizational potpourri won’t come cheaply. Hawtin, for one, admits that it won’t be easy to raise \$300 million in one go. But the backers of the initiative are hoping to get more nations to sign on and to develop a groundswell of support by next June, when they will take their case to world leaders gathered at the United Nations’ Earth Summit meeting in Rio de Janeiro. The hope is that world leaders will recognize—and invest in—the concept that their national futures depend not only on economic and social diversity but also on the diversity of the plants that feed their populations. ■ ANN GIBBONS