



Tough To Swallow

As America and Europe squabble over the viability of genetically modified foods, Egypt is quietly developing modified corn and cotton crops that have the potential to boost output and reduce chemical spraying. But even if the crops prove safe, some fear GM production could interfere with Egypt's exports to the EU. Are GM foods worth the risk

In May of 2002, a number of southern African nations faced the worst food shortages in more than a decade when crop yields already weakened by poor management, political turmoil and the devastation wrought by AIDS were further aggravated by a summer of severe flooding, followed by an equally severe drought. Aid groups estimated that nearly 15 million people faced starvation. The international community acted quickly, with the United Nations World Food Program (WFP) promising a substantial amount of emergency food aid in the form of surplus crops, primarily from the United States, the WFP's chief donor. Zambia, Zimbabwe, Malawi and Mozambique politely declined.

Leaders said they could not accept food aid from America, because it was contaminated with genetically modified organisms (GMOs), which they claimed made it hazardous to human health. The most outspoken was President Levy Mwanawasa of Zambia, who refused to admit even milled grains from the United States. Simply because my people are hungry, that is no justification to give them poison, to give them food that is intrinsically dangerous to their health, said Mwanawasa, during a development conference in Johannesburg.

Many speculated that African leaders' opposition to the aid was motivated by other concerns, namely the fear that GMO contamination could harm their countries' long-term ability to export to Europe, which at that time had a strict moratorium on the import of genetically modified foods. The United States implored the small African countries to accept aid, claiming that there is no scientific proof that GM foods are harmful to human health. The threat of famine is something we know, Andrew Natsios, head of the United States Agency for International Development (USAID), told the BBC. We know what happens when people don't eat they die. Natsios added that he and his family, like most Americans, have been eating genetically modified foods for the last several years without any noticeable effects on their health.

The countries eventually gave in and accepted milled GM cereals, but Zambia refused to budge, and was only spared from the catastrophe at the last minute when European donors stepped in to provide certifiably non-GM aid.

The Zambian case remains one of the most extreme and often discussed events in the history of a controversy that has engulfed the entire world, pitting the United States against the European Union and large-scale agribusiness against the global environmental movement. As a result, nearly every developing country in the world has had to carefully navigate between the rival export markets, while making hard decisions about a new technology that manipulates the building blocks of biological life, promising big dividends and, critics allege, potentially catastrophic long-term effects on human health and the environment.

Since 1990, the Agricultural Research Center (ARC), based in Egypt under the leadership of Magdi Madkour, has been actively researching and developing genetically modified crops that scientists believe can address a host of problems faced by the agricultural sector, from insect infestations to drought and rising soil salinity. But until now, the country has refused to delve into commercial production, largely out of the fear that doing so may shut down export markets in Europe, where hostility to GM foods runs high. In recent months, however, as the European Union has softened its stand by lifting a five-year moratorium on GM crops, opened the door to 18 GM products including soybeans, maize, and some vaccines and taken 24 more under review, Egyptian advocates of GM technology have grown bolder, calling for the commercial production of GM cotton and corn crops by 2006. Egypt would not be the first developing country to embrace the technology. China and Argentina have been growing GM crops for years but the decision will nevertheless mark a crucial juncture in the history of Egyptian agriculture. However, whether a cautious majority of growers and consumers in Egypt will embrace GM technology remains to be seen.

Sowing GM crops in Egypt

South of Cairo University, behind the tall concrete walls that separate it from the bustling city, sits the Agricultural Research Center, a sprawling commune of fields, greenhouses and administrative buildings. Here scientists in lab coats and straw hats wander through narrow furrows in several sequestered gardens, carefully monitoring and evaluating a microcosm of Egypt's agricultural landscape the

size of a football field. It was here that Egypt launched its own applied biotechnology research program, the Agricultural Genetic Engineering Research Institute (AGERI), in 1990.

Anticipating the important role the burgeoning science of genetics would eventually come to play in agriculture, the Ministry of Agriculture partnered with USAID to establish the center. Now, nearly 15 years later, it may be on the verge of launching the country's first commercially grown genetically modified crop, a strain of cotton that could save the industry millions of pounds every year by boosting output and virtually eliminating chemical crop spraying.

Cotton is a very safe product to start with, because the areas in which cotton is grown are restricted to certain varieties, so each variety is segregated, says Hanaiya Al Itriby, AGERI's director and one of the pioneers of GM technology in Egypt. Every year there's a decree that comes out that says the Giza variety so-and-so will be grown in this district, so it's allocated to specific areas.

Cotton is also a safe bet for export markets. Although exporting cotton seed oil from genetically modified plants would qualify as a GM product, the fibers themselves, especially when transformed into yarns and fabrics, do not contain any genetic material that would shut them out of European markets, and while many consumers refuse to eat GM products, few object to wearing them.

Over the last decade, AGERI has been actively researching a wide array of products everything from virus-resistant potatoes to bananas that contain vaccines for hepatitis. But with cotton, the center has found a commercial partner in the Monsanto Company, the US-based producer of the world's No. 1 herbicide, and anticipates Egypt will be able to start growing GM cotton by 2006.

The new cotton crop will contain a gene purchased from Monsanto that makes the plants resistant to certain insects, but Al Itriby maintains that the crop will retain its unique Egyptian characteristics in every other respect. In addition to collaborating with Monsanto, AGERI has also cooperated with the Cotton Research Institute (also part of the ARC) to insure that the new plants produce sought-after long staple fibers Egypt is known for. The breeders of the cotton are making sure that we keep the Egyptian line with all its characteristics, Al Itriby says. The selection was done by the breeders, so it's a collaborative and multi-disciplinary approach.

Although many in the cotton industry are optimistic about the new technology, some wonder whether the idea will actually catch on among Egyptian growers. The only thing they modify is the ability of the plant to sustain the attacks of insects, so that means less spraying, less cost and a better quality of fiber theoretically at least, says Amin Abaza, the Managing Director of the Modern Nile Cotton Company, which is heavily involved both in the agricultural and industrial side of the crop. But all of this remains to be seen, it has to be tried. [The grower] has to see it to believe it, especially our growers. They don't usually believe what the scientific community tells them until they see it themselves and they make sure that there really is a lower cost and a higher quality.

Abaza, who is in favor of genetically modified crops, believes that resistance to the concept will not come from any widespread health or environmental concerns, but from the increased price of the new seeds. People have to be convinced that if they are paying a little more for the seed, they are going to get their money's worth in crop management and in the quality of the crop, and this has to be seen in practice.

Because the new seeds contain a patented gene, anyone who uses them will have to pay a royalty to Monsanto, but advocates say that increased output, along with the amount farmers will save on chemical fertilizers, will more than cover the price of the switchover. Al Itriby points out that, in addition to developing the new crops, AGERI is also actively working to ensure that they find both commercial producers and markets. We are not doing research for research only, we are looking to put a product out, she says.

Although Egypt will have to purchase the initial genes from an international company, Al Itriby expects that the scientists at AGERI will eventually be able to develop their own genes, and has created an intellectual property rights office to help them to secure their own patents. Once you have your own genes, you have something important that you can use to barter if you want something that another person, or another institution, or even the private sector has and is willing to exchange.

The debate

Outside of Egypt, the commercial production of GM crops has caught on quickly since its inception in 1995, spreading to 18 countries and growing by more than 10 percent over the last seven years, according to the International Service for the Acquisition of Agri-biotech Applications (ISAAA), an international nonprofit organization dedicated to promoting GM technology. The United States retains the lion's share of production, but has recently been joined at the top by Argentina, China, Canada, Brazil and South Africa, all of whom account for 99 percent of production. According to the ISAAA, nearly one-third of GM crops and nearly 85 percent of farmers are from the developing world, statistics that GM food advocates point to as proof that the technology contributes to the alleviation of world poverty.

Farmers have made up their minds, says Clive James, the chairman and founder of ISAAA, in an official statement. They continue to rapidly adopt biotech crops because of significant agronomic, economic, environmental and social advantages.

Advocates of GM foods, particularly in the United States, have long argued that the crops offer a way out of poverty for countries that rely on agriculture. They point out that in addition to producing higher yields, biotech crops reduce or even eliminate the need for chemical fertilizers or pesticides, making them safer for the environment and cheaper for growers. Many hope that the new technology can continue the work of the Green Revolution of the 1970s and 1980s, which spurred development in Asia and Latin America, nearly doubling the amount of food production in much of the developing world.

All the countries who are involved in biotechnology are moving ahead at a very fast pace, says one senior US official at the American Embassy in Cairo, who asked not to be named. That clearly shows that there are economic benefits in the development, production and trade of biotech products. With its ever-growing population and dwindling land resources, many believe that Egypt would benefit from following in the footsteps of those who have already adopted the technology. If Egypt were to follow the same path, it is very clear that they would derive enormous benefits in terms of savings in the cost of production and market development outside, the official says.

Egypt's hesitation in embarking on the commercial production of GM crops largely springs from the fear that it could lose its European export markets, where a solid majority of consumers and elected leaders have not only rejected genetically modified foods, but have lobbied for stringent regulations to govern trade with countries who produce such products, all part of an attempt to prevent any contamination of non-GM foods.

Much of Europe refuses to accept advocates claims that GM foods are a panacea for the developing world, insisting that world hunger is caused by poor governance and inadequate distribution, rather than the inability to grow enough food. Many are also jaded by the memory of the excesses of the Green Revolution, which some saw as a scheme promoted by US farming interests that resulted in widespread social inequality and environmental degradation. Nowadays, many accuse US Agribusiness of foisting genetically modified foods on unsuspecting countries in order to glean royalties from patented seeds. Several aid organizations, including Oxfam International, supported Zambia's refusal to accept GM crops because they feared that acceptance would consign the country to a dangerous cycle of dependency on large foreign companies.

The UN Food and Agricultural Organization (FAO) is concerned that GM technology favors large agribusiness at the expense of small farmers, who are the most in need of increased productivity. Neither the private nor the public sector has invested significantly in the new genetic technologies for the so-called orphan crops, such as cowpea, millet, sorghum and teff that are critical for the food supply and livelihoods of the world's poorest people, says FAO Director-General Jacques Diouf, in the introduction to a recently released report entitled *The State of World Food and Agriculture 2004*. The report, which encourages a cautious approach to the spread of GM crops, accuses scientists and policy makers of largely ignoring the problems of small farmers in poor countries.

Opponents have also expressed concerns about the possible environmental consequences of GM foods. By manipulating the most basic building blocks of biological life, they argue, scientists may at best hinder biodiversity and, at worst, cause permanent damage to fragile ecosystems. They are quick to point out that while some crops, like biotech corn and cotton, are engineered to resist insects and viruses, others, like the Monsanto Company's patented Roundup Ready crops, are designed to endure one of the most potent herbicides on the market, Monsanto's Roundup, which is also patented. Opponents say this kind of tampering could give rise to plants that are so resilient that they overwhelm their neighbors and become weeds themselves.

Many in Europe also worry about the possible health effects of genetically modified crops. Although people in the United States and many other countries have been consuming GM foods for several years, many who oppose the technology maintain that there is still too much uncertainty when it comes to what they call Frankenfoods.

The US Embassy official says that such claims are unfounded, tied more to a political agenda than to scientific fact. The scientists and politicians in the European Union seem to be on two different tracks, he said. In our own biotech-related seminars, when we talk about the benefits of biotechnology, we have invited a number of scientists from the European Union who have been able to come and talk about their research and the benefits of biotechnology and what it can do for humanity.

In recent months, the scientists appear to have gained the upper hand, as the European Union, once a bastion of the movement opposing GM foods, has been slowly warming up to the idea. In May of this year, the European Commission lifted a five-year moratorium on the import of GM foods, putting a rigorous regulation system in its place. Now any member wishing to import genetically modified products may apply for permission to do so, but any product intended for human or animal consumption, even those that contain only trace amounts of GMOs (the threshold is .9 percent of the product) must be labeled as containing genetically modified organisms. Given the distrust many in Europe feel towards genetically modified products, officials in the European Union say the labeling is necessary in order to allow consumers to make their own choices.

The United States has long rejected the rationale for labeling GM products in Europe, maintaining that there is no reason to draw attention to something that is not proven to be dangerous. The US position is that one should label things if they are substantially different from non-biotech products, the embassy official says. We don't put anything on the label to say these fertilizers were used to produce those products, whereas those fertilizers and chemicals could be more harmful than the genetic modification.

Although the United States and the European Union officials continue to disagree on what level of regulation is necessary when it comes to GM foods, recent evidence suggests that the latter are gradually moving closer to the position of the former. Since the lifting of the moratorium, the European Commission has approved a number of GM products, and both Spain and Germany are already growing their own GM crops, albeit in small amounts. Earlier this year, the United Kingdom gave the go-ahead for planting genetically modified corn after the British Medical Association gave its approval, with Chairman David Carter saying it was necessary to move away from the hysteria that has been so often associated with GM foods.

But despite the recent movement towards GM foods at the policy level, Europeans remain skeptical of the products, and if the EU maintains its labeling policies, most consumers who do not share in the economic benefits of the new technology are unlikely to purchase GM products.

The organic option

The discussion of genetically modified foods in Egypt has largely mirrored the international debate, with a small number of detractors gradually giving way to a growing majority that favor the technology. One advocate is Adel Yaseen, chairman and managing director of Fine Seeds International, who describes himself as probably the biggest and most enthusiastic supporter of the technology in Egypt today. Yaseen's company, which supplies seed varieties to farmers, is spearheading the drive for GM crops on the part of the private sector. Yaseen hopes to complete the application process and begin marketing GM maize by the end of next year, through a partnership with Monsanto.

I know that the matter of GMO is highly controversial, but deep inside of me I feel the controversy is more political than scientific, Yaseen says. I think it's a fight between the Americans and the Europeans and I don't think we have anything to do with it. They can go and bang their heads against each other it has nothing to do with us.

Over the last few years the dynamics of maize farming in Egypt have changed, Yaseen says, with more and more farmers trying to plant earlier and later than the high season for growing, leaving their crops open to infestations of insects that bore into the stems and eat away at the insides of the plant. There are chemicals on the market to deal with the pests, Yaseen says, but they are only 20 percent effective. The new crops promise to deter the bugs and eliminate the need for chemical pesticides, allowing farmers to extend their growing season and maximize output.

Other growers disagree with that logic, claiming that the real problem is not the bugs, but the attempt to artificially maximize output at the expense of the natural environment. Helmy Abouleish, the Managing Director of Sekem, is one such critic. As a grower and producer of certified organic foods, Abouleish says GM crops pose problems, not only for his worldview, but also for his business, which would be forced to carefully insulate its own crops from even trace amounts of genetically modified organisms.

While Abouleish thinks it is important for Egypt to continue researching GM crops, he believes that a much better understanding is necessary before any crops are grown commercially. As we all know, science is dynamic and developing, and the latest technology and the latest scientific results are outdated two years later, Abouleish says. DDT at a certain stage was a very safe pesticide. Ten or 20 years later, it was found to be a very terrible pesticide which stays in the soil for 200 years. So when they recommended it, with the latest knowledge and results, everyone thought it was safe. Ten years later, 20 years later everyone knows that it is one of the deadliest of poisons. DDT was banned in Egypt in 1996.

Yaseen doesn't buy that argument, pointing out that people in the United States, which he considers highly health conscious, have been consuming such products since at least the middle of the 1990s. Moreover, Yaseen says, if GM crops are indeed a Pandora's box, then the lid has already been lifted with respect to both Egyptian and European consumers. Europeans are putting their heads in the sand, and so are we, here in Egypt, because most of the corn imported into Egypt, five and a half million tons every year, comes from the States, and 80 percent of it is genetically modified. So we know for a fact that we already have [GM foods] in Egypt, and the Europeans know it as well. They call it Frankenstein or whatever, but it gets imported into Europe and it gets into their poultry and ultimately into their houses, so it's a hypocritical position.

Yaseen believes that if Egyptians are willing to import GM maize for human consumption, then there should be nothing stopping them from growing it themselves. As an Egyptian, I don't see why we should import from somebody while we sit here hopelessly and without producing our own maize. If we can do it, then why let the American farmers produce it?

AGERI's Al Itriby understands the concerns that some have expressed about the new technology, but thinks progress on GM foods has been stymied more by general hysteria than any specific concerns. There are issues [when it comes to GM crops], but you have to state them, and then from there you address them, she says. At least you identify exactly what you're scared of, and then you can say what needs to be done. But I can't just ignore technology that is going to be useful, especially in developing countries like ours. We are looking at things that are tolerant to drought and salinity. These are major problems in Egyptian agriculture.

As a farmer, Abouleish understands the problems facing Egypt's agriculture sector, but believes that the organic movement offers a cleaner and safer alternative, both for supplying Egypt and for tapping overseas markets. The organic movement today is capable of producing healthy crops of most of the plants that I know about in the world, and without any impact on the environment or human health. So if we can switch today, in a safe manner, to organic farming and organic food production, and could feed the world population with healthy food, then why should we search for something with this high amount of risk, to do the same things we are able to do without it

For now at least, it appears that the rival schools can continue to coexist alongside each other. Those who favor the commercial deployment of GM crops in Egypt admit that the country cannot afford to lose its export markets in Europe, but they nevertheless maintain that the new technology offers, if not a cure, then at least a reprieve for Egypt's struggling agricultural sector. bt