



Can biotechnology feed Africa?

Anne Perkins asks whether GM crops might be key in helping to unlock Africa's agricultural potential

[Comments \(15\)](#)



Katine farmer Paul Odongo ploughing his land. Photograph: Dan Chung

It seems the perfect answer: use scientific advance to develop food crops such as bananas and maize that are capable of resisting the pests, diseases and the vagaries of the rainfall that each year threaten the survival of many of sub-Saharan Africa's small farmers. This, surely, is the key to unlocking its green revolution - and preventing another [food crisis](#) like the current one.

Where the rest of the world has seen an explosion in agricultural productivity that has mainly outstripped population growth, Africa produces less food per capita now than it did in 1960. The average [calorie consumption](#) is about 600 calories less than required. In some parts of Africa, as much as a third of the population are reliant on some degree of food aid. About 40 years of structural transformation has yielded almost [no growth](#).

Poor soils, increasing salinity, and lack of security are part of the story. But the damage that diseases and pests inflict on crops and livestock is a significant

problem. For example, the infestation of maize by a [parasitic weed called striga](#) has spread to over a million hectares of Africa's precious grainlands. The East African banana, another vital food source, is attacked by fungi such as black leaf strike and banana wilt, which is creeping south across the Great Lakes region.

Global warming poses another threat. Already farmers are complaining of infrequent and variable rainfalls which the [latest research](#) suggests will lead to somewhere between a 17% and a 30% fall in productivity before the end of the century. The difference depends on the use of carbon fertilisers. But they are major contributors to global warming.

Biotechnology seems to offer some protection from these challenges. But doubts persist not only about its safety, which has led to some African countries banning the import of genetically modified maize and soya (as well as Europe refusing to take GM exports), but also about its usefulness in building food security. Africa has been a slow and reluctant recruit to the [biotech revolution](#).

One reason is that technological advances in agriculture are largely done by big business for big farmers. Biotechnology is expensive to develop, and the companies involved such as Monsanto want big returns. Only large-scale commercial farms can afford the investment, particularly when the product is accompanied by licences that restrict its sale and further use. The so-called 'terminator' strategy - now less common - made it impossible to hold back seed for the following year's sowing.

When a new technology is successful on a wide scale it has the effect of forcing smaller producers into the same game. The commercial dominance of the new drives out the diversity of the old, even though it is variety that small producers need to get the most from their land for the lowest inputs. They find themselves forced into a relationship they can't afford with the corporate sector.

Commercial farming carries a high level of risk for a small grower. Relying on a single crop makes them highly vulnerable to drought and flood, while a variety of produce sown at varying times gives at least some resilience. If the worst happens, small producers find themselves in debt, with nothing either to sell or to eat. Far from enhancing food security, it destroys it.

Part of the answer is to reduce the cost of technological advance. That means rebuilding public research centres from the ruins of the privatisations of the 1990s enforced by World Bank economists demanding reform in return for loans. This is now happening across Africa. In Uganda, for example, trials are underway for a [genetically-altered banana variety](#) that will resist black leaf wilt.

Bananas are particularly vulnerable to pest and disease epidemics because there are few genetic variations - they propagate by cloning through suckers. But this also means they are safer for genetic modification because there is little risk of them spreading the modification unintentionally through cross-pollination.

But like many African countries, Uganda has allowed its infrastructure of agricultural 'extension' workers - trained agronomists who relay developments from research centre to the farmer, and report on farmers' needs to the researchers - to fall apart. It

is the commercial sector that has developed a marketing network in rural areas, not government, and its objective is profitability rather than poverty alleviation.

Nonetheless experiments and [trials in GM crops are now underway across Africa](#), in countries including Kenya, Nigeria, Zimbabwe, Senegal and Burkina Faso. They have ratified the Cartagena Protocol on [biosafety](#) and are developing their research and development capacity.

But outside agribusiness, there are few believers in the transformative powers of biotechnology. Equally few rule it out altogether. This week the UK government - unlike the US - accepted the report of the UN-backed [International Assessment of Agricultural Science and Technology for Development](#) (IAASTD) from its meeting in Johannesburg in April.

This body of American, European and African scientists recommended a completely different approach to stimulating an African green revolution. Its report is the latest in a growing body of research that says the smallholder is the key to unlocking Africa's agricultural potential and building food security.

This is the agronomy approach. As [Farm-Africa seeks to do in Katine](#), it believes that the men and women who work the land are the people who know what problems need to be solved, and in what order. The challenge is to find ways of channelling their knowledge into research and the results back out into rural communities - and the funding to do it.

GM crops may one day be part of the answer. They must not be allowed to become part of the problem first.



Posted by [Anne Perkins](#) Friday 20 June 2008 14.43 BST [guardian.co.uk](#)

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About this article

Can biotechnology feed Africa?

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Comments in chronological order (Total 15 comments)

-  [burgerchrist](#)

20 Jun 08, 11:14pm

rubbish. the first thing that a "typical" African country should be doing is how to feed its own population, not how to respond to externally imposed loans, Structural Readjustment Programs etc.

-  [EvilClanger](#)

21 Jun 08, 2:50am

Why has 'The Guardian' gone pro-GM with two blog leads on the same day? As they say, 'I think we should be told'.

-  [weddingdash](#)

21 Jun 08, 4:57am

"...Asks whether GM crops might be key in helping to unlock Africa's agricultural potential"

Let's ask why it's "locked"- ridiculous word- in the first place. It is certainly not because they lack GM technology.

Local infrastructure geared to local needs

Land reform

Indigenous technologies, enhanced where appropriate through solidarity-based exchanges with other international farming technologies

A brakes-on to climate change

An end to predatory trade regimes and lending policies

An end to subsidizing industrial farming that floods local markets with cheap imports (means developing world protectionism, like we practiced for ages)

An end to biopiracy and the defence of the right of people to their own genetic resources- the ones the ecosystem has been producing for millenia

I'll take those over the Gates-Rockefeller Green Rev 2.0. They are behind the new "Green Revolution with a human face", promising big science on a micro-level:

http://www.etcgroup.org/en/materials/publications.html?pub_id=613

-  [weddingdash](#)

21 Jun 08, 5:09am

"Commercial farming carries a high level of risk for a small grower. Relying on a single crop makes them highly vulnerable to drought and flood, while a variety of produce sown at varying times gives at least some resilience. If the worst happens, small producers find themselves in debt, with nothing either to sell or to eat. Far from enhancing food security, it destroys it.

Part of the answer is to reduce the cost of technological advance."

So, lower the costs of turning Africa into a maize and banana plantation, albeit with small-holders doing all of the monoculturing? Doesn't much of the first paragraph negate the recommendation in the last sentence? to repeat:

"Relying on a single crop makes them highly vulnerable to drought and flood, while a variety of produce sown at varying times gives at least some resilience."

So why not continue to plant a variety of crops at different times, rather than genetically engineering a more resistant (for a while only, 100% guaranteed that the pests will evolve too) monoculture? Makes little sense to me even by the standards offered in the article.

-  [weddingdash](#)

21 Jun 08, 5:31am

Re: above

I shouldn't have said "standards", wrong word. Meant to say criteria.

-  [TonyChinnery](#)

21 Jun 08, 7:52am

gm maize and soya are crops designed to feed to animals. The beef and dairy products they produce are more unhealthy than that produced by cows grazing on grass (which is what cows were designed to do). It takes several times the area of land to feed your population by growing crops, feeding them to livestock and then eating the livestock, as it does to feed them by growing the crops and eating the crops. Perhaps the USA can afford to use the first roundabout (and unhealthy) method, but Africa certainly cannot. It just does not have the land. The world does not have the land to feed itself as the USA and Europe does. At the moment world arable production is sufficient to feed the world's human population, but not the world's human population plus an army of domestic livestock.

And we in Europe should be setting an example of self sufficiency instead of subsidizing our livestock producers to buy precious grain to feed their animals, thus pushing up prices and denying it to the poor.

Instead we are trying to push a completely inappropriate technology which would end up enriching Monsanto and co. and lead to increasing starvation of those who cannot afford to feed themselves on hamburgers.

-  [FundusVentriculi](#)

21 Jun 08, 8:09am

Im not against gm crops, but "to feed africa" c'mon! behave yourself!

stop EU / US farm subsidies, and allow Africans to sell a bit as well!

but this will never happen, just fantasy. then famous americans will go there and feed starving children for a day, go back, cry about how bad the world is, and then buy food from the supermarkets which propagate this whole thing.

thank god i dont live in africa, otherwise i'd be fucked everyday by the EU/US

-  [maltster](#)

21 Jun 08, 9:10am

"Where the rest of the world has seen an explosion in agricultural productivity that has mainly outstripped population growth, Africa produces less food per capita now than it did in 1960."

Although Ethiopia is facing food shortages again in 2008, since the famines of the mid 1980s, its agricultural output has risen by more than 3% per year (doubling every 25 years), however the population has grown at 5%. The population in Ethiopia is more than double what it was at the time of Live Aid.

In addition, simply increasing agricultural output will solve little; Africa has almost no indigenous food processing industries, a very high proportion of current food crops are lost due to the inability of farmers get them to local markets before they rot or are eaten by pests.

It is the policy of Norway (where I live) not only to encourage better agricultural practices, but to help African countries develop the capacity to process indigenous foods for local consumption thereby reducing the vast amount of food currently lost between producer and consumer.

-  [Plataea](#)

21 Jun 08, 10:54am

Whilst the writer makes some good points, it might be helpful if we "start at the very begining" by asking the question: "what do we want" (re Africa) and then proceeding to more elaborate questions (those familiar with Wittgenstein will understand the process). The problems facing Africa are multiple (poor fertility of land, lack of stability, high population growth) etc etc. Solving one problem (lets use GM to address crop diseases) could make another worse (over population). Given that Africa is where humanity came from, those that stayed-on (when the rest high-tailed it to the rest of the world) deserve our support. This support should not, as it has been in the past, piecemeal, but a well thought out plan that also recognises that ultimately it is the small-scale actions, or actions that need to take place at a local level and which benefit locals that are most likely to succeed (ref Popper). "Succeed" in this case being an Africa that is peaceful and prosperous in its own terms

-  [RickDavies](#)

21 Jun 08, 10:21pm

It would be good if at least one of the people responding to Anne's article could get to the second last paragraph, which talks about what Farm Africa is trying to do (with Guardian funding), and talk about that.

-  [gadf](#)

22 Jun 08, 10:26pm

As the previous poster says it is good to read to the end of this article where the alternatives to GM are discussed, all too briefly.

If there is any doubt in anyone's mind about whether GM works or not go to <http://www.nlpwessex.org/docs/gmagric.htm>

-  [KatineEditor](#)

23 Jun 08, 9:32am

I second Rick's comment above, please read to the end of the article!

@EvilClanger, there's no conspiracy, I'm afraid. I commissioned this piece as part of our coverage of the Katine project. I then emailed the environment team as I thought it might be something they would be interested in linking to. Honest.

-  [MsFerozi](#)

26 Jun 08, 10:09pm

Remember BSE and the impact of animal protein feed given to livestock. This was no doubt in the name of science, better quality, easier for farmers etc. Bad harvests happen what we need to know is when. We can predict whether systems to some extent, hence lack of rain should be tackled by better water irrigation. Africa has a huge coastline, they should be looking at desalination plants. Pests normally have predators in nature to keep them under control, and also plants which deter pests could be planted with vulnerable crops as is done by organic farmers.

We need to be looking at systems of farming which work, after all it is a very old profession, and which has fed the world before the advance of science. Ancient cultures had their own ways of ensuring harvests.

Africa also needs stability. Unfortunately the country has not recovered from colonisation and various ethnic and political factions continue to war to the detriment of the population. Great leaders do not kill their people.

<http://ferozi.blogspot.com>

-  [MsFerozi](#)

26 Jun 08, 10:14pm

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Bad harvests happen; what we need to know is when. We can predict whether systems to some extent, hence lack of rain should be tackled by better water irrigation. Africa has a huge coastline, they should be looking at desalination plants, resevoirs, canals etc.

Pests normally have predators in nature to keep them under control, and also plants which deter pests could be planted with vulnerable crops as is done by organic farmers.

We need to be looking at systems of farming which work, after all it is a very old profession. Farming has fed the world before the advance of science. Ancient cultures had their own ways of ensuring harvests, maybe we need to learn from the past as well as the future.

Africa also needs stability. Unfortunately the country has not recovered from colonisation and then decolonisation. Various ethnic and political factions continue to war to the detriment of the population. Great leaders do not kill their people.

<http://ferozi.blogspot.com>

-  [KatineEditor](#)

27 Jun 08, 9:54am

MsFerozi,

Thanks for commenting. Some really interesting points there (we could probably write a huge feature on each).

If anyone has any direct experience of farming in Africa (or other aspects of development/aid that can be compared to Amref's work in Katine), feel free to get in touch at: katine.editor@guardian.co.uk