

The world's biggest agrochemical companies and the US government are rushing to introduce genetically modified (GM) crops into West Africa, starting with cotton. Bt cotton has already hit Burkina Faso and Senegal, and Mali is next. Benin and Ivory Coast are also on the list of targets. For many of these countries cotton is the top export crop, and national and community livelihoods are closely tied to cotton revenues. Will Bt cotton fulfil its promises of increased profits for farmers?

Bt Cotton on Mali's Doorstep

GRAIN



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Agriculture in Mali, as in most African countries, is characterised by small-scale, family farming. Like several other countries in West Africa, cotton is Mali's number one export, and the success or failure of a cotton crop has a direct and drastic impact on families and communities. Mali's farmers and their unions have fought hard to earn their proper place in decisions to obtain their share of the country's cotton revenues. These gains, however, are in danger of disappearing. Transnational corporations are at the gate, ready to squeeze the country's farmers for everything they can. Researchers with the Institut d'Economie Rurale in Mali are finalising a five-year plan with the US Agency for International Development (USAID), Monsanto, Syngenta and Dow Agrosciences to develop and commercialise GM cotton, starting with field testing in 2004. This will make Mali the third country in West Africa to start field trials with Bt cotton, following in Burkina Faso and Senegal's footsteps.

Other countries on the hit list for Bt cotton are Benin (where a moratorium on GM crops was declared on March 6, 2002) and Ivory Coast. Cotton is just

the beginning. In November 2003, USAID with the official support of the International Institute of Tropical Agriculture in Nigeria, declared its intention to 'GMise' Africa. "*Bt cotton is the biotech industry's trojan horse for bringing patented GM crops into West Africa,*" says Jeanne Zoundjikhépon of GRAIN in Benin. "*The infrastructure for cotton is well established and they want to take advantage of this. But cotton is a critical crop for the region. It is shameful for public researchers to play with the livelihoods of their people, when the technologies they are bringing in offer nothing to farmers but greater dependence on foreign companies.*"

The letters "Bt" stand for *Bacillus thuringiensis*, a toxin-producing bacterium found naturally in the soil. Scientists have isolated certain genes responsible for the production of these toxins and have then used genetic engineering techniques to insert them into cotton. The resulting cotton plants produce the Bt toxins and susceptible pests are supposed to die when they eat them. Almost the entire global acreage of Bt cotton is currently sown to Monsanto's Bollgard variety. This company

has developed a second Bt cotton variety, Bollgard II, which produces two different toxins. In 2004, Dow Agrosiences hopes to introduce Widestrike, another Bt cotton producing two toxins, while Syngenta is trying to introduce its Bt cotton, VIP Cotton.¹ The companies selling Bt cotton offer several reasons for introducing Bt cotton into West Africa, none of which stand up to scrutiny.

The pesticide lie

The first is that Bt cotton will eliminate pesticide use. Bt cotton will not eliminate the use of pesticides; at best it can only reduce it. Experience with Bt cotton in other countries shows that the technology provides only partial control of several important caterpillar pests. In the US in 2002, in spite of the use of supplementary insecticides, approximately 14,152 tonnes of cotton or 7.5% of the total Bt cotton crop was destroyed by bollworms and about 2600 tonnes or 1.4% of the total Bt cotton crop was destroyed by *Spodoptera* and *Pseudoplusia includens* caterpillars.² In the Indian state of Andhra Pradesh, where Bt cotton was grown for the first time in 2002, Bt cotton was not able to control the cotton bollworm much better than non-Bt cotton.³ Moreover, Bt cotton is ineffective against sucking pests, which keeps insecticide use high in Bt cotton fields. In the Indian example above, farmers had to apply more insecticides against aphids in fields of Bt cotton than in those of conventional cotton.⁴ In the US, while insecticide use against bollworms and budworms declined significantly with Bt cotton, the total use of insecticides has remained relatively stable due to the increase in secondary pests.⁵

There are more effective and appropriate methods to reduce the use of insecticides, such as targeted application management, where insecticides are only applied when the level of damage from pests surpasses economic thresholds determined by researchers, and Integrated Pest and Production Management (IPPM), which encourages the use of farmers' knowledge and local resources, like neem. During one project's first season in 2002, cotton farmers practising IPPM eliminated pesticides without reducing yields. But, despite the success of such strategies, few Malian farmers use these techniques or even know about them, because of the lack of training programmes and publicity.

Richer pickings?

A second argument for introducing Bt cotton into West Africa is that it will increase yields and thus farmers' profits. In India, a 2003 study showed that conventional varieties produced more and larger bolls (95 per plant) than Bt varieties (50 bolls per plant).⁶ Another study showed that farmers' yields fell by 35% when they grew Bt cotton.⁷



When farmers buy Bt cotton seed, they are obliged to pay "technology fees" on top of the price of the seed itself. In West Africa, where Monsanto plans to introduce Bollgard II, the technology fees for Bt cotton are likely to be at least \$US 50/ha (the existing rate in South Africa), or 30,300 CFA/ha. In Mali, the total price for insecticides is around 37,600 CFA/ha (\$US 62/ha). At this price, even if Bt cotton were to reduce insecticide use by half, which is difficult to imagine, the costs of the seeds would still outweigh the savings in expenditures on insecticides.

Criminalising farmer practices

At present, cotton seed is not sold in most West African countries; it is distributed for free. For farmers, the seeds belong to them because they are derived from their previous harvests and because they have paid for the breeding programs that have developed the region's cotton varieties. Moreover, farmers customarily exchange seeds with their neighbours, friends and family members. The introduction of Bt cotton will upset these traditional practices. Farmers will be obliged to pay for seeds and to sign Monsanto's infamous Technology Use Agreement which states that:

- Farmers are prohibited from saving seeds for replanting.
- Farmers are prohibited from supplying seeds to anyone else.
- Farmers must pay 120 times the technology fee, plus Monsanto's legal fees, if they violate the contract.

Monsanto takes these contracts very seriously. The company keeps lists of all farmers who are growing GM varieties and monitors them closely. It goes after farmers in Brazil as aggressively as farmers in the US.⁸ In West Africa, where the majority of farmers are illiterate, they may well not even understand the clauses of the contracts. The fact that there will not be any visible difference between Bt cotton and conventional cotton will create even more confusion. In this chaotic situation, farmers risk being prosecuted and judged as criminals.

¹ Jeremy Greene (2003), "How Bollgard II cotton fits," *Delta Farm Press*, June 6.

² Leonard Gianessi et al (2002), *Plant Biotechnology: Current and Potential Impact For Improving Pest Management In US Agriculture: An Analysis of 40 Case Studies*, National Center for Food and Agricultural Policy.

³ Abdul Qayam and Kiran Sakkhari (2003), *Did Bt Cotton Save Farmers in Warangal? A season long impact study of Bt Cotton - Kharif 2002 in Warangal District of Andhra Pradesh*, AP Coalition in Defence of Diversity and Deccan Development Society, Hyderabad: www.ddsindia.com

⁴ *Ibid*

⁵ Charles Benbrook (2003), *GMOs, Pesticide Use, and Alternatives: Lessons from the US Experience*. Delivered at the Conference on GMOs and Agriculture, Paris, France, June 20: www.biotech-info.net/lessons_learned.pdf

⁶ Suman Sahai and Shakeelur Rahman (2003), *Performance of Bt cotton in India: Data from the first commercial crop*, Gene Campaign, India: www.genecampaign.org/btcotton.html

⁷ Abdul Qayam and Kiran Sakkhari (2003), *op cit*.

⁸ International Cotton Advisory Committee (1999), "Technology Protection Systems", *ICAC Recorder*, March 1999.



Bt and contamination

Bt cotton is not visibly different from conventional cotton, and mixing is therefore inevitable. Significant amounts of Bt cotton will be able to easily slip into stocks of conventional cotton. Contamination can also come about through cross pollination of Bt and conventional cotton plants, particularly via insect pollinators. Such contamination has serious consequences:

- Once the transgene (the gene that is transferred from one species to another) is introduced into the environment, it is difficult if not impossible to remove it if harmful effects for human or environmental health are discovered.
- Monsanto holds patents on the transgenes of Bt cotton and claims intellectual property rights on all plants containing these transgenes, even if they arrived in farmers fields through accidental contamination.
- Gene flow could occur between Bt cotton and local varieties or wild species of cotton—important reserves of biodiversity.
- Contamination by Bt cotton could compromise the entire production of organic cotton in the sub-region, since organic certification criteria prohibit GMOs.

Despite these risks, field trials of Bt cotton have already been undertaken in the sub-region, in Senegal and in Burkina Faso, without monitoring by regulatory authorities and without appropriate public information or consultation. The same situation is set to play out in Mali, where the national agricultural research centre (Institut de l'Economie Rurale), USAID, Monsanto, Syngenta, and Dow Agrosiences have just completed a five-year plan for the introduction and development of Bt cotton in that country.

Despite risks of contamination and other unknown effects, field trials of Bt cotton have already been undertaken in the sub-region without monitoring by regulatory authorities and without appropriate public information or consultation. *"The Expert Group of the African Union's Scientific, Technical and Research Commission has expressly recommended the need for its member states to consider a moratorium on GMO introduction,"* says Mariam Mayet of the African Centre for Biosafety in South Africa. *"But GM continues to be pushed into Africa through the back door, putting the whole continent at risk".*

Since farmers will be the people most affected by the technology, they need to be at the centre of decisions on Bt cotton. But it is unlikely that governments or Monsanto will engage in the major effort required for serious consultations with farmers, who, for the most part, lack even minimal knowledge of genetic engineering. So it is up to farmers, and especially the farmer organisations, to insist that they be fully informed and consulted before a decision is taken to introduce GM cotton, even for field trials.

As François Traoré, President of the National Union of Cotton Producers of Burkina Faso, says: *"If we already have the means to reduce pesticide use, why look for things that are going to complicate life?"*⁹ The IPPM project in Mali clearly shows that farmers can minimize – if not totally eliminate – the use of insecticides in a sustainable way, without having to rely on costly foreign technologies like Bt cotton. Instead of introducing GM cotton, why aren't the national cotton companies and the state authorities promoting practices that are less costly and have fewer risks?

GRAIN will be publishing a full report in French and English on Bt cotton in West Africa in April 2004.

⁹ Personal communication with François Traoré, President of the Union Nationale des Producteurs de Coton du Burkina Faso, Ouagadougou, Burkina Faso, June 27, 2003.



Cotton is an important export crop for more than 20 countries in Africa