Seeds of Success

The importance of seed security for small cotton farmers
Introduction

Millions of farmers in some of the world’s poorest countries grow cotton. But their chances of earning a good living from their crop are being undermined from the very outset.

The key to earning a good living from cotton depends on getting the right seed. Yet many farmers face serious difficulties in accessing good quality seeds that suit their growing conditions and type of land.

Seed supply problems sit at the heart of a range of further challenges cotton farmers face, including volatile but often low prices, high input costs, lack of research funding, soil degradation and climate issues.

But, despite its importance, problems of seed supply have received relatively little attention from governments and development practitioners.

This briefing aims to begin to redress that balance. Following three pieces of research, covering the international seed industry, and farmer-level research in India and Africa, Traidcraft has identified a series of obstacles and challenges that prevent farmers accessing the good quality seeds they need.¹

Problems include:

- Poor quality and poor performing seeds;
- Lack of choice in the type of seed and associated market access problems for their cotton;
- Lack of competition amongst seed providers (both state and private);
- Poor seed provision (late or inadequate amounts);
- High seed costs.

In India we are already witnessing the high human cost of seed insecurity, including spiralling debt and thousands of farmer suicides. This paper assesses how this situation has developed and draws out lessons for Africa as it starts to follow India’s path of privatised provision and rapid uptake of new technologies, particularly genetically modified (Bt) cotton.² The role of Government seed research, production and provision is also assessed along with intellectual property rules that govern the technologies. The report concludes with recommendations for the cotton community, developing country governments and donors.

---

Footnotes


2. The dominant form of genetically modified cotton is referred to as Bt cotton as it has had the bacterium Bacillus thuringiensis (Bt) inserted into it which produces a natural insecticide against the bollworm, a common cotton pest.
1. India’s story

The end of ‘free’ seed

Traditionally cotton farmers in India were able to save and re-use their cotton seeds. This meant that seeds were essentially free. However this system was only really feasible when cotton ginning happened at the most local level (as promoted by Gandhi), or when the seed was retained and redistributed by the local ginner.

From the mid 1960s onwards the Indian Government encouraged farmers to use so-called high yielding hybrid varieties.1 2 These were bred in the state sector, particularly through the agricultural universities and were distributed by various state agencies such as the National Seed Corporation and State Farms Corporation of India.3 These seeds led to higher yields but not necessarily higher income for farmers as the seed costs were higher.

In contrast to traditional varieties, hybrid seeds cannot be re-used so farmers began to depend on the state for seeds. Around the 1980s there was a move towards facilitating the entry of the private sector into seed research and provision. This happened fairly rapidly and at the same time the process of economic liberalisation led to drastic reductions in funding for agricultural research and extension programmes. It has now become the norm in India for cotton farmers to pay for their seeds and the process of privatisation of seed production and provision is almost total as the state, including some of the Indian state Governments, have withdrawn from research and provision of seeds.

Mr. Sudhir, Lingi Village Yavatmal, “Earlier the entire village used to grow only Desi/conventional cotton. Due to continuous neglect all Desi seeds of cotton have vanished.”

The rise of Bt cotton

Genetically modified or Bt cotton seeds were first commercialised in India in 2002. Extensive advertising and promotion resulted in rapid take-up of the seed with approximately 90% of cotton planted now being Bt. Because the genes used in Bt technology are ‘owned’ the price farmers pay includes a royalty fee. Just one company, Monsanto accounts for 90% of all the Bt cotton seed sold in India with only two companies (Nath and JK Seeds) selling non-Monsanto Bt seeds.1 2 There are other companies (up to 40 in some states) selling Bt seeds, but they are all licensees of Monsanto, and are all charging the same price.3 4 This is a serious problem for farmers for two reasons:

- The lack of competition has allowed companies to dictate prices. This means that the seeds are expensive and farmers are vulnerable to sudden price hikes.
- It is now extremely difficult for farmers wishing to farm organically and sell their cotton into the high value added organic and fair trade markets as it is very difficult for them to buy non-Bt seeds.

Farmers from Katamala “Bt cotton seed market is not like other commodities where more brands and varieties lead to competition in the market and thus reduce the cost of product and benefit the consumers.”

The high cost of Bt seeds make it a risky option for smaller farms but Transfair’s research has found that alternative seed types are becoming virtually impossible to source in India.

In 2006 the state Government of Andhra Pradesh successfully challenged Monsanto’s pricing through the Monopolies and Restrictive Trade Practices Commission, describing it as exorbitant and unjustified. Monsanto was forced to bring prices down from Rs. 1800 per 450gm packet to Rs. 750. Monsanto challenged the decision in the Supreme Court arguing that the MRTPC had no jurisdiction over prices, only over trading practices. Several other state Governments followed suit using the Essential Commodities Act, with each being challenged by Monsanto.5 The issue is ongoing in the Indian courts.

Hiramal Rokade, Umeri, “It is mainly the seeds cost with the other input which forces the farmers to borrow the money from the Bank.”

Is Bt cotton suited to small farmers?

The performance of Bt cotton has been the subject of fierce debate. Some studies and a great deal of industry-backed PR cite increased yields and reduced pesticide use with positive impacts for farmers’ income and health. Others paint a very different picture, citing high costs, mixed results in terms of yield, problems of secondary pests and growing pest resistance and the difficulty of establishing a causal link between the technology and changes in pesticide use. Particular concerns have been raised over the suitability of Bt cotton for smaller farmers.

Researchers from the University of Sussex looking at the impact of Bt cotton ten years on reported a mixed verdict.6 7 8 "A detailed look at the evidence reveals that the impacts of GM crop varieties have actually been very mixed. Although some farmers have captured substantial benefits, others, especially smaller-scale and poorer farmers who lack key resources like irrigation and credit have not.”

It is important to remember that the technology itself is designed to reduce losses from pests and is not intrinsically yield-enhancing, nor does Bt cotton command a higher price in the marketplace. Further the researchers found that "Bt cotton appears to be a pro-profit success because encouraging results have been emphasised while negative and equivocal ones have been played down.” 9 10

It seems that initial positive results were overplayed. Commenting on an increase in farmer suicides in Maharashtra in 2010, Indian farmer Shabirra Yawiliker said “We were cheated by the seed companies. We did not get the yield promised by them, not even half of it. And the expenditure involved was so high that we incurred huge debts.”11

In India Bt cotton seeds cost more than four times the price of hybrid varieties. And in Burkina Faso Bt seed costs nearly seven times as much. The technology is designed to reduce risk from pest losses not to increase yields per se.

<table>
<thead>
<tr>
<th>Seed Type</th>
<th>Seed cost</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmer owned</td>
<td>Rs. 0 - 50 per kg</td>
<td>200kg per acre</td>
</tr>
<tr>
<td>Hybrid varieties</td>
<td>Rs. 300 - 400 per kg</td>
<td>3-400 kg per acre</td>
</tr>
<tr>
<td>Bt</td>
<td>Rs. 650 for Bollgard 1 and Rs. 750 for Bollgard II [for 450gms] Equivalent to Rs. 1444 – 1666 per kg</td>
<td></td>
</tr>
</tbody>
</table>

Burkina Faso

<table>
<thead>
<tr>
<th>Seed Type</th>
<th>Seed cost</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>3 500 FCFS/bag</td>
<td>No data</td>
</tr>
<tr>
<td>Hybrid varieties</td>
<td>4 000 FCFS/bag</td>
<td>700-1500kg per hectare</td>
</tr>
<tr>
<td>Bt (FK59BG2)</td>
<td>27 000 FCFS/bag (sufficient for 1 hectare)</td>
<td>800-1000kg per hectare</td>
</tr>
</tbody>
</table>

Footnotes

3. A hybrid seed is produced by cross pollinating plants, thus retaining characteristics of both parent plants. These seed are high yielding, but lose their vigour with re-planting. They are not suitable for saving and re-use.


8. Other companies supplying Bt cotton seeds in India include Nuziveedu (30% market share in Vidarbha), Ankur (16.9%), Mahyco (12.4%).

9. The first Bt cotton variety developed by the public sector Central Institute of Cotton Research – the medium staple variety Bikaner Narma – was approved in 2008.


11. http://www.i-sis.org.uk/FarmerSuicidesBtCottonIndia.php


13. Some cotton seed supply for planting in Africa: A study into the functioning of current structures for research, breeding, multiplication and distribution and their impacts on cotton farmers”, Simon Ferrigno, January 2011

What is clear is that Bt cotton is not a silver-bullet and success is dependent on a range of contingent factors. It is clearly an extremely risky option for small farmers already struggling with poor soil, lack of irrigation and debt.

“Paying the higher price for GM seeds remains a risky choice, especially for cash-poor farmers.”10

“Poor soils and drought – this is what will determine a good crop. But if anything happens, with the high cost of GM seed, we will have lost a lot of money.”12

Farmer in Burkina Faso
2. The lessons from India’s experience

There are important lessons for other countries from India’s experience of privatisation and increasing monopoly control of cotton seed provision. The experience of India has already been mirrored to a degree in South Africa where cotton seed supply and distribution is now almost entirely privatised. Instead of leading to greater competition and lower costs to farmers this has led to a situation where all cotton seed is distributed by Delta and Pineland (a subsidiary of Monsanto) and 90% of cotton is Bt cotton. This has been a disaster for small cotton farmers — their number has dropped by 80% in five years to just 619 in 2010/11 and their share of production has fallen from 15% to 1.5% over the same period. This suggests that the experience of India is not an isolated one and that one potential consequence is the exit of farmers from cotton production altogether, with associated poverty impacts.

A number of other African countries have now adopted Bt cotton on a wide scale and many more are on the cusp of doing so. In Burkina Faso, according to the national seed plan, they are moving towards producing 75% Bt seed and 25% conventional, so although farmers nominally have the choice, in reality supplies of non-Bt seed will be increasingly limited. In Uganda Bt seeds are at the trial stage. Kenya has announced the rolling out of commercially produced Bt cotton from 2014.

India’s experience clearly points to a number of important lessons:

• The need for rigorous independent research to test the performance of Bt cotton for farmers in resource-poor settings;
• The need to ensure continued production and supply of non-Bt cotton seeds;
• The need to consider the social consequences if farmers are pushed out of the cotton sector altogether;
• The need for appropriate Government regulation of the technology and the companies to ensure adequate competition and prevent exortionate prices.

3. Research dilemmas

Cash-strapped research

It is now widely acknowledged by developing country governments and donors that agricultural research has been sorely underfunded, particularly in Africa, leading to a tendency to rely on private provision. For example the cotton research body in Burkina Faso receives no state funding for research or transportation, only for basic salaries and buildings. The main funding instead comes from the cotton company SOFITEX and according to one official donors are only a rumour.

As constrained resources force control of research to be handed over to the private sector and away from national stakeholders with a public interest remit, efforts to improve farmer participation in research programmes are undermined. It becomes much harder for farmers’ needs to be heard and addressed and this has compromised the ability to develop more appropriate seeds.

Regional and international collaboration is also an important way for cash-strapped research bodies to pool their limited resources. The research body in Burkina Faso for example would like to collaborate more with Brazil and India as well as other African countries and would like to look at drought resistance for cotton in both conventional and Bt varieties. However Traidcraft’s research found that there seems to be very little regional or international collaboration around cotton seed research at present.

Quick-fix research bias

The severe resource constraints in the field of seed research and development, along with the growing role of the private sector has contributed to a tendency towards adopting high-tech ‘quick fixes’. These are cheaper and have the potential to be more lucrative for the companies involved than investing the time and resources to properly analyse and tackle the complex problems facing farmers in resource-poor settings.

However the high tech solutions proposed often require high cost input systems and so are of benefit to larger and better resourced farmers with access to credit and irrigation. Low cost systems that will help poor farmers manage cost, risk and maximise revenue are often neglected and so seed research, development and production does not reflect the needs and constraints of the production system where it is to be used.

As one researcher put it: “Seed research needs to take a long view of major challenges such as soil, climate and water as well as the socio-economic reality of farmers.”

“Whatever the decisions taken on introducing GM technology, basic research should continue and be funded on conventional seeds, as well as seeds adapted to other sectors such as organic or sustainable cottons...Smallholder farmers in particular need research that breeds seed and researches production techniques aimed at lowering costs of production, as well as technological innovation and maintaining different options for farmers based not only on yield output but on the net return and risk level to farmers.”

4. Practicalities of seed provision

In Africa seed supply for planting remains relatively centralised and the state is usually involved in seed research, seed breeding and/or distribution. Some of the major problems faced by farmers in these circumstances include late delivery of seed, poor germination rates, poor storage, poor management of seed multiplication and insufficient volumes of seed.

In Uganda the main problems are under-supply, poor germination rates and late delivery. There are always shortages and this can sometimes lead to violent confrontations in communities desperate to get adequate seed supplies to cope with this farmers often try to save and re-use seed, but this does not work well with hybrid seeds.

“I have to plant three seeds per hole as only one will germinate” Ugandan cotton farmer

“Especially the insufficient quantities of seed can cause conflicts among farmers to the extent of stealing from neighbouring villages and physical fighting.” Ugandan cotton farmer

These problems relate back to research and seed development, under-funded cotton sectors and challenging transportation and infrastructure which prevent seeds from being delivered on time and to the right places, with the right agricultural extension or support.

There are exceptions however, Zambia manages to maintain high yields and seed quality through state controlled oversight. It has not yet adopted Bt cotton (although there is considerable pressure for it to do so) underscoring the importance of improving the management of the sector and the quality control of seed supply rather than adding a new technology into already challenging logistical situations.

Visit to a cotton store by National Organic Agricultural Movement of Uganda (NOGAMU)

15. Cotton South Africa
5. International trade and intellectual property

Backing the increasingly private provision of seed supply is a complex legal picture of intellectual property rights (IPR). Private companies seek to secure high levels of protection through international trade agreements and agree to a higher level of protection for companies.

- At present India's Protection of Plant Varieties and Farmers' Rights Act (2001) explicitly recognises the right of farmers to save and re-use seeds. This is in line with the internationally agreed Convention on the Protection of New Plant Varieties (UPOV) as revised in 1978. India, along with a number of other developing countries, deliberately chose not to adopt the later stricter version of UPOV (1991) as this is seen as tipping the balance of rights away from farmers. However, it is a constant struggle for Indian farmers to keep this balance in check. Under its free trade agreement (FTA) talks with India the EU has suggested that each party agree to "promote and reinforce the protection of plant varieties based on UPOV 1991". India is resisting this pressure.

- As part of negotiations towards establishing Economic Partnership Agreements (EPAs) with African, Caribbean and Pacific countries the EU has recommended those countries join UPOV '91 as well.

The UK Commission on IPR which considered how national IPR regimes could best be designed to benefit developing countries found that UPOV '91 was not well suited to use as a model in developing country contexts as its requirements around distinctiveness, stability and uniformity work against use of traditional and local seed varieties and against farmer controlled save and re-use schemes. The Commission encouraged developing country governments to think carefully before adopting this system and to consider modifications. In addition the Commission found a link between increasing protection of plant breeders' rights and the growing levels of corporate concentration discussed earlier.

6. Implications for food security

Ensuring that they earn enough to be able to eat is a problem raised by farmers in all of the countries studied.

The increasing cost of seed without guaranteed higher returns is contributing to the indebtedness of farmers and is compromising their ability to use their cotton income to buy food. This is a real cause for concern.

But many farmers' groups and activists see this as just the tip of the iceberg. They are concerned that the trends that have been seen around the provision of cotton seeds could also impact food crops. Should one company corner the technology and rights over a crop on which many people rely for their food security (such as rice in India or cassava in Africa) this would have profound consequences for food security and hunger around the world.

As the official UK Commission said: "There are considerable dangers to food security if the technologies are overpriced to the exclusion of small farmers, or there is no alternative source of new technologies, particularly from the public sector." In the long term it is clear that there is a need to support a move away from a reliance solely on cash crops such as cotton, towards broader and more sustainable agricultural production and food security.

"Seed provision is political", Farmer in Uganda.
7. Conclusion and next steps

Small cotton farmers face a range of problems when trying to access good quality, appropriate and affordable cotton seeds. These include the increasing role of the private sector in seed provision which has been accompanied both by a reliance on high-tech solutions - including the rapid uptake of Bt seed in some countries - at the same time as growing levels of corporate concentration backed by high levels of legal protection. This has lead to high prices and lack of choice for farmers. Other problems include the under-resourcing of research into more appropriate technologies and the lack of investment in the agricultural extension and distribution systems required to deliver them effectively.

Together these problems erode the income that farmers can make from what is already a risky cash crop with highly volatile prices. This is compromising the food security, health and wellbeing of millions of farmers around the world.

Next Steps
These issues can be tackled but only as part of an holistic strategy and there are clearly no quick fixes. There is a vital role for developing country governments, donors and international trade negotiators to make a real difference. Below are some suggested next steps.

European Union:
- Should withdraw its demand that developing countries accede to UPOV ’91 as part of FTA negotiations;
- Should work with partners to assess how higher levels of IPR protection will impact small farmers.

Donors and cotton producing country governments should:
- Invest in farmer-led research into low cost seeds that require low cost inputs;
- Produce and provide more appropriate and non-Bt seeds;
- Support regional collaboration around seed research and development;
- Support diversification strategies to reduce farmers’ reliance on cotton, support food security and upstream development activities to add value to cotton;
- Monitor and tackle the impacts of increasing levels of corporate concentration in particular sectors and intervene to ensure affordable seed prices;
- Ensure IPR protection does not undermine traditional seed varieties and the save and re-use schemes that are so important to small farmers.

Acknowledgements
Traidcraft would like to thank Simon Ferrigno, Rachel Dechenne, NOGAMU in Uganda, Agence Corade in Burkina Faso and Navdanya in India for the background research used for this report. We would also like to thank Simon Ferrigno, and Shalini Bhutani for their helpful comments.

Photo credits: Jayde Bradley, Stephanie Celt, Shailan Parker & Richard Else.

Right: Seeds are separated from lint at the Kitui ginnery, which is one of the oldest in Kenya.
About Traidcraft

Traidcraft Exchange is the UK’s only development charity specialising in making trade work for the poor. In collaboration with local partners we work to create opportunities for poor people to harness the benefits of trade, helping them to develop sustainable livelihoods. Traidcraft also aims to use the experience of its sister fair trade company, Traidcraft plc, to improve wider trade practices. Traidcraft’s Policy Unit conducts research and advocacy work to improve trade rules and the practice of companies.