



Fortnightly Bulletin on Genetic Engineering South Against Genetic Engineering (SAGE)

Contents in this edition

1. **News:** Bt cotton fails in Tamil Nadu
2. **News:** AP govt agrees to out-of-court settlement with Monsanto
3. **News:** Sri Lanka Enforces Labelling of GM Food
4. **GM Watch's** vote for the *most interesting piece of research published in 2006*
5. **Article:** Monsanto, Cereal Killer GM and Agrarian Suicides in India

Bt cotton crop fails in Tamil Nadu

After Andhra Pradesh, it is now Tamil Nadu where the much hyped Bt cotton seeds of Mahyco has run into rough weather. The Tamil Nadu government has asked Mahyco to pay compensation to farmers for failure of Bt cotton in the state in the current season. **Bt cotton crop has failed in Dharampuri, the major producing district in the state. The farmers and the local NGO Pasumai Vakatan had complained to the district collector and subsequently to the joint director for agriculture in charge of Dharampuri, Duraisamy.**

Duraisamy had on December 22, 2006 asked the scientists at Coimbatore Agriculture University to verify the fact. The scientists conducted tests on the soil where the crops were planted and took samples of the seeds sown.

Speaking over the phone the Tamil Nadu agriculture minister Veera Pandi Arumugam confirmed reports and told FE, "The authorities had informed me that improper seeds only had caused all the problems. I had talked to the chief minister immediately and I had ordered that the said company should not sell any type of seeds in Tamil Nadu. We had advised the company to pay compensation to the affected farmers. So the farmers need not be worried."

The minister further added, "We have formed a cell to safeguard the interests of farmers under the leadership of the chief minister. Experts from various sections of agriculture ministry shall be in the cell. They shall watch out for the problems of farmers and keep submitting solutions for the problems. . On the whole, our objective is there should not be any problem to the farmers."

www.financial express.com

AP govt agrees to out-of-court settlement with Monsanto

In a significant move, the Andhra Pradesh government expressed its willingness to have an 'out-of-court settlement' with Mahyco-Monsanto Biotech Ltd in the 'BT cotton seed' issue, however, with a rider.

Speaking to the media here on Sunday, AP agriculture minister N Raghuvendra Reddy said the AP government had no objection to the out-of-court proposal by the company as long as it would be beneficial to farmers in the country. "The government has no problem and is even ready for the out of the court settlement, if the proposal benefits the farmers and reduces

the cost of cotton crop," Reddy said.

The company had recently approached the state government with a proposal for out of the court settlement, he added.

Making it categorical that the government was not ready for any sort of compromise on the 'price front', the minister, however, said the compromise formula should also be accepted by the other state governments and farmers' associations which have impleaded in the writ-petition.

AP was the first state to raise the issue of higher prices being charged by the Monsanto stable

through its joint venture company in the country. The government had approached the Monopoly and Restrictive Trade Practices (MRTP) Commission to get relief for the farmers, who were unable to pay higher seed prices. It had even suspended the marketing rights of Mahyco-Monsanto Biotech in the state.

MRTPC had issued interim orders directing the company to reduce the seed price, which prompted other states, Maharashtra and Punjab, to also implead in the case. According to the Andhra Pradesh government's claim, the company was charging Rs 1,850 per 450 gm packet, where the

Monsanto stable would receive Rs 1,250 per packet towards trait value. Reddy claimed that due to the reduction in the cotton seed price,

the Indian farmers benefited by about Rs 1,200 crore, besides the crop area having increased throughout the country. "Today, farmers

are able to get the genuine BT cotton seed and there is no trace of spurious cotton seed in the state," Reddy said.

http://www.financialexpress.com/fe_full_story.php?content_id=150515

Sri Lanka Enforces Labelling Of GM Food

Sri Lanka brought in labelling regulations from Jan 1 to ensure stricter control of Genetically Modified (GM) food but it's a far cry from the original plan to altogether ban GM food.

Under new rules by the Health Ministry, all GM food or food that includes GM organisms must be labelled to state that they are GM modified. If the products are GM or contain GM organisms, the sellers or importers have to specify so. If they fail to do so they are liable to a fine of up to 10,000 rupees (US\$100).

This is in sharp contrast to the earlier decision where Sri Lanka was one of the first countries to ban the importation, manufacture and sale of

GM food from Sept 1, 2001. The ban was however indefinitely postponed a month after its announcement following protests from the US government and commerce chambers in Sri Lanka.

After years of debate and discussion, the government abandoned the ban plan and decided to enforce labelling of GM food products from 2007 saying it would leave the choice of whether to consume or not GM or non-GM food with the Sri Lankan consumer.

Director, Food Control Unit, Health Ministry, P. Madarasinghe says that any food products likely to fall into the GM category but are declared by the importer as "GM-free" must be certified by the Chief

Food Authority (CFA) Dr. Athula Kahandaliyanage, who is also the country's Director General of Health.

Under the earlier Sept 1 ban, the government issued a list of crops that could potentially contain GM food and importers were required to obtain approval for all related food items. That list includes soy, wheat, tomatoes and potatoes. Under the current labelling rules, however, there is no such list.

Some government laboratories are to be equipped with GM testing facilities while Genetech Molecular Diagnostics, the pioneering genetic laboratory in Sri Lanka, said it has developed a new low-cost test for detecting GM food or GMOs.

Genetech is the only private lab with this facility. Dr Neil Fernandopulle from Genetech said any product that has a 0.1 percent content GM food or organism must be labelled and that importers are free to use stickers saying their product is GM free if certified so.

The Genetech official said so far they haven't

done any testing of imported food products but have handled a few export consignments of soy meat from exporters seeking GM-free certification.

The term GM food is used when foreign genes have been introduced into the DNA of a particular plant, which gives rise to a plant with favourable characteristics, for example with herbicide

resistance, insect resistance or frost resistance.

While some countries like the United States and Canada have not imposed a ban on GM food and don't require labeling, others like Australia, New Zealand and the European Union countries have made it mandatory to label GM food, the private lab said.

<http://www.bernama.com/bernama/v3/news.php?id=239977>

GM Watch's vote for the most interesting piece of research to be published in 2006- *Tarnishing Silver Bullets: Bt Technology Adoption, Bounded Rationality and the Outbreak of Secondary Pest Infestations in China, July 2006*

This research looks at Bt cotton growing in China. Bt cotton has been hyped as biotech's big success story and the saviour of poor cotton farmers in the developing world.

Below is the transcript of a GM Watch podcast which looked not only at the findings of the research on what was happening in China but

at a whole series of recent studies.

This new research evidence suggests Bt Cotton provides no benefits for biodiversity, no yield increases, no reductions in herbicide use, and that any initial reductions in pesticide use are now being undermined by growing problems with secondary pests. The evidence from these studies also shows that GM cotton is

particularly unsuited to the needs of small famers in the developing world.

TRANSCRIPT

Peter Brown: [In this GM Watch] podcast we're returning to the subject of GM cotton - something we looked at in detail in the second of our podcasts and something we've returned to since then. So, Jonathan, why

are we looking at GM cotton again?

Jonathan Matthews: Well, there's 2 reasons for this. One is that GM cotton is particularly important in the whole GM debate because it's always been promoted as an outstandingly good example of what genetic engineering supposedly can do to help farmers but also to help the environment. But the other reason is that since we last spoke about this a whole series of studies have come out that show that GM cotton is not doing what is claimed for it - that's on both fronts, in relation to farmers and in relation to the environment. And the research shows that it's failing and that it is particularly suspect in the context of the developing world

Peter: Perhaps we could just clarify what's supposed to be so special about GM cotton. How, for instance, is it supposed to help the environment?

Jonathan: Well, GM cotton's been grown for about a decade now and

from the start it's been claimed that because Bt cotton - a genetically engineered cotton where a soil bacterium has been engineered into the cotton to act as a kind of pesticide within the plant - because it's got it's own built in pesticide in this way, that its use will lead to major reductions in the amount of pesticides farmers use and that this will consequently be very good for biodiversity, for wildlife. That it will lead to an increase in insect life and then in the small mammals and birds that feed on the insects, and so on. So there've been some quite extravagant claims about the impact of GM cotton along these lines.

Peter: And what about the farmers? How is GM cotton supposed to help them?

Jonathan: There's two issues there. One is if farmers aren't spraying so many pesticides then that's good for farmers' health, and agricultural workers, and it's also been claimed that GM cotton can significantly increase cotton yields. So if you can get this

increase in productivity and you can make savings on pesticides, then hard pressed farmers can make better profits out of GM cotton. That's the claim. So it's been pushed as a fantastic crop for cotton farmers, particularly in the developing world, and Monsanto and other pro-GM lobbyists and supporters have made a lot of big claims about there being huge increases in yields and profits for poor farmers in these countries, and so on.

Peter: So those are the claims. What can you tell us about this new research you've mentioned?

Jonathan: Well, the most important of the new studies has come out of China.[1] And China was one of the first countries in the world to adopt Bt cotton. And it's worth mentioning that GM cotton in China has been hyped almost more than anything else in the GM debate. It's repeatedly been claimed that GM cotton has been - quotes - "a miracle crop". I mean, that's been said

repeatedly - "a miracle" for Chinese farmers. And that idea of "a miracle crop" has been used to promote GM crops in China itself, to encourage China to grow more GM crops, and it's been used to egg on China's neighbours in Asia who've been told that China's forging ahead thanks to GM cotton and they'd better jump on the GM bandwagon or they're going to get left behind. And China's also been used as a sort of GM showcase to say to the rest of the world, "Look, in China there are millions of small farmers who've adopted GM cotton in a not very developed agricultural system and they're really benefiting and this shows why it's so important not to stand in the way of GMOs."

Peter: And what does the new research tell us about what's actually been happening in China?

Jonathan: OK. Well, this was the first study to look at the longer-term economic impact of Bt cotton. And the

researchers from Cornell in the States working with Chinese agricultural scientists looked at data from nearly 500 farmers, and that's across five major cotton producing provinces in China, so they got a very broad picture of farmers who'd been involved in growing (Bt) cotton over a period of seven years.

And they found that in the early years these farmers were reducing their use of pesticides and were saving money because of the resistance that Bt cotton gave them to bollworms, which are a major pest. So that seemed to bear out the type of story that had been coming out of China. But what the researchers found was that longer term that pattern didn't hold up, and by 2004 the gains had disappeared and this was because secondary pests had emerged - pests other than the bollworms - and this was forcing the farmers to use lots of pesticides. In fact, they found that by 2004 they were spraying more or less as much pesticide as the farmers who weren't growing Bt

cotton. So the whole supposed advantage in terms of pesticide reduction seemed to have disappeared.

But the problem - the economic problem - is that Bt farmers pay an awful lot more for Bt cotton seeds. In fact, the Bt seeds cost about 3 times as much as the conventional cotton seeds. So if they're not saving money on pesticides and they're paying an awful lot more for the seeds, then obviously they're losing money. And that's just what they found - that, relative to the non-Bt cotton farmers, they were getting less income. So the supposed reductions in pesticides weren't there and the increases in profits weren't there either.

Peter: So the study showed that what was actually happening was the exact opposite of what was claimed.

Jonathan: Yes, absolutely. As we said, Bt cotton has been called "a miracle crop" in China, but this study suggested

it would actually be a miracle if the farmers there went on using it because it's hitting them in their pockets.

Peter: And the problem in China is not due to the bollworm developing resistance to Bt cotton, which is a concern that many researchers have raised, but due to the secondary pests that are not targeted by Bt cotton. The secondary pests seem to be at the heart of what's been going wrong in China. Can you explain a bit more about that?

Jonathan: Yes, sometimes when Bt cotton is hyped, it's made to appear that because it can supposedly control bollworms, which are a major cotton pest, that that's the end of the story. But there are other pests that can cause problems for cotton growers. This was seen in Indonesia, for example, where Bt cotton growing had to be abandoned after the Bt cotton crop succumbed to infestation by other pests, and there have been reports of this kind of thing happening in

other parts of the world too - in India, for instance.

What seems to have happened in China is that the changes in the bollworm population possibly or perhaps more likely the reduction in spraying of the bollworms seems to have enabled some kind of population explosion of other pests which previously hadn't been such a problem. And it's the emergence of these so-called secondary pests that's been forcing the farmers in China to spray so much more. And the Cornell researchers say that they think these secondary pest problems could become a major threat in other countries where Bt cotton has been widely planted.

Peter: So that's what the research tells us about what's happening in China. What about the other studies you referred to? What do they tell us and which countries were they done in?

Jonathan: One of the other major studies was

done in North America - in Arizona[2], where farmers have also been growing GM cotton for many years, almost a decade now. So this is another part of the world where GM cotton is well established. And this was the first large-scale study that simultaneously looked at Bt cotton in terms of yield - what it was doing in terms of actual production, pesticide use, but also they looked at biodiversity - you know, the amount of wildlife where GM cotton was being used.

And the results have again - like with the Chinese study - the results have been very damaging to the claims made for GM cotton. The researchers from the University of Arizona found Bt cotton gave farmers no advantage at all in terms of yield, so they weren't getting more cotton, despite all the claims made to that effect by the companies. We'll come to pesticide use in a minute, if that's ok, but the really damaging finding was in relation to biodiversity. They randomly selected

81 cotton fields - split between non-GM and GM cotton breeds - and they looked at them over the course of two growing seasons and they found that Bt cotton appeared to offer no benefits at all to wildlife.

Peter: So there was no yield increase and no benefits to biodiversity. What about agrochemicals - did the use of these reduce, as it's supposed to do with GM cotton?

Jonathan: It was a mixed picture. They did find pesticide use was down but in the second year of the study it rose. And it looks like secondary pests could be the factor that accounts for the rise that was seen in the second year of the study. One of the researchers who was asked about this said, you know, "if you control some pests with GM cotton, other pests become more of a problem." And that, of course, is exactly the pattern found in the Cornell study of the long-term effects of Bt cotton cultivation in China. There, as you remember, after seven years of Bt

cotton production, pesticide use was basically equivalent to what had existed before - any gains had been lost - and that was down to secondary pests.

The other interesting thing in relation to agrochemicals that comes out of the Arizona study is that they found there was no reduction in herbicide use with GM cotton. And this was the case even where it was a variety of GM cotton that had herbicide resistance built into it, so this is the type of cotton that's promoted as helping farmers reduce their use of weed killers, but it just wasn't doing it.

Peter: So the study showed no benefits for biodiversity, no yield increases, no reductions in herbicide use, and although there was some pesticide reduction there were increased problems with secondary pests.

Jonathan: Yes.

Peter: What were the other studies you referred to?

Jonathan: There are a couple of new studies looking at Bt cotton economics and environmental effects and pesticide use that are coming out soon. This is the way that scientific publication is going now. These papers aren't going to appear in print until September or October but they're already available online even though they are not available yet in print. They're both brand new papers - one's from South Africa and the other's from the United States.

Peter: From the information available what do these two new studies tell us?

Jonathan: The first study, which is going to be published soon in the journal *Crop Protection*[3], looks at insecticide use in fields cropped with conventional - non-GM - or Bt cotton varieties in a smallholder farming area of KwaZulu Natal in South Africa. This area is known as Makhathini Flats.

And after China, Makhathini has probably been the biggest source of hype for the biotech industry and its lobbyists. It's been another area where there have been extravagant claims about big reductions in pesticide use and savings in terms of labour, and these savings helping to increase farmer incomes for these small farmers by large amounts.

So there's been a lot of hype about Makhathini. A lot of the claims have been contested and this study certainly throws cold water on the hype. If I can quote from the abstract for this paper, it says, "cropping Bt cotton in Makhathini Flats did not generate sufficient income to expect a tangible and sustainable socioeconomic improvement due to the way the crop is currently managed..." Now, in other words, what that's saying is that it's not really increasing profitability - certainly not in any way that looks like it could sustainably improve the economic position of those farmers.

And then it goes on to say something else that's particularly significant. It says, "Adoption of an innovation like Bt cotton seems to pay only in an agro-system with a sufficient level of intensification."

That's significant because we're talking about poor smallholder farmers. These are people who are not going to have intensified agricultural systems. That's the one thing that isn't going to be easy for them to have.

And so this completely demolishes the promotion of GM cotton as a technology that's particularly suited to the needs of poor farmers. There've been these claims, which we've talked about before in these podcasts, of saying that with something like GM cotton "the technology is in the seed" and the implication is that for the farmer his other resources don't matter you just give him this magical seed and it will do the rest. Well, what's clear from this study is that doesn't work. You

need certain conditions in order to get a return on this cotton and small farmers - poorer farmers - just haven't got those kind of conditions.

Peter: What about the other new study?

Jonathan: The other study is going to come out in the journal *Agricultural Systems*, and this is a North American study. It's based on data from a survey of cotton growers in North Carolina. And what it confirms is that GM cotton is popular with North American, capital-intensive farmers, so the opposite kind of farmers to the ones we've been talking about. These richer farmers like Bt because it gives them a kind of convenience of management, but it's not actually cost-savings, it's not actually the economics that's driving their interest. They're prepared to pay for expensive seeds because it suits their convenience in terms of the way that they farm. We can see from this again that the technology doesn't have much to

offer to poor farmers in the developing world.

And even for capital-intensive farmers in the US, who may be going for convenience rather than income, there are also signs that GM cotton may not be without its problems. According to Glenn Studebaker an entomologist at the University of Arkansas, farmers are finding much more damage in GM cotton this year than they've previously been finding. So this is separate from the new study which is just looking at the issue of economics. Studebaker's looking at what's actually happening on the cotton plants this year in Arkansas. And what he's saying is that farmers are

having to spray a lot more because of bollworm damage on Bt cotton. Now you'll remember Bt cotton is supposed to protect from bollworms. That's one of the principal claims made for Bt cotton, and yet Studebaker says that not only are the bollworms damaging the Bt cotton plants in Arkansas but that the insects are successfully feeding on the upper part of the Bt cotton plants, which is an area where they would not usually be able to survive, so clearly something unusual is happening.

Peter: So why isn't GM cotton giving them some degree of protection?

Jonathan: Well, it seems that it's too early to say

yet. But Studebaker says, "it could be growing tolerance for Bt in these insects." And if that's the case, then GM cotton would be failing to do one of the main things that it's supposed to do and then alarm bells should really start to ring because GM cotton in that case is not providing any kind of sustainable solution to the pest problems faced by US cotton farmers. And, of course, that's the same kind of conclusion that's emerged out of the long-term study on the impact of GM cotton in China. And if it's failing to do that core task even in North America then the biotech industry is in very, very serious problems.

Source: www.gmwatch.org

ZNet/India: *Article.*

Monsanto, Cereal Killer GM and Agrarian Suicides in India

The Green Revolution is dead. Its hybrids and high-yield varieties allowed for significant increases in the production of crops like wheat. But its negative side effects have

intensified rather than gone away.

The technological package of the Green Revolution caused severe salination of the soil, indiscriminate exploitation and

choking of aquifers and intense pollution with all types of pesticides. More seriously, it sowed an economic, social and environmental crisis in the life of poor farmers that takes more lives

every year. One example is that of Anil Khondwa Shinde, a small farmer of Vidarbha district in Maharashtra state (in mid-western India). He killed himself two months ago consuming a powerful insecticide. He was 31 years old and died within minutes. The difference between the production costs and the retail price did not allow him to pay back to the providers the credit extended to him for the inputs.

An isolated incident? Not at all. The Indian Ministry of Agriculture admits to the following figures: there were 100,000 suicides by farmers between 1993 and 2003. And between 2003 and October 2006, there have been some 16,000 suicides by farmers each year. In total, between 1993 and 2006, there were around 150,000 suicide by farmers, 30 a day for 13 years!

The Maharashtra government itself accepts the figure of 1,920 farmers' suicides in Vidarbha between January 2001 and August 2006. Farmers'

organisations of the district state that there were 782 suicides by agricultural producers. Data for the past three months indicate that on average there was a suicide every eight hours.

What conditions give rise to a suicide rate of about 30 farmers a day? It is said that the reason for this is indebtedness, but the ultimate reason is the imposition of a completely unsuitable agricultural technology, as much from the economic as from the environmental viewpoint.

Anil Shinde had decided to plant Bt cotton, a transgenic variety produced by Monsanto that supposedly reduces the need for insecticides and increases the return for the grower. Shinde is not an exception. Hundreds of farmers who had planted transgenic cotton in the states of Maharashtra, Andhra Pradesh and Karnataka have sought suicide as way out of a desperate situation that worsens year after year.

An important element of the tale is that Monsanto's Bt cotton variety offers some protection against cotton bollworm (*Helicoverpa zea*) but not against other pests (*Spodoptera*, for example) which affect this commercial crop in India. Producers like Shinde, who turned to Monsanto cotton looking to lower pesticide costs, were taken by surprise though in any case, they have had to keep using the inputs. Even worse, the debt trap got on top of them much quicker as the Monsanto cotton seeds are more expensive.

In many districts, the local moneylenders of the past have been substituted by the network of dealers and salesmen of large companies and their methods of debt recovery have been frequently criticised. When the incidence of suicides intensified, the government launched a "help" programme with an assured payment of about \$2,000 to the surviving families but that money goes straight to the pockets of the

creditors and, in fact, has become a perverse incentive that more farmers take their lives.

But the politicians are the same on all sides. The Agriculture Minister, Sharad Pawar, delights in living in the past, always speaking about the triumph of the Green Revolution. The message of his speeches is always the same: India needs genetically modified crops to help the poor farmers escape poverty and to resolve the "problem of hunger". Thanks to the neo-liberal opening-up promoted by the government, the area

dedicated to transgenic cotton in Vidarbha increased from 0.4% to 15% in just three years. In that timeframe, the rate of agrarian suicides also increased, which makes Monsanto the worst serial killer in history. Or, if we want to play with words, just as that company plays with the life of millions of farmers, we could describe Monsanto as the worst cereal killer of the planet.

Thousands of farmers, whose way of life has been destroyed as they have fallen into the clutches of the creditors, have turned to suicide as

the only escape. In the process, they have exposed the failure of an agricultural project based on a technological "solution" with multiple negative effects and dysfunctional social relations. Why not heal the damages of the Green Revolution rather than rush to embrace the GM technology?

The seeds of destruction want to tell us something. But this winter, New Delhi seems more concerned with environmental pollution than the tragedy that unfolds daily in the countryside.

<http://www.zmag.org/content/showarticle.cfm?SectionID=66&ItemID=11790>

This fortnightly bulletin is brought out by South Against Genetic Engineering (SAGE), a coalition of civil society activists, farmers, scientists, academicians, and consumer groups of four Southern States of India, viz., Andhra Pradesh, Karnataka, Tamil Nadu and Maharashtra. SAGE has been waging a concerted battle against genetic engineering through a series of activities that involve public protests, media actions, seminars, consultations and publication of a series of education materials.