**Monsanto in India**

 In the spring of 2013, Elizabeth Reynolds, the Lead Executive of Monsanto’s India operations, was reading the news when she came upon an article titled “The Seeds of Suicide: How Monsanto Destroys Indian Farming.” Reynolds herself led Monsanto’s expansion into India a few years prior, so the headline made her jaw drop. An excerpt from the article stated:

*“Monsanto’s talk of ‘technology’ tries to hide its real objectives of control over seed where genetic engineering is a means to control seed. Monsanto India’s website makes lots of promises, alongside pictures of smiling, prosperous farmers from the state of Maharashtra. This is a desperate attempt by Monsanto and its PR machinery to delink the epidemic of farmers’ suicides in India from the company’s growing control over cotton seed supply — 95 per cent of India’s cotton seed is now controlled by Monsanto. Control over seed is the first link in the food chain because seed is the source of life. When a corporation controls seed, it controls life, especially the life of farmers.”[[1]](#footnote-1)*

When she led Monsanto’s Indian expansion effort, Reynolds’ motives were to grow the company while providing the resources for a more prosperous Indian cotton industry, so that everyone could win. In developing biotech crops for India, Monsanto wanted to boost impoverished Indian farmers’ profits and help reduce food imports. With Monsanto’s help, the Indian cotton industry could be transformed into the likes of the American cotton industry, with more profits, higher yields, and happier Indian farmers.

However, after a few years of hard work and market expansion, this article's headlines made Reynolds’ jaw drop. She had not intended for these effects to play out when Monsanto had started selling to Indian farmers.

Her mind went back to another headline she has seen a few months prior titled “Monsanto’s Seeds Squeeze Out Family Farmers.” That article had highlighted that Monsanto’s seeds have forced smaller farmers out of the market, specifically in India. It claimed that the cost of industrial agriculture in India was forcing farmers to “get big or get out.” The article even went on to say that profit margins were smaller for farmers due to the fact that GM seeds had driven up seed prices in India.

In Elizabeth’s mind, Monsanto’s seeds promoted commercialized agriculture, which led to more resources for more people. In her mind, Monsanto was forging a biotechnological path toward feeding and providing for a growing world population. Through GM seeds and these high-output agricultural practices, Monsanto could assist developing areas of the world in growing their agricultural sectors. This is what she wanted to accomplish in India. However, after all the headlines that Elizabeth was reading that year, she got a sense that the public felt differently about Monsanto’s business practices. With the increasing rates of farmer suicides in India, as well as the claim that Monsanto was pushing out small farmers and driving up seed prices in India, Elizabeth knew she needed to act swiftly.

**Monsanto and GMOs**

Monsanto is an American agrochemical and agricultural biotechnology corporation that was founded in 1901 by John Francis Queeny. The Monsanto Industry expanded into drugs and industrial chemicals, leading the introduction of polychlorinated biphenyls (PCBs) in the 1920s. Later, the company began focusing on controversial products such as insecticide DDT and Agent Orange. In the 1930s, the company formed its initial hybrid seeds. This organization deals with herbicides, crop seeds, and GMO products. In 1975, Monsanto introduced glyphosate-based herbicide, Roundup, and emerged as the largest producer of genetically engineering foodstuffs.[[2]](#footnote-2)The use of Roundup pesticide seed has led to an increase in crop yields through close rows plantations. In 1996, Monsanto majored in the maize seed business and focused on Cargill’s global seed corporate two years later, and its seeds have since widely been used in fruits and vegetables.

Monsanto does not only operate in countries that allow GMO products. Dr. Sergiy Dmytriyev, lead of business development for Monsanto in East Europe, was spoken to about attitudes in regions where GMO’s are not permitted. “Yes, employees at Monsanto as well as a bigger portion of farmers wanted to have them. There were large benefits- higher yields, less/no chemicals to be used for GM crops). The bigger concerns taken into consideration when deciding whether or not to implement the use of a GMO crop is more about an “unknown future,” since much of FDA testing does not show immediately harmful effects.

GMO products are allowed in India, where Monsanto seeds are widely used, resulting in a high productivity rate. India’s development and transformation into the world’s top producer have been contributed by Monsanto’s GM cotton seeds resulting in sustainable growth. Monsanto also helped some countries to provide seeds for free, and these seeds were instrumental in changing the agriculture of these countries, such as those working with Monsanto Africa. The use of Monsanto seeds in these crops such as maize, wheat, cotton and soybeans arose from the rapid purchase of the industries that deal with the seeds by Monsanto Industry. For instance, Monsanto took ownership of the Delta and Pine Land Industry that deals with cotton seeds in 2006. These seeds are usually made resistant to herbicides such as glyphosate. Monsanto seeds (recombinant bovine somatotropin) are used in cows to increase their milk production. Generally, Monsanto seeds are used in agriculture, pharmaceutical, and animal health. Nowadays, Monsanto has the largest seed reserves in the world. They almost monopolize the market for seeds of rice, corn, soybean and cotton in many countries. But they couldn't prove that some of their seeds were harmless, so in 2013 there were many people against Monsanto and their transgenes technology.

**Monsanto in India- Bt Cotton**

Commercial genetically modified (GM) food was first introduced back in 1994 by Calgene Inc., an agricultural biotech company later acquired by Monsanto.[[3]](#footnote-3) Calgene introduced the first GM tomato, certified for human consumption, but the project was later called off due to soaring R&D costs and low tomato prices. Despite the failure, the world saw an increased number of agricultural biotech companies investing into the market for GM food, engineering the traits of organisms to generate better yield and specific characteristics. These GM organisms cover cash crops that Monsanto had pushed to develop, including Monsanto India’s insect resistant cotton, also known as Bt cotton.

Monsanto’s Bt cotton arrived in India in 1995, when Mahyco (Maharashtra Hybrid Seeds Company) imported 100 grams of Bt cotton from abroad without prior approval from the Genetic Engineering Appraisal Committee (GEAC)[[4]](#footnote-4), which was responsible for governing the release of GM organisms into the environment[[5]](#footnote-5). Instead of obtaining an approval from the GEAC, Mahyco obtained the approval from the Review Committee of Genetic Manipulation of the Department of Biotechnology (RCGM – DBT), which had no authority over the imports of GM organisms. By 1998, Monsanto and Mahyco introduced a joint-venture and performed large-scale field trials of Bt cotton in nine states across India[[6]](#footnote-6). Following a series of field trials, Bt cotton proved to deliver protection against bollworms, a common pest in cotton farming[[7]](#footnote-7), increasing yields of up to 50% on average[[8]](#footnote-8).

It has been found that germination rates for Bt cotton in comparison to non-Bt cotton were higher, with 100% of the Bt seeds having a germination rate of over 75%, and 88% of the non-Bt seeds having a germination rate of over 75%. However, the differences in germination are not significant, sometimes even showing Bt seeds with somewhat lower germination rates than non-Bt seeds. The purity and quality of cotton is dependent more on the method of picking than on the type of seed used- hand picking is more beneficial than machine picking. Machine picking is more often used with Bt cotton due to the higher yield. The quality of Bt cotton is meant to be superior in some aspects due to the reduced need for insecticides combatting bollworms.[[9]](#footnote-9) However, there is some variation in the resistance Bt cotton has demonstrated to bollworms.

The increased yield of Bt cottons soon attracted the attention of non-GM cotton farmers. By 2015, Indian farmers grew cotton on 11 to 12 million hectares of land, with roughly 95% being Bt cotton[[10]](#footnote-10). Specifically, Bt cotton farms rose from 50,000 hectares in 2002 to 10.8 million hectares in 2016, expanding the income of Bt cotton farming by more than 21 billion US dollars between the years[[11]](#footnote-11). With the increased yield, however, comes rising prices for farmers. The seed for Bt cotton cannot be reused by farmers year to year, the way other seeds can be, which also contributes to rising costs, often leading to insurmountable debt for many. Since its introduction in 1998, the price of Bt cotton seeds rose from ₹5 – ₹9 per KG, to a peak of ₹1,600 per 450 grams, a whopping 80,000% increase[[12]](#footnote-12). Around 300,000 suicide incidences of Indian farmers are recorded since the mid-1990s, with a majority of them related to the inability to repay loans taken to purchase seeds.

India is in the midst of a crisis of farmer suicides, with a large part of the public placing the blame on GMO based agriculture. Due to the cost of Monsanto’s seeds, Indian farmers have attempted to find alternatives. However, many of them find themselves bounded by Monsanto’s patents, making it difficult to purchase similar seeds from other vendors. Allowing Monsanto to retain the patent is a move meant to strengthen India’s image as a country welcoming to innovation and research. Without proper knowledge about the consequences of infringing patents, however, several Indian farmers were sued by Monsanto, leading to heavier debts among farmers. However, it has also been shown that Bt cotton led to an 18% increase in consumer expenditures, used as a measure of living standards.[[13]](#footnote-13)

**What’s next?**

Elizabeth Reynolds doesn’t know in what direction to take Monsanto India. If sales are pulled back as a recognition of damage caused this will be harmful to Monsanto’s prospects for growth as well as for their image, and by most projections the country’s yield will drop dramatically.

Elizabeth thinks about the ways in which she knows cotton production in India has benefitted from Monsanto’s product. Indian cotton production experienced an 180% increase from 2001-02 to 2014-15 as a result of the use of Monsanto’s Bt cotton. This enabled India to reduce cotton imports, increase exports, and overtake China as the world’s largest cotton producer.[[14]](#footnote-14)

Bt cotton, however, is significantly more expensive than local non-GMO types, which can make things especially difficult for farmers who want to purchase and use it since the seeds need to be bought for each season. Another challenge for farmers is being well-informed about which type (hybrid) of Bt cotton to use depending on where they’re farming. Some types are more suitable for rain-fed areas than others. Should part of Monsanto’s strategy include changing the way Monsanto communicates with farmers?

In the past, the preservation of the Monsanto seed patent has been framed in the context of intellectual property protection pulling more business and innovation to India. Can Elizabeth continue to use this as the company’s reasoning and justification behind fighting to keep their patent?

Despite concerns from activists, farmers, and other citizens, Elizabeth wonders if the right choice is the one that involves the least change. After coming across comparative research about farmer crises, she sees the possibility that the farmer crisis in India might have been inflated. Comparative rates of farmer suicide puts India ahead of some countries like England and Wales, but behind otheres such as Scotland and France. More tellingly, some analysis of rates of farmer deaths in the context of the use of Monsanto’s product fails to show a significant increase in farmer suicides after the introduction of Bt cotton.[[15]](#footnote-15) By pulling back sales or changing marketing policy, will Monsanto be assuming culpability for something they do not yet need to? The Indian public is growing restless, and Elizabeth is unsure of how to proceed.

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