

A lost desi cotton heritage

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- *In the cotton fields of Maharashtra, hybrid varieties are unable to withstand the onslaught of pests and diseases, prompting a shift in course towards India's indigenous (desi) cotton varieties.*

However, farmers want newer technologies or better alternatives but few are willing to test out desi cotton for fear of losing yields.

Illegal Bt cotton seeds are more popular than desi seeds. Even in the face of abundant evidence, there has been no action against the sale of illegal seeds.

- **Though there are NGOs promoting desi cotton, experts feel government backing is a must for a large-scale shift from Bt cotton to desi varieties.**

In a region where Bt cotton rules the roost, Kamal Kishore Dhiran, a farmer in Balodi, 50 km from Yavatmal (in Vidarbha region of Maharashtra) is an outlier. He has been planting desi cotton seeds and withstood the pressure to grow transgenic or Bt cotton since it was introduced in 2002. He was once part of a successful organic cotton venture – the Vidarbha Organic Farmers Association (VOFA) which is now defunct, and which used to export organic cotton. Dhiran still grows 'straight' (as opposed to hybrid) varieties of cotton; he sources it from the Punjabrao Deshmukh Krishi Vidyapeeth in Akola every few years. He is among the few farmers who saves the seed and only buys fresh ones every three years or so. Dhiran has been a farmer since 1960, and owns 60 acres. He did try out hybrid cotton seeds and grew them with fertilisers and other chemicals – soon he found the yields were falling and he decided to grow desi (indigenous) cotton which was more suited to the area. Today he grows desi varieties like AK 7 and AK 8, and some American varieties, and gets 4 to 5 quintals (100 kg) per acre in dry land and about 8 quintals per acre in his irrigated land. He spends Rs 10,000 to Rs 12,000 per acre, which includes cow dung and other inputs. He deals with his pests using natural enemies and finds that his neighbours are spraying heavily for Bt cotton. "Bt cotton is like Fair and Lovely [a popular fairness cream]. Does it really change your or make you fair? Similarly Bt cotton doesn't address the main problem of pests. I have better techniques and fight pests using their natural enemies," he said. Dhiran stands alone in a market dominated by hybrid Bt cotton seeds, now numbering over 2,000. Few seed companies sell desi cotton seeds and they serve a niche market. A cursory look at the seeds market in Yavatmal shows the dealers only stock Bt cotton. A Mahabeej (Maharashtra state seeds corporation limited) dealer remarks no one wants alternative seeds. If they do, they have to place an order in advance; but often, there are no stocks available.



Desi cotton at Gopuri, Wardha. Photo by Meena Menon.

The last few years have seen a vicious attack by the pink bollworm which has developed resistance to Bollgard 2, the proprietary Bt cotton variety produced by Monsanto, reducing cotton yields and driving farmers to despair. This has prompted a belated shift in course away from hybrids, thanks to secondary pest attacks and pests like the pink bollworm that used to 'minor' morphing into a serious menace. *The alternatives to Bt cotton* Since 2002, field trials of 25 to 30 Bt cotton hybrids and straight varieties have been conducted under the All India Coordinated Research Project on Cotton. Since 2017, two straight [Gossypium hirsutum](#) varieties have been released for north Maharashtra. One of them was developed by the Punjab Agricultural University and is named PAU Bt 1; and the other developed by CICR is Bt 6. Farmers are growing them and a private seed company is commercially multiplying the Bt 6 seeds. In addition, the six straight varieties that have approved for release in Maharashtra are also [G. hirsutum](#) varieties — PKV 081, Rajat, Surat, and some others, but they are in the seed multiplication stage. Vijay Waghmare, director, **Central Institute for Cotton Research (CICR)**, Nagpur, said the trials were promising and the yields were as good as the early Bt cotton seeds — at 15-20 quintals per hectare in rainfed conditions and upto 24 quintals per hectare in irrigated conditions. It remains to be seen how these seeds perform in farmers' fields over time. Straight varieties can be reused by farmers but unless they gain wider acceptance, seed companies may not be interested in producing them on a large scale. However, hybrids continue to dominate the Indian market. [The prevalent menace of illegal Bollgard 3](#) After cotton fields were devastated by the American or green bollworm, Bt cotton was launched in 2002 but soon secondary pests including the mealy bug

surfaced for the first time on cotton in India. The pink bollworm was already chewing up Bollgard 1, and the company Monsanto Mahyco came up with Bollgard 2. Even that has proved to be ineffective against the pink bollworm, as is evident in the last few years.



Desi cotton at Gopuri, Wardha. Photo by Meena Menon.

However, illegal herbicide tolerant (HT) Bt cotton is being sold and has found great popularity among farmers. Two years ago, Monsanto withdrew its application for approval of herbicide tolerant cotton from the Genetic Engineering Appraisal Committee over differences on its royalty being cut, but illegal herbicide tolerant cotton has found its way into farmers fields and seems to be extremely popular, with farmers naming it "Bollgard 3". Agents come to villages and sell it cheaply to farmers who have been planting it all over the place. Maharashtra, Andhra Pradesh, Telangana, Gujarat and Tamil Nadu, among other states are growing this cotton but there is little regulation. After many complaints of illegal cotton, in October 2017, the Prime Minister's Office formed a Field Inspection and Scientific Evaluation Committee (FISEC) under the **Department of Biotechnology** in the Union Ministry of Science and Technology. Its report recommended action against such companies and destruction of illegal seeds. Maharashtra reportedly seized over 16,000 seed packets till April and confiscated unpacked seeds, apart from filing over 20 cases. After analysing over 13,361 samples, the report found illegal herbicide tolerant cotton on 15 per cent of the area in Maharashtra, Telangana, Gujarat and Andhra Pradesh in 2017. The samples tested negative for all other herbicide tolerant genes except for that of Monsanto's MON88913. This entire episode is reminiscent of 2001 when illegal Bt cotton was found in Gujarat fields even before it was approved by the government a year later. While there were an estimated 35 lakh packets of illegal herbicide tolerant Bt cotton sold in 2017, despite the Committee's recommendations, in 2018 too, Waghmare estimates that 12- 20 per cent of the cotton area is planted with this illegal cotton. At least 15 per cent of the area in Vidarbha is growing this illegal variety on which glyphosate is sprayed and the CICR has been warning farmers as glyphosate has long-term effects on the soil and the germination of the next crop.



[The cotton spinning and weaving unit at Gram Seva Mandal, Gopuri, Wardha, which uses some desi cotton. Photo by Meena Menon.](#) The **Centre for Sustainable Agriculture (CSA)** in Hyderabad has been taking up the matter since a decade. G.V. Ramanjaneyulu, its executive director said herbicide (glyphosate) tolerant cotton was illegally grown on more than 20 per cent of the cotton area and despite testing and findings positive samples, no action was taken. While Telangana and Andhra Pradesh have adopted laws to regulate glyphosate, there is abysmal regulation despite so much evidence. **Few takers for the desi varieties** While farmers are planting this illegal cotton, even if it is sometimes more expensive than legal cotton, there are few takers for what India once grew and was proud of. The Punjabrao Deshmukh Krishi Vidyapeeth, Akola, like other government agricultural universities has been trying to promote desi cotton. N M Kolapkar, Yavatmal district superintendent agricultural officer said every year desi cotton seeds (PH 904) were given to farmers to be grown in trial plots. In 980 villages in Yavatmal district, there is one plot each growing desi seeds but there are few takers. The government also makes seed plots in all 16 talukas of the district and tries to "motivate" farmers to adopt desi cotton, to little avail. People are not interested in growing desi cotton, though they keep saying they want alternatives. "If farmers want desi cotton seeds we can make arrangements for the seed," said Kolapkar. Devanand Pawar, a political activist and convenor of Shetkari Nyayhakk Andolan Samiti, Yavatmal, who has been taking up the cause of farmers, said the government and others promised alternative seeds after last year's disaster, but nothing has happened. Illegal herbicide tolerant Bt cotton seeds are grown everywhere and Vidarbha is a major market for them. The seeds sell for Rs 700, less than official Bt cotton and are made in Gujarat. "Why is the government taking no action against illegal seeds and

companies making them?," he asked. Fewer takers, lesser demand, low availability: a vicious cycle CICR has over 2000 accessions of desi cotton but only 8 to 10 desi varieties developed by scientists can be made available for growing. The various agricultural universities are also focusing on desi cotton and their seeds are available to those who need them. However, due to less demand, there is no widespread commercial availability.



Spinning cotton at Wardha. Photo by Meena Menon. There

are several farmers and NGOs promoting desi seeds but these efforts need to be scaled up. The Gram Seva Mandal Trust which has a cotton ginning, spinning and weaving unit at Gopuri in Wardha has received a new lease of life with Karuna and Vasant Phutane since 2009. Acharya Vinobha Bhave had formed the Mandal in 1934 to promote "cotton to cloth" and encourage local industries. Karuna, president of the Mandal, sources fine cotton – Suvin — from Tamil Nadu and is trying to use desi cotton by giving farmers seeds and buying back the cotton. Since the last five years, Vasant Phutane said the government agricultural universities in Maharashtra had developed desi cotton varieties from which he selected Anmol, a medium staple *Gossypium arboreum* desi cotton from Rahuri University which he found was suitable for the Wardha area. After growing it for two years, he gave it to some farmers who found it had fewer pests and more pickings despite the smaller bolls. The Mandal pays 10 percent extra for desi organic cotton and also sources cotton from the Vidarbha organic cotton network called Samvad. In 2017-18, some 200 farmers (about half the total number) sold organic cotton to the Mandal. Tarak Kate of the NGO Dharamitra has been working with over 500 organic cotton farmers in Wardha district. Since the last one year, a few farmers agreed to grow desi seeds — Suraj and Palamneru — sourced from the Gram Seva Mandal. "So far the cotton has fewer pests than Bt cotton, though there is water stress as leaves are reddening. Also the farmers get more pickings as desi varieties continue to grow as their roots go deeper in search of water. Even if the farmers get 3 quintals an acre it is worth it as the cost of producing desi cotton is much less than Bt cotton," Kate said. **India's diverse desi cotton: what happened to it?** India had a huge bio diversity in cotton seeds of the short staple variety — *G. herbaceum* and *G. arboreum* or tree cotton. Small pockets like Wagad in Gujarat, in Assam and elsewhere grow desi cotton even today. The British introduced longer stapled American cotton (*G. hirsutum*) and Indian farmers had to grow them for the Manchester mills. Cotton research before and after Independence focused on these longer stapled varieties which were suited to the British mills. Yet even in 1947, 97 percent of the cotton area comprised desi cotton. Now, more than 70 years later, that much area is swamped by Bt cotton hybrids, leaving only a small area for desi varieties.



Making coloured cotton at Gopuri, Wardha. Photo by Meena

Menon. Indian cotton has many hardy features and CICR notes it can adapt to climate change vagaries. Yet, only 5 percent of Indian scientists work on desi cotton and even if there are straight varieties from desi cottons, they have little popularity. Despite these small efforts, unless there is government backing to promote non-Bt or desi cotton it cannot be scaled up to any level of significance, according to Ramanjaneyulu from CSA. The government infrastructure has the responsibility, resources and infrastructure to promote seeds, he said. Historically, Ramanjaneyulu said there were three factors responsible for desi cotton seeds going out of the market. Between 1996 and 1998, the central government decided that there was a lot of diversity of cotton in terms of staple length and this was getting all mixed together, which in turn was detrimental to the textile industry. And so it denotified 190 varieties, which means that the government is not responsible to maintain these seeds or replicate them in the future. Cotton was the first crop on which much research was conducted even before 1947 and some of these were desi cottons, which were withdrawn from research. Secondly in 2004 a Comptroller and Auditor General's report stated that the National Bureau for Plant Genetics Resources (NBPGR), which collected all the desi varieties of cotton and other plants said they could not be stored and was destroyed, he said. As a result in six years, not only were desi cotton varieties withdrawn from the market as well as for research but they were destroyed as well, he added. So the entire research focused on Bt cotton hybrids and after that not a single straight cotton variety was launched, and there were no varietal improvement programs.

Most companies became licensees of Monsanto for the Bt technology. There is little doubt that desi cotton was adapted to Indian conditions and geographical variations. But lower yields and difficulties in picking the bolls deter farmers. However, growing hybrids and Bt cotton hybrids in rain fed areas has created its own problems. CICR's efforts to distribute straight varieties of Bt cotton is one way of tackling the problems faced by farmers of pest attacks, disease and water stress, but unless this effort is scaled up to some magnitude, it will be another lame effort at helping farmers. An alternative to hybrids was to plant non-GM open pollinated cotton varieties desi/American/proved with high density planting, suggested by former CICR director K R Kranthi which can increase yields. Universities have desi cotton seeds but the use is localised. There is little research and this is justified by saying there is no demand for desi cotton seeds. Only the government can invest on maintain parental lines, not individuals. The CSA too is promoting non GM cotton and Suraj, is a variety that is gaining popularity with 200 farmers in Warangal and Adilabad. With non Bt cotton, the farmers find that it can tolerate drought conditions better and does well under stress conditions. By giving in to private players all these years, the Indian government has relegated its own responsibility to protect, save and research desi cotton, leaving the farmers at the mercy of seed companies. In terms of choice, the cotton seed market is straightjacketed by Bt cotton and after the patent dispute went against Monsanto, seed companies may be less hesitant about going in for straight varieties of Bt cotton. Still, the fetish for technology and newer and newer seeds sway farmers towards growing illegal cotton which is herbicide tolerant, even if spraying glyphosate is harmful. With increasing resistance being developed by minor pests like the pink bollworm since the last few years and white fly infestations damaging the crop, now is a good time as any for the government to diversify the seed availability, regulate illegal seeds and tighten laws so farmers have a real choice not a Hobson's one. First published by [Mongabay](#) on 17 Sep. 2018