

Seeds of stagnation in Bt cotton

Manufacturers said deferrals in introducing newer variants would seriously hit productivity

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Last month, a meeting of the Genetic Engineering Appraisal Committee (GEAC) decided to seek fresh information from Mahyco on the Bollgard-2 Round-up Ready Flex (BG-2 RRF), a second-generation variant of the genetically modified (GM) Bt cotton seed. Specifically, the GEAC wanted to recheck BG-2 RRF's efficacy claims against certain targeted pests, including the dreaded pink bollworm. The committee also wanted a revised analysis of the socioeconomic impact of the use of this hybrid.

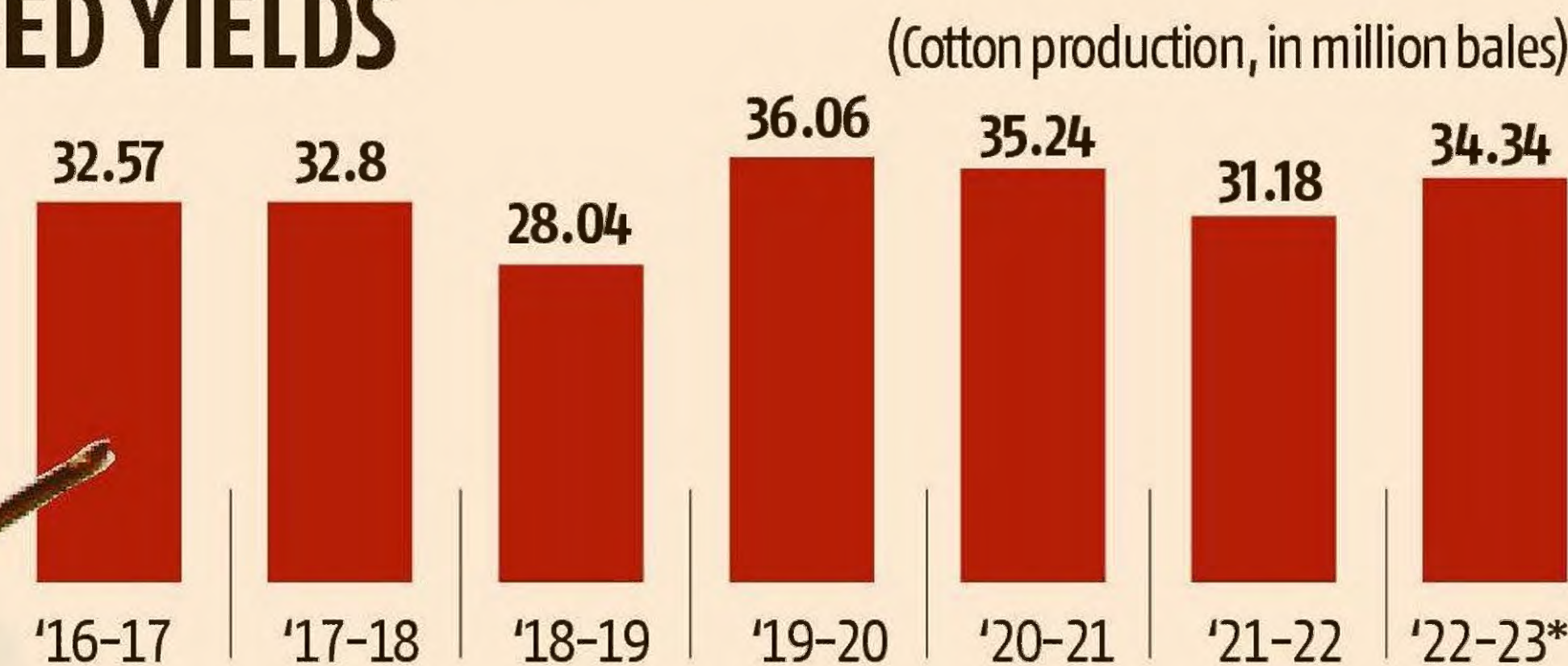
This dossier has had a chequered history. It was first submitted in 2013, according to senior industry sources. In 2016, it was voluntarily withdrawn owing to problems with intellectual property rights with its principal partner, US-based Monsanto. The dossier was resubmitted in November 2021, following which a panel was constituted to study it. In the first dossier, the socioeconomic assessment was conducted independently by Indian Council of Agricultural Research (ICAR) and its affiliate, the National Academy of Agricultural Research Management.

Though the dossier's contents and the panel's findings are not available in the public domain, the demand for a fresh dossier and socioeconomic study has dismayed seed manufacturers. Bhagirath Choudhary, founder and director of the South Asia Biotechnology Centre (SABC), Jodhpur, told *Business Standard* that revisiting the original dossier would delay the approval process for introducing next-generation GM cotton in India by at least two years. Seed manufacturers say the delay in granting approval for the new technology has resulted in stagnating cotton yields (per hectare yield has stagnated at 400-600 kg for the past few years).

Some industry players are also perplexed at GEAC linking BG-2 RRF with pest management for dreaded pests such as the bollworm complex. "BG-2 RRF is purely for weed management. To seek information on its specific impact on certain pests such as the bollworm complex is not very clear," a senior industry official said.



CROPPED YIELDS



NOTE: The cotton season runs from October to September; *As per third advanced estimate released on May 25, 2023; 1 bale equals 170 kg Source: Government of India

At the same meeting, the regulator also approved field trials of a separate application by Hyderabad-based seed company Bioseed Research India for field trials of a new variant of GM cotton that has a gene resistant to pink bollworm. The fate of these trials is also uncertain; some states where they were to be conducted have not been forthcoming in granting the mandatory no-objection certificates (NoCs) required for such trials.

In response, the GEAC, according to the minutes of the meeting, directed the Department of Biotechnology (DBT), ICAR, and the ministry of agriculture to consider jointly organising capacity-building activities with regard to GM crops for (appraising) states and Union Territories of the technology involved and regulatory framework in place for evaluating these GM crops, thereby enabling informed decision-making by them.

This intervention has infuriated civil society activists who allege that far from being independent, the regulator is trying to influence states or even coerce them to grant NoC for field trials of GM cotton. This direc-

tion, they say, ignores the fact that agriculture is a state subject and granting permission for field trials lies squarely in the state's domain.

The upshot of all this is that farmers are increasingly opting for illegally manufactured and untested second-generation Bt cotton, which may be detrimental to their own health and the soil in which it is being grown. Moreover, opposition by non-governmental organisations to field trials of new seed varieties of Bt cotton will only fuel the sale of illegal BG-2 RRF cotton, Choudhary said.

In any case, they contend, the pink bollworm has already developed resistance to Bt cotton owing to alleged delays in allowing the growing of refugia, or non-Bt cotton crops, along with Bt cotton to maintain the resistance of Bt cotton to new emerging pests.

The proliferation of illegal Bt seeds is growing with each passing season. Some years ago, a report by the Field Inspection and Scientific Evaluation Committee set up under the DBT by the Prime Minister's Office had apparently found that in 2017 the area under

unapproved Bt cotton was around 15 per cent of the overall figures.

Though the report was never made public, industry sources said that it pointed towards a disturbing trend. In the 2023 kharif, cotton sowing has begun in several northern and western Indian states, and industry players said some 7.5 million out of the estimated 45 million packets of cotton seed sold (around 17 per cent) were of illegal Bt cotton.

"Unless this is curbed, it will have serious consequences on cotton production and cotton crop in India," another industry official said. That's because the Bt cotton has a unique resistance to pink bollworm.

According to various studies and an SABC note, pink bollworm is one of most common pests to inflict cotton farms worldwide and also in India where it has emerged as a major threat.

The outbreak of pink bollworm was first reported in 2013-14 in Gujarat from where it has quickly spread to Maharashtra, Andhra Pradesh and Telangana. Now, the pest has heavily infested cotton crops in Punjab, Haryana and northern Rajasthan. Cotton is grown in 12-12.5 million hectares in India and much of this is threatened by pink bollworm. The pest, said SABC, could reduce seed cotton yields by 35 to 90 per cent, and degrade the quality of the cotton that can be produced from the lint.

Scientists and field researchers say there are mainly three ways to deal with pink bollworms. One is disrupting the pest's mating cycle, the other is releasing sterile moths to control its reproduction, and the third is the extensive use of advanced varieties of Bt cotton seeds that are naturally resistant to pink bollworm.

The US, which is a big cotton producer, has used a combination of all three techniques. In India, the option has to exponentially raise the number of pesticide sprays. This requires spraying pesticides; after 50 days in the field, the crop will require one dose of pesticide every 10 days. Before the advent of pink bollworm, the average number of pesticide sprays had dropped to just two or three times because the available seeds had strong resistance to the pests. Now, for the pink bollworm, this is no longer an issue.