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An extensive review of existing research on genetically modified (GM) corn is done to check the impact of GM corn on the ecology. A researcher with the United States Department of Agriculture (USDA-ARS) and his Swiss colleagues worked on this study.

The study reviewed hundreds of international studies published between 1997 to 2020 and found that GM corn has no impact on the beneficial insects. It also established that GM corn is far less harmful to non-target organisms such as arthropods, earthworms and nematodes than growing corn through conventional methods, where insecticides are used to fight off pests that can destroy the crop.

The analysis compiled the largest pool of high-quality data ever analyzed for the purpose of assessing GM corn's impact on non-target organisms. The data set, comprised of 7,279 individual invertebrate records from 233 experiments in 120 articles, three-quarters of which were published in peer-reviewed journals.

Bt corn controls harmful insect pests by producing proteins from a common soil bacterium, *Bacillus thuringiensis*, that is also used for pest management in organic farming. It is the most widely grown GM crop in the world. While Bt corn is successful in warding off attacks by corn borers, corn rootworms and other major corn pests, researchers found that it has no negative effects on ladybeetles, flower bugs, lacewings and other non-target insects.

We believe that all Governments will come forward and encourage farmers to adopt Bt Corn to help them realise the benefits and provide consumers with quality products.

We have also covered news around several important developments on agriculture across India, globally and in the area of research in this newsletter. We hope you find it a good read!



**Shivendra Bajaj**  
**Executive Director**

**Federation of Seed Industry of India-Alliance for Agri Innovation**

## **News from India and Around the World**

### **Illegal variety occupies about a fifth of GM cotton seed market**

**(The Financial Express)**

A flourishing illegal trade in a new unapproved herbicide-tolerant variety has come to occupy nearly a fifth of the genetically modified (GM) cotton seeds market in India. Over three dozen seed companies, which are authorised to sell the transgenic Bt cotton by licence-holder Bayer Crop Science-Mahyco, warn that the illegal seeds, first seen in the market in 2019, could contaminate the regular Bt seed and lead to “heavy losses” for cotton growers. However, farmers’ organisations say since the unapproved seeds help them in weed management and cut costs, they would continue to use it. Sources say the illegal seeds are being sold at a 60% premium over the government-fixed price of Rs 810 per packet for regular Bt cotton. Central to the issue is the refusal of the regulator — the Genetic Engineering Appraisal Committee (GEAC) — to consider the Bayer-Mahyco’s application for the new herbicide-tolerant Bt (HTBt) cotton.

### **Gene-Edited Beer Is Next in Argentine Crusade for GMO Acceptance**

**(Bloomberg)**

Argentina’s Bioceres Crop Solutions Corp., the farm technology company that’s trying to convince the world to eat genetically modified wheat, is in talks with Buenos Aires craft beer maker Rabieta to brew the first-ever GM lager. The US-listed firm is moving to supply its HB4 wheat seeds to Rabieta and to a poultry producer for feed, Chief Financial Officer Enrique Lopez Lecube said in an interview on Wednesday at Bloomberg’s New Economy Gateway Latin America event in Panama.

### **Study Shows Herbicide Tolerant Cotton Has No Adverse Environmental Impacts**

**(Seed World)**

While genetically modified herbicide tolerant (GMHT) crops are the most widely adopted GM crops across the globe, the potential ecological and environmental risks have attracted attention and controversy over the last two decades. A study published in the Journal of Cotton Research set out to investigate the potential effects of GMHT crops on arthropod communities. The two-year investigation revealed that GMHT cotton did not exhibit any harmful effects on the arthropod community. In fact, the study found that the GMHT crop had the same abundance and diversity of insects as its near-isogenic line counterpart.

### **‘Britain must address the madness of its organic-obsessed, science-denying agricultural system’**

**(GLP)**

Had we adopted genetically modified crops 25 years ago, today European farmers would be getting higher yields, with lower emissions, less use of chemical pesticides and greater biodiversity in their fields. We know this because that is the experience of farmers who did adopt those crops elsewhere. The food our farmers produced would be safer, more nutritious and healthier because that is what the scientists are making elsewhere and were on the brink of doing to the varieties we grow here before the rug was pulled out from under them. That technophobic lurch was based on entirely false

fears. "Science has not evidenced any harm from use of GM crops," concludes an authoritative recent study by Spanish scientists.

### [U.K. speeds crop gene editing approval](#)

(Western Producer)

In a bid to produce more food, the United Kingdom government is fast tracking legislation that will allow the use of gene editing in crops. The move comes amid fears the war in Ukraine could lead to mass food shortages across the world, causing hunger in vulnerable nations. The UK government bill will allow farms to grow more crops by planting variants edited to be more disease resistant or require less water or fertilizer. "Precision technologies allow us to speed up the breeding of crops that have a natural resistance to diseases and climate change, better use of soil nutrients so we can have higher yields with fewer pesticides and fertilizers," said environment, food and rural affairs secretary George Eustice. With difficult terrain and a sometimes unforgiving climate, Scotland is one part of the UK where gene editing may boost agricultural production.

### [New research confirms that GM corn is safe for beneficial insects](#)

(Alliance for Science)

Growing genetically modified (GM) corn has virtually no impact on the abundance or ecological function of beneficial insects, according to an extensive review of existing research. And it is far less harmful to non-target organisms than growing corn through conventional methods, where insecticides are used to fight off pests that can destroy the crop, the study found. It was conducted by a researcher with the United States Department of Agriculture (USDA-ARS) and his Swiss colleagues. The meta-analysis, published in the journal Environmental Evidence, attempted to address concerns raised by critics of GM corn, including contentions that previous assessments of potential impacts were limited in scope.

### [Public comments reveal overwhelming support for GM cowpea in Ghana](#)

(Alliance for Science)

Public comments submitted to Ghana's National Biosafety Authority (NBA) show overwhelming support for approving pod borer-resistant cowpea, the country's first genetically modified crop. Of the 889 letters received following a public comment solicitation period that closed in early May, only one expressed objection, with the other 888 urging approval, said Eric Okoree, chief executive officer of the NBA. Almost 50 percent of the public comments supporting the GM cowpea approval came from university students studying agriculture, biotechnology and related sciences, with the rest coming from rural farmers.

### [First genetically edited crops sown under new UK regulations](#)

(Agriland)

Rothamsted Research has confirmed that it has sown seed of genetically edited (GE) *Camelina sativa*, a member of the brassica family, just weeks after regulations for scientific field trials were eased. Using a seed drill specifically designed for the relatively small seed numbers used in field trial work, the plot was prepared and seeded in just a few hours. However, the big difference was the time saved in applying for permission to conduct the trial. Under previous regulations, trial sites had to be specifically identified and permission sought from the Department for Environment, Food and Rural Affairs (DEFRA) following a detailed application procedure.

### [Ministry of Ayush Signed MoU with Department of Biotechnology to Explore New Opportunities](#)

(Krishi Jagran)

A Memorandum of Understanding (MoU) was signed between the Ministry of Ayush and the Department of Biotechnology of the Government of India to explore the possibility of cooperation, convergence, and synergy in bringing out expertise under one platform towards evidence-based biotechnological interventions in the Ayush sector. Through this collaboration, it is hoped that traditional healthcare and biotechnology will open up tremendous opportunities for innovative and ground-breaking research into various fundamental principles of Ayush systems. There is a need for multifaceted and technological approaches to exploring and applying this ancient scientific system of health care into the public health care domain.

### [Doors gradually open to GM cereal production](#)

(Western Producer)

Genetically modified wheat is finding paths into crop production in some parts of the world, and the science behind it is increasingly established and sound. It could lead to higher yields and reduce production risks, enhancing the global food supply. So why isn't it on the table globally? The primary answer is lack of widespread market acceptance, and that is no small hurdle. But the world is gradually changing. Two weeks ago, Australia and New Zealand approved the consumption of foods made with wheat that has been genetically modified for drought resistance and/or glufosinate tolerance. Brazil was the first to allow imports last year. However, none of those three countries permit production of the crop. To date, Argentina is the only nation that permits GM wheat to be grown. The binational regulatory agency in Australia and New Zealand, when it approved Argentine drought tolerant wheat for food, noted that it produced about 20 percent higher yields than conventional wheat varieties when under drought stress. Genetically modified cereals are an attractive concept for many producers.

### [China issues certification standards for GM crops in major boost for commercialization](#)

(Global Times)

The Ministry of Agriculture and Rural Affairs on Wednesday issued two variety certification standards at the national level for genetically modified (GM) crops, including soybeans and corn, in what industry observers said a significant step in China's legalization of GM crops as the country seeks to further bolster its food security. The move reduces the approval period for such varieties, which will pave the way for further commercialization in one of the world's top crop-producing countries. The board of the national crop variety approval committee was told to immediately implement the standards, according to the notice. "This is a critical step that paves the way for the commercialization of GM crops. In terms of upstream R&D, biotech scientists will be given standards to draw on to facilitate the GM breeding process. Crops that pass the standard test and obtain the necessary certifications will be qualified for massive planting in the future," Li Guoxiang, a research fellow at the Chinese Academy of Social Sciences, told the Global Times.

### [It's time to invest more into biotechnology and food nutrition is now – Former IFAJ president](#)

(My Joy Online)

The former International Federation of Agricultural Journalists (IFAJ) president believes everyone must be involved keenly in the decision process while noting that inclusive authority and social justice at all levels protect the rights of all humans. "We must unify and take action, today, for the future of agriculture and our planet. With the challenges the world is facing in relation to achieving global food security and the exponential growth in population, GM technology will gradually become the order of the day and, therefore, there is a need for us to invest in developing capacity for GMOs. "Agriculture is integral to all three pillars, from ensuring there is enough nutritious food for all to enabling local economies and communities to thrive. GMO may not be the only solution to feeding the world, but it is the best option the world has got now," Mr Rediger said.

## **New Research**

### [From Pharma to Farm: Can CRISPR Feed the World?](#)

(GEN)

After researching wheat for two decades, Catherine Feuillet, PhD, the CSO of Inari Agriculture, is all too aware that plant genetics research can move slowly. Early in her career, she spent a decade isolating a single wheat gene. Despite knowing the value of patience, she also recognizes when time is of the essence. That time is now: The world of agriculture needs to do better than it has in the past if it is to solve an extremely complex problem—feeding more people while facing increasingly dire resource constraints. Agriculture has been increasing production, but at the environment's expense. "We cannot continue this trend," Feuillet asserts. "Climate change is here now. But we cannot compromise on yield because we have more people to feed." Inari conducts genome editing of soy, corn, and wheat—the three crops that feed the world and impact the environment the most. Indeed,

Feuillet asserts that Inari is the only company working on genome editing these crops. "We are the bold ones," she declares.

### [RNA technology used to develop COVID vaccines can protect crops from viruses, fungi and insect pests](#)

(GLP)

It's one of the biggest challenges facing the environment and farmers across the globe – pest control. But now, University of Queensland scientists have developed an environmentally friendly spray which could prove to be a game-changer for the agricultural industry. The breakthrough is part of UQ's BioClay™ technology, a safe and sustainable alternative to chemical pesticides, which has been developed over the past decade by Queensland Alliance for Agriculture and Food Innovation (QAAFI) and the Australian Institute for Bioengineering and Nanotechnology (AIBN). Research team leader Professor Neena Mitter said it was an important development for crop protection because it was effective against whitefly (*Bemisia tabaci*), a small insect responsible for the loss of billions of dollars in agricultural crops around the world.

### [GM Tomatoes could be a New Source of Vitamin D](#)

(Krishi Jagran)

The John Innes Centre's Professor Cathie Martin's group used CRISPR-Cas9 gene editing to change the genetic code of tomato plants so that provitamin D3 accumulates in the tomato fruit. The edited plants' leaves contained up to 600 ug of provitamin D3 per gramme of dry weight. Adults should consume 10 ug of vitamin D each day. When growing tomatoes, the leaves are usually discarded, but those from the edited plants could be used to make vegan-friendly vitamin D3 supplements or food fortification. "We've shown that using gene editing, you can biofortify tomatoes with provitamin D3, which means tomatoes could be developed as a plant-based, sustainable source of vitamin D3," said Professor Cathie Martin, the study's corresponding author. "One billion people worldwide, including 40% of Europeans, are vitamin D deficient. We are not only addressing a major health issue, but we are also assisting producers because tomato leaves, which are currently wasted, could be used to make supplements from gene-edited lines."

### [Genetically modified corn does not damage non-target organisms](#)

(Science Daily)

The largest, highest quality analysis of data ever conducted reveals that genetically modified Bt corn has little impact on nontarget insects and other organisms, especially compared to growing conventional corn. Bt corn is corn that has been genetically modified so that it produces proteins from the bacterium *Bacillus thuringiensis* to control corn borers, corn rootworms and other major pests of corn. The first Bt corn was approved in 1996 and critics have been suggesting that it also can destroy beneficial insects or other non-targeted organisms. One of the issues with assessments of possible nontarget organism damage by Bt corn has been that each study was limited in scope, environment or size. The paper's three authors have made up for these shortfalls by systematically pulling together data from studies in 12 bibliographic databases, 17 specialized webpages, and the reference sections of 78 review articles that all met the highest standards for research quality.

### [Brazil Introduces Two New Transgenic Cotton Cultivars](#)

(ISAAA)

The BRS 437 B2RF and BRS 500 B2RF are transgenic cotton cultivars that feature multiple resistance to diseases and pests, and other favorable agronomic traits. B2RF stands for Bollgard II Roundup Ready Flex technology and confers resistance to the main species of caterpillars that infest cotton and to glyphosate at all stages of crop development. BRS 437 B2RF has multiple disease resistance that mainly targets ramularia leaf spot disease, a major cotton disease that requires around eight applications of fungicides per crop on conventional cotton varieties. BRS 437 B2RF is also resistant to blue disease bacteriosis, common mosaic disease, and root-knot nematode. It has the potential to produce as much as 6,015 kilos per hectare of seed cotton and 2,425 kilos per hectare of lint. BRS 500 B2RF, on the other hand, is a transgenic cotton cultivar that also features high productivity and production of medium-length white fiber. It also has resistance to caterpillars, glyphosate, ramularia leaf spot disease, and root-knot nematode.

### [CTNBio Grants “Milestone” Approval to Brazil's GM Maize Event EH913](#)

(ISAAA)

National Technical Commission on Biosafety (CTNBio) President Paul Barroso calls the approval of genetically modified (GM) maize event 913 a “milestone for Brazilian science” because it is the result of a 100% national public-private partnership between the companies Brazilian Agricultural Research Corporation (Embrapa) and Helix. EH913 event, which is comparable to the best Bt technology in the current market, was found to be effective to lepidopteran pests specifically on the cartridge caterpillar, a known major pest to corn, and to the sugarcane borer. During laboratory tests, the event was also found to be effective against fall armyworm larvae even when it is diluted 25 times in an artificial diet. It also exhibited the absence of cross-resistance with other Bt proteins in the market as it was found to be effective against Bt resistant fall armyworms.

### [Alternative cover crop yielding progress for researchers](#)

(TSPR)

Researchers at Western Illinois University, Illinois State University, and several other institutions are in the midst of studying the viability of pennycress as a cash cover crop for farmers. Win Phippen, Director of the Alternative Crops Research program at Western, is excited about the progress they’re making. “It’s amazing the amount of change we’ve done to this crop to produce a viable commercial crop for Illinois,” said Phippen, who is also a Professor of Plant Breeding Genetics in the School of Agriculture at WIU. He has been at Western for 22 years and started working with pennycress in 2009. Phippen said they have used gene editing to create a new cover crop called CoverCress.

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