A commercialization framework has been developed by FSII along with National Seed Association of India (NSAI) for sustained development of new traits and plant varieties in India. The Seed Industry, FSII and NSAI reached a consensus on this framework for developing superior plant varieties which will benefit the farmers.

Few highlights of the Commercialization framework are:

- An Industry Governing Body (IGB) to be formed with representatives from both the associations, an independent scientist and an independent expert to chair it. The Chair and the Scientist will take impartial view of the matters and ensure that concerns and interests of all parties including farmers are taken care of.
- Some basic criteria including technical and financial capacity to handle technology and readiness to follow stewardship guidelines are identified to determine the qualifications of the seed company for giving access to the trait through an Access Agreement.
- The IGB determines trait value within a range of 5 to 20% of the seed value and a gradual reduction in trait value over a defined period. This ensures that the technology remains affordable for the farmer while the technology developers are provided with adequate return on their investment.

We believe this significant step will usher new achievements in the agriculture sector in India. We have also covered news around several important developments on agriculture across India, globally and in the area of research. We hope you find the newsletter a good read!

Shivendra Bajaj
Executive Director
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News from India and Around the World

NSW has lifted its ban on genetically modified crops: what difference will it make to food and farmers?

(The Guardian)

New South Wales lifted its ban on genetically modified crops this month, after an 18-year moratorium. It follows the repeal of a similar moratorium in South Australia last year, making Tasmania the last Australian state with a blanket ban on GM crops. The move has been welcomed by GM proponents as helping farmers become more resilient to the effects of climate change but opposed by organic farming representatives.

Seed industry players reach consensus on commercialization framework for new traits

(AgroSpectrum)

The seed industry through National Seed Association of India (NSAI) and Federation of Seed Industry of India (FSII) reached a consensus on the commercialisation of a framework for new traits for the development of superior plant varieties which will benefit the farmers. The consensus developed through consultations and discussions among the industry players is significant, putting an end to the fears of monopoly or restricted access to the traits by the plant breeders and at the same time providing assurance to the trait developing companies of a reasonable return on their investments. The optimisation of interests of different stakeholder groups including farmers will also lead to clarity to the regulatory agencies in future to evaluate and approve the new traits or plant varieties.

With New Biotech R&D Hub, BrightFarms Increases Indoor Farming Innovation Tenfold

(Farm Weekly)

A grower of indoor leafy greens has set up BrightLabs, an innovation and research hub at its Ohio growing facility. The lab's main focus will be on biotech research and increasing yields thus developing next phase solutions for its profitable model. N.Y.-based BrightFarms opened an R&D lab to accelerate its indoor farming innovation by tenfold. The company focuses on developing proprietary and patented ecosystems for plants to grow. In the process, the flavour, yields and texture of the plants are increased.

Scientists bank on GM crop to lift cassava industry in East Africa

(Xinhua)

Catherine Taracha, a scientist at the Kenya Agricultural and Livestock Research Organization (Kalro), is looking forward to starting planting genetically modified (GM) cassava on a trial basis after the government recently approved the process. "We will do the trials in Western Kenya, at the Coast and in the Eastern part," Taracha said during a virtual meeting in Nairobi, expressing optimism that in two years' time, farmers across the country and other parts of East Africa would start growing the crop commercially.

India reports record plantation of illegal cotton hybrid

(The Indian Express)

The Current season has seen the highest sowing of unauthorised genetically-modified (GM) cotton. As compared to the sale of approximately 30 lakh packets of this hybrid in 2018, seed companies say, this year, the sales have been between 60-65 lakh packets. Cotton is the only GM crop allowed to be cultivated in India. However, farmers can only grow the BT (Bacillus thuringenisis) cotton that can naturally protect itself against natural pest – the pink bollworm. However, since the past few years, cotton growers have veered towards another hybrid, which allows the plant to develop resistance to the application of herbicide glyphosate or HT BT. Manual weed control, cotton farmers say, is both time consuming and difficult given the paucity of labourers in the rural area.

Study shows higher farm productivity from GM corn
(Manila Standard)
About 460,000 Filipino farming families have gained economically from adopting genetically modified (GM) corn, as the area planted with this crop has reached around 835,000 hectares in the country since its first regulatory approval in 2002. Based on a recent study entitled "Economic Assessment of GM Corn Use in the Philippines", the total factor productivity growth in the corn industry was estimated to be 11.45% higher due to GM corn adoption. The study, authored by Flor Alvarez, Abraham Manalo, and Ramon Clarete, was published in the International Journal of Food Science and Agriculture.

Kenya on track to commercialize GM maize by 2022 to increase yields, cut pesticide use
(GLP)
The maize, which is genetically modified (GM) to include a gene from the Bacillus thuringiensis (Bt) bacterium that provides insect protection, will help farmers improve yields and control pests without chemical insecticides. Bt has long been popular with organic farmers because it is considered a "natural insecticide" and is only toxic to specific insects. Charles Chiro, KALRO senior technical assistant in the food crops program, maize breeding and agronomy section in Mtwapa, says the stem borer is the main pest affecting maize production. The problem is countrywide, reducing yields significantly. KALRO researchers have traversed the coastal region counties of Kilifi and Kwale, working with farmers and evaluating maize varieties adapted to the coastal lowlands in search of varieties that could be improved through research. However, all varieties currently grown in the region are infected by the stem borer.

How Scientists Are Creating the Crops of the Future
(Discover Magazine)
In Kansas, a small team of scientists is working on what they hope will be the grain of the future. To the untrained eye, the long-stemmed, seed-topped wheatgrass looks quite similar to the normal wheat that sways in farm fields across the central U.S. But researchers at a nonprofit called The Land Institute, based in Salina, Kansas, have spent decades fine-tuning their flagship product with year after year of selective breeding. Today, they say that Kernza brings higher yields and can contain more seeds per stem than average wheat. And the crop is perennial, meaning it returns each year without the need for tilling and replanting. That helps keep carbon in the ground and cuts down on the need for chemical herbicides. And because their roots remain in the soil, perennial crops are a powerful defense against soil erosion.

Landmark field trials show potential of gene-editing in crops
(John Innes Centre)
Field trials investigating healthy compounds in agronomically important brassica crops have underlined the "immense potential" of gene editing technology, say researchers. The trials are the first field application of the technology in the UK since the reclassification of gene-edited crops as genetically modified organisms by the Court of Justice of the European Union (CJEU) in 2018. The results come as the UK Government is determining whether to allow gene-editing approaches for the purpose of food production, following a DEFRA-led public consultation.

How farmers and scientists are engineering your food
(BBC)

You might be surprised that flavour ever went out of fashion. But finding truly tasty fruit and vegetable varieties can be difficult, largely due to the requirements of supermarkets, he says. "They started demanding that varieties have a longer shelf life, so for example in the case of a tomato, it has a thicker skin, so the skins don't split more easily; a tomato that perhaps ripens faster, that can absorb more water. "So over time you breed your varieties for attributes other than flavour. The flavour attribute starts falling in importance, and as nature has it, if you breed for other traits you breed out flavour." Breeders and researchers are leading this search, using sophisticated techniques to produce fruit and vegetables that have all the flavour of traditional varieties - while still keeping the supermarkets happy.

GMO prohibition: Many farmers want GE crops so badly, they'll grow them illegally
(GLP)
Countries that ban biotech crops aren't necessarily GMO-free. There's a prohibition-inspired lesson for regulators and activist groups in these nations if they're willing to listen. If you remember your high-school US history class, you know that prohibition was an abject failure. Alcohol consumption declined sharply in the early 1920s only to spike over the next several years, accompanied by a massive black market and increasing gang violence. The takeaway from this lesson is pretty clear: laws are not magic spells; writing words on a piece of paper doesn't necessarily incentivize people to change their behaviour. The same phenomenon is at work in several countries that restrict farmer access to genetically engineered (GE) crops. Fortunately, no Al Capone copycats are killing rival gangsters over the right to sell biotech seeds today, but there is a black market for the technology, and many farmers openly take advantage of it.

Sustainable food: A common goal but how to get there?
(Open Access Government)
Mark the date 29th April 2021, which could well become a watershed moment for European food production. A European Commission study published that day acknowledged that gene editing techniques could contribute to sustainable food systems with plants more resistant to diseases, environmental and climate change effects. It went further, stating that while some commentators branded such techniques unethical, "missing opportunities as a result of not using them" is equally unethical. The study also states that gene editing will contribute to "the EU's objectives of innovation and sustainability of food systems, as well as a more competitive economy, [and] can have benefits for many sectors of our societies." However, the playing field has been mapped out in a way that recognises what is happening across the world. Many countries are looking to gene editing to improve plant breeding through editing a plant's own DNA without the insertion of external genes such as those used in genetic modification. As such, these countries are not seeking to regulate gene editing in the manner applied to genetically modified crops.

New Research

University of Adelaide could breed climate-smart barley plants
(Food Mag)
The University of Adelaide has partnered with an international research team to identify a new mechanism in barley plants, which could aid crop growers in achieving high yields at higher temperatures. The study published by Nature Plants explored increasing seed production through the reproductive systems in plants that respond to high temperatures. The research was led by University of Adelaide Waite Research Institute's Professor Dabing Zhang, and Shanghai Jiao Tong University's Joint Lab for Plant Science and Breeding. "By having a better understanding of the genes underpinning desirable plant traits in response to temperature, scientists can offer insights into breeding climate-smart plants to sustain productivity," University of Adelaide Waite Research Institute deputy director and study co-author, Associate Professor Matthew Tucker said.

Improved cotton transformation protocol mediated by Agrobacterium and biolistic combined-methods
(Doc Wire News)

The combined Agrobacterium- and biolistic-mediated methods of cotton transformation provide a straightforward and highly efficient protocol for obtaining transgenic cotton. Cotton (Gossypium spp.) is the most important crop for natural textile fiber production worldwide. Nonetheless, one of the main challenges in cotton production are the losses resulting from insect pests, pathogens, and abiotic stresses. One effective way to solve these issues is to use genetically modified (GM) varieties. Herein, we describe an improved protocol for straightforward and cost-effective genetic transformation of cotton embryo axes, merging biolistics and Agrobacterium.

AATF, partners unveil genetically modified insect resistant beans

(Enviro news Nigeria)

Nigeria has achieved what looks like a major milestone in the history of agricultural research and development with the official launch and release for commercialisation of the transgenic Pod Borer Resistant (PBR) Cowpea. PBR Cowpea (beans), a genetically-modified cowpea, is the product of an international partnership under the coordination of the African Agricultural Technology Foundation (AATF) that included scientists from the Institute for Agricultural Research (IAR) of Ahmadu Bello University, Zaria. Released as SAMPEA 20-T variety in Nigeria in December 2019, the PBR Cowpea is the first transgenic food crop in Africa outside of South Africa. SAMPEA 20-T is resistant to the insect pest, Maruca Vitrata, the insect that is responsible for up to 80 per cent Cowpea yield losses.

Bioheuris Partners with GDM to Develop Crop Management System in Soybeans Using Gene Editing

(Seed World)

Bioheuris and GDM announced a collaboration agreement to develop high-yielding varieties using gene editing technology. Through this collaboration, both companies will be engaged to precisely modify soybean genes to obtain elite varieties with a novel crop management system. “Two months ago, we filed a provisional patent in the U.S. to cover crop genes optimized with the use of our novel protein evolution technology Heurik. Bioheuris’ miniaturized high-throughput approach is able to mimic in a few weeks in the lab what it would take hundreds of acres and years of field trials to accomplish,” said Lucas Lieber, CEO and co-founder of Bioheuris. “Partnering with GDM to improve elite soybeans is an important step towards bringing farmers access to more integrated crop protection solutions on high yielding varieties.”

Research institutes launch innovative collaboration to combat crop disease

(John Innes Centre)

An ambitious collaboration between the John Innes Centre and the University of Hertfordshire will fast track urgently needed solutions to the growing problem of crop diseases. The innovative project, launched on Thursday 1 July, combines the expertise in Light Leaf Spot pathology at the University of Hertfordshire with oilseed rape genomic technology at the John Innes Centre. Announcing the BBSRC-funded project Dr Chris Ridout from the John Innes Centre said: “Our project develops a strategy to accelerate deployment of disease resistance and other traits into crops. We are focusing on oilseed rape (OSR, Brassica napus) which is the most important temperate oilseed crop in the world with a production of close to 70 million metric tonnes and is the third most important crop in the UK after wheat and barley.”.

New findings to boost barley yields at higher temperatures

(Science Daily)

An international team of researchers has identified a novel mechanism in barley plants, which could help crop growers achieve high yields as temperatures rise. With grain production highly sensitive to changing environmental conditions, rising temperatures are known to reduce the number of seeds that can be produced on each plant. One solution is to increase the number of flowers or branches on each 'spike', which is the reproductive structure from which grain is harvested. In a study published in Nature Plants, research led by Professor Dabing Zhang from the University of Adelaide's Waite Research Institute and Shanghai Jiao Tong University's Joint Lab for Plant Science and Breeding, explored the possibility of increasing seed production through the reproductive mechanisms in plants that respond to high temperatures.

East Africa’s banana ranchers invite new assortments that oppose sickness and dry spell

(People News Chronicle)

An international team of researchers has identified a novel mechanism in barley plants, which could help crop growers achieve high yields as temperatures rise. With grain production highly sensitive to changing environmental conditions, rising temperatures are known to reduce the number of seeds that can be produced on each plant. One solution is to increase the number of flowers or branches on each 'spike', which is the reproductive structure from which grain is harvested. In a study published in Nature Plants, research led by Professor Dabing Zhang from the University of Adelaide's Waite Research Institute and Shanghai Jiao Tong University's Joint Lab for Plant Science and Breeding, explored the possibility of increasing seed production through the reproductive mechanisms in plants that respond to high temperatures.

New approach can add diversity to crop species without breeding GMOs

(EurekAlert)

Breeding better crops through genetic engineering has been possible for decades, but the use of genetically modified plants has been limited by technical challenges and popular controversies. A new approach potentially solves both of those problems by modifying the energy-producing parts of plant cells and then removing the DNA editing tool so it cannot be inherited by future seeds. The technique was recently demonstrated through proof-of-concept experiments published in the journal Nature Plants by geneticists at the University of Tokyo. "Now we've got a way to modify chloroplast genes specifically and measure their potential to make a good plant," said Associate Professor Shin-ichi Arimura, who leads the group that performed the research.

Drought Tolerant Rice Comparatively Safe with Non-GM Counterpart

(ISAAA)

Researchers in Korea conducted a study to determine the environmental safety of a drought tolerant rice variety in terms of selected agricultural traits and gene flow. They concluded that genetically modified (GM) rice can be used as a means to address the food problem caused by climate change. The researchers focused on GM rice varieties HV8 and HV23 which carry the CaMsrB2 gene insertion. The gene functions as a defense regulator against oxidative stress in rice. They compared GM rice with its non-GM counterpart and observed that both were the same in terms of agricultural traits, germination rate, potential weediness, and nutritional composition. They also noted that no gene mobility occurred in the GM rice. The study was conducted as the researchers found it important that the safety of any GM plant must first be demonstrated prior to adoption.

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