



**Seed Connect**

**Edition 14**

A monthly newsletter of Federation of Seed Industry of India

January 2020

New technologies and innovations in agriculture has always been viewed under microscopic lens in India by regulators, policy makers and activists. Amid controversies of illegal planting, farmers call for access to technologies and a reasonable policy support surrounding the regulation of genome editing technology, Department of Biotechnology, India has released a draft document “Genome Edited Organisms: Regulatory Framework and Guidelines for Risk Assessment” on 9th January 2020.

The draft guideline is an unprecedented move to regulate genome editing technology under the existing biotechnology regulatory framework of (Rules 1989) under Environmental Protection Act (EPA), 1986. Few salient features of the draft regulatory guideline includes that genome edited products will be regulated under the existing (Rules 1989) EPA 1986 & other applicable laws, acts and procedures governing Genome Editing. A tiered approach for risk assessment of genome-edited organisms and products derived thereof.

Genome editing organisms (GEOrganism) will be grouped into three regulatory categories such as GEd Group I, GEd Group II and GEd Group III. GEd Group I for plants will be regulated at Indian Biomedical Skill Consortium (IBSC) level, GEd Group II will be regulated at Review Committee on Genetic Manipulation (RCGM) and The Genetic Engineering Appraisal Committee (GEAC) level and GEd Group III will be regulated at GEAC level. Further, institutional mechanisms for governance and oversight of genome editing products shall be divided between Self-Governance and Institutional Governance.

The Department of Biotechnology, Government of India is now welcoming comments and suggestion from researchers, institutions and other stakeholders by 8th February 2020. We look forward to your feedback to incorporate and share a comprehensive document with the Department of Biotechnology.

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



**Shivendra Bajaj**  
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## New Research

### [Plants speak 'roundworm' for self-defense, study shows](#)

(Cornell Chronicle)

Nematodes are tiny, ubiquitous roundworms that infect plant roots, causing more than \$100 billion in crop damage worldwide each year. New research has found that plants manipulate the worms' pheromones to repel infestations, providing insights into how farmers could fight these pests. Led by faculty member Frank Schroeder, the group studied a group of chemicals called ascarosides, which the worms produce and secrete to communicate with each other. As described in a paper published in Nature Communications, the researchers have shown that plants also "talk" to nematodes by metabolizing ascarosides and secreting the metabolites back into the soil.

### [US Department of Energy to provide \\$75 million for biofuel crop research](#)

(Biofuels)

The US Department of Energy (DOE) plans to provide up to \$75 million (€67.4 million) over a five-year period for research to develop sustainable bioenergy crops, which are resistant to environmental stress and changing environmental conditions. With this research, the US will lead the way in laying the agricultural foundation for the emerging bioeconomy. It is critical for crops grown for bioenergy and bioproducts to be able to survive and thrive under marginal growing conditions and maintain resiliency to environmental stresses and changes to avoid competing with food production.

### [Eden Research helping to transform crop science](#)

(Proactive)

Crop science's focus on protecting plants from seed to harvest is changing as it faces environmental and regulatory challenges. Key among them is the issue of polymer-based coatings used to preserve and protect seeds that are adding to the microplastics problem. Two years ago, the European Union initiated restrictions on the use of these tiny pollutants in cosmetics and most experts believe the agri-sector has no more than five years before it is subject to similar strictures.

### [Simulations incorporate evolutionary theory to evaluate different rotation patterns](#)

(Science Daily)

A new computational model shows how different patterns of crop rotation -- planting different crops at different times in the same field -- can impact long-term yield when the crops are threatened by plant pathogens. Maria Bargaés-Ribera and Chaitanya Gokhale of the Max Planck Institute for Evolutionary Biology in Germany present the model in PLOS Computational Biology. The continual evolution of plant pathogens poses a threat to agriculture worldwide. Previous research has shown that crop rotation can help improve pest control and soil quality. Other research shows that switching the environment in which a pathogen grows can limit its reproduction and change its evolution. However, these two concepts have been rarely studied together from an evolutionary point of view.

### [Multi-state potato research analyzes improving soil health](#)

(Farm Ranch)

It's called the kitchen sink treatment among the scientists involved in a four-year, 10-state research project analyzing how to replenish depleted soils in potato rotations. Essentially, the researchers throw "everything but the kitchen sink" into improving soil health in their plots — fertilizing with composted dairy manure and planting a crop as "green manure" between rotation crops. Green manure maintains living roots to limit erosion and to "leak" additional nutrients, before being plowed into the earth to further boost organic matter. The research project — heading into its second season in major potato production states including Idaho — is evaluating more than a dozen treatments in two- and three-year potato rotations. The goal is to determine which treatments are best at boosting soil health, what makes them work and whether or not they're cost effective.

## ["Insect damage can boost nutrition of crops"](#)

(Fresh Produce)

Bugs eating crop leaves can help produce more nutritious fruit and vegetables, according to new research. Scientists from Texas A&M AgriLife Research found the stress response shown by strawberry plants following insect damage initiated an increase in antioxidant compounds before harvest. The report by Science Daily said that the results could "transform" the fresh produce industry and support the argument that organic fruit and vegetables have greater nutritional content than their non-organic counterparts.

## News in India

### [FSII recommends making India global seed production hub & pushes for 200% deduction of R&D expenditure in the seed industry](#)

(The Economic Times)

The Federation of Seed Industry of India (FSII) has urged the Centre to restore the 200% income tax deduction (under the section 35 (2AB) of the Income Tax Act, 1961) for the in-house Research and Development (R&D) expenditure in seed industry in the upcoming budget. The income tax deduction for the in-house R&D has been reducing over the last few years, it said. Through an amendment as per Finance Act 2016, the weighted deduction was reduced to 150% effective from April 1, 2017 through March 31, 2020 and it indicated a further reduction to 100% from April 1, 2020.

### [How Vertical farming is the Solution for Modern-Age Agriculture](#)

(Krishi Jagran)

Vertical farming helps fight the issue of decreasing percentage of the arable lands, which is one of the biggest challenges faced by agriculture all around the world. The concept of vertical farming scales up the prevalent concept of indoor farming to another level and comes along with some added benefits for modern-age farmers. Vertical farming is the practice of growing crops in vertically stacked layers in a controlled environment, where a natural environment is modified to increase the crop yield. The environment modification generally covers four aspects of the farming, which are: (a) physical layout, (b) lighting, (c) growing medium, and (d) sustainability feature.

### [A year of hits and misses: Indian agriculture in 2019](#)

(Fortune India)

The growth rate and gross value added (GVA) by agriculture and allied sectors had improved from a negative 0.2% in 2015 to 6.3% in 2017, only to slow down to 2.9% in 2019 as per the Economic Survey 2019. While the crop sub-sector witnessed negative growth, fisheries and aquaculture, and livestock, grew steadily over the past few years. In terms of value, exports of agricultural commodities and processed food increased by 7% in 2019 to ₹1.28 lakh crore from ₹1.20 lakh crore in the 2017-18.

### [Only reasonable income jobs can help curb inequality in India: Narayana Murthy](#)

(Mint)

Infosys co-founder and chairman emeritus N.R. Narayana Murthy said that the country needs to focus on creating jobs that give a reasonable income to tackle the issue of inequality. He also emphasised on shifting more number of people from agriculture, where the per capita GDP income is low, to low-tech manufacturing and services, where the income levels are comparatively better. He further said that in India, nearly 58% or about 650 mn people depend on agriculture, which contributes only 14% to the GDP.

### [Agricultural goods can fetch India additional \\$97 bn in exports: FAO](#)

(Business Standard)

Select agri and agri-based commodities like meat, milk and fruits, among others, present export opportunity worth over USD 97 billion (about Rs 6.9 lakh crore) for India, as per data from the Food & Agriculture Organisation. India's export share in agri items such as bananas, oranges, chicken, meat, and milk products like cheese and butter milk is miniscule at present, the data showed.

### ['India's farm sector growth may reach 3.1% in current fiscal'](#)

(Business Standard)

India's farm sector growth for current fiscal is expected to remain higher at 3.1 per cent compared to 2.9 per cent in FY19, Niti Aayog member Ramesh Chand said at an ASSOCHAM event. He further said that role of private sector in Indian agriculture sector has to come in a big way, more competition in agriculture, more investment and the face of agriculture from traditional to modern and movement of agriculture from present stage to higher evolution will not happen without any active involvement of private sector.

### [Haryana approves 212 schemes of around Rs 201 crore to protect agriculture land](#)

(Zee News)

As many as 212 new schemes costing around Rs 201 crore were approved at the 51st meeting of Haryana State Drought Relief and Flood Control Board (HSDR&FCB) held under the chairmanship of Chief Minister Manohar Lal Khattar. According to an official statement, most of the schemes focus on the protection of agriculture land, procurement of flood machinery, repair or reconstruction of bridges or structures and more.

### [Budget 2020: To fix the slowing economy, begin with agriculture](#)

(Money Control)

First, over 50 percent of India's population depends on the rural economy. And that means agriculture. Irrespective of the contribution of the agricultural sector to India's GDP, the sheer scale of population requires any government to pay heed to the well-being of this sector and to make it sustainable – not through doles, but through policies that make this sector healthy.

### [More than 10,000 farmers, farm hands committed suicide in 2017](#)

(Down To Earth)

In 2017, 10,655 people involved in agriculture committed suicide in India, according to data released January 2, 2020 by the National Crime Record Bureau (NCRB). The official agency, however, highlighted that the toll was the lowest since 2013. Among those who took their lives, 5,955 were farmers / cultivators and 4,700 agricultural labourers — both lower than in 2016. They comprised 8.2 per cent of all suicide cases in the country in 2017.

### [Need to improve supply chain in agriculture: RBI Governor Shaktikanta Das](#)

(Business Standard)

Reserve Bank of India (RBI) Governor Shaktikanta Das said that there was a need to improve the supply chain in the agricultural market, and that increasing the average share of farmers in retail prices should be a priority area. The average share of farmers in major primary food items varies between 28 per cent and 78 per cent, the governor said that the higher share of retail prices going to farmers augurs well for the rural economy, which, in turn, could help sustain domestic demand.

### ['AI must invade agriculture to help India prosper'](#)

(Deccan Herald)

With India facing the prospect of feeding 1.6 billion people by 2050, experts have said that the country must turn to Artificial Intelligence (AI) to weed out inefficiencies in national agriculture. Speaking at the 107th Indian Science Congress at the University of Agricultural Sciences in Bengaluru, the experts said that the massive responsibility of the government to provide for its citizens requires a fundamental shift in how the government and society view agriculture.

### [Agriculture has key role in making India \\$5 trillion economy: PM Modi](#)

(The Economic Times)

Prime Minister Narendra Modi on Thursday said that agriculture has a key role to play in helping the country achieve its goal of becoming five trillion-dollar economy and the government was focusing on formulating a cash crop and export-centric farming system. Addressing a gathering at Krishi Karman Awards, Modi said that the effort of Central government has led to an increase in the production and export of spices in the country.

## News Around the World

### [Share your thoughts on the new agriculture bill](#)

(The Guardian)

After Brexit, the UK's food security is to be regularly assessed by parliament to ensure minimal disruption to supplies while new trade deals are being sought, outlined in a new agriculture bill, introduced to parliament. British agriculture is facing the biggest shakeup in 40 years, and the bill requires a regular report to MPs outlining supply sources and household expenditure on food, as well as consumer confidence in food safety.

### [Italy smashes mafia racket defrauding EU agriculture funds](#)

(Reuters)

Italian police arrested 94 people in pre-dawn raids as part of an investigation into an alleged Mafia scam that defrauded European Union agriculture funds of millions of euros. Prosecutors said they believed the fraud was orchestrated by two Mafia clans in eastern Sicily who obtained at least 5.5 million euros (\$6.1 million) in EU farm subsidies for land they did not own between 2010 and 2017. Amongst those arrested were the heads of the two families, a number of public officials who help farmers apply for EU aid, a local mayor and an accountant. Some 150 companies were also seized as part of the investigation.

### [Wheat Could Be Surprise Winner of the U.S.-China Trade Deal](#)

(Bloomberg)

In the agriculture world, news of the partial U.S.-China trade deal has sparked a lot of buzz about soybeans. It turns out, wheat could actually end up being a bigger surprise winner. Speculation is mounting that China will work to fill its wheat-buying quota as part of the detente, a pledge it failed to stick to in the past. While the allotment, set by the World Trade Organization, could be filled by supplies from any country, it still means additional global demand at a time the market is tighter.

### [From sustainable to regenerative: bold business moves to transform the agriculture system](#)

(Green Biz)

The 2020s herald a pivotal chance to deliver on our great climate, environment and development challenges, and the scale and pace of change will require truly transformative thinking. We will need to move beyond efficiency and doing less harm, and base strategies on new goals that ensure business success also meets the needs of people and the planet. It's time to step up a gear or three on our journey toward a sustainable future. But what does this mean for how we do business? At the heart of this shift is a move toward "regenerative" rather than just "less extractive" business strategies. With growing public commitments to "carbon zero" targets, businesses are refocusing on how to work in ways that put back more into society, the environment and the global economy than they take out.

### [Climate 'must be top agricultural priority'](#)

(The Ecologist)

Ministers must support farmers to become "net zero heroes" and make tackling the climate and nature crises a top agricultural priority, it has been urged. The call, timed to coincide with farming conferences taking place in Oxford this week, comes as polling suggests nine out of 10 people (92%) think it is important that farmers focus on climate change and wildlife losses. A survey of 2,140 UK adults by YouGov for the nature and animal welfare coalition Wildlife and Countryside Link suggests only a fifth (22%) think the UK farming sector has reduced its climate impact in the last five years.

### [Developing economies reliant on agriculture are more exposed to climate risks, McKinsey finds](#)

(CNBC)

Countries and regions with lower per capita GDP levels are generally more exposed to climate change, according to McKinsey Global Institute's newest climate risk report. Poorer regions often have climates that are closer to physical thresholds. They rely more on outdoor work and natural capital and have less financial means to adapt quickly.

## Upcoming Events

### January 2020

#### **Grain Tech fair**

**Date:** January 10, 2020

**Venue:** Pune, Maharashtra

#### **South West Agriculture Conference**

**Date:** January 07-08, 2020

**Venue:** Canada, North America

#### **Cropping Systems Conference**

**Date:** January 07-08, 2020

**Venue:** Kennewick, USA

#### **National Youth Summit on Agri Science**

**Date:** January 09-12, 2020

**Venue:** Chevy Chase, USA

#### **Hi-Tech Agri Fair (iKISAN)**

**Date:** January 10-13, 2020

**Venue:** Bhuj, India

#### **Annual Northeast Aquatic Plant Management Society Conference (Annual NEAPMS Conference)**

**Date:** January 14-16, 2020

**Venue:** North Elba, USA

#### **Wheat Industry Winter Conference (WIWC)**

**Date:** January 13-18, 2020

**Venue:** Washington DC, USA

#### **Global Forum for Food and Agriculture Berlin (GFFA)**

**Date:** January 16-18, 2020

**Venue:** Berlin, Germany

#### **9th Edition Krushi Mahotsav**

**Date:** January 23-27, 2020

**Venue:** Nashik, Maharashtra

#### **International Production & Processing Expo**

**Date:** January 23-30, 2020

**Venue:** Atlanta, USA

### February 2020

#### **Organic Vegetable Production Conference**

**Date:** January 31-February 01, 2020

**Venue:** Madison, USA

#### **International Conference on Agriculture, forestry, Biotechnology and Food Science (ICAFBFS)**

**Date:** February 01, 2020

**Venue:** Kuta, Indonesia

**International Conference on Renewable, Environment and Agriculture (ICREA)**

**Date:** February 01, 2020

**Venue:** Puri, India

**Agritech South**

**Date:** January 31-February 01, 2020

**Venue:** Hyderabad, India

**International Conference on Chemical, Agricultural, Biological and Environmental Sciences (ICCABES)**

**Date:** February 02-03, 2020

**Venue:** New Delhi, India

**Asta Vegetable & Flower Seed Conference**

**Date:** February 01-February 04, 2020

**Venue:** Monterey, USA

**International Crop Modelling Symposium (iCROPM)**

**Date:** February 03-February 05, 2020

**Venue:** Montpellier, France

**International Conference on Advances in Agricultural, Biological and Environmental Sciences (RAABE)**

**Date:** February 03-February 05, 2020

**Venue:** Ciampino, Italy

**International Crop Modelling Symposium (iCROPM)**

**Date:** February 03-February 05, 2020

**Venue:** Montpellier, France

**March 2020**

**World Agriculture Summit**

**Date:** March 02- 03, 2020

**Venue:** Valencia, Spain

**International Conference on Plant Tissue Culture & Plant Biotechnology**

**Date:** March 02- 03, 2020

**Venue:** Valencia, Spain

**International Conference on Food and Agricultural Engineering (ICFAE)**

**Date:** March 02-March 03, 2020

**Venue:** Abu Dhabi, UAE

**Conservation Tillage and Technology Conference (CTC)**

**Date:** March 03- 04, 2020

**Venue:** Ada, USA

**Seminar on Paddy Straw Management Issues in Intensive Agriculture**

**Date:** March 03- 04, 2020

**Venue:** Ludhiana, India

**Plant Genomics and Gene Editing Congress**

**Date:** March 04-05, 2020

**Venue:** Rotterdam, Netherlands

**BioAg Asia (BioAsia)**

**Date:** March 04- 06, 2020

**Venue:** New Delhi, India

**Think Wheat**

**Date:** March 04- 06, 2020

**Venue:** Assiniboia, Canada

**African Farming Agro Investment Summit (AIS)**

**Date:** March 12-13, 2020

**Venue:** Assiniboia, Canada

**Global Summit on Plant Genomics and Plant Biotechnology**

**Date:** March 19-20, 2020

**Venue:** London, UK

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