



Agri Innovation Post

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Trust for Advancement of Agricultural Sciences (TAAS) in collaboration with Indian Society of Seed Technology (ISST) organised a stakeholders' dialogue on 'Way forward for the Indian seed sector' at New Delhi on February 22, 2020. The event saw participation of dignitaries from Ministry of Agriculture, Government of India, scientific institutions, seed industry and farmers who discussed India's accomplishments in agriculture through research and innovation in the seed sector, major constraints faced by the seed sector and solutions for its faster growth.

Dr RS Paroda, Ex-Director General of Indian Council of Agricultural Research (ICAR) and Founder, Trust for Advancement of Agricultural Sciences (TAAS) while setting the context for the event emphasised the importance of seed in growth of the agricultural sector during the Green Revolution. The growth in the sector has been 10-15% in the past decade and has enabled the growth of 500 seed companies, of which 6-7 companies have now a turnover of 10,000 crores. On adoption of technology, Dr Paroda said that the farmer in the country wants hybrid seeds and it should be swiftly made available to them. On India's presence in the global market, he said that India could play a very prominent role in the global seed sector. Currently of the 67 billion Global seed market, India's share is 2.6 billion, though it has the potential to significantly contribute to the 100 billion Global seed market by 2025. He further said that we need to re-vamp the system and capitalise our scope for making an impact in the global market, especially South Asia and Africa, as these are the potential markets where there is a possibility of higher seed rate replacement and need for new plant varieties to tackle biotic and abiotic stresses.

While presenting the views from the government, Shri Ashwani Kumar, Joint Secretary (Seeds, Mechanisation & Technology), Government of India said that farmers need quality seeds at their doorsteps and the government will support public & private sector for delivering good quality seeds. He further informed the audience that the government is planning to include bio-fortified seeds in the public distribution system and that support will be required from both public & private sector in growing these varieties. On technology adoption, he said that the government is planning to introduce traceability mechanism to ensure transparency, curb spurious seeds and evaluate the performance of seeds. He also informed that government desires to introduce protocols for seed treatment and that discussion will be held with the industry for streamlining it. On seed storage, he expressed that an international standard of seed storage system needs to be established and together with private and public sector, guidelines can be established.

While discussing the constraints and growth in the seed sector, the Industry was of the view that there should be a conducive policy framework to encourage investments in research & infrastructure

development along with adequate protection and enforcement of Intellectual Property Rights (IPRs). Support should be provided by the government to introduce new technologies such as the emerging gene editing technology. The success of these technologies can only be witnessed when there is harmonization of various laws and removal of regulatory hindrances for the development of such new genetics and technologies. There should be a transformative plan for improving seed quality to International standards. Government should further take steps to release GM traits in Brinjal, Mustard & Cotton since they have passed the trials. Government control of cotton seed price needs to be discontinued as it is negatively impacting innovation. Further, the industry was of the view that for ease of doing business, there should be an uniform implementation of Seed Act across states, a national license for companies that operate in multiple states, uniform label requirements across States and over regulation of new technologies needs to be avoided. Product testing and approvals need to be based on agro eco-zones rather than being state-wise. Government needs to devise a better process of picking market samples and upgrade quality laboratories, processes and personnel.

Dr RB Singh, President, National Academy of Agricultural Sciences (NAAS) while concluding the event appreciated the active participation of all the stakeholders. He provided a draft summary of the sessions and analysed that all decisions of seeds should be based on humanising science. New technology can improve productivity for small holder farmers, and it can improve nutrition for the poorest of the poor. For benefitting the poor, Public-Private-Partnership (PPP) should be transformed to Public-Private-Peasant-Partnership (PPPP) to harmonise the whole system. Entrepreneurship in agriculture should be encouraged and collaboration in research should be open minded. Agro-ecologically differentiated crops, its production and distribution should be worked out. Seed quality of informal sector needs to be considered. Mechanisms for right data collection should be established for right analysis which will lead to better target and selection. A recommendation to set up an Autonomous Seed Legislation & Promotion Board was also suggested for quality control as well as facilitation.

In this newsletter, we have captured interesting developments and research work from around the world in the agri industry. We hope you find it a good read.



Shivendra Bajaj
Executive Director
Federation of Seed Industry of India-Alliance for Agri innovation

AgBiotech News

[After Golden Rice approval, Philippines poised to implement rules to accommodate GMO animals, CRISPR crops](#) **(USDA-GAIN)**

The Philippines continues to be a regional biotechnology leader. Golden Rice (GR2E) field tests were harvested in October 2019 and the Application to Propagate is expected soon. The regulatory agencies of the United States, Australia, New Zealand, and Canada have already issued safety and nutrition approvals for GR2E. Parallel to this are positive regulatory developments that may come to fruition by early 2020, including the completion of an ongoing review of the current biotechnology regulations embodied in the Joint Departmental Circular (JDC) of 2016. Likewise, expected to be in place around the same time are regulatory frameworks for genetically engineered (GE) animals and another for new innovative biotechnologies (e.g. gene editing).

[French court ruling that already-approved mutagenized crops should be heavily restricted](#) **(GLP)**

Unless there is an unexpected change in European and French policy on GMOs, the February 7 judgment by the Council of State mandates that French farmers can no longer legally grow crop varieties derived from a breeding technique known as mutagenesis that has been used since the 1930s. Consumers will now only have access to varieties using this technique if they are authorized for import and marketing.

[Sugar beet crop set for revival in Eastern Scotland](#)

(The Courier)

A revival of the sugar beet crop in the east of Scotland could be on the cards after a report identified an opportunity for up to 20,000ha to be grown on arable land in Angus, Fife, Perth and Kinross to produce bioethanol. Half a century on from the closure of Cupar's sugar beet factory, a feasibility study will now investigate the steps required to re-establish the crop and a processing plant to help meet Scotland's greenhouse gas reduction targets. The move follows a Scottish Enterprise-commissioned report which estimated up to 20,000ha of class 3.1 land or better would be required within a 30 to 60-mile radius of a refinery plant in eastern Scotland. A Rural Innovation Support Service (RISS) stakeholders' group will look into the feasibility of the potential project and interested farmers will have a chance to get involved.

[Agricultural economist explains the risks and benefits of GMOs and the future of crop biotechnology](#)

(Potato News Today)

Few academics eagerly engage the public on controversial scientific topics, content to quietly focus on their research. Agricultural economist and author Stuart Smyth aren't among them. Smyth has consistently worked to translate his detailed books and scholarly publications about crop biotechnology into digestible educational content geared toward a general audience. In recent years, Smyth has taken on popular myths about GMOs, called for sensible regulation of biotechnology and faced down the activist groups that have attempted to smear him for daring to teach consumers not to be afraid of their food. Smyth discusses his views on the risks and benefits of GMO crops, arguing that genetic engineering is a safe and thoroughly studied tool that has made our food supply more bountiful.

[Ugandan teachers trained in agricultural biotechnology](#)

(Alliance for Science)

In a bid to popularize technology in local schools, the Uganda Biosciences Information Center (UBIC) has begun training teachers and textbook authors in modern agricultural biotechnology. UBIC offered its first training to 27 teachers and 12 textbooks authors shortly after Ugandan education officials incorporated new information about science and technology into the national curriculum in secondary and tertiary schools. The one-week training course at the National Crops Resources Research Institute (NaCRRRI) in Namulonge covered the science of biotechnology. Participants visited confined field trials of genetically modified (GM) crops and Uganda's national biotech laboratories, where research is underway on both GM crops and livestock.

[Indian scientists from IBSD identify 2 new bacterial bio-agents for crop protection](#)

(Indus Dictum)

Scientists have discovered two actinomycetes bacterial strains to fight against a fungal plant pathogen called *Colletotrichum gloeosporioides*. The lead scientists behind this discovery are from the Department of Biotechnology's Imphal-based Institute of Bioresources and Sustainable Development (IBSD). The strains called *Streptomyces vinaceus* RCS260 and *Kitasatospora aburavienis* RCS252 were discovered when researchers were investigating the antimicrobial potential of actinomycetes isolated from rhizosphere soil (soil near roots of plants) from Lachung area of northern Sikkim. The pathogen poses a major threat to large cardamom plants, which are a major source of income for the farmers of Sikkim.

[GMO cotton, corn have increased farmer incomes in Colombia more than \\$300 million since 2003](#)

(GLP)

This study assesses the economic and environmental impacts that have arisen from the adoption and use of genetically modified (GM) cotton and maize in Colombia in the fifteen years since GM cotton

was first planted in Colombia in 2003. A total of 1.07 million hectares have been planted to cotton and maize containing GM traits since 2003, with farmers benefiting from an increase in income of US \$301.7 million. For every extra US \$1 spent on this seed relative to conventional seed, farmers have gained an additional US \$3.09 in extra income from growing GM cotton and an extra US \$5.25 in extra income from growing GM maize.

[GMO crop, animal production ban necessary to safeguard Russia's food security, says President Vladimir Putin](#)

(USDA-GAIN)

Russian President Vladimir Putin signed a new Food Security Doctrine for Russia to replace the Doctrine adopted in 2010. The revised Doctrine names prevention of genetically engineered seed imports for planting as one of the Russian national interests in the sphere of food security and expands the list of self-sufficiency indicators to include: vegetables, melons and gourds, fruit and berries, and seeds. The Government has been instructed to develop and approve a roadmap for implementing the provisions within three months. According to the Russian Ministry of Agriculture, the emergence of new risks and threats to food security associated with economic sanctions, Russia's accession to the WTO and enhanced integration processes within the Eurasian Economic Union prompted the revision of the Doctrine.

[More countries adopting biotech crops](#)

(Monitor)

Kenya hopes to create 680,000 direct jobs through biotech cotton farming, 210 jobs at ginning level, 6,000 jobs at integrated mills, and 25,000 jobs at garments manufacturing. Nigeria's adoption of biotech cowpeas is noteworthy because most African countries are unaware of the advantages of biotechnology in modern farming. Cowpeas are a staple crop in Nigeria and an important source of protein for over 200 million people. Nigeria is also the world's largest producer of cowpeas although it still has to import around 500,000 tonnes to meet internal demand since the potential loss in yield due to pests is more than 90 per cent. The new cowpea variety is expected to be adopted by a number of West African countries including Ghana, Burkina Faso, and Niger.

[CRISPR-edited immune cells can be safely given to cancer patients](#)

(News Medical Life Sciences)

The emergence of CRISPR-Cas9 gene-editing technology has spurred hope in both doctors and patients since it shows promise in treating a multitude of diseases, including cancer. For the first time in the United States, a team of scientists has shown that CRISPR-edited immune cells can be safely used to cancer patients.

[MO Weed: The Future of Bud](#)

(Greencamp)

The cannabis plant is a wonder of evolution, but in terms of maximizing the amount of medicinally useful molecules — like THC and CBD — that the plant produces, nature could use some juicing up. So, imagine the possibilities if the cannabis plant could somehow be re-engineered so that it could produce those THC-bearing trichomes from root to tip. It would mean more than 90% of the plant could be used commercially, rather than being sent straight to the compost heap. A trichome-saturated cannabis plant would also give producers much more buck, as it could produce more THC and/or CBD without more water, fertilizer or energy.

[Fact-checking anti-GMO activist Vandana Shiva's 'Poison-Free, Fossil-Free' food lecture](#)

(GLP)

The contention that organic production systems outcompete conventional systems is not supported by the weight-of-evidence in the peer-reviewed literature and is one of the reasons that less than 1% of US farmland is under organic production. But it was when discussing anything related to GMOs, Monsanto, patents and especially glyphosate (Round-up) that things (perhaps as might be expected) went totally off the rails. There was discussion about the need for farm-workers to be paid a living wage, but little discussion of what removing all pesticides and fertilizers might mean for those same farm-workers in terms of their job duties, or the economic sustainability of the farms that provide

their employment. In other words, there was NO discussion of what trade-offs might result from this re-envisioning of the entire agricultural production system in California.

[GMO cowpea: Ishiyaku's '10-year slow walk journey](#)

(Alliance for Science)

Ishiyaku, the principal investigator of the GM pod borer resistant (PBR) cowpea, ticked off the benefits: a drastic reduction in the use of pesticides, increased crop yields and improved livelihoods for farmers in Nigeria. Ishiyaku and other IAR scientists conducted a decade of intensive research and field trials to ensure the safety and effectiveness of the crop, which is also known as Bt cowpea in reference to the gene that confers resistance to the destructive pod borer pest. Their work finally met success last December when the government approved the commercial release of PBR cowpea — its first GM food crop. Pest-resistant Bt cotton was commercialized in mid-2018.

[Meiogenix, Bayer Team Up to Boost Genetic Diversity in Crop Breeding](#)

(Labiotech)

For many years, the only way to improve characteristics such as yield and nutritional value of crops was through selective breeding, which can be an extremely slow process. Meiogenix is one of a number of biotech companies that aim to speed up the process. Bayer and the French biotech company Meiogenix will work together to advance the development of Meiogenix's plant breeding and genome editing technologies with the hope of improving food crops for farmers.

New Research

[Epigenetics: A New Plant Breeding Technology](#)

(Seed World)

New plant breeding technologies (NBTs) are a group of techniques which encompass a wide variety of approaches, methodologies and unique characteristics to develop new varieties. They may either be used alone in the breeding process or they may be used in combination with other NBTs, conventional breeding approaches or with genetically modified (GM) technologies. NBTs usually allow for the development of new varieties in a faster and more precise manner than conventional breeding techniques.

[Local genetic adaption helps sorghum crop hide from witchweed](#)

(Penn State News)

Sorghum crops in areas where the agricultural parasite striga, also known as witchweed, are more likely to have genetic adaptations to help them resist the parasite, according to new research led by Penn State scientists. Changes to the LGS1 gene affect some of the crop's hormones, making it harder for parasites to find in the soil, at least in some regions. The changes, however, may come at a cost, affecting photosynthesis-related systems and perhaps growth.

[Cibus Achieves Milestones for Two New Gene-Edited Traits](#)

(Seed World)

Cibus announced significant milestones in developing two new critical traits for rice. In helping provide tolerance to two separate classes of herbicides, each trait has the promise to increase crop yields and quality for farmers and reduce harmful environmental impacts. Field trials for these traits are planned in 2020. These advances in rice validate Cibus' overarching mission: using precision gene editing to produce input traits that improve yield for one of the world's largest crops, all while advancing the global sustainability movement in food said Peter Beetham, PhD, chief executive officer of Cibus. With these traits advancing, rice is now a core platform for Cibus. We expect to add additional beneficial traits in the coming years, such as disease resistance, that will help farmers improve the efficiency of their land and feed our growing population.

[GMO corn that tolerates temperature drops could help farmers protect crop yields](#)

(Science Daily)

Many people aren't aware that corn is a tropical plant, which makes it extremely sensitive to cold weather. This trait is problematic in temperate climates where the growing season averages only 4 or 5 months — and where more than 60% of its 1.6 trillion-pound annual production occurs. A chilling-

tolerant strain could broaden the latitudes in which the crop could be grown, as well as enable current farmers to increase productivity. A group of researchers led by David Stern, president of the Boyce Thompson Institute, have taken a step closer to this goal by developing a new type of corn that recovers much more quickly after a cold snap.

[CRISPR-edited immune cells can be safely given to cancer patients](#)

(News Medical Life Sciences)

The emergence of CRISPR-Cas9 gene-editing technology has spurred hope in both doctors and patients since it shows promise in treating a multitude of diseases, including cancer. For the first time in the United States, a team of scientists has shown that CRISPR-edited immune cells can be safely used to cancer patients.

[How we'll reengineer crops for a changing climate](#)

(Chemical & Engineering News)

Efforts to improve the genetics of food crops are as old as agriculture. Crossbreeding plants to select for traits is nothing new, but synthetic biology techniques, including CRISPR-Cas9 and other gene-editing systems, have sped up the process and made new approaches possible. As climate change threatens the world's food-growing systems, plant scientists, industry, and governments hope to use these powerful methods to make plants hardier and land more productive. Here are some of their targets – Resisting disease, Supercharging photosynthesis, Shrinking stems, Expanding roots, Surviving soil extremes, Saving seeds.

[Astronaut Scholars have set high goals](#)

(University of Minnesota)

Selected by the Astronaut Scholarship Foundation (ASF), DeJong and Vollbrecht are two of 52 Astronaut Scholars for 2019-20. Vollbrecht, from Ames, Iowa, studies genetics, cell biology and development in the College of Biological Sciences. She has spent two and a half years working with Professor Dan Voytas, a nationally recognized innovator in the field of precision targeting of plant genome modifications. She currently works on a project to speed up the editing of potato genes. They said that with this project, we are ultimately hoping to streamline the process of generating gene edited plants by bypassing certain bottlenecks often inherent in this process. Working in the lab has important implications for basic plant biology, improving crop stress tolerance, and generally addressing issues of food security.

Upcoming Events

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

April 2020

Extension Risk Management Education National Conference (ERME National Conference)

Date: March 31- April 02, 2020

Venue: Denver, USA

New Zealand Agricultural Climate Change Conference

Date: March 31- April 02, 2020

Venue: Palmerston North, New Zealand

Residuals and Biosolids Conference

Date: March 31- April 03, 2020

Venue: Minneapolis, USA

Australasian Seed Science Conference (ASSC)

Date: April 05- April 09, 2020

Venue: Canberra, Australia

International Conference on Agricultural Science

Date: April 07- April 09, 2020

Venue: Shimla, India

International Conference on Agricultural and Biological Science (ICABS)

Date: April 13- April 14 , 2020

Venue: Brussels, Belgium

International Conference on Biotechnology and Agroforestry Technology (ICBAT)

Date: April 17- April 19, 2020

Venue: Guiyang, China

BioAg Asia (BioAsia)

Date: April 22- April 24, 2020

Venue: New Delhi, India
