



Seed Connect

The monthly newsletter of Federation of Seed Industry of India

Edition 6 May 2019

The unpredictable climate changes leading to harsh temperatures, low rainfall, floods or drought are adversely impacting farming communities globally. According to research published in Environmental Research Letters, climatic variations in the growing season of maize, rice, soy and spring wheat account for 20%-49% of yield fluctuations. This is critical in the view of the required 1.75 percent annual agricultural growth, to meet the demands of nearly 10 billion people by 2050. Asia has been selected as a hotspot for global production and thus climate change planning for both rice and maize. We expect rainfall to impact crop productivity the most, leading to drought or flooding, that is not the case. Temperature extremes have a far more devastating effect on crop yield. Though some of the temperature impact can be reversed with irrigation, the paucity of freshwater due to limited rain, compounds the impact of temperature.

In India the below normal rainfall days have been increasing over the past decade and excess rains have caused around 12.8% decrease in kharif yields. It is predicted that India may experience a rise in temperature in the range of 1-4 degrees, which will be detrimental for more than half of agricultural land under cultivation. The Economic survey of India has also warned of decrease in annual agricultural incomes in the range of 15-18 percent for irrigated and up to 20-25 percent for rainfed areas. The temperature changes are also impacting the life cycle, feeding patterns and infestation intensities of crops pests and diseases.

We are already seeing some negative effects with the drop in yields of cotton and maize this year. India has recorded lowest cotton yields in the last nine years. Similarly, kharif 2018 maize production too has been impacted due to low rainfall. This has led us to resort to import of cotton and maize to meet the domestic industry demands. This year too a below normal monsoon rainfall is expected, especially for Eastern India.

Since the severity of climate change is projected to rise with time, in the short-term farmers need to adapt to and manage these changes in the weather patterns and higher pest infestation but they require access to most predictive weather data, forecast and information on farm and pest management that will help them prioritize and plan for mitigating the challenges.

In the long term we need to select and breed for crop plants that are less susceptible and adapt better to climate change. This would require a prioritized approach to target critical factors utilizing the available germplasm, sequence information and technology in the most efficient manner.

Investment in improving infrastructure for better climate change prediction and analysis that will enable farmers to choose the right crop and hybrid will also be essential.

-Shivendra Bajaj
Executive Director

Federation of Seed Industry of India

Seed News in India

India's cotton imports could surge to record high as output plunges: CAI

[Economic Times]

India's 2018/19 cotton imports are likely to double from a year ago to a record 3.1 million bales as the drop in production to the lowest level in nine years forces textile manufactures to ramp up overseas purchases, a senior industry official said. Higher imports by the world's biggest cotton producer could support global prices which are trading near their lowest in two months. The drop in Indian supplies could help rivals such as the United States, Brazil and Australia increase cargoes to key Asian buyers such as China, Bangladesh and Pakistan.

Extreme climate can halve crop yields: Study

[Down to earth]

Climate extremes like droughts or heat waves significantly impact the yield of major staple crops around the world like wheat, rice and maize and soybean, says the study led by researchers from Australia, Germany, Switzerland and the United States. The study underlines the importance of mitigating impacts of climate extremes on the global food system and adapting agriculture to changes during extreme events to meet future food demands. Overall, year-to-year changes in climate factors during the growing season of maize, rice, soybean and spring wheat accounted for 20-49 per cent yield fluctuations, according to the study.

Maize shortage hits poultry feed, starch industries

[Economic Times]

With the price of maize at an all-time high, the poultry-feed and starch industries, which rely heavily on this grain, are facing tough times. Shortage of the raw material has led to high production costs and underutilisation of capacities with the starch industry fearing the shutting down of plants. The maize crop has been hit by drought and pests leading to the shortage. The feed industry has started using other raw material like wheat and rice as substitutes. However, the maize-based starch industry has no other alternative raw material to use.

Farmers Upset after Crops worth Lakhs Destroyed Due to Cyclone Fani in Puri & Khurda

[Krishi Jagran]

Farmers are the ones who are left high and dry in every natural disaster. And cyclone Fani is no exception. The deadly cyclone Fani made a landfall in Puri on May 4 and has badly affected the farming community and animal husbandry sector in the state. Cyclone Fani has broken the spine of growers. In addition, the animal husbandry sector in the districts of Khurda, Puri and other coastal areas has witnessed large-scale damage affecting the fish farming ponds & poultry sector.

Precision Agriculture more Affordable & Accessible to India: Rajan Aiyer, MD, Trimble, SAARC

[Krishi Jagran]

Mr. Rajan Aiyer is the Managing Director for Trimble, SAARC region. He is responsible for Trimble operations in India, Bangladesh, Bhutan, Nepal, Pakistan, and Sri Lanka and under his leadership Trimble has seen exponential growth with revenues in SAARC region quadrupling in the last five years.

Scientists fear widespread contamination of Bt Brinjal

[Hindustan Times]

Farmers in Haryana and experts fear widespread contamination of genetically modified (GM) brinjal or eggplant in the state with the farmer accused of cultivating Bt brinjal in Fatehabad district in the north-eastern part of the state, adjoining Punjab, admitting that he has been growing and selling the GM produce since 2017. GM brinjal isn't legal in India. To understand the extent of the damage, the

Haryana agriculture department is getting the state's brinjal crop tested to determine whether it is GM-free at the National Bureau of Plant Genetic Resources (NBPGR), which will share the test results with the Haryana government next week.

[New CEA Subramanian's first Eco Survey may suggest big regulatory changes to solve agrarian distress](#)

[Money Control]

This is one of the bigger ideas that the economic survey this year would concentrate on - how to use technology and reduce regulations to bring markets closer to the farmers

[Multi-state initiative in South India to help paddy farmers](#)

[Times of India]

A group of paddy farmers in Kerala has taken the initiative to form an association linking with compatriots in other southern states to provide marketing support and ensure fair price for their produce by eliminating middlemen. The multi-state paddy farmers association proposes to add 500 core paddy farmers and thousands of associate members.

[India hikes wheat import duty to support local farmers](#)

[Times of India]

India has raised its import duty on wheat to 40 percent from 30 percent, the government said late on Friday, as the world's No. 2 producer of the grain tries to support local farmers. Local wheat prices have fallen over 11 percent in 2019 due to ample supply from last year's crop and forecasts of record output. The hike in duty is likely to make imports of wheat unviable for flour mills even after recent declines in global prices, potentially dragging further on global grain markets.

[UK, India experts explore smart tech solution for Indian farmers](#)

[Times of India]

Experts from the UK and India have concluded that harnessing smartphone technology which could help Indian farmers not only make better business decisions but also tackle the sustainable cooling challenges being faced by the country. The University of Birmingham, working with the Shakti Sustainable Energy Foundation and MP Ensystems to uncover the cooling needs of farmers in the states of Haryana, Punjab, Maharashtra and Karnataka, launched a new report to highlight the potential of smart tech.

[Surge in Adoption of Hybrid and Biotech Crops Boost Indian Seed Market](#)

[Industry Research]

The increasing seed replacement rate in the country and the adoption of hybrid and biotech crops are the major drivers of the market," according to the latest India Seed Sector Analysis market report. Overall, the Indian seed market was valued at USD 2.21 billion in 2018 and is projected to have a compound annual growth rate of 6.4% in the next five years (from 2019 to 2024). Despite growing concerns over stiff government regulations, delays in the approval of genetically modified (GM) crops, steadily increasing population, and a decline in farm lands, the hybrid seed sector has seen a 15%-20% annual growth in the last decade. Indian farmers have been progressively adopting hybrid seeds particularly Bt cotton hybrids, single-cross corn hybrids, and hybrid vegetables due to their disease- and pest-resistant properties.

[Alignment on FAW Strategy Reached in Asia](#)

[CropLife International]

On 1-3 March, the United States Agency for International Development (USAID) and the Consultative Group for International Agricultural Research (CGIAR) hosted a regional workshop on Fall Armyworm (FAW) in Hyderabad, India. Discussion focused on Integrated Pest Management (IPM), counterfeits,

and registrations of both crop protection and plant biotech products to control it. There was positive, aligned consensus from participating regions that an IPM approach is necessary and more efficient and harmonized registration protocols are needed.

[Unseasonal rains damage chunk of paddy crop in Telangana](#)

[liveMint]

A sudden spell of heavy unseasonal rainfall and thunderstorms across Telangana during April 20-22 has resulted in serious damage to crops in different districts. Officials from the state agriculture department said paddy crop sown across 2,826 hectares has been damaged due to the rains, and an assessment is currently being undertaken to find out the extent of loss that farmers have suffered. Besides paddy, maize crop across 51 hectares and sesam sown across 140 hectares have also suffered damages.

[Delhi High Court sets aside centre's move to restrict Basmati rice cultivation](#)

[liveMint]

The Delhi High Court in its April 25 order has set aside the Centre's decision to restrain production of Basmati rice only to the Indo-Gangetic plains in Delhi, Haryana, Punjab, Uttarakhand, Himachal Pradesh, part of Uttar Pradesh and some parts of Jammu and Kashmir (J &K) on the pretence of maintaining the quality and purity of seeds. The State of Madhya Pradesh had claimed that the thirteen districts in the State of Madhya Pradesh should also be included in the GI for Basmati Rice. The Seeds Act is not concerned with where and how the seeds are used.

[Potato row: Gujarat working on solution that favours farmers](#)

[Hindu Businessline]

The Gujarat government is working for an out-of-court settlement of cases filed by PepsiCo against nine farmers for growing a variety of potato "registered" by the food and beverages giant, Deputy Chief Minister Nitin Patel said. Nine farmers from Sabarkantha and Aravalli districts have been sued by the multinational in two separate courts for allegedly growing a variety of potatoes for which the company has claimed plant variety protection (PVP) rights and sought damages of as much as ₹1 crore from each of them.

[Important Details of Robotic Agriculture, Different Technologies & Drones in Agriculture to Benefit Farmers](#)

[Krishi Jagaran]

In the fast-paced world with evolving basic humanitarian needs agriculture which is the most basic entity of industries, is also going through a lot of reforms with the rising of technologies. Now due to a shortage of labour and increasing need to feed the large population around the globe, Agriculture Robots have entered into the picture. Interestingly, they are becoming a common yet useful assistant of farmers in various different works. However, as the tech industry is still in the dawn of agri-robo revolution, many of its models are still in trial, research and development zone.

[Farm production: Are we growing enough pulses?](#)

[Financial Express]

Are we self-sufficient in pulses?" Peter Carberry, the director-general of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the Hyderabad-based institute, asked Narendra Pratap Singh, the director of Kanpur's Indian Institute of Pulses Research (IIPR), during his presentation earlier this month. Although there has been a step up in the production of pulses to an average of 24 million tonnes in the past three years, Singh estimates the demand at about 32 million tonnes, which is why we import 5.5-6.5 million tonnes annually.

[Pune farmers reap benefits of expert advice](#)

[Hindu BusinessLine]

Two years ago, in 2017, when CybageAsha, the Pune-based charitable trust and philanthropic arm of Cybage Software, began working in Maharashtra in partnership with the BAIF Institute for Sustainable Livelihoods and Development, though farmers were not ready to give up their agricultural practices. They didn't believe in integrated water and pest management or soil fertility for improving productivity. Today training provided by CybageAsha has increased yield and income.

[Present & future trends in Indian cotton breeding](#)

[CITI Times]

Cotton breeding is going to be a very important activity for the country in the short term. The science of cotton breeding will undergo qualitative change in terms of the tools and techniques that will be used. An integrated approach incorporating several research disciplines will be the key.

[Snakes and ladders game developed for Rayalaseema awareness](#)

[Trending Telugu News]

Snakes and Ladders, India's ancient board game is about 100 squares full of fortunes (Ladders) and traps (Snakes), a fascinating race that players of all age groups can take part in. The game is called in Telugu as "Vaikuntapali" / "Parama Pada Sofana Patam". The game is about symbolizing the ups and downs in life. Rayalaseema Saguneeti Sadhana Samithi (RSSS) has initiated programs to educate the people of Rayaleema for the last five years. The Snakes and Ladders game has made RSSS job of educating and enlightening the people much easier.

[Seed News Around the World](#)

[Soil health & conservation practices at center of sustainability](#)

[AGDaily]

Corteva Agriscience announced a two-year agreement to support the efforts of The Nature Conservancy (TNC) to help farmers grow food more sustainably, while protecting water quality. The initiative will accelerate environmental sustainability and increase productivity for farmers who operate in the Mississippi watershed. The initiative builds upon the strengths of each collaborator by tapping into the technology and agronomic expertise at Corteva Agriscience, along with the scientific conservation knowledge and expertise at TNC.

[Malaysia to spend RM1 bil on 4-year program for mixed farming](#)

[The Edge Markets-Malaysia]

A Program will be run from 2019-2022 to introduce mixed farming that can generate produce in shorter time span. Economic Affairs Ministry will utilize land banks owned by its agencies and Agriculture Ministry will provide technical advice and marketing services via its agencies, in a coordinated effort for the program goal.

[Bayer's contributions to a sustainable Vietnam](#)

[Vietnam Investment Review]

As the government looks to develop sustainable agriculture, German life sciences giant Bayer has launched many innovative solutions for Vietnamese farmers to secure harvests and increase productivity. The programme combines timely applications of seed treatments, herbicides, fungicides, and insecticides connected with farmer's practices as integrated crop management methodologies that helps them reduce inputs and improve rice yield and quality, and ultimately - profitability.

[USDA report reveals benefits of precision ag & rural broadband](#)

[AGDaily]

Agriculture Secretary Sonny Perdue unveiled a ground-breaking report on April 30th, *A Case for Rural Broadband: Insights on Rural Broadband Infrastructure and Next Generation Precision Agriculture Technologies*. The report finds that deployment of broadband e-Connectivity and Next Generation Precision Agriculture Technology in U.S. could result in at least \$47 billion in national economic benefits every year. The report explores the symbiotic relationship and potential economic benefit of broadband buildout and the complementary adoption of connected agriculture technologies.

New research

[Genetic diversity analyses of rice germplasm using morphological traits](#)

[Journal of PLANT BREEDING AND CROP SCIENCE]

The study of genetic diversity of any germplasm helps to facilitate its use and management. This experiment was carried out to determine the genetic diversity among 87 rice accessions from six countries. Seventeen quantitative traits were recorded based on internationally accepted standard evaluation system for rice from IRRI. This experiment has proven that morphological markers are effective in assessing genetic diversity in rice. The genetic diversity revealed by the morpho-agronomic traits in this study would be very important in selecting appropriate genotypes for rice improvement in Africa and elsewhere.

[Excessive Rainfall as Damaging to Corn Yield as Extreme Heat, Drought](#)

[Science daily]

Recent flooding in the Midwest has brought attention to the complex agricultural problems associated with too much rain. Data from the past three decades suggest that excessive rainfall can affect crop yield as much as excessive heat and drought. In a new study, an interdisciplinary team linked crop insurance, climate, soil and corn yield data from 1981 through 2016. The study found that during some years, excessive rainfall reduced U.S. corn yield by as much as 34% relative to the expected yield. Data suggest that drought and excessive heat caused a yield loss of up to 37% during some years.

[The genome of cultivated peanut provides insight into legume karyotypes, polyploid evolution and crop domestication](#)

[Nature Genetics]

The report presents a high-quality peanut genome sequence, comprising 2.54 Gb with 20 pseudomolecules and 83,709 protein-coding gene models. They have characterized gene functional groups implicated in seed size evolution, seed oil content, disease resistance and symbiotic nitrogen fixation. Resequencing of 52 accessions suggests that independent domestications formed peanut ecotypes. Whereas 0.42–0.47 million years ago (Ma) polyploidy constrained genetic variation, the peanut genome sequence aids mapping and candidate-gene discovery for traits such as seed size and colour, foliar disease resistance and others, also providing a cornerstone for functional genomics and peanut improvement.

[The genome sequence of segmental allotetraploid peanut *Arachis hypogaea*](#)

[Nature Genetics]

Like many other crops, the cultivated peanut (*Arachis hypogaea* L.) is of hybrid origin and has a polyploid genome that contains essentially complete sets of chromosomes from two ancestral species. The article reports the genome sequence of peanut and shows that after its polyploid origin, the genome has evolved through mobile-element activity, deletions and by the flow of genetic information between corresponding ancestral chromosomes (that is, homologous recombination). The report suggests that diversity generated by these genetic mechanisms helped to favour the domestication of the polyploid *A. hypogaea* over other diploid *Arachis* species cultivated by humans.

[Resequencing of 429 chickpea accessions from 45 countries provides insights into genome diversity, domestication and agronomic traits](#)

[Nature Genetics]

The authors performed whole-genome resequencing of 429 chickpea lines sampled from 45 countries. They identified 122 candidate regions (204 genes) under selection during chickpea breeding. The study establishes a foundation for large-scale characterization of germplasm and population genomics, and a resource for trait dissection, accelerating genetic gains in future chickpea breeding.

['Exotic' genes from obsolete cotton varieties could boost crop yields without sacrificing fiber quality](#)

[GLP-American Society of Agronomy]

Cotton breeders face a "Catch-22." Yield from cotton crops is inversely related to fibre quality. In general, as yield improves, fibre quality decreases, and vice-versa. "This is one of the most significant challenges for cotton breeders," says Peng Chee, a researcher at the University of Georgia. To overcome the yield vs quality challenge, Chee and colleagues turned to obsolete cultivars—or strains—of cotton with 'exotic' genetic material. They report findings that could help breeders improve cotton fibre quality while maintaining or even improving yield.

[Molecular Basis of Disease Resistance in Banana Progenitor *Musa balbisiana* against *Xanthomonas campestris* pv. *musacearum*](#)

[Nature- Scientific Reports]

Banana Xanthomonas wilt disease, caused by *Xanthomonas campestris* pv. *musacearum* (Xcm), is a major threat to banana production in east Africa. All cultivated varieties of banana are susceptible to Xcm and only the progenitor species *Musa balbisiana* was found to be resistant. The molecular basis of susceptibility and resistance of banana genotypes to Xcm is currently unknown. This study reports the first comparative transcriptome profile of the susceptible and resistant genotype of banana during early infection with Xcm and provide insights on the defence mechanism in *Musa balbisiana*, which can be used for genetic improvement of commonly cultivated banana varieties.

Upcoming Events

April 2019

Global Forum for Innovation in Agriculture

Date: April 1-2, 2019

Venue: Abu Dhabi National Exhibition Centre – ADNEC, Abu Dhabi, UAE

World Biotechnology Conference

Date: April 3 –5, 2019

Venue: Gothenburg, Sweden

International Conference on Agricultural and Biosystems Engineering

Date: April 2-3, 2019

Venue: New York, USA

ISER - 567th International Conference on Agricultural and Biological Science (ICABS)

Date: April 15-16, 2019

Venue: New Delhi, India

International Biotechnology and Research Conference

Date: April 15- 17 2019

Venue: Valencia, Spain

May 2019

International Conference on Plant Physiology and Biotechnology

Date: May 6-7, 2019

Venue: Prague, Czech Republic

Bioassays - Scientific Approaches & Regulatory Strategies

Date: 05-07 May 2019

Venue: Gaithersburg Marriott Washingtonian Center, Gaithersburg, USA

Swiss Biotech Day

Date: 7 May 2019

Venue: Basel, Switzerland

Genome Editing & Co-located Transgenic USA Congress

Date: May 14-15, 2019

Venue: Boston, USA

The APSA/WorldVeg Vegetable Breeding Consortium Annual Workshop

Date: May 15-16, 2019

Venue: Tainan, Taiwan

World Biotechnology Congress

Date: May 20-21, 2019

Venue: Shepton Mallet, UK

CRISPR & Genome Engineering Conference

Date: May 21-23, 2019

Venue: Boston, USA

June 2019

ISF World Seed Congress 2019

Date: June 3 –5, 2019

Venue: Nice, France

International Conference on Agricultural and Biosystems Engineering (ICABE)

Date: June 5 –6, 2019

Venue: Rome, Italy

Agro Expo Uzbekistan

Date: June 10 –13, 2019

Venue: Tashkent, Uzbekistan

Symposium Plant Breeding and Biotechnology

Date: June 11 –13, 2019

Venue: Wageningen, Netherlands

12th World Congress on Plant Biotechnology & Agricultural

Date: June 12 –13, 2019

Venue: Prague, Czech Republic

International Rapeseed Congress (IRC)

Date: June 16 –19, 2019

Venue: Berlin, Germany

International Symposium on Soil and Plant Analysis (ISSPA)

Date: June 17 –20, 2019

Venue: Wageningen, Netherlands

International Scientific Conference Plant Genetics, Genomics, Bioinformatics and Biotechnology

Date: June 24 –29, 2019

Venue: Novosibirsk, Russia

International Seed Testing Association Congress (ISTA Congress) 32nd edition

Date: June 26-July 3, 2019

Venue: Hyderabad, India

PHOTOSYNTHESIS CONFERENCE 2019

Date: June 30 – July 3, 2019

Venue: Brisbane, Australia

ISHS International Symposium on Cucurbits

Date: June 30- July 4, 2019

Venue: Ghent, Belgium

July 2019

Plant Genome Editing & Genome Engineering

Date: July 5-6, 2019

Venue: Vienna, Austria

International Conference on Biodiversity and Ecosystems (ICBE)

Date: July 6-7, 2019

Venue: New York, USA

Southeast Asia Vegetable Symposium 2019, Melaka

Date: July 9-11, 2019

Venue: Melaka, Malaysia

International Conference on Agricultural and Biological Science (ICABS)

Date: July 13-14, 2019

Venue: Brussels, Belgium

International Conference on Agriculture, Forestry, Biotechnology and Food Science (ICAFBFS)

Date: July 27, 2019

Venue: Jaipur, India

International Conference on Recent Trends in Engineering, IT, BioTechnology & Agriculture Sciences (RTEIT)

Date: July 27-28, 2019

Venue: Taipei, Taiwan