Seed Connect **Edition 11**

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A report by the Food and Agriculture Organisation (FAO) named 'State of Food and Agriculture' (SOFA) provided latest estimates of food loss and waste, lays out the costs and benefits of addressing problems from source to shelf. The report finds that harvesting is the most frequently identified critical loss point for all types of food. Inadequate storage facilities and poor handling practices are the other causes of on-farm storage losses. For fruits, roots and tubers, packaging and transportation also appear to be critical. With regard to food waste, the report emphasises the importance of reducing the wastage linked to limited shelf life and consumer behavior, such as demanding food products that meet aesthetic standards and limited incentives to avoid food waste. It notes that losses and waste are generally higher for fruits and vegetables than for cereals and pulses at all stages in the food supply chain, with the exception of on-farm losses and those during transportation in Eastern and South-Eastern Asia. On loss, the report finds that in lower-income countries, fresh fruit and vegetable loss is attributed to poor infrastructure more than in industrialized countries. For instance, many lower-income countries lose large amounts of food due to poor storage facilities, like warehouses without refrigeration. In the case of high-income countries, even though they possess adequate storage facilities, losses occur during storage largely because of a technical breakdown, poor management of temperature, humidity or overstocking. The report suggests that critical loss points can inform measures to reduce both loss and waste.

In another development, to fulfill India's committment to building its longstanding partnership with Africa, India will cover five more African countries in the second phase of the cotton technical assistance programme (TAP) for the region. In the five year long second phase, the programme will be scaled up in size and coverage. It will be introduced in five additional countries, namely Mali, Ghana, Togo, Zambia and Tanzania. India is engaging meaningfully in providing assistance to strengthen both the agriculture and textile part of the cotton value chain in Africa through training and capacity-building of farmers, scientists, government officials and industry representatives and through the creation of cotton-related infrastructure.

As reported in the news, researchers at the Indian Institute of Technology (IIT) Madras have engineered sunflower plant cells to enhance their production of Vitamin E by ten times. It is believed that this advancement may pave the way for effective and efficient commercial production of the vitamin with fewer unwanted side products.

In an interesting development, Pete the fern - a plant, has taken the world's first plant-powered selfie. This initiative is part of a research that could lead to major advances in data collection for conservation efforts. It is part of a trial looking at the use of microbial fuel cells at ZSL London Zoo. These cells allow Pete to create energy that powers a camera and takes his own photo. So how does this technology work? Plants naturally deposit biomatter as they grow, which in turn feeds the natural bacteria present in the soil, creating energy that can be harnessed by fuel cells and used to power a wide range of vital conservation tools remotely, including sensors, monitoring platforms and camera traps. This kind of technology can be used in remote and inhospitable locations that are hard to reach for humans, who usually need to change batteries.

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

Shivendra Bajaj
Executive Director
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New Research

BAU VC invents blast-resistant rice variety

(Asian Age)

Bangladesh Agricultural University (BAU) Vice-Chancellor Professor Dr Lutful Hassan of Genetics and Plant Breeding department has invented a high yielding advanced rice variety for Boro season. The name of new rice variety is BAU Dhan-3. The average yield of BAU Dhan-3 is 7-8 metric tons per hectare of land which is 1-2 tons higher than BRRI Dahn-28.

Search for the Brown Planthopper Resistance Gene in Vietnamese Native Rice Varieties

(**Crop Biotech Update**)

Based on the sequence data of 48 native rice varieties conducted by Agricultural Genetics Institute and partners, the researchers have screened and designed Bph26del24 marker to determine Bph26 candidate gene. The Bph26 gene is dominant, was cloned and mapped from indica variety, ADR52 which located on chromosomes 12. Bph26 gene encodes a CC-NB-LRR protein that mediates antibiosis to brown planthopper.The research team identified sixteen native rice varieties that have been carried homozygote candidate gene Bph26. The results provide a significant genetic sources and molecular marker for breeding programs by using marker assisted selection.

First genome of spotted lanternfly built from a single insect

(**EurekAlert**)

Agricultural Research Service (ARS) scientists, in cooperation with Pacific Biosciences and Penn State University, have published the first genome of the invasive Spotted Lanternfly (SLF) in the journal Gigascience and they did it from a single caught-in-the-wild specimen. Not only is it the first published genome for this pest, but no closely related species has had its genome sequenced, making the data even more important, according to entomologist Scott M. Geib with the ARS Daniel K Inouye U.S. Pacific Basin Agricultural Research Center.

New research traces family tree of green plants over a billion years of evolution

(**Folio**)

A co-ordinated international effort involving almost 200 plant scientists has revealed the history of how and when plants gained the ability to grow tall and make seeds, flowers and fruits, providing a framework for understanding plant diversity around the planet including annual crops and long-lived forest trees. The One Thousand Plant Transcriptomes Initiative (1KP) examined the diversification of

plant species, genes and genomes across the more than one-billion-year history of green plants dating back to the ancestors of flowering plants and green algae.

IIT Madras researchers develop method for enhanced Vitamin E production

(The Economic Times)

Researchers at the Indian Institute of Technology (IIT) Madras have engineered sunflower plant cells to enhance their production of Vitamin E by ten times, an advance that may pave the way for effective and efficient commercial production of the vitamin with fewer unwanted side products. The study, published in the Biochemical Engineering Journal, noted that in its most active form known as alpha-tocopherol, vitamin E helped prevent tissue damage from certain toxic chemicals produced in the body known as reactive oxygen species. However, according to the researchers, the form of alpha-tocopherol synthesised chemically in labs was less active than its natural form found in plants.

Plant takes 'selfies,' showing possibility of plant-powered devices

(CNN)

A plant has taken the world's first plant-powered selfie as part of research that could lead to major advances in data collection for conservation efforts. The plant -- known as Pete the fern -- is part of a trial looking at the use of microbial fuel cells at ZSL London Zoo. These cells allow Pete to create energy that powers a camera and takes his own photo. Researchers say their findings could enable major progress in conservation efforts.

Ants inhibit at least 14 different plant diseases

(Science Daily)

New research from Aarhus University shows that ants inhibit at least 14 different plant diseases. The small insects secrete antibiotics from glands in the body. On their legs and body, they also host colonies of bacteria that secrete antibiotics. It is probably these substances that inhibit a number of different diseases and researchers now hope to find biological pesticides that may conquer resistant plant diseases.

News in India

India to expand cotton assistance programme to 5 more African nations in 2nd phase

(The Economic Times)

India will cover five more African countries in the second phase of cotton technical assistance programme (TAP) for the region. India implemented a technical assistance programme (TAP) for cotton in six African countries, namely Benin, Burkina Faso, Chad, Malawi, Nigeria and Uganda, from 2012 to 2018. In the five year long second phase, the programme will be scaled up in size and coverage and will be introduced in five additional countries, namely Mali, Ghana, Togo, Zambia and Tanzania. The Cotton TAP programme will now cover 11 African countries including the C4 (Benin, Burkina Faso, Chad and Mali).

Threat to agri sector, data localisation, China's influence keep India wary of RCEP deal

(Business Today)

As the negotiations of Regional Comprehensive Economic Partnership (RCEP) near closure, lobby groups in India have upped their ante to push the government for a no-RCEP case. The ASEAN and their six Free Trade Agreement (FTA) partners in the Asia Pacific region are negotiating this major multilateral trade agreement. India is also non-committal on the provisions of data sovereignty and concessions on e-commerce. There is a strong lobby that wants the country's dairy and agriculture sectors to be kept out. In the past, India kept these sensitive sectors out of the other FTAs, but with RCEP, the players from Australia and New Zealand are eyeing the Indian market.

Govt to now launch Rs 100 crore scheme for cooperatives

(The Economic Times)

In line with schemes like Start-up India and Stand-up India aimed at young entrepreneurs, Agriculture Minister Narendra Singh Tomar launched the Yuva Sahakar-Cooperative Enterprise Support and Innovation Scheme 2019 with an annual outlay of Rs 100 crore. The scheme is aimed at

cooperatives in the north-eastern region, cooperatives registered and operating in aspirational districts as identified by NITI Aayog, and cooperatives with 100 per cent women/SC/ST/persons with disability members.

Punjab offers agriculture training for J&K farmers

(The Times of India)

Punjab government offered special training camps for farmers and officers of the border state of Jammu and Kashmir to facilitate technical exchange for agriculture. Interacting with a group of farmers of Akhnoor Tehsil, who toured Punjab as part of Indian Army's Operation Sadbhavna, senior advisor to CM, Lt Gen (Retd) T. S. Shergill, asked director agriculture, Punjab, to coordinate with his Jammu Kashmir counterpart and devise a mechanism for holding focussed programmes for farmers at Punjab Agriculture University (PAU).

'India has the potential to be the Food Factory of the world'

(The Hindu Business Line)

India is a big producer in many areas – mostly for the domestic market, has many climate zones, whereas Dutch vegetable seed companies are very successful in cultivation of varieties that prosper in a semi-arid climate that has become more and more common across India. One can witness Dutch-Indian collaboration across various forms of protected cultivation – net houses, poly houses, glass houses – leading to what we call hybrid innovation: combining the frugal innovation for which India is famous, with Dutch hi-tech.

India's August rice exports drop 29% on weak African demand: Govt

(The Economic Times)

India's rice exports in August fell 29% year-on-year to 644,249 tonnes, government data showed, due to weak demand from African countries for non-basmati rice, among other factors. Nitin Gupta, vice president of Olam said that India's rice business Demand from west African countries is weak for non-basmati rice. They have bought a lot from China and don't need to buy huge volumes now. India is the world's biggest rice exporter, but its shipments have plunged 27% in the first five months of the 2019/20 financial year, starting on April 1, to 3.8 million tonnes, the data showed.

Experts dwell on precision agriculture

(The Tribune)

Punjab Agricultural University (PAU), in collaboration with the Indian Society of Agricultural Engineers (ISAE), conducted the the 8th Asian-Australasian conference on precision agriculture at Dr Manmohan Singh Auditorium, PAU. The conference, which was held in India for the first time, was designed to be a collaborative effort with capacity-building on potential adoption of precision agriculture technologies in the Asian-Australasian region and around the world.

India faces the risk of a decline in growth of crop yields

(The Hindu Business Line)

Environmentally unsustainable farm practices and weather variations are to blame. An innovative system based on indigenous and traditional knowledge that enhances the natural resource base while increasing productivity is what Indian agriculture needs. Expanding food production have often come at a heavy cost to the natural environment. Important key resources like water, soil quality and land are moving in a very unfavourable direction. Constant use of chemical-based inputs like fertilisers, pesticides, herbicides and mechanised farming have led to overexploitation of natural resources, especially groundwater and soil to the extent that most of the farming enterprises have turned out to be environmentally unsustainable.

A road to economic revival runs through agriculture

(The Hindu)

The current growth slowdown is an ideal time to implement doable agricultural reforms. One of the world's fastest growing economies, India, is now facing sluggish growth, with the Reserve Bank of India sharply cutting GDP growth forecast to 6.1% for 2019-20, which is lowest in last six years; there has been a sharp decline in the performance of key sectors. Agricultural Developmental Council

(ADC) in line with the GST Council is a dire need to make agricultural reforms more expressive and representative. For better income distribution, there is also a need to revisit regional crop planning and the agro-climatic zone model at the highest possible level so as to make agriculture the engine of sustainable economic growth in India 2.0 by 2022.

India's 2019 soybean output could drop 18% on excessive rain: Trade body

(The Economic Times)

India's soybean output in 2019 is likely to fall nearly 18% from a year ago to 9 million tonnes as excessive rainfall hit the oilseed crop in the top three-producing states. Lower production could force the world's biggest edible oil importer to raise overseas buying of palm oil, sunflower oil and soy oil in the 2019/20 marketing year starting from Nov 1.

Assam tea workers get only 7 per cent of price, says report

(The Economic Times)

Tea brands and supermarkets capture over two thirds of the price paid by consumers for Assam tea in India with just seven per cent remaining for workers of estates. The new research, commissioned by Oxfam and undertaken by the Tata Institute of Social Sciences (TISS), called for urgent action from supermarkets, tea brands and state authorities to end the suffering of Assam's tea workers.

Climate Change will impact agriculture and rural mortality in India

(News Intervention)

Compared to developed countries, developing countries such as India are much more susceptible to this transforming climate as lives and livelihoods are majorly climate sensitive. India is already under the abnormal spells of dry extended summers, late monsoons and heavy rains that cause flooding, shorter winters and so on. India is totally unprepared and has no mechanism to adapt or even have the open mindedness to acknowledge this imminent danger. However sensational it may sound, there is a clear threat to our lives and livelihoods mainly in the rural areas and the most affected would be our agricultural sector, which could witness string of crop failures due to unpredictability of nature.

Skymet joins hands with Bengaluru-based firm Pixxel for earth imageries

(The Hindu Business Line)

Bengaluru-based earth imaging company Pixxel said that it joined hands with private weather forecaster Skymet to develop products that would help improve the productivity of small farms. The partnership with Pixxel will give Noida-based Skymet access to the former's high-resolution satellite imagery, designed to observe and map changes in agricultural phenomena like crop and soil health, soil moisture and chlorophyll content. This will help increase small farm productivity and yield in India while decreasing costs, minimising the environmental impact with precision agriculture practices, and better-managing agriculture production.

News Around the World

Stop the waste: UN food agencies call for action to reduce global hunger

(UN News)

The study contains fresh estimates of the scale of the problem, enabling a better understanding of the challenge, and suggesting possible solutions, by looking into why, and where, loss and waste take place. The FAO makes a distinction between food losses, which occur at the stage when food is harvested, up until the moment when it is sold; and food waste, which occurs during the sale and consumption of food.

Turkey ‘can expand its role to eradicate global hunger'

(Hurriyet Daily News)

Despite domestic criticism of agricultural policies, Turkey has a lot of experience to share in agriculture and forestry. Viorel Gutu, representative of the Food and Agriculture Organization (FAO) of the United Nations said that while hunger is not an issue in Turkey, the Turkish government can expand its role to eradicate hunger around the world.

Global crop protection (herbicides, insecticides & fungicides) market forecast report 2019-2023

(Business Wire)

The global crop protection market is estimated to reach US$65.04 billion in 2023, growing at a CAGR of 2.97% for the period spanning from 2019 to 2023. The factors such as increasing population, urbanization, rising global economy, decreasing arable land and growing agriculture production are expected to drive the market. However, growth of the industry will be challenged by increasing adoption of genetically modified crops, stringent norms and availability of non-genuine products. A few notable trends include rising demand for animal feed, increasing demand for bio-herbicides, the launch of new active ingredients and changing dietary preferences.

EU agriculture chief nominee warns of loss of more farms

(The Times of India)

The candidate to become the European Union's agriculture commissioner said a key goal is promoting the survival of small and family farms. Polish candidate Janusz Wojciechowski said he would put farming at the center of his policies during a five-year term that starts in November and make family farms a prime driver of progress.

The State of Food and Agriculture 2019 Report Explores Food Waste and Loss Points

(SDG Knowledge Hub)

The State of Food and Agriculture (SOFA) 2019 report identifies critical loss points across the supply chain, explained as points where food losses have the highest magnitude, the greatest impact on food security, and the largest economic dimensions. The publication highlights that reducing food loss and waste generally entails costs, and it recommends that farmers, suppliers and consumers take measures only if the costs outweigh the benefits.

China offering extra U.S. agriculture purchases: FT

(Reuters)

Chinese officials are offering to increase annual purchases of U.S. agricultural products as the two countries seek to resolve their trade dispute, the Financial Times newspaper reported citing unnamed sources. The report said China will offer to boost annual purchases of U.S. soybeans to 30 million tonnes from 20 million tonnes currently, adding the increase will be equivalent to about $3.25 billion in additional orders.

Ant Financial and Bayer to Jointly Develop Blockchain for Agriculture

(Coin Desk)

Bayer Crop Science has agreed to work with Ant Financial, the payments affiliate of Alibaba, to develop a blockchain-based system for agricultural product monitoring. The companies signed a letter of intent to utilize blockchain technology to increase efficiency, improve the income of farmers, ensure the production of high-quality food and aid in the digitization of agriculture.

Regenerative Agriculture Could Help Stop Climate Change -- Can Tech Help Us Get There?

(Forbes)

The practice of regenerative agriculture is an approach to farming that treats farms as part of whole ecosystems. Modern conventional farms often segment crops into separate monocultures, which can strip the soil of nutrients. One 2008 study showed that monoculture corn produces significantly higher nitrous oxide and carbon dioxide emissions than when corn follows soybeans on the same land. In contrast, regenerative agriculture is typically intended to take carbon out of the air and put it into the soil while replenishing and nourishing the land. The result can be more productive farms and healthier, more nutritious crops — and it might even fight climate change.

Agriculture Funds Aim to Harvest Profit, Along With Corn and Wheat

(The New York Times)

Two realities undergird the investment case for agriculture: The world’s population keeps swelling and everyone must eat. A third reality — climate change — will make satisfying those billions of appetites harder and companies that can help farmers potentially more valuable. Agriculture isn’t a standard investment sector in the way that, say, financial stocks are, and definitions of it vary,

including things ranging from the obvious, like the American equipment-maker Deere & Company, to the offbeat, like Leroy Seafood, the Norwegian fish farmer.

China agriculture expands steadily in first three quarters
(Xinhua)
China's agricultural sector expanded steadily during the first three quarters of the year, with a stable increase in farmers' incomes. The added value of the country's primary industry hit 4.3 trillion yuan (about 614.3 billion U.S. dollars) during the period, up 2.9 percent year on year. Disposable incomes of farmers jumped 6.4 percent year on year to 11,622 yuan. China's grain output is expected to reach over 650 billion kg for a fifth straight year in 2019, sustaining 16 consecutive years of bumper harvest.

Upcoming Events

November 2019

Training Course on Horticultural Production and Marketing
Date: October 28-November 01, 2019
Venue: Datastat Research, Nairobi, Kenya

AgriBusiness Forum
Date: October 31-November 02, 2019
Venue: Elpida Resort & Spa, Serres, Greece

Sustainable Agriculture Conference
Date: November 01-03, 2019
Venue: Durham, USA

International Conference on Sustainable Agriculture Technologies
Date: November 01-03, 2019
Venue: Kaohsiung, Taiwan

International Conference on Agricultural and Biological Science
Date: November 02-03, 2019
Venue: Radisson Blu, Abu Dhabi Yas Island, Abu Dhabi, UAE

World Congress on Medical and Aromatic Plants
Date: November 02-03, 2019
Venue: Yerevan, Armenia

National Field Crops Conference
Date: November 01-04, 2019
Venue: Hotel Kervansaray Lara, Antalya, Turkey

National Field Crops Conference
Date: November 01-04, 2019
Venue: Hotel Kervansaray Lara, Antalya, Turkey

International Conference on Food, Agriculture, Horticulture and Aquaculture
Date: November 04-05, 2019
Venue: Bangkok, Thailand
Plant Genomics & Gene Editing Congress
Date: November 04-05, 2019
Venue: The StateView Hotel, Autograph Collection, Raleigh, USA

International Society for Biological and Environmental Repositories Regional Meeting
Date: November 04-05, 2019
Venue: Renaissance Minneapolis Hotel, The Depot, Minneapolis, USA

Ontario Pest Management Conference
Date: November 05, 2019
Venue: Victoria Park East Golf Club, Puslinch, Canada

Agri-Food Innovation Council Conference
Date: November 04-06, 2019
Venue: Delta Hotels by Marriott Bessborough, Saskatoon, Canada

Synergy International Conference
Date: November 04-06, 2019
Venue: Szent Istvan University, Godollo, Budapest, Gödöllő, Hungary

Global Agriculture Summit
Date: November 06, 2019
Venue: NASC Complex, New Delhi, India

Pulse Science and Technology Forum
Date: November 05-07, 2019
Venue: Courtyard by Marriott Toronto Downtown, Toronto, Canada

Circular Agri Food Summit
Date: November 07, 2019
Venue: Wageningen Campus, Wageningen, Netherlands

Congress on Soil, Plant and Water Sciences
Date: November 11-12, 2019
Venue: Madrid, Spain

Asian Seed Congress
Date: November 25-29, 2019
Venue: Kuala Lumpur, Malaysia

December 2019

International Conference on Food, Nutrition Security and Sustainable Agriculture
Date: December 01-03, 2019
Venue: Grand Nile Tower Hotel, Cairo, Egypt

African Farming Agro Investment Summit
Date: December 02-03, 2019
Venue: The Tower Hotel, London, UK

AgriBusiness Global Trade Summit Southeast Asia
Date: December 03-04, 2019
Venue: Jakarta, Indonesia

Women in Food & Agriculture summit
Date: December 03-04, 2019
Venue: NH Collection Grand Hotel Krasnapolsky, Amsterdam, Netherlands

ANZ Smart Farms and AgTech Forum

Date: December 03-05, 2019
Venue: The Langham Melbourne, Melbourne, Australia

ISCA International Science Congress
Date: December 08-09, 2019
Venue: Bhilai Institute of Technology Durg, Durg, India

International Conference on Plant & Soil Science
Date: December 09, 2019
Venue: Park Taipei Hotel, Taipei, Taiwan

International Conference on Agricultural, Biological and Environmental Sciences
Date: December 09-10, 2019
Venue: Mercure Pattaya Ocean Resort, Pattaya, Thailand

EU Agricultural Outlook Conference
Date: December 10-11, 2019
Venue: Brussels, Belgium

International Conference on Green Urbanism
Date: December 11-13, 2019
Venue: Università degli Studi Roma Tre - Architettura, Rome, Italy

International Conference on Agricultural and Biological science
Date: December 19-20, 2019
Venue: Palm Garden Hotel, Putrajaya, Malaysia