



Seed Connect

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COVID-19 has been declared a global pandemic by the World Health Organization (WHO) and we support the efforts taken by the Government of India to avert further spread and its impact. In India, next three months are critical for the farmers and for the food security of the country, as the farmers are preparing for the Kharif season. The seed industry is working tirelessly to ensure that there is adequate production, processing, packing, transportation and timely supply of seeds to meet farmer's needs.

It is important to ensure that the food delivery channels, and agricultural input supply can run without disruption. Since seed is the starting point for the food supply therefore, the season for the production cannot be delayed. Farmers need to secure their living and consumers need to be fed. Therefore, it is important that the Central and State Governments ensures uninterrupted and timely global and domestic movements of farm inputs like seeds, agricultural produce and food. These products should be allowed access to quarantine checkpoints so that there is continuous production of staple and essential food items. There should be opening of 'green lanes' or special food lanes at national and state toll booths, check-posts and on highways where food and agricultural input delivery vehicles can pass unhindered and are not subjected to roadblocks which might have been put up to restrict movement of people and other materials to fight the virus. Further, all services like laboratory testing and phytosanitary certificates should remain open with a minimal workforce. These recommendations were also shared by FSII with the respective authorities in the government.

At the height of the COVID-19 crisis in China, the central and local governments issued a policy to ensure the stable supply of food products and agricultural production materials. The government also released a stimulus package to effectively support the stability of production and supply of agricultural products.

As per the European Food Safety Authority, there is no evidence to date that the Coronavirus can pass through food and seeds. Our member companies are committed to adhering and implementing national and local health directives to prevent the spread of COVID-19 and are adopting the highest health precautions and hygiene measures for the health & safety of their office and factory employees. Our members are working tirelessly to ensure that farmers are well equipped, the supply is steady and that there is no surge in prices of crops and vegetables in coming months due to non-availability of seeds

Next few weeks are crucial for us while our public health system fights to minimise the impact of COVID 19. On an optimistic note, this situation presents an opportunity for agritech to create value in the supply chain management, heighten initiatives such as traceability to promote safety and transparency and adopting science-based solutions. On a concluding note, efforts at this point should be taken towards precautions and mitigating any exponential effect.

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
Executive Director
Federation of Seed Industry of India

News in India

[Covid-19 lockdown: Seed industry demands easy inter-State movement](#)

(The Hindu Business Line)

FSII — which represents both domestic and multinational seed firms — sought government support to ensure timely and uninterrupted global and domestic movement of seeds and other farm inputs. There should be an opening of 'green lanes'/special food lanes at national and State toll booths, check-posts and on highways where food and agricultural input delivery vehicles can pass unhindered and are not subjected to roadblocks which might have been put up to restrict movement of people and other materials to fight the virus. The special food lanes will allow smooth passage of all vehicles carrying essential food commodities and agri-inputs.

[Tech that could be useful in Indian agriculture: Supercomputer helps track locust attacks in East Africa](#)

(The Asian Age)

A supercomputer is boosting efforts in East Africa to control a locust outbreak that raises what the U.N. food agency calls "an unprecedented threat" to the region's food security. Such technology could be of enormous use in India too where farmers struggle with pest control. The computer, a donation from Britain, uses satellite data to track locust swarms and predict their next destination. Quickly sharing the information of the locusts' movements with regional authorities is key to controlling the outbreak, as even a small swarm of locusts in a single day can move nearly 100 miles and consume the number of crops that would otherwise feed 35,000 people.

[Agriculture: Punjab's concerns need to be addressed](#)

(The Tribune)

Since almost the entire net sown area in Punjab is irrigated, the average yield of principal crops, especially paddy and wheat, remains high as well as stable. As a result, there is less risk and few claims for any yield loss of these crops. Agro-ecology-specific guidelines are not in favour of the state as higher indemnity level is required in irrigated regions. The new scheme provides an indemnity level of 90 per cent. The analysis of time-series yield data for the past 28 years shows that the average loss of major crops (wheat and paddy) remained below 10 per cent in Punjab.

[The 'insect plague' that's eating crops in India & why monsoon may not bring good news](#)

(The Print)

Several countries across multiple agro-climatic zones ranging from Africa, the Middle East to Asia are reeling under unprecedented locust attacks. A warning — 'Desert Locust Watch' — put out by the UN's Food and Agriculture Organisation (FAO) on 2 March has described the situation as extremely alarming, especially in Kenya, Ethiopia and Somalia. While India has also suffered from the locust

attacks, the country has for now brought the situation under control but only after substantial damage to crops in Rajasthan and Gujarat.

[Punjab on the path of Agricultural transformation](#)

(The Tribune)

Fulfilling its one of the major promises with the state farmers immediately after taking the reins in March 2017, Captain Amarinder Singh Government gave a debt relief worth Rs. 4624 crore to 5.64 lac small and marginal farmers indebted to cooperative and commercial banks. Besides, nearly one lac such more farmers would be extended debt relief shortly. Taking its pro-farmer stance way forward, Captain Amarinder Singh has also announced his Government's commitment to provide debt relief worth Rs. 520 crore to 2.85 lac farm labourers and landless farmers of the coop. societies.

[Himachal signs pacts with WB to boost agriculture](#)

(Outlook India)

The central government, the Himachal Pradesh government and the World Bank signed an \$80 million loan agreement to improve water management practices and increase agricultural productivity in selected gram panchayats in the hill state. The Integrated Project for Source Sustainability and Climate Resilient Rain-Fed Agriculture in Himachal Pradesh will be implemented in 428 gram panchayats in 10 districts, benefiting over 400,000 small-holder farmers, including women, and pastoral communities.

[Govt doesn't have data on financial condition of farmers: Narendra Singh Tomar](#)

(Mint)

The government does not have data regarding financial condition of farmers in the country, Agriculture Minister Narendra Singh Tomar said. In a written reply to a question in the Lok Sabha, he said that the last survey was conducted by the National Sample Survey Office (NSSO) in 2013 and, therefore, no data is available with the ministry indicating the financial condition of the farmers. He further added that as per the last survey conducted by NSSO in India in 2013, rural India had about 90.2 million agricultural households, which constituted about 57.8 per cent of the total estimated rural households of the country during the same period.

[COVID-19 outbreak could help agri exports: Agriculture Ministry analysis](#)

(The Hindu)

In the wake of the COVID-19 outbreak, the Centre has identified 21 agricultural products, including honey, potatoes, grapes, soya beans and groundnuts, in which Indian exports could benefit from trade restrictions against Chinese goods. The total value of China's global exports of these products amounted to \$5488.6 million in 2018. India exported \$4,445.9 million worth of these commodities in the same period and could now have a chance to grab part of China's market share.

[Is the worst really over for the country's agricultural sector?](#)

(Mint)

Estimates of gross domestic product (GDP) released on 28 February confirmed that India's economy is decelerating. While the pain was visible in most of the sectors—with manufacturing showing a contraction for the second consecutive quarter—the silver lining was growth in agriculture, which accelerated for the third quarter in a row to 3.5%. For the full year as well, the advance estimates suggest a growth rate of 3.7% for agriculture, as against 0.9% for manufacturing, and 3% for construction.

[Making agriculture more rewarding for farmers](#)

(The Hindu Business Line)

The Indian agriculture sector certainly deserves much more attention and allocation of resources. The allocation of ₹15 lakh crore is a great step, but does it ultimately reach the farmer? We tend to forget that more than half this allocation gets utilised in meeting the assistance required during natural calamities, including droughts and floods.

News Around the World

['Climatic events': How farm groups skirt global warming](#)

(E&E News)

Major farm groups have hit on a new way to tiptoe around climate change affected by human activity: Call it "climatic events." That's the catchphrase in a new initiative by the American Farm Bureau Federation and 20 other farm groups meant to address the ongoing debate about agriculture's contribution to — and role in mitigating — a warming climate. The shifting vocabulary illustrates the difficulty some farm organizations and lobbying outfits continue to have acknowledging the scientific consensus that farming plays a part in climate change.

['There Won't Be Anyone to Harvest the Crops.' Coronavirus Travel Bans Squeeze Migrant Labor](#)

(Time)

Across the globe, governments are imposing travel limits in a bid to stem the spread of coronavirus. The unintended consequence is a squeeze on migrant labor that's a cornerstone of food production. American produce growers preparing to harvest crops are warning of a devastating impact on fruit and vegetables after the U.S. Embassy in Mexico announced a halt to visa interviews for seasonal farm workers. Slaughterhouses also may face labor shortages. In Australia, growers say the country may face shortages of some fruits and vegetables because of travel curbs, with the nation traditionally using overseas workers for one third of seasonal farming jobs. Kiwifruit pickers are in short supply in New Zealand. And in Canada, travel limits threaten meat processors that rely on temporary foreign workers to fill chronic labor shortages.

[Brazil and Argentina grow half of world's soybeans](#)

(Successful Farming)

Aided by record plantings, Brazil's soybean crop was estimated at a record 126 million tonnes, up 1% from the February forecast and 9% larger than last year. More than 40% of the crop was harvested by late February and yields were 6% above normal, said USDA's World Agricultural Production report. "Soybean area continues to increase," said USDA. Brazil is the longtime leader in soybean exports and will be the top grower in 2019/20 as well.

[U.S. senator's trade advice to EU: Keep calm and put agriculture on the table](#)

(Firstpost)

Brussels should seek a mandate from its member states to negotiate with Washington over agriculture, calling it the "locomotive that brings along manufacturing and services." The United States sells some agricultural products to Europe, ranging from wine and processed foods to soybeans, but has long sought greater access to the European market. European officials have raised the possibility of negotiating a "mini deal" on trade with the United States as a way of establishing some good will toward more comprehensive negotiations.

[Polish farmers push to keep Ukrainians in agriculture after border closure](#)

(Euractiv)

After Poland closed its borders to slow down coronavirus spread, agriculture unionists are demanding that the government allow Ukrainians to remain in the country and help to keep agri-food production going. The agricultural organisation appealed to the Prime Minister to enable employees from Ukraine in Poland to stay, in order to avoid the paralysis of agri-food production.

[The coronavirus will delay agricultural export surges promised in trade deal with China](#)

(The Conversation)

Concerns about potential global economic decline has made implementation of the U.S.-China phase one trade deal uncertain. This deal requires China to purchase an additional US\$12.5 billion worth of U.S. agricultural products in 2020, and \$19.5 billion more in 2021. In our recent research on the impacts of the U.S.-China trade war on U.S. agriculture, we argue that China has the capability to make these purchases, despite delays and disruptions to supply chains and trade flows caused by the coronavirus. A resilient and recovering Chinese economy means the country can comply with the trade deal and potentially minimize damage to the U.S. economy from an ongoing trade war.

[Time to choose a sustainable future for food and farming in Europe](#)

(New Europe)

Can the European Agriculture Policy finally reorient to boost nature and health or is it destined to drive factory farms, chemical-laden monocultures, and global deforestation? While the safety and quality of food in Europe has improved over the past decades, the negative impacts on the climate, biodiversity and health from our agriculture system have been acknowledged only recently, despite NGOs and scientists raising concerns for more than two decades. The European Commission is now committing Europe to 'become the global standard for sustainability' and promises that the EU Farm to Fork Strategy will strengthen farmers' efforts to tackle climate change, protect the environment and preserve biodiversity.

[What will be the new face of European agriculture in the coming years?](#)

(New Europe)

At least 22 million EU farmers and workers in agriculture are directly exposed to climate extremes, while 44 million food-related jobs may also feel their impacts. Producing one-eighth of global cereals output, two thirds of the world's wine and three-quarters of its olive oil, Europe is facing a climate change adaptation challenge across all of its farming systems.

[With Australia's borders closed, farmers worry about how to harvest their crops](#)

(7 News)

Australian farmers are worrying about who will harvest crops amid a ban on foreigners entering the country. The agricultural sector is working to forecast how many people it will need to pick crops and take on other jobs once the foreign workers it relies on are blocked by a border closure. Agriculture, forestry and fisheries employees make up 2.5 per cent of Australia's workforce. But seasonal workers from Pacific nations are also needed for fruit and vegetable picking. The countries they call home had already announced they'd be stopping their citizens from leaving amid the coronavirus pandemic, before Australia said it would be closing its borders to foreigners.

[World food security at risk as exporters curb sales, importers buy more](#)

(Wkzo)

Compounding the anxiety stemming from erratic consumer buying has been concern that some governments may move to restrict the flow of food staples to ensure their own populations have enough while supply chains get disrupted by the pandemic. Vietnam, the third largest rice exporter, and Kazakhstan, the number nine wheat exporter, have already made moves to restrict sales of those staples amid concerns over domestic availability. India, the top global rice exporter, has just entered a three-week lockdown that has brought several logistics channels to a halt. Elsewhere, Russia's vegetable oil union has called for a restriction in sunflower seed exports, and palm oil output has slowed in the number two producer Malaysia. On the importer side, Iraq announced it needs 1 million tonnes of wheat and 250,000 tonnes of rice after a "crisis committee" advised building up strategic food stocks. Together, these moves have raised concerns among agriculture traders about unnecessary food supply distortions.

[How the Philippines is empowering farmers with tech](#)

(Tech Wire Asia)

A web-based information support system called the "Agri-Information Support Portal" will be developed to link farmers and fishers to aiding bodies that can address their issues efficiently as they move forward. The online portal is a nation-wide initiative that will weave together regions of the Department of Agriculture, attached agencies and bureaus to keep all parties in a loop about agricultural advances and efforts. The system will be an instrumental component in encouraging farmers and fishers to be more digitally aligned, technologically capable and generally smarter when it comes to how they carry out their processes. More importantly, it was reported that the system will provide improved sourcing of agriculture data and information to keep players consistently up to date at all times.

New Research

[Efficient Generation of CRISPR/Cas9-Mediated Homozygous/Biallelic *Medicago truncatula* Mutants Using a Hairy Root System](#)

(Frontiers)

Researchers reported an efficient method for obtaining biallelic or homozygous mutation lines using the fast-growing hairy root system. Because the plants regenerated from *M. truncatula* hairy roots are fertile, the mutated plants obtained by this strategy could allow assessment of gene function at the whole plant level. This strategy could be applied to other plants whose hairy roots can be regenerated into a normal plant, thus providing a different path for studying gene functions in non-model plants without a mature tissue culture regeneration system.

[Prime genome editing in rice and wheat](#)

(Nature)

Prime editors, which are CRISPR–Cas9 nickase (H840A)–reverse transcriptase fusions programmed with prime editing guide RNAs (pegRNAs), can edit bases in mammalian cells without donor DNA or double-strand breaks. We adapted prime editors for use in plants through codon, promoter, and editing-condition optimization. The resulting suite of plant prime editors enable point mutations, insertions and deletions in rice and wheat protoplasts. Regenerated prime-edited rice plants were obtained at frequencies of up to 21.8%.

[Comparative analysis of chitin synthaseA dsRNA mediated RNA interference for management of crop pests of different families of lepidoptera](#)

(Frontiers)

Lepidopteran crop pests including *Spodoptera litura* (Fabricius) (Noctuidae), *Chilo partellus* (Swinhoe) (Crambidae), *Plutella xylostella* (Linnaeus) (Plutellidae) and *Maruca vitrata* (Fabricius) (Pyralidae) are the devastating pests of a variety of crops. To tap the potential of RNAi against insect pests, a gene coding for the key enzyme in chitin biosynthesis in arthropods, the chitin synthaseA (CHSA), has been targeted through an exogenous delivery of dsRNA and plant-mediated RNAi. The introduction of dsCHSA caused “Half ecdysis” and “Black body” type lethal phenotypes and a significant reduction in larval body weight.

[Blast resistance gene Pi54 over-expressed in rice to understand its cellular and sub-cellular localization and response to different pathogens](#)

(Nature)

The transgenic lines developed in this study could show a moderate level of resistance to *Xanthomonas oryzae* and *Rhizoctonia solani*, the causal agents of the rice bacterial blight and sheath blight diseases, respectively. This study is a first detailed report, which emphasizes the cellular and subcellular distribution of the broad spectrum blast resistance gene Pi54 in rice and the impact of its constitutive expression towards resistance against other fungal and bacterial pathogens of rice. In total, out of 502 calli, 127 plantlets were regenerated after three selection cycle and grown under standard rice growing conditions. Finally, 28 plants belonging to eight independent transformation events could survive up to maturity and these plantlets were further subjected to molecular analysis (Fig. 1). The average efficiency of transformation in this study was found to be 1.59%

[Gene editing of three BnITPK genes in tetraploid oilseed rape leads to significant reduction of phytic acid in seeds](#)

(Wiley)

Commercialization of *Brassica napus* L (oilseed rape) meal as protein diet is gaining more attention due to its well-balanced amino acid and protein contents. Phytic acid (PA) is a major source of phosphorous in plants but is considered as anti-nutritive for mono-gastric animals including humans due to its adverse effects on essential mineral absorption. The undigested PA causes eutrophication, which potentially threatens aquatic life. PA accounts to 2-5% in mature seeds of oilseed rape and is synthesized by complex pathways involving multiple enzymes. Breeding polyploids for recessive traits is challenging as gene functions are encoded by several paralogs. Gene redundancy often requires to knockout several gene copies to study their underlying effects. Therefore, the

researchers adopted CRISPR-Cas mutagenesis to knock out three functional paralogs of BnITPK. They obtained low PA mutants with an increase of free phosphorous in the canola grade spring cultivar Haydn. These mutants could mark an important milestone in rapeseed breeding with an increase in protein value and no adverse effects on oil contents.

[Scientists of ARI, Pune develop biofortified, high protein wheat variety](#)

(PIB)

Scientists from Agharkar Research Institute (ARI), Pune, an autonomous institute under the Department of Science & Technology, Government of India, have developed a biofortified durum wheat variety MACS 4028, which shows high protein content. The wheat variety developed by the ARI scientists group on Wheat improvement, shown high protein content of about 14.7%, better nutritional quality having zinc 40.3 ppm, and iron content of 40.3ppm and 46.1ppm respectively, good milling quality and overall acceptability.

[Root-specific expression of chickpea cytokinin oxidase/dehydrogenase 6 leads to enhanced root growth, drought tolerance and yield without compromising nodulation](#)

(Wiley)

Root-specific expression of CaCKX6 led to a significant increase in lateral root number and root biomass in Arabidopsis and chickpea without any penalty to vegetative and reproductive growth of shoot. Transgenic chickpea lines showed increased CKX activity in root. Soil-grown advanced chickpea transgenic lines exhibited higher root-to-shoot biomass ratio and enhanced long-term drought tolerance. These chickpea lines were not compromised in root nodulation and nitrogen fixation. The seed yield in some lines was up to 25% higher with no penalty in protein content. Transgenic chickpea seeds possessed higher levels of zinc, iron, potassium and copper. The results demonstrated the potential of cytokinin level manipulation in increasing lateral root number and root biomass for agronomic trait improvement in an edible legume crop with indeterminate growth habit.

[Elevating seed oil content in a polyploid crop by induced mutations in SEED FATTY ACID REDUCER genes](#)

(Wiley)

The researchers performed a candidate gene association study using a world-wide collection of rapeseed germplasm. We identified Seed Fatty Acid Reducer (SFAR) genes, which had a significant effect on SOC and fatty acid (FA) composition. SFAR genes belong to the GDSL lipases, and GDSL lipases have a broad range of functions in plants. After quantification of gene expression using RNA-seq and quantitative PCR, they used targeted (CRISPR-Cas mediated) and random (chemical) mutagenesis to modify turnover rates of seed oil in winter rapeseed. For the first time, it demonstrated significant increase of SOC in a crop after knocking out members of the BnSFAR4 and BnSFAR5 gene families without pleiotropic effects on seed germination, vigor, and oil mobilization. The results offer new perspectives for improving oil yield by targeted mutagenesis.
