



Seed Connect

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A monthly newsletter of Federation of Seed Industry of India

July 2021

Philippine Rice Research Institute (PhilRice) announced that a biosafety permit for propagating the Golden Rice was issued on July 21, 2021 for Philippines. This means that Golden Rice can now be planted for commercial production as per the terms and conditions specified by the Department of Agriculture's Bureau of Plant Industry.

This biosafety approval of Golden Rice is the first authorization for commercial propagation of a genetically engineered rice in South and Southeast Asia. Prior to marketing, Golden Rice will need varietal registration by the National Seed Industry Council, which approves the registration of all new varieties based on consistent good agronomic field performance.

Around one in five children from the poorest communities in the Philippines suffer from vitamin A deficiency (VAD), a condition affecting an estimated 190 million children worldwide. The condition is the most common cause of childhood blindness and a contributing factor to a weakened immune system. Golden Rice is engineered to provide up to 50 percent of the estimated average requirement (EAR) for vitamin A of young children, the age group most susceptible to VAD in the Philippines.

Golden rice is as affordable as any other conventional varieties of rice and with its commercial propagation there will be affordability, availability and accessibility of nutritious rice for the underprivileged.

Golden Rice is part of the Healthier Rice Project carried out by DA-PhilRice in partnership with the International Rice Research Institute (IRRI).

In this newsletter we have also covered news around 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 and Alliance for Agri Innovation

News from India and Around the World

Farming gets innovative push with tech support

(The Tribune)

Agri-tech startups have scope in areas such as development of farm-specific, data-driven diagnostics to ascertain soil and crop health and collection of real-time data on pests and diseases in field crops through image recognition technology. Agri equipment renting is a high potential area to reduce the input costs since modern farm equipment is not affordable for the average farmer. Public-private partnership in the agriculture value chain is gaining ground for startups.

3 Important Indigenous Cultivation Methods in India

(Krishi Jagran)

India is an agricultural country. The interesting thing about this country is that as you travel in various directions, you see a change in culture, food habits, attire, language, and agriculture system. Although there are various ways of doing farming, here I wish to throw light on three systems of farming that are indigenous to our country and still followed – shifting cultivation, Taungya Cultivation and Zabo Cultivation.

India breaks into the top 10 list of agri produce exporters

(Mint)

India broke into the top 10 list of agricultural produce exporters in 2019 with a sizeable share in the export of rice, cotton, soya beans and meat, according to a World Trade Organization (WTO) report on the trends in world agricultural trade in the past 25 years. In 2019, Mexico and India, with 3.4% and 3.1% share in global agri exports, respectively, replaced Malaysia (7th) and New Zealand (9th) as the largest exporters, while the US, which topped the list in 1995 (22.2%), was overtaken by the European Union in 2019 (16.1%). The US's share fell to 13.8% in 2019. Brazil maintained its ranking as the third largest exporter, increasing its share from 4.8% in 1995 to 7.8% in 2019. China climbed from the sixth spot in 1995 (4%) to fourth in 2019 (5.4%).

India Needs Widespread Adoption of Artificial Intelligence to Improve Crop Productivity

(KrishiJagran)

In order to fulfil the rising food demand, great emphasis is being given to efficient farming through automation in the field and need based resource management in farm operations to improve the crop productivity. Though the scientific advances help us in understanding the crop, soil, weather and in what conditions it can grow better, some aspects of agriculture can become more efficient by

monitoring and predictive analysis for understanding the accurate status of crops, input requirements and possible yield output.

[India's new geospatial norms pave way for agri boost](#)

(Mongabay)

The government, on February 15, 2021 opened access to its geospatial data and mapping services for all Indian entities. Until now, individuals and companies willing to use mapping data had to seek approval under the Geospatial Information Regulation Act, 2016. The Department of Science and Technology has rendered obsolete all policies that regulated information on data in restricted zones. It also released a draft National Geospatial Policy, 2021 in May that further discusses the methods to create, access, and use geospatial data under the new guidelines. Following this move, Prime Minister Narendra Modi said, "India's farmers will be benefited by leveraging the potential of geospatial and remote sensing data. Democratising data will enable the rise of new technologies & platforms that will drive efficiencies in agriculture and allied sectors." Location information is critical to agriculture. While the global positioning system (GPS) locates precise crop location, the global information system (GIS) stores this data. This data later helps in crop scouting, soil sampling, weed location, accurate planting and harvesting.

[Mahratta Chamber, NABARD launches India's first Agriculture Export Facilitation Centre](#)

(Agri Times)

Mahratta Chamber of Commerce Industries and Agriculture (MCCIA) in association with the National Bank for Agriculture and Rural Development (NABARD) formally inaugurated India's first Agriculture Export Facilitation Centre (AFEC) on the occasion of Maharashtra Krushi Din. The new facilitation centre aims to enhance the agricultural and food exports of Maharashtra by disseminating need-based information, providing timely guidance and organising training courses for all stakeholders. The centre will work as a one-stop-centre for the exporters in the agricultural sector as well as boost agricultural exports from the region, as per global standards. It will cater to the needs of farmers, Farmer Producing Organisations (FPOs), MSMEs in agri-food processing, existing exporters, and new entrants by handholding them through the various stages involved in exporting products. It will support capacity building by providing expert guidance on a range of topics like Orchard Management, Minimum Residue Level (MRL), Branding and Marketing, Packhouse and Special Export Treatments, Country-wise Protocols and Quality Parameters, Special Certifications required by specific countries, Government Export Schemes etc.

[Tractorisation in India high, but agriculture mechanisation low](#)

(CNBC TV18)

The tractor industry in India registered an increase in sales by more than 40 percent in 2020 as compared to 2019. And to all of our surprises, this was recorded when we were hit by a global pandemic and all the other segments were performing poorly. In fact, 2020-21 has been dynamic for this sector as the tractor industry witnessed the highest ever sale of about 9 lakh units. Now while these numbers are a good sign of tractor penetration in India, only 'tractorisation' is not agriculture mechanisation. In fact, mechanisation in agriculture is very low in our country.

[What will shape the future of India's agriculture industry?](#)

(Tech Wire Asia)

According to the Food and Agriculture Organization of the United Nations (FAO), agriculture also happens to be the largest source of livelihood for Indians — 70% of rural households still depend on agriculture for their livelihoods. Despite this, the industry's contribution to its GDP has declined from 1951 to 2011. A whopping 82% of farmers are still small and marginal in impact. Although the nation has achieved grain self-sufficiency, production remains resource-intensive, cereal-centric, and regionally biased. Food security is still an issue for the majority of people, and the poverty rate is still high at 30%. Furthermore, women more than men are negatively impacted as women are not only contributing labor on the field but are expected to handle domestic responsibilities as well.

[SaaS for agriculture: How FarmERP's digital farming solutions manage 600,000 acres of farmland in 25 countries](#)

(YourStory)

Over the last 10 years, FarmERP's smart agricultural systems have been deployed at over 600,000 acres of farmland in 25 countries, including India, the US, and markets in Europe, Latin America, Africa, Southeast Asia, and the Middle East. It has served 1.3 million farmers directly or indirectly and helped them achieve higher efficiency, yields, profitability, and traceability. The size of their landholding ranges from 10 acres and 300 acres.

[First consignment of vegetables from Uttarakhand exported to UAE](#)

(Mint)

In a major boost to agricultural exports from Uttarakhand, the first consignment of vegetables, sourced from farmers of Haridwar, was exported to Dubai, UAE. The export of vegetables, including curry leaf, okra, pear, and bitter gourd, comes after a consignment of millets was exported to Denmark in May, 2021 from Uttarakhand. Agricultural and Processed Food Products Export Development Authority (APEDA), in collaboration with Uttarakhand Agriculture Produce Marketing Board (UKAPMB) & Just Organik, an exporter, sourced and processed ragi (finger millet), and jhingora (barnyard millet) from farmers in Uttarakhand.

[Indian Students Create Soil-Less Farming Technique That Uses 95% Less Water](#)

(IndiaTimes)

Two students from the TERI School of Advanced Studies have developed a community level solar-powered hydroponic fodder unit that can grow rich, nutritious green fodder with very little water and soil-less farming technique, capable of increasing crop yields by sixfold compared to traditional approaches. For this, they were also awarded a bronze medal in the Grand Final of the Efficiency for Access Design Challenge.

[India to push for climate resilient farm practices as part of economic revival, support agricultural marketing in Northeast](#)

(The Times of India)

The Centre will revive the Northeastern Regional Agricultural Marketing Corporation (NERAMAC) to help farmers in eight Northeastern states get remunerative prices of agriculture-horticulture produce, promote climate-resilient and sustainable farming across India, and provide Rs 14,775 crore for additional fertiliser subsidy as part of the stimulus package this financial year.

[The Indian Young Farmers Forum, a collective where successful farmers mentor those new to farming](#)

(The Hindu)

Saravanan points to a growing trend in the last 10 years, where many young people are making a mid-career drift to invest in agricultural land and start farming. Kailash Nandan, 27, worked in Bengaluru for a few years before returning to his ancestral land at Narasipuram. "I wanted to try out non-conventional farming atour Nandan Agri Farms. We have coconut, arecanut, turmeric, groundnut, and sesame on a commercial scale. The forum is a neutral place to collaborate and learn from each other. We have verified members who supply customised agriculture equipment. Then, there are others like the team of Kultivate, an agri-tech startup by people who have returned from the US after working there for over a decade."

[Govt scraps basic customs duty on masur dal to bring down retail prices](#)

(CNBC TV18)

The government reduced the basic customs duty on imports of masur dal to zero and halved the agriculture infrastructure development cess on the lentil to 10 percent, with an aim to augment domestic supplies as well as provide "relief to consumers" from high prices. With the reduction in basic customs duty and the cess, the effective import duty on masur dal will come down to 10 percent from 30 percent.

[Will our food break the climate or save it?](#)

(The Hill)

Given the global food system's immense contribution to climate change — and its potential to become an important solution to the challenge — governments are beginning to focus on actions that can reduce emissions while building resilience against climate shocks. The European Union, for example, has been working on reforming its agricultural policy with new, more robust environmental and climate provisions. World Food Prize Winner Rattan Lal, of Ohio State University, and others have highlighted the staggering potential of farmland to store carbon by restoring landscapes that were degraded.

[5G impasse in global and Dutch agriculture. TNO calls for cooperation](#)

(Innovation Origins)

Vonder outlines an example of one of the applications of 5G in agriculture: “Suppose your tractor suddenly breaks down somewhere abroad and you are far from the farm. Then a mechanic has to come. Perhaps that mechanic only has to press a button or tighten a nut. It would be great if they could instruct you through a digital connection instead of doing it themselves. The mechanic would then not have to travel all the way to the site.” There are also many possible applications in the Netherlands, particularly because coverage is much less of a problem here. According to TNO, there is also a clear need for advanced data communication on land and in stables. Some examples of current projects are drones for crop inspection, a sensor network for water quality measurement, a hoeing robot, virtual fencing for cows, cows with 5G collars and the Pieperkieker. This last innovation concerns a potato selection cart. The cart drives independently and systematically over a potato field to check the quality of the potato plants.

[Golden Rice gets close to production in the Philippines](#)

(ISAAA)

It has been over a year since a ruling in the Philippines found that Golden rice is safe for consumption, and anticipation has been brewing for the island nation to approve it for planting. Now, Dr. John C. de Leon, executive director of the Department of Agriculture Philippine Rice Research Institute (PhilRice), announced that a biosafety permit for propagating the Golden Rice was issued on July 21, 2021. Filipino rice consumers will benefit from this genetically engineered provitamin A-infused rice variety thanks to this approval of its commercial propagation permit. This biosafety approval of Golden Rice is the first authorization for commercial propagation of a genetically engineered rice in South and Southeast Asia. With this permit, Golden Rice can now be planted for commercial production as per the terms and conditions specified by the Department of Agriculture's Bureau of Plant Industry. Prior to marketing, Golden Rice will need varietal registration by the National Seed Industry Council, which approves the registration of all new varieties based on consistent good agronomic field performance.

[Philippines calls for more international, regional agriculture collaboration](#)

(PhilStar Global)

The Philippines has cited the need for regional and international collaboration in the agriculture sector in a bid to build more sustainable food systems. In a virtual meeting with five other Asian agriculture ministers, Agriculture Secretary William Dar encouraged his counterparts to unite and strive to achieve desired goals and initiate transformative change in their respective countries. “We acknowledge that our countries are confronted with similar challenges to our agriculture sector and food systems,” Dar said. “Thus, we fully support any international or regional collaboration and initiatives that will result in increased agricultural productivity, competitiveness and profitability, taking into account sustainability and resilience for our agriculture smallholders,” he said.

[How can Australian agriculture and land management adapt to climate change in a way that promotes Indigenous leadership and sustainable development?](#)

(Resilience)

The implications of a changing climate for Australia's agricultural sector are therefore significant. Annual crop production will be greatly impacted in many areas; especially in the wheat growing region of south-eastern Australia as reduced rainfall is especially likely to occur during the peak winter-spring growing season; and these drought-prone areas are also likely to expand in size in future. Additionally, poorer soil quality will result in greater levels of water run-off. Problems with pest and weed species

will also increase, further threatening fragile cropland and grazing zones at risk from heatwaves and storms; while livestock will also suffer higher levels of heat stress, leading to reduced productivity.

[Australia helps Vietnam develop hi-tech agriculture](#)

(Hortidaily)

A project to improve the knowledge and capacity of Vietnamese businesses in hi-tech agriculture will be soon carried out by Asialink Business of Melbourne University and Beanstalk AgTech of Australia. The project is part of the Australia-Vietnam Enhanced Economic Engagement Grant Pilot Programme (AVEG) of the Australian Department of Foreign Affairs and Trade. It is expected to equip Vietnamese agricultural producers with practical information and understanding of newly emerging consumer trends over the globe.

[Industry calls on Government to implement Agriculture Visa Trial](#)

(Hortidaily)

The horticulture sector is calling for a trial of the newly announced Seasonal Agriculture Worker visa to commence before year-end. The Australian Fresh Produce Alliance (AFPA) has previously welcomed the announcement of a dedicated Seasonal Agriculture Worker visa, which will reduce the industry's reliance on working holidaymakers and allow the industry to better develop a productive, returning harvest workforce. "As some of the largest employers in the sector, AFPA members have been developing a 10-year outlook on their workforce requirements. A long-term outlook reduces the reliance on backpackers and focuses on better pathways for employing Australians, workers from the Pacific, and new Seasonal Agriculture Worker visa holders" said AFPA CEO, Michael Rogers. The AFPA is calling on the government to implement a trial of the Seasonal Agriculture Worker visa and focus on a group of registered employers, prospective visa holders, and sending countries. A smaller-scale trial will also enable the industry to work with relevant agencies in managing quarantine pathways for Seasonal Agriculture Worker visa holders traveling to Australia.

[How will heavy rain in Central China's Henan affect food prices?](#)

(Global Times)

Heavy rainfall during the flood season every year impacts China's agricultural production, but the impact is generally limited. Judging from history, the impact of floods on agricultural products and other crops is relatively small, and the impact on agricultural production throughout the year will not be particularly severe. The heavy rain in Henan in recent days will only have a short-term impact on the production and logistics of vegetables and other agricultural products. As the major commodity crop in central China, corn is harvested once a year and will be affected if encounters heavy rainfall during pollination; otherwise, the impact is limited. At present, the pollination period in the central region has not yet reached; it has little effect on the growth of corn throughout the year.

[China's 'green' agriculture robust](#)

(The Manila Times)

China has made notable achievements in facilitating the greener development of its agricultural sector, a report has said. The fertilizer utilization rate for China's three major crops -- rice, wheat and corn -- stood at 40.2 percent last year, up 5 percentage points from the 2015 level, according to a report jointly released by the Chinese Academy of Agricultural Sciences and an agricultural green development research institution in the country.

[Chinese demand, lower inventories and drought spurring soybean markets as harvest approaches](#)

(Talk Business)

Arkansas' soybean farmers are two months away from harvest, and both the cash and book markets for the crop are well into double-digit dollars. Markets closed Friday (July 23) as high as \$14.31/bu. for cash crops and \$13.51/bu. for crops that are booked. A series of factors are colliding to cause these continued price spikes as the harvest season looms. Robert Stark, agricultural economist for the University of Arkansas System Division of Agriculture, said that a combination of rising demand, primarily from China, and reduced supply has brought the price up after a brief dip at the end of June. "There are some key elements driving the market," Stark said. "The first is the amount of stocks we have on hand. In the March 31 stocks report from the U.S. Department of Agriculture, they indicated

we were down 31% in soybean stock versus 2020 — down to 1.56 million bushels. At the end of June, we were down 44% from the year before, to 767 million bushels of stocks on hand.

New Research

[Quantification of global and national nitrogen budgets for crop production](#)

(Nature)

Input–output estimates of nitrogen on cropland are essential for improving nitrogen management and better understanding the global nitrogen cycle. Here, we compare 13 nitrogen budget datasets covering 115 countries and regions over 1961–2015. Although most datasets showed similar spatiotemporal patterns, some annual estimates varied widely among them, resulting in large ranges and uncertainty. In 2010, global medians (in TgN yr⁻¹) and associated minimum–maximum ranges were 73 (64–84) for global harvested crop nitrogen; 161 (139–192) for total nitrogen inputs; 86 (68–97) for nitrogen surplus; and 46% (40–53%) for nitrogen use efficiency. Some of the most uncertain nitrogen budget terms by country showed ranges as large as their medians, revealing areas for improvement. A benchmark nitrogen budget dataset, derived from central tendencies of the original datasets, can be used in model comparisons and inform sustainable nitrogen management in food systems.

[Excess irrigation over northern India risking agriculture in other regions](#)

(The Indian Express)

Climate researchers have discovered that excess irrigation over northern India shifts the September monsoon rainfall towards the north-western part of the subcontinent, increasing widespread weather extremes over Central India. These meteorological hazards expose the vulnerable farmers and their crops to risks of failure. The study, which establishes that monsoon precipitation is sensitive to the choice of irrigation practices in South Asia, can help plan agricultural practices in this region. South Asia is one of the most heavily irrigated regions of the world, largely using groundwater, and its major summer crop is paddy, cultivated in flooded fields. Hence it was pertinent to study how such practices can influence the monsoons that form the fulcrum of this agro-based economy.

[Scientists in New Zealand find more sustainable way to treat apple waste](#)

(Waste Management World)

Scientists in New Zealand have discovered a greener way to extract health-promoting molecules from organic waste materials. In a study published in the journal Green Chemistry, researchers at the University of Adelaide tested extraction with a new type of green solvent. They used the specific solvent to recover compounds found in apple pomace, that is, apple waste consisting of peels, pulp and seeds. Apple pomace is known for its powerful antioxidant, antibacterial, anti-diabetes and anti-inflammatory properties. Molecules generated in this way are intended for repurposing in the skincare and pharmaceutical industry. According to Dr. Long Yu, co-author of the study, apple waste is still underutilised by the manufacturing industry. She maintains that only 20% is recovered and used as animal feed, the remainder being destined for incineration, composting and landfill, the latter of which is responsible for the increased release of methane into the atmosphere. “Extracting the ‘goodness’ from apple pomace is one way to make better use of this waste product and could help the apple processing industry become more sustainable.”

[Indian seaweed scientist wins award for diabetes breakthrough](#)

(The Fish Site)

Dr Kajal Chakraborty, principal scientist at the Central Marine Fisheries Research Institute (CMFRI) won the Norman Borlaug National Award for Excellence in Agricultural Research. The prize, which is only awarded once every five years, was instituted by the Indian Council of Agricultural Research (ICAR), functioning under the Ministry of Agriculture and Farmers’ Welfare. Dr Chakraborty’s research achievements involve in developing and commercialising nutraceutical products from selected seaweeds to combat rheumatic arthritic pains, type-2 diabetes, dyslipidaemia, hypertension and hypothyroidism. The latest efforts in this line of research include antiosteoporotic and immune-boost nutraceuticals, and the latter received wider attention in the wake of the Covid-19 pandemic. His

research group developed an antimicrobial therapeutic product of heterotrophic bacterium for use against multi-resistant gram-negative pathogens.

[Mechanism for enhancing the growth of mung bean seedlings under simulated microgravity](#)

(Nature)

To elucidate a mechanism for enhancing mung bean seedlings' growth under microgravity conditions, we measured growth, gene expression, and enzyme activity under clinorotation (20 rpm), and compared data obtained to those grown under normal gravity conditions (control). An increase in fresh weight, water content, and lengths were observed in the clinostat seedlings, compared to those of the control seedlings. Real-time PCR showed that aquaporin expression and the amylase gene were upregulated under clinorotation. Additionally, seedlings under clinorotation exhibited a significantly higher amylase activity. Near-infrared image showed that there was no restriction of water evaporation from the seedlings under clinorotation. Therefore, these results indicate that simulated microgravity could induce water uptake, resulting in enhanced amylase activity and seedling growth. Upregulated aquaporin expression could be the first trigger for enhanced growth under clinorotation. We speculated that the seedlings under clinorotation do not use energy against gravitational force and consumed surplus energy for enhanced growth.

[A 'greener' process for extracting compounds from agricultural and food waste](#)

(Phys.org)

Researchers at the University of Adelaide have identified a 'greener' process for extracting health-promoting molecules found in agricultural and food waste, which can be repurposed in products such as skincare and pharmaceuticals. In a study published in Green Chemistry, the researchers trialed the use of greener solvents to collect compounds found in apple pomace known for their powerful antioxidant, antibacterial, anti-diabetes and anti-inflammatory properties. Co-author of the study, researcher Dr. Long Yu from the University of Adelaide's School of Agriculture, Food and Wine said: "Apple-processing industries generate tons of waste and by-products every year. "Currently only around 20 percent of apple waste is retrieved and used as animal feed. The rest is incinerated, or sent to landfill or composting, which releases significant amounts of greenhouse gases."
