Three improved varieties of chickpea have been developed by International Crops Research Institute for Semi-Arid Tropics (ICRISAT) in collaboration with the Indian Council of Agricultural Research (ICAR). These varieties have been made better in yields, drought tolerance and disease resistance.

According to the researchers, IPC L4-14 and BGM 4005 are drought-tolerant varieties that were developed by transferring a “QTL-hotspot” (genes for drought tolerance) from the donor chickpea variety ICC 4958 into two leading parental chickpea varieties, DCP 92-3 and Pusa 362, respectively.

The new varieties has shown 14.76 per cent and 11.9 per cent overall mean yield advantage over their parental lines. As per the experts the new varieties are well poised to strengthen food and nutrition security as well as livelihoods in India by providing adaptation mechanisms to the climate related challenges confronting the agriculture sector. These varieties have been released for cultivation in Punjab, Haryana, Planes of Jammu and Kashmir, parts of Rajasthan and western Uttar Pradesh.

Cultivation of such varieties showcase the strength of science and innovation to tackle real life challenges in the fields posed by unpredictable climatic conditions. We are hopeful that India will continue to empower farmers by allowing adoption of new technologies.

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
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News from India and Around the World

Indian Who Created Machine That Turns Agricultural Waste Into Fertiliser Bags Earthshot Prize

(India Times)

An Indian company, Takachar, has won the inaugural Earthshot Environmental prize, created by Queen Elizabeth II's grandson Prince William, to reward efforts to save the planet in the face of climate change and global warming. Takachar is among the five winners, each receiving a million pounds ($1.4 million). The ceremony, held in London, saw projects from Costa Rica, Italy, the Bahamas, and India picking up prizes. Delhi-based Takachar won the "Clean our Air" prize for the creation of a portable machine that turns agricultural waste into fertiliser so that farmers do not burn the waste and cause air pollution. Each of the finalists -- chosen by experts from more than 750 nominations -- will be given help from companies to develop their projects.

India needs a comprehensive rice strategy to deal with challenges: Report

(The Economic Times)

Despite some significant region-specific differences, generic factors, such as, government support in rice production, favorable monsoons, rising number of rice processing companies and increasing exports have positively impacted the Indian rice industry, said rating agency Infomerics Valuation and Rating in a report. The report - Rice Industry – Emerging Contours is optimistic about the future of the rice industry in India. It highlights the need for a comprehensive rice strategy, with focus on new systems, technologies and new rice seed varieties. It lists the government initiatives on bringing about structural changes in the sector and the efficient ways to reduce the extent of dependence on the vagaries of the monsoon.

Vertical farming & drones in agriculture

(The Times of India)

Concepts and technologies like vertical farming, use of drones and satellites have emerged as game-changers in agriculture over the last few years. Unlike legacy techniques, vertical farming is a technological approach that involves crop production using vertically stacked layers, thus optimising space usage. Since it is carried out in a regulated environment, it delivers a consistent output, cuts labour cost, reduces waste consumption and drives energy efficiency.

Only 4% of $3 bn spend targets sustainable agri

(Fortune India)

India spends $3 billion annually on agricultural innovation but only 4% of that is targeted towards innovations that have explicit environment and social sustainability objectives, a study conducted by

consulting firm Dalberg Advisors on behalf of the Commission on Sustainable Agriculture Intensification (CoSAI) has found. The study, released on October 5, says about 75 per cent of the overall $3 billion is public funding, with Union Ministry of Agriculture & Farmers' Welfare accounting for more than half of the spending. State governments and other ministries contribute the other 50%. Almost all public investment is directed towards research institutes (50%) or government agencies (50%). Institutional investors contribute $500-600 million and OECD bilateral/multilateral investors about $60 million annually for agriculture innovation targeting adoption of sustainable measures.

Does hydroponics have the potential to become mainstream in India?
(Hortidaily)
Hydroponics is still not a widely practiced technique in India, owing to the traditional nature of farming, high-initial set-up cost, lack of technical know-how, lack of awareness, and the complexity of the technology. However, the most crucial inhibiting factor is the mindset. "Farmers believe that some staple crops and vegetables cannot be grown successfully without good soil/water, and plenty of sunlight," said Akanksha Priyadarshini, co-founder, Food Revolution, a group of growers, innovators, foodies and plant 'romantics'. "In my personal experience, they are not susceptible to change. Over 50 percent of the population, with very limited know-how and low awareness levels, is engaged in agriculture," added Dhruv Khanna, co-founder, Triton Foodworks, a brand that stands for clean growing, accountable farming, and reliable supply of produce.

Global surge in plant-based, cultivated meat; Indian market sees substantial growth
(CNBC TV 18)
In India, the plant-based market is expected to grow to $650-700 million by 2025. Reports indicate, 54 percent of the early adopters in India are familiar with plant-based meats. And nearly 80 percent are willing to try them. 2020 saw a major expansion of this sector. Some eight out of 21 plant-based meat alternative Indian startups were launched during 2019-20. And five major International and Indian players entered this segment during 2020-21.

Centre infused Rs 131,000 cr to boost agriculture, allied sectors: Minister
(Business Standard)
The Centre has infused Rs 1,31,000 crore to boost agriculture and allied sectors with special emphasis on becoming an export-oriented economy as India has tremendous potential to satiate global demand, Union Minister Shobha Karandlaje said. The minister was in Jammu and Kashmir's Kathua district as part of the Centre's public outreach programme. Karandlaje e-inaugurated various projects of the public works department, costing Rs 519.50, lakh and laid e-foundation stones of different projects worth Rs 198.2 lakh.

India needs a carbon policy for agriculture
(The Indian Express)
The Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) Working Group – 1 has literally issued a "code red" to humanity as we rush towards a 1.5 degree Celsius hotter planet by 2040. The UK is set to host the 26th UN Climate Change Conference of the Parties (CoP26) in Glasgow from October 31 to November 12 with a view to accelerate action towards the Paris Agreement's goals. Union minister for environment, forest and climate change, Bhupender Yadav, says that the focus should be on climate finance and transfer of green technologies at low cost.

Farmer producer organisations are coming in a big way in India: NABARD chairman
(The Hindu)
NBARD chairman G. R. Chintala on Monday said that farmers producer organisations (FPO) are coming in a big way in India and will immensely help them in getting a good price. Speaking at a webinar organised by BCCI, Mr. Chintala said that FPOs is the new paradigm in Indian farming. There are nearly 10,000 FPOs in the country today out of which 5000 have been promoted by NABARD. "It has been seen that farmer belonging to the FPOs get additional benefits ranging from 40 per cent to 60 per cent. Farmers are getting inputs at a lower price and higher realisation for selling", he said. Mr. Chintala said that of the 5000 FPOs promoted by NABARD, 2500 of them have gone into investment grade.

Supply chain woes hit every industry, including agriculture

(Feed Strategy)

Agriculture is facing challenges resulting from a combination of higher energy prices, a rising dollar and steepening yield curve. “For those in agriculture, this confluence of factors poses a headwind and creates even higher operating costs to close out the calendar year,” the report said. Corn, soybean and wheat prices have declined from their third-quarter highs, but CoBank says the next major catalysts for grains are fall harvest, Gulf port activities and China grain purchases. “The export picture remains cloudy in the short term as grain terminal operations in the U.S. Gulf are just beginning to open after Hurricane Ida, and export volumes remain depressed. That said, the current corn and soybean crop marketing years have just begun, thus it is too early to sound the alarm on U.S. exports to China for 2021-22,” the report said.

Precision Agriculture Grows Up in US

(IoT for All)

Precision Agriculture is the leading-edge IoT application for farmers, and the most extensive farming areas in the U.S. are sprinting to the front of the pack. Precision agriculture is a farming management method used to describe farming that uses IoT technologies like satellite farming or site-specific crop management to observe, measure, and respond to changes in crop conditions in real-time. This presents apparent benefits to farmers because it can help them avoid the worst outcomes of overwatering, dry periods, and even pest infestations while preserving land viability and improving profits. In addition, these tools can allow farmers and ranchers to reduce environmental footprints, lower costs, and improve productivity.

Chinese corn gets cheaper, regains lost share from wheat in feed rations

(Reuters)

For the first time in a year, corn prices in China's key Shandong hub this week have fallen to the same levels as wheat, leading some feed producers to switch back to using more of the yellow grain, traders and analysts said. Corn prices in key animal-feeding hubs such as Shandong province had been trading at a rare, sustained premium to wheat for most of the past year. That's because corn production hiccups and a drawdown in stocks last year led to a slide in supply that pushed domestic prices to record highs.

Why Australian unions should welcome the new Agricultural Visa

(The Conversation)

Unions have been quick to condemn Australia’s new Agricultural Visa, which will give approved employers access to “skilled, semi-skilled and unskilled” workers from ASEAN nations and the UK from late this year. ACTU president Michelle O’Neill has warned of a “second-class workforce” with “none of the protections or rights that all Australian workers should be able to rely on”. But many aspects of the visa are actually a step in the right direction and could provide unions with organising opportunities. The scheme is being sold as a complement to two existing schemes, the Seasonal Worker Programme and the Pacific Labour Scheme. In reality, it’s a concession to farmers who lost rights to British backpackers.

Farming Innovation Programme launched to boost the future of farming

(UK Gov)

A new long-term funding programme to support farmers, growers, foresters and other businesses to embrace innovative ways to maximise productivity and drive sustainability has opened for applications. The Farming Innovation Programme, one of the new measures set out in the Government’s Agricultural Transition Plan, will support ambitious projects to transform productivity and enhance environmental sustainability in England’s agricultural and horticultural sectors, whilst driving the sectors towards net zero. In partnership with UK Research & Innovation (UKRI), Defra is today making £17.5 million available for the first round of the three funds which make up the Programme. The first fund to open is the ‘Industry-led R&D Partnerships Fund’, where farmers, growers, foresters and businesses can bid for funding to develop new technologies and practices that will help them overcome challenges and exploit new opportunities in the sector such as the use of

artificial intelligence and low-emission machineries to optimise the production process, and the development of climate-resilient crops.

World Food Day: Time for global leaders to invest in Africa's agriculture
(CGTN)
On World Food Day, it is time for African and global leaders, as well as development organizations, to join the African Development Bank Group's call for increased investments in agricultural technologies that boost Africa's food production and food security in the face of climate change. The continent has immense potential to feed itself and to become a breadbasket to the world: about 65 percent of Earth's remaining uncultivated, arable land is in Africa. However, that potential is threatened by erratic weather extremes. It is also stunted because a majority of African food growers are subsistence smallholder farmers. We need to scale up delivery of modern and climate-smart farming practices.

UK-first sustainable farming school launched
(Farming UK)
A UK-first school seeking to help farmers adopt regenerative methods of agriculture has launched at Harper Adams University. The School of Sustainable Food and Farming is the first of its type in the UK, with courses covering livestock, soil health and biodiversity. In the UK, agricultural production is currently responsible for 10 percent of all greenhouse gas emissions. Harper Adams University says the school will play a part in realising the government's new 'green' agriculture policy, unveiled in November last year. Based in Newport, Shropshire, courses will be designed using the work on sustainable farming and food production by the university.

Women shine brightly in agriculture
(Farm Weekly)
When you picture a farmer in Australia or an agricultural corporate leader, what does that person look like? Chances are you'd picture a man, because the majority of people around a boardroom table in agriculture are still men, as is the typical stereotype of a farmer. It makes sense as up until 1994, women were not recognised in Australian law as farmers, but 'support workers' to their male counterparts. So being acknowledged as a farmer or a leader in agriculture didn't happen overnight, it has taken decades for women to even get a seat at the boardroom table and there's still a long way to go until women are equally represented. Opening up opportunities for women in agriculture is not only for the purpose of gender equity, but also for economic sustainability of primary industries.

Governments Advancing Career Choice in Ontario's Agri-food Sector
(Ontario)
The governments of Canada and Ontario are investing up to $1.5 million through the Canadian Agricultural Partnership to address agri-food labour challenges and build a strong and resilient labour force to keep grocery store shelves stocked and Ontario's agri-food supply chain running. Starting today, a new intake is open to support industry-led projects that promote and attract jobseekers to careers in the agri-food sector, help them gain the skills and training needed to build a successful career, and ensure Ontario's food supply chain is protected. "Labour challenges continue to be one of the leading bottlenecks to growth in our agriculture sector," said the Honourable Marie-Claude Bibeau, federal Minister of Agriculture and Agri-Food. "At the same time, there are countless quality and dynamic job opportunities for Canadians looking for rewarding careers. This cost-shared funding for employee attraction, training and retention helps bridge that divide between employable Canadians and labour shortages and is vital to ensure the long-term prosperity of the sector."

We can learn a lot from ancient civilizations about modern water management
(We Forum)
Despite the severity of these droughts, the worst may be yet to come. Extreme weather events are expected to become increasingly severe and frequent in the Prairies, with longer dry periods coupled with the risk of floods from intense rainstorms. While Canada benefits from a world-class agricultural technology industry, lessons can also be drawn from low-tech solutions developed by ancient societies that flourished in arid climates. One such society was the Nabataean culture, which thrived in the hyper-arid deserts of Jordan, northern Saudi Arabia and southern Israel 2,000 years ago. For over a

decade, I have worked on Nabataean and Roman archeological sites of this region, exploring their building practices and innovative strategies for overcoming environmental limitations.

PH's 1st urban farming hydroponic hub to address food shortages

(PNA Gov)

In light of the government's thrust to promote urban farming, the Department of Agriculture (DA) unveiled the Urban Agri Hydro Hub Learning Center at The Pop Up Katipunan in Quezon City. "This launching serves as our first step in reaching our goal. Today, we established our country's first urban farming hydroponic research and training facility to overcome food shortages and heal hunger in the Philippines," Agriculture Secretary William Dar said in his speech. The project is a collaboration of the DA, the Philippine Association of Agriculturists Inc. (PAA), University of the Philippines (UP) Diliman Institute of Biology, and The Freshest. Dar was joined by PAA Chairman Roberto Rañola Jr., UP Diliman Chancellor Fidel Nemenzo, Food Security Ambassador James Reid, and Fiona Faulkner and Jeff Oh of The Freshest during the inauguration of the facility.

New Research

Three drought, disease-resistant chickpea varieties developed

(The Hindu Business Line)

They were developed by International Crops Research Institute for Semi-Arid Tropics (ICRISAT) in collaboration with the Indian Council of Agricultural Research (ICAR). Three improved varieties of chickpea, which are better in drought tolerance, disease resistance and yields, have been developed by the International Crops Research Institute for Semi-Arid Tropics (ICRISAT) in collaboration with the Indian Council of Agricultural Research (ICAR). They have notified for cultivation by the Central Varietal Release Committee. "Thirty-five varieties of different crops with special traits including climate resilience were dedicated to the country by Prime Minister Narendra Modi. Two of these were chickpea were developed in partnership with ICRISAT," Trilochan Mohapatra, Secretary, Department of Agricultural Research and Director-General of ICAR, said in a statement.

China's future food demand and its implications for trade and environment

(Nature)

Satisfying China's food demand without harming the environment is one of the greatest sustainability challenges for the coming decades. Here we provide a comprehensive forward-looking assessment of the environmental impacts of China's growing demand on the country itself and on its trading partners. We find that the increasing food demand, especially for livestock products (~16%–30% across all scenarios), would domestically require ~3–12 Mha of additional pasture between 2020 and 2050, resulting in ~−2% to +16% growth in agricultural greenhouse gas (GHG) emissions. The projected ~15%–24% reliance on agricultural imports in 2050 would result in ~90–175 Mha of agricultural land area and ~88–226 MtCO2-equivalent yr−1of GHG emissions virtually imported to China, which account for ~26%–46% and ~13%–32% of China's global environmental impacts, respectively.

Promising Pusa Arhar-16 may cut India's dependence on imports

(The Hindu Business Line)

Developed by IARI, the crop matures early, yields more. Anant Bahadur Singh, a farmer from Amethi Uttar Pradesh, who has been growing arhar (tur/pigeonpea), a key variety of pulses since 1990s, has taken up cultivation of a new variety Pusa Arhar-16 developed by Indian Agricultural Research Institute (IARI), Delhi, since its introduction in 2018. According to Singh, Pusa Arhar-16 matures in about 120 days against the maturity time in the range of 165 to 190 days for all.

USDA Invests In Cellular Agriculture For The First Time With $10 Million Grant

(Plant Based News)

The US Department of Agriculture (USDA) has made its first investment in cellular agriculture research and development. The federal agency put forward US $10 million to support the first-ever Institute for Cellular Agriculture. It's part of the USDA's wider investment of $146 million into sustainable agricultural projects. The hefty $10 million grant will be given to Tufts University over a period of five years to establish the institute. CULT Food Science – an investment platform focusing exclusively on

cell-based food – named it a 'significant milestone' for the field. Further, CULT says the investment sets cellular agriculture up to be the 'future of food'.

Proposal to set up Tropical Crop Research Institute in Cambodia

(Khmer Times)

Hybrid seeds are produced when crops are cross-pollinated to improve the characteristics of the offspring plants. Over the past century, the large-scale use of hybrid seeds has contributed to a revolution in agriculture production, both fortifying crops and increasing yields. However, hybrid seeds need to be generated afresh every season. The seed production process is labor-intensive and results in higher costs for farmers. To circumvent this production bottleneck, the Foundation for Food & Agriculture Research (FFAR) awarded a $600,000 Seeding Solutions grant to the University of California, Davis (UC Davis) to develop hybrid plants which produce seeds that are genetic clones of the parent plant, substantially reducing their climatic impact and farmers' bottom lines.

Farm typology for planning targeted farming systems interventions for smallholders in Indo-Gangetic Plains of India

(Nature)

Due to complexity of smallholder farms, many times technologies with great potential fail to achieve the desired impact in leveraging productivity and profitability of the farming community. In the Indo-Gangetic Plains there is an urgent need to understand the diversity of farm households, identifying the main drivers deciding their system thus, classifying them into homogenous groups. In the present study, the diversity of smallholder farms was assessed using crop, livestock and income related characteristics and associated farm mechanization. Using principal component analysis and cluster analysis for 252 farm households, 4 farm types were identified.

Supply chains for processed potato and tomato products in the United States will have enhanced resilience with planting adaptation strategies

(Nature)

Food systems are increasingly challenged to meet growing demand for specialty crops due to the effects of climate change and increased competition for resources. Here, we apply an integrated methodology that includes climate, crop, economic and life cycle assessment models to US potato and tomato supply chains. We find that supply chains for two popular processed products in the United States, French fries and pasta sauce, will be remarkably resilient, through planting adaptation strategies that avoid higher temperatures. Land and water footprints will decline over time due to higher yields, and greenhouse gas emissions can be mitigated by waste reduction and process modification.

Food and feed trade has greatly impacted global land and nitrogen use efficiencies over 1961–2017

(Nature)

International trade of agricultural products has complicated and far-reaching impacts on land and nitrogen use efficiencies. We analysed the productivity of cropland and livestock and associated use of feed and fertilizer efficiency for over 240 countries and estimated these countries' cumulative contributions to imports and exports of 190 agricultural products for the period 1961–2017. Crop trade has increased global land and partial fertilizer nitrogen productivities in terms of protein production, which equalled savings of 2,270 Mha cropland and 480 Tg synthetic fertilizer nitrogen over the analysed period. However, crop trade decreased global cropland productivity when productivity is expressed on an energy (per calorie) basis.

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