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6th Edition
Fresh India Show
 1-2 March 2024
 NASHIK, Maharashtra, India
www.freshindiashow.com

Fresh India Show to Promote

NASHIK - HORTICULTURAL CAPITAL OF INDIA



India's horticultural landscape is a testament to its rich agricultural heritage, contributing significantly to the nation's employment and foreign exchange earnings. As the horticultural capital of India, Nashik has played a pivotal role in shaping the trajectory

of this industry. Against this backdrop, the Fresh India Show 2024 is set to unfold on the 1st and 2nd of March 2024 at the picturesque Sahyadri Farms in Nashik, Maharashtra. Nashik has emerged as a hub for horticultural production and exports, driving economic growth and

sustainability. The region's commitment to innovation and quality has positioned it as a key player in the global market for fruits, vegetables, frozen produce, beverages, dehydrated fruits, and more. The Fresh India Show aims to serve as a prestigious platform to showcase the nation's

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LESSON FROM GERMAN FARMERS' STIR

- Devinder Sharma

During their protest against the government's plan to scrap tax breaks on diesel for farm vehicles, German farmers used cranes to lift tractors. This was meant to demonstrate the fragility and vulnerability of agriculture, which continues to literally hang by a thread. This reminded me of a protest in France a couple of years ago when farmers hung dolls from trees outside the French Parliament to depict farm suicides and agrarian distress.



As tractors take over Berlin, many other cities in Germany - Cologne, Hamburg, Munich and Nuremberg - are also facing tractor blockades. Deviating from the modus operandi of earlier protests when tractors moved in a column, angry farmers are now blocking highways at many places and disrupting rail traffic. Throwing heaps of manure outside government buildings, furious farmers brought sheep outside the German Louvre museum in Berlin, with placards that read: 'We do not want to end in a museum'.

mark the eight-day deadline that farmers had set for the coalition government to respond. Although the government partially pulled back on agricultural diesel subsidies, farmers are still infuriated at the austerity measures that will eventually lead to the withdrawal of domestic support. The diesel subsidies alone amount to 900 million euros every year.

While the protests have been going on for almost three weeks, a massive demonstration was organised in Berlin on January 15, to

This will mean that most farmers would annually lose 5,000-10,000 euros; for some, it may be still higher, agitating farmers claim. "For our businesses, it's a catastrophe," a farmer from Bavaria was quoted as saying. Before the latest protest, EU Agriculture Commissioner Janusz Wojciechowski had pointed out that more than 1,000 farmers were

quitting farming every day due to unprofitability. This is primarily because EU countries have continued with the legacy of former US Agricultural Secretary Earl Butz, who in the early 1970s had asked farmers to 'get big or get out'. The EU prescription of 'grow or die' led to the demise of small farms. Later, the Washington-based International Food Policy Research Institute, too, prescribed the same flawed economic course as a solution to the crisis in Indian agriculture.

The emphasis on larger farms and industrial agriculture has brought the world closer to a climate emergency. While farmers are under attack for excessive greenhouse gas emissions (GHGs) emanating from the

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ARUNACHAL LAUNCHES 'ATMANIRBHAR SCHEME APP', NOW FARMERS CAN EASILY APPLY FOR THESE GOVT SCHEMES

The state government rolled out a new online app and portal for the Aatmanirbhar schemes, making it easier for people to access benefits. Okit Palling, the Chief Executive Officer of the Arunachal Pradesh Agriculture Marketing Board (APAMB), shared that the portal is designed to simplify the application process for various schemes, like Aatmanirbhar Krishi Yojana, Aatmanirbhar Matsya Palan Yojana, Aatmanirbhar Bhagwani Yojana, and Aatmanirbhar Pashu Palan Yojana.



internet access, Taki assured that physical applications would still be accepted, ensuring inclusivity.

A key feature of the portal includes a real-time application tracking system, enabling beneficiaries to keep tabs on their application statuses. This functionality is designed to enhance transparency and streamline the entire process for greater efficiency.

Taki officially launched the Arunachal Agro Mart website and portal, which serves

as an e-commerce platform dedicated to promoting local produce and backing agricultural entrepreneurs. Palling highlighted the initial emphasis on packed food items with a validity ranging from 3 to 6 months, underlining the importance of employing scientific packaging techniques. APAMB is dedicated to supporting entrepreneurs in adopting these practices and offering market-ready labeling services.

Agriculture Commissioner Bidol Tayeng and Fisheries Commissioner Saugat Biswas also expressed their thoughts, with officials from various departments attending the function. As the state takes steps toward a digital future, these initiatives are set to benefit both the government and citizens, creating a more transparent ecosystem for agricultural schemes and commerce.

Source: www.tractornews.in

INSIDE STORIES

- Karnataka Announced Rs.1,475 Cr in Crop Insurance to 7 Lakh Farmers
- Enriching tomato production with dynamic lighting
- The 8th edition of Asia Agri-Tech Expo is Moving to Tainan, the Thriving Cluster of Agriculture, Livestock, and Aquaculture Industries in Southern Taiwan
- Impact of Postharvest Handling and Processing on the Human Health Benefits of Citrus Fruit

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FRESH INDIA SHOW TO PROMOTE NASHIK ...



strength in these domains, highlighting the diverse array of products and the cutting-edge technologies that define India's horticultural landscape.

in the sector. Additionally, it will serve as a platform to introduce and discuss innovative technologies that are shaping the future of horticulture in the country.

Significance of Nashik as the Horticultural Capital:

Nashik's ascent to the title of the Horticultural Capital of India is rooted in its conducive climate, fertile soil, and the industrious spirit of its agricultural community. The region has become a beacon for excellence in horticulture, contributing not only to the national economy but also fostering employment opportunities for thousands. The Fresh India Show seeks to celebrate and amplify the impact of Nashik's horticultural prowess on the global stage.

Diversity in Produce and Innovation:

The exhibition at the Fresh India Show will be a testament to the diversity and quality of India's horticultural products. From succulent fruits to crisp vegetables, from refreshing beverages to innovative dehydrated fruits, the showcase will encompass the entire spectrum of the industry. The event will feature new varieties of fruits and vegetables, reflecting the ongoing commitment to research and development

Join the Exhibition, Conference, and Networking Summit:

The Fresh India Show is more than just an exhibition; it is a comprehensive platform that brings together stakeholders from across the horticultural value chain. The exhibition will allow businesses to showcase their products and services to a diverse audience, fostering potential collaborations and partnerships. The conference will delve into critical issues, industry trends, and emerging opportunities, providing valuable insights for participants. The networking summit will facilitate meaningful connections, creating a conducive environment for knowledge exchange and collaboration.

Engaging with Thousands of FPOs and Horticultural Growers:

One of the highlights of the Fresh India Show is the opportunity to engage with thousands of Farmer Producer Organizations (FPOs) and horticultural growers. This direct interaction will enable knowledge transfer, create

avenues for market linkages, and empower farmers with the latest trends and technologies. By bringing these stakeholders under one roof, the event seeks to strengthen the foundations of the horticultural ecosystem and contribute to the overall growth of the sector.

In conclusion, the Fresh India Show 2024 is poised to be a landmark event in India's horticultural calendar. By choosing Nashik as its

host, the event not only pays homage to the region's contributions but also signifies a commitment to furthering the growth and sustainability of the horticultural sector in India. Participants can expect a dynamic blend of exhibition, conference, and networking opportunities, all aimed at showcasing and propelling India's strength in horticulture onto the global stage.



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LESSON FROM GERMAN ...

farming practices they were forced to adopt, no questions are being asked of the political parties, global institutes or banking establishments that pushed for intensive agriculture. With the focus on providing surpluses, and relying on the mistaken power of markets, farm incomes dropped and that led to a decline in the number of cultivated farms.

Farmers fear such drastic cuts will wipe out farming. While the Russia-Ukraine war led to a price increase for farmers, farm incomes had remained almost static prior to that. A report submitted to the German Federal Parliament showed that as many as 36,000 farms closed down in a decade, between 2010 and 2020, which comes to 10 farms per day. In neighbouring France, the agricultural census report (released in December 2021) points to a sharp drop in the number of farms – almost one lakh closed down in a decade. Against 4,90,000 farms in 2010, the number came down to 3,89,000 in 2020. In Europe, 5.3 million farms disappeared in 15 years (2005-20).

This is what happens

when agriculture is left to the whims of politicians who call for policy decisions that suit corporate interests. When markets are unable to provide farmers remunerative prices, subsidies are given to cover the loss. This ensures protection to corporates, but the real cost is borne by the farmers. In America, more than 150 programmes are designed to dole out direct and indirect subsidies amounting to \$30 billion per year. And yet, for most of the past few decades, farmers have suffered losses. In Europe, too, agriculture survives on subsidies and direct income support.

An interesting analysis by the US-based farmdoc daily has shown that in the past four decades (1980-2020), net returns as a share of the total economic cost of production reveal that US farmers have suffered losses for 33 years. If it were not for federal support, the remaining family farms in America would have collapsed too. In Germany, the income losses are compensated by subsidy support, including diesel subsidy. In India, a recent study by the Organisation

for Economic Cooperation and Development (OECD) has conclusively shown that farmers have been incurring losses since 2000. Another analysis shows that in the case of paddy, except for Punjab, farmers across the country have been incurring losses or barely scraping through. In the Philippines, the National Anti-Poverty Commission has identified farmers and fishermen at the bottom of the pyramid.

The common thread is that agriculture in all these countries, and elsewhere too, is dependent on markets. If the markets were efficient and benevolent, as corporate economists want us to believe, there is no reason why farming should be a loss-making proposition. For rich as well as poor countries, markets have rendered agriculture as more or less a paralysing burden. The fundamental breakdown is primarily because of a broken financial system that sucks wealth from primary production up the value chain.

Whether it is in the US, Germany, France or India, farmers must realise that subsidies are not a solution to the farm crisis. Since agriculture hangs by a thread, the symbolism, too, has to change. We need a realignment that is permanent and leads to a new global economic awakening that focuses on assuring farmers a remunerative and guaranteed income. ■

Source: www.tribuneindia.com

KARNATAKA ANNOUNCED RS. 1,475 CR IN CROP INSURANCE TO 7 LAKH FARMERS

—Priyanka Pramanik

Agriculture Minister N. Cheluvaryaswamy announced a financial lifeline for farmers hit by last year's scorching drought. Nearly 7 lakh farmers across the state have already received a much-needed Rs.475 crore as crop insurance payouts, easing their financial burdens. Also, an additional Rs.1,000 crore will be distributed soon, ensuring no farmer is left dry of support.

This timely assistance comes even as the Minister highlighted a sobering reality where only 2% of the state's 20 lakh farmers had the foresight to avail crop insurance. Recognizing this gap, Cheluvaryaswamy emphasized the crucial role of agriculture universities and departments in educating and encouraging farmers to adopt this safety net.

He envisions a future where farmers are not just cultivators, but empowered entrepreneurs, free from the grip of middlemen and exploring value addition through processing and marketing. The recent International Millet Fair in Bengaluru, where farmers actively participated and collaborations were forged for



millet-based products, serves as a prime example of this potential.

Cheluvaryaswamy highlighted the rapid technological innovations in the agriculture sector and urged farmers to adopt them for economic progress. He also called for more developments in the farm sector, reminiscent of the impact of the Green Revolution on the country's profile.

Agriculture Commissioner Y.S. Patil expressed the Minister's vision of transforming farmers into entrepreneurs, reducing middlemen interventions. He pledged support from everyone in the sector to achieve this goal. The Krishi Mela featured lectures by experts from agriculture

and agriculture universities on various topics. Senior officials, including Deputy Commissioner Kumara, Agriculture University Vice-Chancellor Suresh, and others, attended the event.

The seer emphasized that similar to the swift technological advancements in the IT and BT sectors, the agriculture sector is also experiencing rapid innovations. He urged farmers to embrace these farm innovations as a means to achieve economic progress. Additionally, he noted that, much like how the green revolution transformed the country's profile, further advancements are essential in the agricultural sector. ■

Source: www.tractornews.in

AGRITECH FIRM BHARATAGRI TO EXPAND TO 3 MORE STATES

Farming technology platform BharatAgri, which helps farmers through a unique algorithm providing a farming calendar for a full year through its mobile app, plans to expand to Gujarat, Karnataka and Telangana. The company will first expand its logistics network in North India to ensure farmers get their inputs on time, said the startup's cofounder and Chief Operating Officer Sai Gole.

BharatAgri, which started off as an advisory by providing an annual calendar to farmers specifying stepbystep actions to be taken by them, has now got into the crop input business, onboarding about 200 companies. The companies include multinationals such as Bayer, FMC, UPL and Dhanuka Agritech, besides regional players. "We have the full logistic part. So we are expanding in North India to ensure that whatever farmers are ordering, they receive it in the least possible time. So for Maharashtra, we can deliver within 48 hours, but for other States, we still take 35 days' time," said the Punebased firm's cofounder.

BharatAgri, incorporated as Leancrop Technology Solutions, is currently present in Maharashtra, Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan, besides a small level of presence in Karnataka and Telangana. In October this year, BharatAgri raised Series A funding of Rs.35 crore (\$4.3 million) led by Arkam Ventures, an earlystage venture fund dedicated to 'MiddleIndia' startups.

Raising Farmers' Yield

Gole, whose family has been traditionally in the agriculture sector, told that she and her cofounder Siddharth Dialani, who is the CEO of the company, launched the startup in 2017 to increase farmers'

Piccap: BharatAgri cofounder and COO Sai Gole productivity in the country. "Bridging the productivity gap was the



initial objective. That's why we started with the advisory part. For the first three years, we spent only on building the technology to ensure how we can have an affordable advisory for farmers," she said.

Gole and Dialani lived on a farm, 100 km from Pune, and carried out all farm activities for three seasons to understand the whole business. "We didn't want to build something where we are dependent on somebody else's knowledge," she said. BharatAgri is an advisory platform where farmers can provide inputs on 20plus of their farm parameters. In turn, the company helps them with advisory which is personalised to their farm. Services are offered in Hindi, Marathi and English.

5 Million Active Users

"And at the same time, the advisory leads to the purchase of different inputs 90 per cent of the time. So, we also have a marketplace where farmers can purchase these," said Gole, who initially showed interest in drones but has put it on the backburner now.

This has helped the company as it has 5 million farmers who are active users of the digital platform. "They come in for all kinds of advice," she said. Growers can get solutions to any issue on BharatAgri platform as it is 100 per cent algorithmdriven and no one sits or addresses these issues, said the company's COO.

Source: www.pressreader.com

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ENRICHING TOMATO PRODUCTION WITH DYNAMIC LIGHTING



In the evolving landscape of agricultural technology, dynamic lighting introduces a pivotal advancement for greenhouse tomato cultivation. Tailored to meet the specific needs of various tomato cultivars, this innovative solution enhances fruit quality and yield while concurrently reducing energy consumption. This business case unveils a pioneering approach that integrates technology with eco-friendly practices, redefining the standards of modern greenhouse tomato production.

Advanced dimming during the shoulder season

For greenhouse growers looking to use supplemental for a summer crop (planted in January and removed the following December), dynamic lighting can help accelerate the

fruit harvests and maintain production throughout the season while limiting electrical energy consumption.

When applying light in the early spring, natural light fluctuates greatly and can quickly lead to over lighting or underlighting the crop if the grower is restricted to stepwise dimming functions. With dynamic lighting, growers can apply lighting during the shoulder months while setting their lighting system to be very reactive to natural light conditions to avoid spending money unnecessarily and causing photodamage to the crop.

Finetuning the lighting strategy to the cultivar

The greenhouse tomato industry is characterized by its varietal diversity. Widely grown tomato types include beefsteak, tomato on the vine

(TOV), cherry, grape, Roma, and specialty. Within each tomato type are at least two dominant varieties, resulting in 21+ commercial varieties of tomatoes across all fruit types. This number is likely higher due to the wider variety in small tomato types (i.e., grape and cherry), exclusive varieties, and others being trialed. Each variety has a unique profile with respect to growth habits, time to harvest, and fruit size, color, and flavor. As Sollum® experienced in commercial pepper production, varieties have unique responses to supplemental lighting and benefit from having tailored, dynamic lighting strategies.



A 20-week study conducted at Wageningen University compared the response of two tomato varieties to different percentages of red photons in the overall light spectrum. This study showed that the crop response was indeed cultivar-specific, with an increasing percentage of red light resulting in a lower fruit fresh and dry mass for Merlice but no significant difference for Briosio. The authors, who used a dynamic lighting system for the study, note that greenhouse growers need to consider the potential trade-offs between fixture efficacy and crop yield. With dynamic lighting, growers can adjust the percentage of red light according to the variety's needs at any point in time. This allows growers to make the most of each cultivar throughout the season and adapt to new cultivars from



season to season.

By implementing fully dynamic LED top lighting such as Sollum's solution, growers gain the convenience of working with a single lighting system to create infinite light zones with variety-specific photoperiod, intensity, and spectra that are dimmable in real-time. As a result, the grower can take full advantage of each variety's genetic potential.

Elevating prevention and crop balance

Extended weather incidents and changing seasons can significantly lower the amount and intensity of light delivered to greenhouse crops, causing the plants to stretch in search of sunlight. This etiolation from low light levels produces weak stems that may struggle to support developing fruit. Etiolation is also characterized by small leaves, long internodes, and a pale yellow color.

From December 2022 to February 2023, parts of eastern Canada received the lowest natural light levels since 1940. For tomato growers, these lower light levels contributed to stem elongation that could easily throw the plant out of balance. With dynamic lighting, tomato growers were able to counter etiolation by applying high blue light levels to re-establish an optimal internode length and stem diameter.

The tunable spectrum of truly dynamic horticulture grow lighting is a powerful tool for countering etiolation when natural light levels are low.

More than just volume - bring back nutritious tomatoes

The unique genetic profile of tomato varieties strongly affects the chemical composition of the fruit and thus the nutritional quality. Tomatoes are an important source of antioxidants, which are biomolecules produced in response to environmental conditions, including light quality. For example, studies have demonstrated that the percentage of red and blue light at the start of flowering stimulates lycopene biosynthesis in tomato fruit. Lycopene is a carotenoid pigment

responsible for tomatoes' red color and antioxidant capacity. Lycopene has been described as one of the strongest natural antioxidants.

Yellow and orange varieties attribute the fruit color to a higher concentration of non-lycopene carotenoids, including beta-carotene and delta-carotene. Similarly, most brown/purple tomato varieties produce a chlorophyll derivative that blends with lycopene to produce a dark flesh. Another noteworthy antioxidant is anthocyanin, which is a class of water-soluble blue, red, or purple pigments found in tomato leaves and stems.

Recent breeding efforts have focused on introducing anthocyanin-related genes into commercial varieties to promote its accumulation in the fruit skin, further elevating tomatoes' nutritional quality. For example, Norfolk Plant Sciences announced in July 2023 that it would be introducing a range of purple tomato products that are engineered to produce high levels of anthocyanin. Anthocyanin production is strongly linked to light quality and has also been demonstrated to upregulate the production of additional beneficial compounds, including carotenoids and polyphenols.

For example, research stemming from South China Agricultural University reported that applying 100 mol/m²/s of blue light in pulses at the start of anthesis (flowering) increased the biosynthesis of lycopene, total phenolic compounds, flavonoids, vitamin C, and soluble sugar. While all treatments increased the overall antioxidant activity of tomatoes, the researchers saw especially positive results when pulsing the blue light treatment for 30 minutes and then 8 minutes off.

Given the apparent link between antioxidant production and light quality, a tomato grower can use dynamic lighting to improve tomatoes' nutritional quality by applying antioxidant-stimulating light recipes at specific points in the crop cycle.

For more information:
Sollum Technologies
sollumtechnologies.com
Source: www.hortidaily.com

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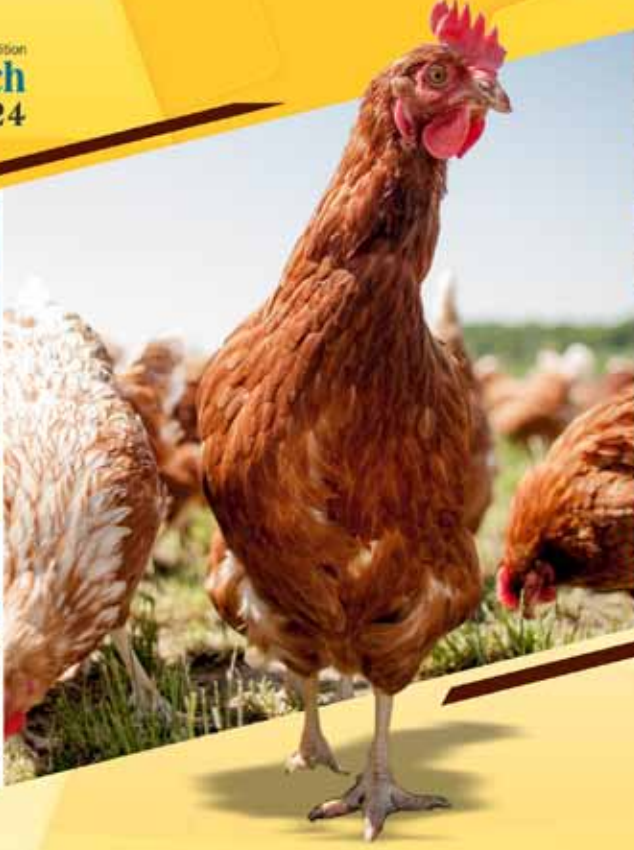

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THE 8TH EDITION OF ASIA AGRI-TECH EXPO IS MOVING TO TAINAN, THE THRIVING CLUSTER OF AGRICULTURE, LIVESTOCK, AND AQUACULTURE INDUSTRIES IN SOUTHERN TAIWAN



After having been successfully organized in Taipei for the past seven years, the organizer, Informa Markets Taiwan, considers that now is the time to inject new energy to Asia Agri-Tech Expo & Forum.

The 8th edition of Asia Agri-Tech Expo & Forum (AAT) will be held on 19-21 June 2024 at ICC Tainan, concurrently held with Livestock Taiwan & Aquaculture Taiwan.

In recognition of the vibrant agricultural landscape, the exhibition will now be held in Tainan, located in the prosperous South Taiwan region known for its cluster of agriculture, livestock, and aquaculture production bases.

This strategic decision reflects the AAT's commitment to provide a platform that highlights the dynamic growth and innovation within these industries. Central and Southern Taiwan serve as important production areas for agriculture, aquaculture, and livestock industries, contributing approximately two-thirds of Taiwan's total agricultural, aquaculture, and livestock output value.

With its convenient

transportation, Tainan provides easy access for professionals in related industries to participate in from all over the world. Furthermore, in 2024, Tainan will celebrate its 400th anniversary since its founding, adding more highlights to the exhibition.

Ms. Sabine Liu, the General Manager of Informa Markets Taiwan, stated that the 8th exhibition will be a larger-scale and more content-rich event. The event will provide new momentum not only for the development of Taiwan's agriculture, aquaculture, and livestock industries, but also contribute to the transformation and upgrading of the industry in the Asia Pacific Regions.

About the show

The 8th exhibition will be themed "Feeding the Future" through "Sustainable, Innovative, Eco-friendly" agricultural technologies. It will showcase the latest agricultural technologies and achievements, including electric agri-machinery, environmental control greenhouses, bio-fertilizer,



feed additives, animal health, poultry and pig farming equipment, seafood processing equipment, cold chain technologies, preserve technology, and more.

Besides the extensive exhibits, industry elites will share their professionalism about hot topics, such as ESG sustainable agriculture, smart agriculture, new technologies, preventive medicine for poultry and pig, fish or shrimp disease countermeasures, case study of fish and electricity symbiosis, etc.

Furthermore, the organizer will host buyer-seller matchmaking and cooperation networking meetings for international associations.

Show Outlook

The relocation of the 8th edition of AAT to Tainan holds

significant importance. Tainan, situated at the heart of Taiwan's abundant agricultural, aquaculture, and livestock resources, boasts a strong industry foundation. As a pivotal platform for Asian agriculture, aquaculture, and livestock industries, the AAT will continue to fulfill its role by facilitating the international development. By doing so, it will bring new opportunities to the agriculture, aquaculture, and livestock industries in Asia and contribute to the transformation and upgrading of Taiwan's overall agricultural sector. ■

For more information, please visit www.agritechtaiwan.com or contact the team via aat.sales@informa.com.

AGRICULTURE EXPORTS LIKELY TO DOUBLE TO \$100 BN BY 2030: COMMERCE SECY

India's agriculture exports, which stood at over USD 50 billion at present, are expected to double by 2030 and reach USD 100 billion, Commerce Secretary Sunil Barthwal said. He said that the country is targeting USD 2 trillion worth of exports of goods and services by 2030.

"I am very sure that this USD 50 billion exports of India today will see a doubling of our exports by 2030 to almost USD 100 billion," he said at the IndusFood Show 2024 here.

This is the largest food and beverage show in South Asia.

The secretary said that areas like the ready-to-eat food segment have huge potential to grow.

He also urged the industry to focus on the technical standard requirements of importing countries.

Inaugurating the show, Commerce and Industry Minister Piyush Goyal said that this fiscal year, the country's agri exports will be more than last year's level of USD 53 billion, despite restrictions imposed on shipments of certain key



commodities, including rice, wheat and sugar.

Earlier, an official said that the export ban and restrictions on these commodities may hit exports of about USD 4-5 billion this fiscal.

The government has prohibited exports of wheat and non-basmati white rice and has also imposed curbs on sugar exports.

Speaking at the event, Trade Promotion Council of India Chairman Mohit Singla said that over 1,200 exhibitors and more than 7,500 buyers from across the world representing about 90 countries are participating in the three-day show.

Over 80 retail chains, such as Choithrams, Carrefour, Khimji Ramdas, Grand Hypermarket, Nesto, Mustafa, X5, Lulu, Almaya Group, and Spar, are also participating, he added.

Source: www.economictimes.indiatimes.com

HARYANA CM ANNOUNCES EXCITING PILOT PROJECT, SUBSIDIZES SOLAR POWER FOR FARMS

The state government is rolling out innovative pilot projects in cluster mode to support farmers and increase profitability. These initiatives are specifically crafted to enhance crop diversification, introduce efficient micro-irrigation schemes, elevate the quality of livestock, and promote various allied agricultural activities. The forefront in crafting novel initiatives to actively encourage organic farming, natural farming, and cooperative farming is being assumed by the Haryana Kisan Kalyan Pradhikaran.

Haryana Chief Minister Manohar Lal Khattar has announced exciting pilot projects in a meeting of the Haryana Kisan Kalyan Pradhikaran held on January 17, 2024. The pilot project aimed at revitalizing the state's agricultural sector and improving the lives of farmers, particularly small and marginal ones.

The meeting witnessed the participation of key figures such as Energy Minister Ranjit Singh, Agriculture and Farmers' Welfare Minister JP Dalal, Cooperation Minister Banwari Lal, Development and Panchayat Minister Devender Singh Babli, and Haryana Kisan Kalyan Pradhikaran Chairman Subhash Barala.



integrating new agricultural systems with traditional practices to elevate the income of small and marginal farmers. He particularly emphasized the untapped potential in the livestock sector, presenting it as a viable avenue for farmers to boost their earnings.

Taking inspiration from Israel's successful cooperative farming techniques, Chief Minister Khattar directed the members of the Haryana Kisan Kalyan Pradhikaran to collaborate with relevant government departments in developing these pilot projects. The goal is to inspire and guide farmers toward more sustainable and lucrative agricultural practices.

Highlighting the pressing issue of declining water tables, Chief Minister Khattar stressed the urgent need for establishing micro-irrigation projects. He also suggested the installation of solar energy-based agricultural borewells in regions where the groundwater level is as deep as 30 meters. To support this initiative, the government expressed its readiness to provide subsidies and cover water and electricity expenses.

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LEAFY IS HERE: NEW DELEAFING TOMATO ROBOT LAUNCHED

"The aim of robotics coupled with AI is not to replace people, but to help them," says Nicolas Salmon, CEO and co-founder of Aisprid. Today, at the Sival trade show in France, the company launched their robot Leafy, an autonomous deleafer for greenhouse grown tomato plants. The robot is currently already in operation in tomato greenhouses, as the growers are true development partners for the company, says Nicolas. "A 3-year long R&D and field testing program can vouch for the robot's operational condition."

It's a novelty in horti robots: deleafing tomato plants done by a robot. Aisprid's Leafy is currently taking on the task in some of Brittanies (France) greenhouses. "Around 10 robots have been deployed there last year", Nicolas shares. "We are starting the commercial phase this year, with more robots being deployed, on a Robot as a service basis with upfront payment."

It has not been an easy task to get here. "A lot of things need to go right to cut a single leaf, both from the software and hardware side. This is one of the biggest challenges in agriculture and is also true for deleafing and harvesting. Then, you need to repeat this a million times efficiently and without hardware failure", Nicolas summarizes the journey.

Leafy is equipped with several cameras. A central camera scans tomato plants, leaves & tomatoes in order to identify points of cuts for leaves as well as potential obstacles for robot trajectory generation. Then, the robotic arm moves towards the point of cut while using another



camera at the end of the robotic arm to adjust its trajectory in the middle of the move.

But there's more. The robot is equipped with AI, and as Nicolas says, it is of vital importance to learn from the experience of interacting with the living world. "Plants are not like factory-made products. They are different from one row to the next and from one grower to the next. Plants change throughout the season. The great diversity and special cases we deal with are what make our work so complex. Our robot is designed to operate in a plant-based and living environment: It can analyze this environment, understand it, and act upon it accordingly."

So, let's talk numbers. Aisprid aims to reach one hectare per robot, taking into account 20-24 hours per day, 7 days per week. "We're not there yet - we're about halfway," Nicolas says, adding it is important to understand the robot is evolutive. "Performance increases every month, with both software, AI, and hardware upgrades."

"Robotizing greenhouse tasks is the future for agriculture and horticulture," says Marine Lechvien, one of

the Brittany-based growers working with Leafy. "The more experience the robot gets, the better it performs. Substantial improvements are already tangible: cutting is neater, and the Aisprid robot is making good progress. It will continue to improve in terms of leaf-cutting precision and numbers."

Currently, the robot operates only on tomatoes, with a specific focus on cluster tomatoes. "Robot performance is affected by varieties, but we are working on covering as much as possible, even potentially other crops like cucumbers. Our goal is to provide a sustainable answer to labor shortages while improving the working conditions of those who handle the plants."

The Aisprid was awarded a gold medal at the Sival tradeshow and will be shown there during the show, in booth 302 - Hall Novaxia Haut. Later on, it will also be present at the World FIRA startup pitch session and at Greentech Amsterdam.

For more information:
www.aisprid.com
Source: HortiDaily.com



kind of agriculture include growing more food in less space and eschewing pesticides.

❖ But the cost of real estate and technology, as well as farms running on fossil fuels, are some of the issues preventing greater adoption.

Shipping containers, underground tunnels and abandoned mine shafts are not obvious venues for growing food. Yet many such spaces are being turned into vertical farms.

So what exactly are they, and how could vertical farming change traditional agriculture?

What is vertical farming?

Vertical farming involves growing plants indoors, which is why it's sometimes also known as indoor farming. Instead of sunlight and rain, vertical farms use LED lighting and controlled growing and nutrition systems. Plants are stacked vertically in layers, so many of the farms look like warehouses filled with large shelving units.

For example, Europe's biggest vertical farm is being developed outside Copenhagen in Denmark by Danish start-up Nordic Harvest. It is a warehouse-like 75,000-square-foot facility where plants are grown in 14 stacked layers, according to Free Think. When it's fully completed, Nordic Harvest will

supply 1,000 tonnes of food a year.

What are the benefits of vertical farming?

Vertical farming is considered a highly efficient and sustainable way of producing food. For instance, Nordic Harvest says it uses 250 times less water than a traditional farm would need.

Automation is the key to this efficiency. Software, robotics and data science are some of the technologies used in vertical farms to monitor crops and create optimum growing conditions. This includes controlling temperature, humidity, CO2 and light.

Controlled environment agriculture like this helps to reduce the vertical farm's environmental impact, eliminating the need for pesticides for example.

Vertical farms also aren't reliant on the weather, so fresh produce can be grown all year round.

How will vertical farming change agriculture?

Instead of growing fruit and vegetables on big farms and then transporting it over long distances in trucks and planes, vertical farming can supply local produce from neighbourhood buildings. This means less fuel is used and the food is fresher.

Vertical farms also tend to produce more than conventional farms. Nordic

Harvest says plants can be harvested 15 times a year. In a conventional field, harvesting is twice a year.

By precisely controlling the growing environment, products can last for 13 to 14 days, against three to four days for the equivalent products from conventional agriculture, according to The Choice.

Why isn't vertical farming already a global solution?

Cost is a big hurdle for vertical farming. Sun and rain are free. Powering LED lights, software and sophisticated growing systems isn't.

While some facilities run on electricity from wind turbines, vertical farms running on fossil fuels may be adding to the problem of climate change rather than making it better, says Free Think.

Buying urban real estate to build a vertical farm can also be expensive. In Australia, for example, an average square metre of city centre land in Melbourne is almost \$3,500, according to Duke University in the US.

That said, the global vertical farming market is steadily growing, says Statista, and is expected to leap from \$5.5 billion in 2020 to around \$20bn by 2025.

Victoria Masterson, Senior Writer, Formative Content.

Source:
www.climatechampions.unfccc.int

VERTICAL FARMING – IS THIS THE FUTURE OF AGRICULTURE?

❖ Vertical farming involves growing plants indoors in layers using LED lighting and controlled growing and nutrition systems. ❖ Europe's biggest vertical farm grows 1,000 tonnes of food a year. ❖ The advantages of this

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JOHN DEERE JOIN HANDS WITH ELON MUSK'S SPACEX'S STARLINK FOR ENABLING SATELLITE INTERNET ON TRACTORS



John Deere and SpaceX's Starlink have recently inked a deal to integrate Starlink satellite internet into tractors and farming machinery and this initiative is set to commence later this year.

— Suneha Mishra

Recently, John Deere, a leading tractor manufacturer, teamed up with SpaceX's Starlink to provide high-speed internet connectivity to farmers. This collaboration aims to bridge the digital gap in rural areas of the United States and Brazil, where a significant portion of farmland lacks adequate internet access. Elon Musk, the CEO of SpaceX, expressed his enthusiasm for the partnership, highlighting the benefits it will bring to farmers, enabling them to fully embrace digital agriculture technologies.

With approximately 30% of farmed acres in the US and a staggering 70% in Brazil lacking sufficient internet connectivity, this collaboration addresses a crucial gap in the agricultural sector. The lack of reliable internet hampers the adoption of digital agriculture technologies developed by John Deere, preventing farmers from remotely monitoring equipment, troubleshooting, and gathering precise data on crops and soil.

John Deere and SpaceX's Starlink have recently inked a deal to integrate Starlink satellite internet into tractors and farming machinery. The initiative is set to commence later this year, initially targeting the US and Brazil. The collaboration comes as a response to the significant connectivity challenges faced by farmers in rural areas, hindering the adoption of modern agricultural technologies.

The digital agriculture tools developed by John Deere enable farmers to monitor equipment remotely and gather precise data for improved crop and soil management. However, a lack of reliable internet connectivity

in vast rural expanses has impeded the widespread use of these technologies. The partnership with Starlink aims to bridge this gap by bringing high-speed internet to the heart of farming operations.

Elon Musk expressed optimism about the collaboration, highlighting the benefits it will bring to farmers. He emphasized the importance of connectivity in enabling farmers to fully embrace the advancements in digital agriculture. About 30% of farmed acres in the US and a staggering 70% in Brazil currently lack sufficient internet access, restricting the potential for technological integration in agriculture.

Starlink's satellite internet service was chosen after John Deere tested various satellite options over eight months. Farmers who participated in the trials reported seamless connectivity, even in challenging terrains. Starlink antennas, designed for rugged and dusty conditions, will be installed on the tops of vehicle cabs, ensuring reliable connectivity regardless of location.

The move aligns with Starlink's mission to connect remote and underserved areas globally. The company has previously provided connectivity to Ukrainian troops and communities recovering from natural disasters. Major partnerships with industry leaders like John Deere are crucial for Starlink's expansion plans. Currently, the satellite company has nearly 5,300 satellites in orbit, with Elon Musk envisioning a constellation of 42,000 satellites, though this has raised concerns among astronomers.

The collaboration between John Deere and Starlink marks

a significant step toward revolutionizing connectivity in the agricultural sector. As these two industry giants combine forces, farmers in previously underserved areas are set to benefit from enhanced internet access, unlocking the full potential of digital agriculture technologies.

Source: www.tractornews.in

INDIA'S WHEAT OUTPUT MAY TOUCH NEW RECORD OF 114 MILLION TONNES IN 2023-24

Wheat production is expected to touch a new record of 114 million tonnes in the ongoing 2023-24 crop year on higher coverage and provided weather conditions remain normal, a top food ministry official said. The last leg of sowing of wheat, the main rabi (winter) crop, is underway and will continue till next week. Till last week, wheat was planted in 320.54 lakh hectares, as per the official data.

Wheat production stood at a record 110.55 million tonnes in the 2022-23 crop year (July-June), compared to 107.7 million tonnes achieved in the previous year.

"We expect that total area under cultivation of wheat will increase this year and God willingly if the climate is alright the production will be 114 million tonne that's what the agriculture ministry has indicated informally to us," Food Corporation of India (FCI) Chairman and Managing Director Ashok K Meena told.

Area sown to wheat crop is also showing an increase compared to the last year. There was a deficit of one per cent in some states but that will also be made up in the first week of January, he said.

"If that is the level of production, we are very



confident that we will be able to procure more than our requirement and also additional stocks needed for the Open Market Sale Scheme (OMSS) for next year," he noted.

When asked if the central nodal agency plans to step up procurement considering the opening wheat balance of 76 lakh tonnes to be on April 1, which is just enough to meet the buffer requirement, the FCI chief said: "We will try our best to provide minimum support price to all farmers. Because of the open market sale, the indications are prices have stabilised and are not higher than it was last year.

"Since the wheat MSP is higher by 7 per cent than the last year, we hope that

lot of farmers will be willing to give their produce to the FCI," Meena said.

Last year, the FCI's wheat procurement stood at 26.2 million tonnes, higher than the annual buffer requirement of 18.4 million tonnes.

This year's wheat crop will be ready for harvest from April onwards.

FCI is the central nodal agency that buys rice and wheat to ensure MSP to the farmers and distributes the same for free to 81 crore poor via ration shops. It also uses surplus grain via OMSS to boost domestic availability and check prices.

Source: www.economicstimes.indiatimes.com

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IMPACT OF POSTHARVEST HANDLING AND PROCESSING ON THE HUMAN HEALTH BENEFITS OF CITRUS FRUIT

– Bhimanagouda S Patil, Vikas Dadwal and Kotamballi N. Chidambara Murthy



The citrus fruit industry is currently in a growth phase; adopting advanced postharvest practices to protect the quality, nutrition, and safety of citrus fruits and processed citrus products could further enhance this growing industry. Various post-harvest methods and parameters have been tested for their influence on fruit and product quality. Degreening by ethylene treatment enhances peel colouration and visual appeal without compromising fruit taste or quality. Ethylene treatment may also preserve some bioactive compounds, thus contributing to more nutritious fruit. Post-harvest irradiation with ionizing radiation has been explored to safely eliminate pathogens, extend shelf life, and inhibit enzymes that promote ripening in citrus fruits. Also, for whole fruit, post-harvest storage conditions play a crucial role in maintaining fruit freshness, nutritional value, and aesthetic appeal, thus minimizing food waste, promoting the consumption of health-promoting bioactives, and ensuring the availability of bioactives and nutritional components from the fresh fruit. For citrus juice, common household processing techniques such as juicing affect different phytochemicals to various extents. For industrial methods, high-pressure processing has emerged as a valuable tool for preserving citrus juices, extending shelf life, maintaining nutritional quality by preserving the bioactive components, retaining the appearance, and maintaining the organoleptic qualities. Further research is needed to optimize these post-harvest treatments of citrus fruit towards developing more beneficial fruits.

Citrus fruit cultivation contributes significantly to the agricultural industry in India and has demonstrated steady expansion, marking its sixth year in a row of increasing market value. Mandarins became the most popular citrus fruit variety in 2023, with production exceeding six million metric tons. The widely grown sweet orange variety on the subcontinent, Mosambi, made a substantial contribution as well, with production of about 3.6 million metric tons. Citrus belongs to Rutaceae family, and cultivated citrus are known for their delicious taste, colour, aroma, and nutrients. In addition to essential nutrients, citrus fruits are rich in phenolics and bioflavonoids with potent antioxidant properties, which hold promise for preventing and managing several acute and chronic conditions (Dadwal and Gupta, 2023). Postharvest treatments preserve fruit quality and fruit bioactives and thus may help maintain growth in the citrus industry in the face of

variations in weather and lack of resources in some sectors. Careful selection of fruits, cleaning, preservation, and transport play significant roles in maintaining the overall texture, quality, and nutrition. Other treatments enhance or maintain fruit quality and marketability. These include conventional methods like degreening to produce a uniform peel colour that appeals to consumers. Newer techniques can also enhance the quality and shelf life of citrus fruit and juice. For example, post-harvest irradiation, aims to eliminate pathogens and extend the shelf life of citrus fruits. It reduces microbial contamination while maintaining nutritional quality by exposing the fruits to ionizing radiation. In addition to these techniques, managing temperature during storage is crucial to preserving the major citrus bioactives and overall quality of citrus fruits. Therefore, for acquiring citrus healthy bioactives, high-pressure processing (HPP) is used, as an innovative method, for preserving juices from citrus and other fruits sources

with no heat involved. It involves subjecting the juice to intense hydrostatic pressure, which kills off organisms responsible for spoilage while preserving the natural flavour and nutritional value. HPP is gaining popularity for maintaining citrus product safety and extending shelf life without the use of heat or chemical preservatives.

Understanding the effects of these various techniques on fruit and juice quality and the levels of specific health-promoting bioactive compounds will help producers provide high-quality, nutritious citrus products that are appealing to consumers for their taste and their health-promoting properties. Here, we explore the various post-harvest treatments and their effects on the diverse repertoire of citrus phytochemicals.

Effect of citrus post-harvest handling and processing on levels of bioactive compounds

Ethylene treatment for citrus degreening

Producers usually

determine the quality of early-season citrus fruit for consumption by ripening ratios, but some ripe fruit have green peels, which might mislead consumers about their ripeness. To address this, early-season ripe grapefruits are treated with ethylene, resulting in a uniform red-orange peel colouration. We observed that ethylene treatment of Star Ruby grapefruit improved fruit peel colour and appearance while having no effect on taste or quality. At 35 days of storage, ethylene-treated fruits had greater levels of nomilin and lower levels of deacetyl nomilinic acid glucoside. In another study, we stored Rio Red grapefruit (*Citrus paradisi* Macf) for 35 days under simulated market conditions and showed that flavonoids and β -carotene levels were higher in degreened fruits. In a similar study, 35 days after ethylene-based degreening, Rio Red grapefruit showed no significant change in carotenoids, limonoids, and flavonoids, whereas levels of the furanocoumarin bioactive 6',7'-dihydroxybergamottin

increased. We also investigated the effect of ethylene on the internal quality of citrus fruit and concluded that, whilst ethylene affects peel colour, it is most likely not involved in regulating internal ripening in citrus fruit and thus, maintained internal fruit quality. Together, these observations suggest that ethylene treatment has no negative effects on citrus fruit bioactives, while, improving the appearance of the fruit and thus making it more appealing to consumers.

Household processing

Citrus juices are often consumed fresh which is made by peeling and blending fruits, or by juicing the edible segments. Our previous studies showed that household processing techniques affect the levels of phytochemicals in citrus juices, with variation observed in naringin, naringenin, bergapten, and furocoumarins in grapefruit. In *Citrus aurantium* fruit, common household processing techniques such as squeezing manually or using mechanized devices did not decrease antioxidant activities. Similarly, another study demonstrated that minimal processing (slightly alteration in parameters such as the peeling, sorted, and packaging) did not affect the chemical composition and antioxidant activity of various citrus fruits, but prolonged storage did. The fruit segments exhibited a noteworthy rise in overall flavonoids, particularly hesperidin, whereas the flavonoid content in the juices decreased.

Studies have addressed whether household processing concentrates pesticides or other agrochemicals in the resulting juice. For example, in oranges (*Citrus sinensis*), pesticides with lower water solubility did not diffuse easily into the fruit juice from the pulp of the fruit. Here the processing factor (PF) was also evaluated that is the ratio between the pesticide residue level found in processed food and the pesticide residue level found in the raw agricultural commodity. Here, the processing factor (PF) was greater than 1 for the separation of the orange peel and less than 1 for the washing step in jam and fruit juice production. In a similar study, in mandarin fruits, washing and peeling removed cyenopyrafen (anacardic acid commonly employed to control mites in fruits and vegetables) residues but cooking and juicing concentrated them.

Overall, Household processing methods have been proved to be a viable means of reducing food waste by using different parts of fruits, including peels and pulp, to make products such as jams and sauces. This approach not only reduces waste but also allows consumers to tailor their food items to their personal preferences and nutritional requirements. It also provides a healthy and affordable option to enjoy fresh fruit without the extra preservatives and sweeteners found in store-bought products. However, more studies are required to precisely assess the levels of health-promoting phytochemicals and pesticides and thus clarify the risks and

benefits for the consumer.

High-pressure processing

High pressure processing (HPP) increases the shelf life of citrus juices, preserves nutrients and bioactive components, and helps retain the natural taste and texture. At a certain level of pressure a decrease in the pathogens was observed, making fruits safer for consumption. Previously, we examined grapefruit juice that had been subjected to HPP and thermal processing (TP) and found different levels of bioactive components.

Interestingly, the HPP treatment maintained better phytochemical levels in grapefruit juice held at 4°C, compared to the TP treatment. Furthermore, the HPP treatment preserved the citrus juice's colour, resulting in an appealing product, even after storage. Another study found that HPP at 350–400 MPa increased flavanone extraction, possibly due to structural changes to in the cell walls of juice sacs. However, it does not appear that these treatments affected antioxidant activity.

Similarly, HPP of whole peeled oranges did not change the bioactive compound profiles in Navel and Cara Cara sweet orange juices, but it did increase the concentration of carotenoids, flavonoids, vitamin C, and antioxidant activity. The extent of this increase depended on the type of bioactive compound, orange cultivar, and HPP conditions. Our research suggests that HPP significantly affects citrus juice, efforts from industries and technological developments could help prevent the loss of essential bioactives.

Post-harvest irradiation

Irradiation uses ionizing radiation to kill pathogens, extend shelf life, and hinder the activity of ripening enzymes. Without chemical treatment, it effectively prevents microbiological contamination and insect infestation. We investigated the effects of harvesting time, storage, and irradiation on functional components and quality of early and late season grapefruit (*Citrus paradisi* cv. Rio Red). We did not observe a significant effect on the quality of late-season grapefruit when exposed to higher doses of radiation (400 and 700 Gy) and stored for 35 days, but early season grapefruit quality was negatively affected. In another study, bioactive compounds were analysed after postharvest irradiation of Rio Red grapefruit. In comparison to freeze-dried controls, irradiated freeze dried pulp had 15% less limonin and 47% less nomilin. However, no statistically significant variations in obacunone (one of the efficient bioactive triterpenoid) levels were found between the irradiated and control fruits.

In follow-up research, we evaluated the effects of electron-beam irradiation on the bioactive compounds of grapefruits (*Citrus paradisi* Macf.). Initially, we found that increasing the e-beam dosage resulted in a decrease in lycopene levels but an increase in β -carotene levels. Furthermore, dihydroxybergamottin levels decreased but bergamottin level remained stable. It is

worth mentioning that these bioactives have health benefits that we have investigated in our in vitro and in vivo research. Similarly, the physicochemical and sensory properties of two Korean citrus fruits, Jinjiyang (hybrid of Citrus unshiu Marc, C. sinensis Osbeck, and C. unshiu) and Chunggyun (hybrid of C. unshiu Marc. and C. sinensis Osbeck), were studied after gamma irradiation. Many bioactives (such as vitamin C and hesperidin), and sensory properties were unaffected by 1 kGy of gamma radiation, however it did produce alterations in flavonoids such as narirutin.

UV-B irradiation has been also used to improve the postharvest quality of stored limes (Citrus latifolia Tan.) and the treatment effectively prevented chlorophyll degradation by limiting the activity of chlorophyll-degrading enzyme and minimizing quality changes in mature green limes under storage conditions. Overall, new advancements in postharvest irradiation is likely to improve shelf-life without significantly altering health-promoting bioactive compounds.

Post-harvest storage

Proper fruit storage conditions can extend the shelf life of fruits by retaining their freshness and preventing spoilage. Proper storage conditions slow down ripening, limit microbial proliferation, and prevent physical damage for nutritional value, taste, and aesthetic appeal. Furthermore, fruit storage can reduce food waste and enhance the long-term availability of fresh fruits. In a previous study, we investigated concentrations of bioactives in Rio Red grapefruit cultivated under organic and conventional production methods after storage at various temperatures. Harvested grapefruits were stored at 23°C or 9°C for 4 weeks and analysed weekly for vitamin C, limonoids, and carotenoids. At room temperature, vitamin C degradation during storage ranged from 0.5% to 7% in organically produced grapefruits and from 3% to 18% for conventional grapefruits. In another study, we observed no significant differences in lycopene, narirutin, poncirin, furocoumarins, or radical scavenging activity among grapefruits after a 12-week storage period at three temperatures. After 12 weeks of storage, limonin levels were found to be significantly higher in conditioning treated fruits, while nomilin levels were significantly higher in fruits stored at 11°C. Conversely, fruits stored at 50°C exhibited lower levels of naringin, neohesperidin, and didymin.

We also investigated how refrigeration temperatures affect Meyer lemons (Citrus meyeri Tan.) and concluded that preserving the fruits at 10°C for a maximum of four weeks efficiently preserves phytochemical levels. In addition, understanding the combined effects of storage and other postharvest treatments remain important. For example, we examined the changes in citrus phytochemicals at simulated market storage conditions

(10°C for 36 d and additional 20 d at 20°C) after gamma irradiation. All storage conditions produced an increase in the D-limonene and myrcene content, and a higher level of narirutin was detected in the fruits exposed to 300 Gy radiations.

These studies underscore the importance of storage and its impact on citrus fruit bioactives. However, the effects of storage conditions on specific types of citrus and the repertoire of bioactives in those fruits are not well understood. Moreover, the differences between different types of citrus and the complex repertoire of bioactives in each type make it very difficult to determine the storage conditions that will preserve all major bioactives in most types of citrus fruit.

Impact of post-harvest and processing treatments on biological activities related to human health

Citrus bioactives have a variety of biological activities that can improve human health. For example, nomilin showed anticancer and anti-proliferative activity in our previous study. Carotenoids, limonoids, and flavonoids have potential anti-cancer properties. Citrus fruits also have high antioxidant capacity and these antioxidants efficiently neutralize reactive oxygen species. Therefore, preserving these bioactive compounds by using proper postharvest treatments remains an important topic for study. In addition to preserving bioactives, post-harvest treatments can enhance food safety and decrease spoilage by killing microbes and insect pests. Irradiation is a somewhat controversial topic for food safety, as it kills pathogens and increases overall shelf life of citrus fruits, but may alter the levels of bioactives. Storage conditions play a key role in preserving bioactives.

Although much research has examined the effects on whole citrus fruit, it is important to consider processed fruit products. Fruit juices are easily available and consumed worldwide. Studies have shown that citrus juices may have anti-inflammatory and protective effects, which could potentially reduce the risk of developing type 2 diabetes. Among fruit and vegetable juices, citrus juices have been the subject of the most research, likely due to their popularity in Western cultures, with orange juice being the most widely consumed juice globally. The flavonoid content of many brands of citrus juice available in the US was evaluated in a study, and no correlation was observed in between the amount of flavonoids (mg) and the cost (US dollars) per volume of orange and grapefruit juice. Significant variations in the concentrations of key flavanone glucosides were found when comparing different brands and within each brand. Therefore, the positive health effects from citrus juices may vary depending on the brand of juice consumed.

Citrus post-harvest procedures protect fruit quality, boost market competitiveness, extend shelf life, and reduce food waste. To serve farmers

and customers, the citrus industry in India needs to develop infrastructure, implement modern sorting and grading, manage the cold chain, build processing facilities, implement quality control, link producers with markets, train producers and industry workers, and develop sustainability practices.

Acknowledgement:

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FERTILIZER SOP TO FALL TO RS. 1.8 TN IN FY24

The government's fertilizer subsidy bill in FY24 is expected to fall 20-24% from the year before to R.1.7-1.8 trillion because of lower international prices and smaller urea imports, said chemicals and fertilizer minister Mansukh Mandaviya.

In FY23, the Centre spent Rs.2.25 trillion on fertilizer subsidies, as per revised estimates. The budgeted estimates for the ongoing fiscal year is Rs.1.75 trillion. "The subsidy bill is estimated to be lower this year at around Rs.1.7-1.8 trillion because of the fall in global prices. We have not increased retail prices to reduce subsidy," Mandaviya said.

"When the global rates skyrocketed in the last financial year, the government increased subsidy and kept the retail prices of urea, diammonium phosphate and other fertilizers to protect farmers' interest," Mandaviya added.

On the ongoing Red Sea tension, Mandaviya said that India has an adequate stock of fertilizers to meet requirements for the summer.

"The Red Sea crisis will not have an impact on Indian trade, including fertilizer imports as the government is intervening and the Indian Navy is providing security

to get vessels in the country safely. Indian fertilizer cargoes are now coming via the Cape of Good Hope that has raised freight costs significantly."

"There will be no shortage of fertilizers next Kharif season as we reserve stocks for one season in advance to avoid shortage," Mandaviya said.

Urea imports are at 4-5 million tonnes this fiscal, lower than 7.5 mt imported in the previous year, helped by higher domestic production and increased use of nano-liquid urea.

"To date, we have 7 million tonnes of urea, 1 mt of muriate of potash, 2 mt of diammonium phosphate, 2 mt of single superphosphate and 4 mt of NPK (nitrogen, phosphorus, and potassium) fertilizers," Mandaviya said.

The geopolitical tension around the Bab-el-Mandeb Strait, a crucial shipping route connecting the Red Sea and the Mediterranean Sea to the Indian Ocean, has escalated due to recent attacks by Yemen-based Houthis militants. This has disrupted trade on one of the world's most important shipping routes, adding 15-20 days to transit times as ships take the safer route around southern Africa.

According to exporters, freight rates have skyrocketed

by up to 600% because of the Red Sea crisis which will hurt world trade.

Mandaviya highlighted that the government has taken several steps since 2014 to boost domestic production of fertilisers and reduce import dependence. He said four urea plants have already been revived and the fifth one will also start production soon.

The minister said the Centre is also promoting alternate fertilisers line – nano liquid urea and nano liquid DAP. Besides, it has launched a scheme to incentivise states that curb the use of chemical fertilisers. The country has entered into long-term supply agreements with global suppliers for assured imports of fertilisers and its raw materials at pre-determined prices, he added.

On the efficacy of nano urea and DAP, Mandaviya said that there is no issue with nano fertilisers. Farmers need to be trained to utilise it properly to increase the productivity of crops.

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TIME FOR PUNJAB TO UNVEIL ITS NEW AGRICULTURE POLICY

— Amarjit Bhullar



The then state agriculture minister opined that new agricultural policy will be drafted keeping in mind Punjab's natural resources such as ground water and soil health, improving the economic condition of farmers, and that, special attention will be given to aspects such as value addition to the agricultural produce, export, and agricultural diversification.

After assuming power in Punjab, the Aam Aadmi Party (AAP) government constituted an 11-member expert committee on January 17 last year to draft the state agricultural policy. The panel's initial deadline for the submission of policy draft was March 31. The then state agriculture minister opined that new agricultural policy will be drafted keeping in mind Punjab's natural resources such as ground water and soil health, improving the economic condition of farmers, and that, special attention will be given to aspects such as value addition to the agricultural produce, export, and agricultural diversification.

The committee got several extensions and still the report is not in the public domain. Interestingly, during this intervening period, in early June 2023, the government also engaged Boston Consulting Group (BCG) as a consultant, for six months, to guide the government and helping the state in its efforts for crop diversification and management of crop residue. The government also reportedly agreed to a hefty consultancy fee. Based on the BCG plan, the government was to take a call on whether to retain the group as consultant in the future, or not. Six months have passed since but there is no word on what BCG has proposed to diversify agriculture.

Punjab agriculture is facing an ongoing and deepening crisis since last four decades. Earlier too, several expert committees were constituted and expert groups formed to precisely pinpoint the problems/issues and suggesting the policy measures to ameliorate them.

Noticeable among them were the Johl Committees in 1986 and 2002.

Several panels formed but no tangible result

In 2013, another agricultural diversification action plan was brought by the Punjab government with emphasised on shifting 12 lakh hectares of area from water-guzzling paddy to other crops with a budget of Rs.7,500 crores. This policy counted on the fictional hope of financial support from the Union government for achieving the desired results in five years but nothing tangible was done to achieve the stipulated objectives. Yet two other agricultural policy drafts were prepared in 2013 and 2017.

The committees/reports suggested several sets of actions, but the irony is that the successive governments predominantly disregarded almost all the reports submitted by these committees, preferred status quo, indulged in competitive populism and with the result of a crisis turning into a disaster. The suicides by the farmers and the agricultural labourer, indebtedness, youth turning away from agriculture and overall, a persisting distress in the rural areas testify all this.

Lack of political will

The experience also shows that almost all the earlier reports/policy drafts, prepared by various committees, had a shelf life of few months. The reports were usually received with enthusiasm, remained drafts (not final policy documents), became headlines in the media, talked about at various platforms and then forwarded to departments concerned.

But action and monitoring plans were never put into place because of the lack of political will. The politics of vote bank and political convenience and the bureaucratic indifference preferred either the status quo, or it took years to initiate a small step. The imposition of ban on paddy transplanted before June 10 was recommended by experts in mid-eighties but the law, 'Punjab Preservation of Sub-Soil Water Act-2009', banning

paddy transplanted before June 10, was passed in 2009.

Rationalising the electricity subsidy is another issue that emerged several times but was abandoned as it seemed politically inconvenient. Many other recommendations were also overlooked time and again.

The architects of these reports, though they were well respected renowned scientists, failed to move the government machinery to implement their suggestions, often vented their frustration in private talks but shirked away from posing any intellectually credible challenge to the power for its inaction.

The AAP, before coming to power, had been critical of the previous governments for their indifference and inaction, and promised aggressive approach allowing agricultural sector to regain the past magnificence. Agricultural policy, in fact, is a set of principles, guidelines, and rules framed by the government to guide the decision making and draw a road map for the future of agriculture. The policy appraises the ongoing challenges, learns from the past mistakes and crafts a pragmatic approach towards solving the persisting problems, paving the way for the growth and sustainability of agriculture.

Farm bodies frustrated

The long wait for the new policy, that will be showcase the present government's approach towards solving the problems of agriculture, has frustrated the farmers unions. Few of them have asked the government to make the policy public by January 21, 2024. They have alerted on their plan to launch an agitation if new policy is not made public. The next Lok Sabha elections are round the corner and before that the Election Commission of India will impose the 'code of conduct' that may prohibit the governments to initiate new measures till the electoral process is over. This will further delay the implementation of the recommendations enshrined in the policy document.

This time, it was expected that the AAP government will deviate from the tradition, impress upon the committee to finalise the report in a time-bound manner, study the report in detail, and make a list of accepted recommendations and draw the roadmap to implement them at once or in a phased manner. But the long wait is wearisome. ■

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Source: www.hindustantimes.com

CHINA, US RESTART AGRICULTURAL COOPERATION MECHANISM



China's Minister of Agriculture and Rural Affairs Tang Renjian (L) shakes hands with U.S. Secretary of Agriculture Tom Vilsack in Washington, D.C., the U.S., January 18, 2024, /China's Ministry of Agriculture and Rural Affairs

China and the US have restarted their agricultural cooperation mechanism as officials from both countries met in Washington.

At the seventh meeting of the China-US Agricultural Cooperation Joint Committee, Chinese Agriculture Minister Tang Renjian and US Secretary of Agriculture Tom Vilsack reiterated the importance of the committee in facilitating exchanges between the agricultural departments of the two countries.

Tang said that China stands ready to work with the US to further promote bilateral agricultural cooperation and stabilize food and agricultural development expectations.

Vilsack said the US is willing to work with China to create a favorable atmosphere for the healthy development of US-China agricultural relations.

Chinese FM meets with Brazilian president

Chinese Foreign Minister Wang Yi has met with Brazilian President Luiz Inacio Lula da Silva in Fortaleza.

Wang emphasized China's consistent prioritization of China-Brazil relations and its firm support for Brazil's development.

The senior diplomat highlighted joint efforts in aligning the Belt and Road Initiative with Brazil's own development plans, while stressing the need for further enhancing unity, mutual trust, and strategic cooperation.

Lula said Brazil supports the one-China principle and expects to elevate bilateral ties to new heights.

During his tour, Wang Yi has also met with Brazil's vice

president, presidential advisor and the country's foreign minister.

WTO chief: Chinese economy helps boost global growth

The chief of the World Trade Organization says China plays a key role in boosting global economic growth.

Ngozi Okonjo-Iweala made the comment on the sidelines of the World Economic Forum in Davos.

She said since joining the WTO more than 20 years ago, China has contributed an average of nearly 30 percent to the world's annual economic growth.

The official noted that it's in the interest of everyone for the Chinese economy to perform well and believed there's plenty of room for its continued growth.

According to the National Bureau of Statistics, China's GDP posted a 5.2 percent year-on-year increase in 2023, marking a strong post-COVID rebound.

Israeli strike on Damascus kills 4 Iranian Revolutionary Guards

Iran's Islamic Revolutionary Guard Corps says four of its members have died in an Israeli air strike in the Syrian capital.

Syrian state media said the attack was targeted at a residential building in the southwest of central Damascus. Iran has called it a "terrorist" attack.

There was no immediate comment from Israel.

Chinese aid arrives in Gaza

Trucks carrying humanitarian assistance from China have successfully reached the Palestinian Red

Crescent Society in Gaza.

An official from the Red Crescent Society has thanked China and said more aid should be allowed to enter the territory.

Meantime, the United Nations has warned of a water crisis in Gaza as the desalination plants are running at just seven percent of the normal capacity amid the ongoing conflict.

New China-Europe freight train route links Xi'an, Poti

The Chinese city of Xi'an has opened a new freight train route linking the port town of Poti in Georgia.

This is the 18th major rail link operated by the China-Europe freight train (Xi'an) service.

Stretching over 7,800 km, the entire journey takes around 15 days by passing through Kazakhstan and Azerbaijan.

Xi'an handled over 5,300 China-Europe freight trains last year, up 15.3 percent.

Since the freight rail service was first launched in 2013, the city has operated over 21,400 train trips, reaching destinations in 45 countries and regions.

Cold wave to sweep across China

China is bracing for icy conditions as the first cold snap of the year is taking hold.

The National Meteorological Center has forecast gales and intense snowfall across many parts of the country, with temperature drops of up to 14 degrees Celsius.

Heavy snow and blizzards are also expected to hit a large part of south China.

Source: www.radio.cgtn.com

REDEFINING AGRICULTURAL INCENTIVES IN TELANGANA – IMPRI IMPACT AND POLICY RESEARCH INSTITUTE

— A Amarendar Reddy and Tulsi Lingareddy



Amarendar Reddy



Tulsi Lingareddy

India's youngest State, Telangana, has achieved remarkable growth in agriculture with 45 per cent expansion in gross area

irrigated since its formation in 2014. However, much of the irrigated area is under rice, which accounts for about 70 per cent of the gross

irrigated areas, whereas pulses and oilseeds account for only about 2 per cent and 4 per cent, respectively, as per the latest Land Use Statistics data published by the Department of Agriculture and Cooperation, Ministry of Agriculture.

Consequently, rice output nearly doubled to about 10.2 million tonnes in 2020-21 from around 5.8 million tonnes in 2013-14, and Telangana stood as the fourth largest producer in the country.

At the same time,





per cent in Telangana, and not rice. This is basically because of lower cost of cultivation. These lower costs may offset the yield advantage in other crops.

Among major crops produced in Telangana, sesamum was followed by chana, at 120 per cent return, maize 50 per cent, rice 46 per cent, soyabean 32 per cent, tur 23 per cent, groundnut 21 per cent, and cotton at only 8 per cent during the triennium ending 2021-22.

Thus, it is more profitable for farmers in Telangana to grow sesamum and chana compared to rice, but the farmers prefer to produce rice mainly because of support policies and procurement.

Moreover, the lower returns from crops like tur compared to rice could be on account of their lower per hectare yields, as they are largely cultivated under rain-fed conditions, as evident from the share of irrigated area at 4.5 per cent for tur against 100 per cent for rice. Hence, diversification of fertile irrigated area to crops like soyabean and tur during kharif season, and to chana and groundnut during rabi season, can potentially increase their yields and profitability, thereby help in increasing farmers' incomes.

Thus, there is an urgent need for the Telangana government to reorient support policies, incentives and schemes like Direct Benefit Transfer for diversifying agricultural production from monoculture of rice to pulses,

oilseeds and nutri-cereals, while ensuring judicious use of expanded irrigation potential and reducing emissions.

Such measures will also help in long-term sustainability of agriculture production in the State with efficient use of natural resources, apart from contributing to nutritional security by increasing production of pulses, nutri-cereals and oilseeds.

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The article was first published in BusinessLine as Telangana must look beyond rice cultivation on January 04, 2024.

Disclaimer: All views expressed in the article belong solely to the author and not necessarily to the organization.

Source: www.impriindia.com

production of coarse cereals declined from 28 lakh tonnes to 19 lakh tonnes, while that of oilseeds declined from about 7.2 lakh tonnes to 5.8 lakh tonnes. In this context, it is pertinent to note that rice procurement from Telangana has increased significantly from about 43 lakh tonnes in 2013-14 to about 52 lakh tonnes in 2018-19 and to about 95 lakh tonnes in 2020-21, according to Food Corporation of India (FCI) data. Thus, the apparent shift in cultivation towards monoculture of rice is largely driven by the assured procurement, policy incentives like free electricity and direct transfer of benefit (Rythu Bandhu).

Such monoculture is not only leading to a shortage of oilseeds and pulses but also causing long-lasting adverse impacts on the

environment, including exhaustion of soil fertility and groundwater resources, increase in greenhouse gas (GHG) emissions, pollution from excessive use of chemical fertilizers, etc. To produce one kilogram (kg) of rice requires 3,000-5,000 litres of water, whereas that of pulses and oilseeds require only about 900 litres. Further, globally, rice cultivation is responsible for 9-11 per cent of total GHG emissions from agriculture, according to Intergovernmental Panel on Climate Change (IPCC).

In order to safeguard the country's food security and protect the livelihoods of farmers, India did not sign the Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action at the Conference of Parties (COP) 28 held during

November 30 to December 12, 2023, in the UAE.

However, it is imperative to reduce the emissions intensity of the country's GDP by 45 per cent from the 2005 level by 2030, as per the updated Nationally Determined Contributions (NDCs) submitted in August 2022. Hence, there is an urgent need to reorient policy measures that can potentially help in reducing emissions in agriculture sector along with other sectors in the country as well as in the State with appropriate incentive measures and mechanisms.

Not the most profitable According to the Price Policy Reports of the Commission for Agricultural Costs and Prices (CACP) released in 2023, the average return on investment was the highest for sesamum, at 198



GUJARAT DAIRY SECTOR BOOMING AS 3.6 MN FARMERS GET RS. 200 CR: OFFICIALS

Gujarat's focus on animal husbandry has contributed significantly to the prosperity of the state's people as 3.6 million milk producers collectively receive Rs 200 crore daily from the Gujarat Cooperative Milk Marketing Federation (GCMMF), officials said. The dairy sector in the state has grown to Rs 1 trillion, they said.

The upcoming 10th edition of the Vibrant Gujarat Global Summit, to be held in Gandhinagar between January 10 and 12, will provide a platform for the government to showcase the state's exponential growth in agriculture, horticulture and animal husbandry, Chief Minister Bhupendra Patel has said.

As per a statement issued by the government, the agriculture, horticulture and animal husbandry sectors in the state are experiencing significant growth through a combination of natural farming and advanced technologies, contributing to the circular economy of Gujarat and advancing its global reputation in the dairy sector.

"The upcoming Vibrant Gujarat Summit 2024 will showcase the state's exponential growth in agriculture, horticulture and animal husbandry, thanks to a combination of natural farming practices and cutting-edge technology. This holistic approach is not only boosting the circular economy but also elevating the state's global standing in the dairy sector," CM Patel said at a function held recently.

The dairy industry in Gujarat has exceeded Rs 1 trillion, with Rs 200 crore being paid daily to 3.6 million milk producers through the GCMMF, a government release said.

"The globally recognised Amul brand, under which the GCMMF markets milk and dairy products, stands as a testament to the hard work of millions of dairy farmers," it said.

Amul's organised dairy procurement from Gujarat has grown from 3 million litres to 27 million litres in 27 years, a

nine-fold growth, showing the leap the state's rural economy has taken over the years, said R S Sodhi, president of the Indian Dairy Association and former managing director of GCMMF.

"Now imagine the entire country's milk production increased by three times, but Gujarat's dairy farmers saw a nine-fold increase. Nearly, Rs 160 crore is getting added to Gujarat's rural economy for dairy farmers," Sodhi said.

Dairy farmers say that the Vibrant Gujarat summit has played a significant role in boosting the sector and adding to their prosperity.

Milk producer Sobhraj Rabari, from Napad Vanto village in Anand district, said his family started (dairy business) with two cows and gradually increased to 35 now.

"The Vibrant Gujarat summit, started by Prime Minister Narendra Modi, has helped us a lot...I supply 2,000 litres of milk a month. My income is Rs 1.10 lakh. We are getting good prices for the milk. We are getting good support from the government," he said.

Jayesh Patel, a dairy farmer from Zarola village in Anand's Borsad taluka, said despite having a small-scale animal husbandry operation on a 1.5-acre plot in his family, he expanded the operation by adopting a scientific approach, advanced education and business acumen.


"I currently maintain a herd of 10 to 12 cows. I ensure they receive regular and timely feed, and I have organised their feeding schedules to ensure they produce the specified quantity of milk each day," he said.

He has also adopted natural farming by using cow dung and urine as fertilisers and pesticides.

As Gujarat prepares for the upcoming Vibrant Summit 2024, Jayesh Patel said he has never missed a single summit.


"This summit is important to me. Many people like me attend this summit and gain numerous benefits. I have consistently leveraged the advantages of the Vibrant Gujarat summit," he said. ■

Source: www.business-standard.com




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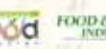
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