

# ACFI NEWSLETTER

MARCH 2023

## Institute to show right way to spray chemicals using drones

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**Pune:** ICAR-Directorate of Onion & Garlic Research (DOGR), Rajgurunagar, will soon demonstrate the correct quantity and method of spraying of chemicals on onion and garlic farms in the state using drones. The DOGR has received two drones from the central government for this purpose.

V Mahajan, director, DOGR, said that the objective is to first standardise the spraying process at its research facility by calibrating the optimum height, drone speed, concentration of pesticide-insecticide etc for various types of onion and garlic crops and then demonstrate it to farmers.

Mahajan said that since this is a new technology, there is a need to standardise the process. "Every crop is different. For example, a sugar cane crop is tall, while an onion crop reaches a height



Pic for representational purposes

The machines will help in onion and garlic farms in the state

of about 2.5ft. Similarly, the chemicals used to protect them from various types of diseases are different. Once we have standardised the process, we will be able to teach growers accordingly," he said.

Rajiv Kale, a scientist at ICAR-DOGR who is in charge of the project, said that from the traditional knapsack sprayer to the tractor-mounted sprayers, spraying chemicals on fields has changed a lot and drones will

revolutionise the agricultural sector, saving labour, money and time.

"There are many onion growing belts in the state in Nashik, Pune, Ahmednagar etc. We will be demonstrating the use of drone to spray on 250 hectares of farmland. So, two drones will cover an area of 500 hectares during demonstrations. This will be done free of cost so that farmers understand the process and use it in their fields," said Kale.



# PepsiCo, Cropin launch crop intelligence model for potato

**Our Bureau**  
Mangaluru

PepsiCo India, through its brand 'Lay's', has announced a crop and plot-level predictive intelligence model.

A media statement said this is aimed at helping farmers maximise potato yields coupled with quality via functional dashboards on user-friendly mobile apps.

Launched in collaboration with Cropin, an agri-tech company, this initiative is a part of PepsiCo's 'precision agriculture' model for India and is being implemented as a pilot project in demo farms at Gujarat and Madhya Pradesh.

It said potato yield losses caused through the blight crop disease can go up to 80 per cent, if not forecasted early.

**The system can generate a forecast up to 10 days in advance which can assist farmers in identifying different crop stages, and close monitoring of crop health**

Significant yield loss caused due to ground frost is another serious issue for potato farmers especially in the northern parts of the country. This initiative of PepsiCo has the potential to address these challenges by using satellite imagery correlated with remote sensing data to provide insights. The system can gen-

erate a forecast up to 10 days in advance which can assist farmers in identifying different crop stages, and close monitoring of crop health, including a disease warning system that relies on weather forecasts and historical data.

PepsiCo works directly and indirectly with over 27,000 farmers across 14 States, it said, adding, 100 per cent of the potatoes for 'Lay's' brand are sourced from farmers within the country. In its pilot stage, the necessary training and hand-holding to the farmers are being provided through field agronomists who are helping them understand the dashboard and leverage the insights. Currently, the model covers 62 farms — 51 in Gujarat and 11 in Madhya Pradesh — as a trial.

## Altered flowering season, hailstorm hit mango growers hard a third time

Jahnvi T. R.  
BENGALURU

While those who love mangoes wait an entire year to savour the king of fruits, the growers toil an entire year for the harvest. However, for three years now, weather conditions have wreaked havoc and brought down the yield to about 50% of its average quantity. This year, even though the season has not started, non-uniform flowering is already threatening the quality of the fruit.

The Hindu visited Srinivasapura taluk, in the heart of the major mango-growing district of the State, Kolar, and found that most mango trees had flowering problems. The hailstorm, which lashed the taluk between March 16 and 18, added to the problems as 90% of fruit in some fields were hit, making it unfit for consumption or even



N. Chinnappa Reddy, a farmer, showing damaged mango at Srinivasapura in Kolar district. BHAGYA PRAKASH K.

pulping and juicing.

**Flowering time**

"The flowering should happen in December, ideally. Then by the end of March, we start getting our full-sized fruit. This year, we saw flowering happening again in January, February and even in March. This leads to nutritional imbalance in the tree which ultimately results in the dropping of already formed fruits," explained Neelaturu Chinnappa Reddy, presi-

dent, Kolar District Mango Growers' Association.

The district of Kolar accounts for more than 60% of mangoes produced in the State. In Srinivasapura, mangoes are cultivated on close to 55,000 hectares of land. Prior to the unprecedented hailstorm, the yield here had come down to 30% and now, the farmers are only expecting 10-15% of their regular yield. "If it was an on year, we used to harvest around 10 lakh tonnes of fruit here, but this time, we



Mango crop damaged after heavy rain and hailstorm in Srinivasapura in Kolar district. BHAGYA PRAKASH K.

might only be able to get 2-3 tonnes of mangoes," Mr. Reddy added.

The farmers said that their countless complaints to the Horticulture Department and the Indian Institute of Horticul-

ture Research (IIHR) scientists have gone in vain. They said that all the fertilisers and pesticides suggested by the experts have made no difference on ground.

"Even in an average or-

chard, a farmer has to spend ₹1.5 lakh on one round of pesticides. We need to spray several such rounds. Mother nature has not been kind to us and we have been facing these flowering problems

for the last few years. Experts advice from their campuses but do not come to our farms. We need to take pictures and send them, and more often than not, pictures cannot convey the problems as they are," said Shivakumar. B., a former MNC employee who is now a mango cultivator.

Even though there was some blossom blight attack in the beginning, the farmers had still anticipated a good yield this year. Then came the flowering problem. The unexpected hailstorms came as the ultimate blow and shattered their hopes. "We had not heard of hailstorms during this season ever. It only comes once the monsoon sets in. From one malgoba tree I would get around half a tonne of fruits usually. But the hailstorm destroyed almost all the fruits," remarked Srinivas Reddy, another mango grower.

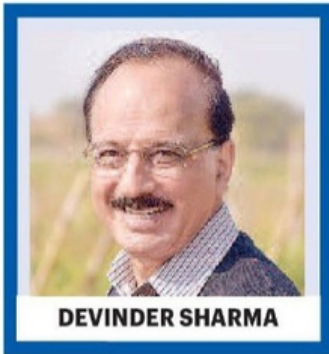
Officials of the Horticulture Department acknowledged that the problem has been there for a few years now and figuring out solutions has been tougher as natural factors are causing problems.

"I have instructed our Agriculture University scientists to visit the spot. Inspection is also taking place for providing compensation," said Rajender Kumar Kataria, Principal Secretary, Horticulture Department. He also said, "I have asked the Indian Council of Agricultural Research (ICAR) to help us out as they are studying similar problems in Uttar Pradesh where there are weather variations too. We are looking at permanent solutions for the flowering problems." Similar problems were also reported from other mango growing regions in the State including Chickballapur, Mandya and Ramnagara districts.



# Tech-driven agri practices pose a bigger threat

Farming communities in developing countries have set best precedents in fighting climate change



DEVINDER SHARMA

THIS is something that I sometimes wonder. If G-20 members have to do what the rich developed countries have been telling us to do, what is the way out for developing countries to chart a new pathway to emerge out of the climate crisis?

It was dismaying to read reports of the first day's happenings of the second Agricultural Deputies Meeting (ADM) of the Agricultural Working Group (AWG) under India's G-20 Presidency that began at Chandigarh on Wednesday.

I wasn't expecting the G-20 agricultural deputies to endorse the vision, howsoever questionable, that has time and again been spelled out by billionaires like Bill Gates and by technology-rich conglomerates.

Focusing on four thematic issues -- a) current challenge of food security and nutrition, b) sustainable agriculture with a climate smart approach, c) inclusive value chains and food systems and d) digitalisation for agriculture transformation are on the same lines as various other initiatives across the globe converge are at. Just the other day, Chandigarh-based 'The Tribune' reported that India had signed the controversial UAE-American led Agriculture Innovation Mission for Climate (AIM4C). Accordingly, the \$ eight billion initiative that India joined has 275 partners, including 42 governments. It also has PepsiCo and the meat producer JBS on rolls.

This follows the US President Joe Biden's programme to invest \$3.1 billion for climate-smart agriculture, under which the US Department of Agriculture gets a grant for 141 experimental projects. Although his Agriculture Sec-

retary Tom Vilsack calls it a 'transformational' new era for American agriculture, there are many others who question the misplaced reliance on sophisticated technology as the saviour. Tyler Lark from the University of Wisconsin-Madison has been reported as saying: "Agriculture is a huge contributor and has the potential to be a big part of the solution. The risk is that the potential carbon savings and greenhouse gas benefits are overstated."

When I look at the two abovementioned international initiatives to move towards environment-friendly agriculture and compare it with the food security challenges that the agriculture deputies of G-20 countries are coming up with, I don't see any formidable change being proposed in their understanding and a different but grounded perspective as well as approach. It is on the same flawed lines, thereby bringing out a severe drought that currently exists among bureaucrats.

With the first meeting that was held at Indore some weeks back also drowned in the same faulty projections, the second deputies meeting was expected to be opening up to innovative and progressive farmers and civil society representatives. But that didn't happen. This is essentially because bureaucrats continue to maintain a tight control.

Several studies have shown that as farming in the Green Revolution era got more industrialised, higher were the greenhouse gas emissions from agriculture. The non-profit Environment Working Group (EWG) estimates that if no drastic measures are taken, emissions from US agriculture will increase three times by 2050, increasing to 30 per cent, from the existing levels of 11 per cent.

I am amused when I see discussions around inclusive value chains and the food systems at a time when a spate of acquisitions and mergers have brought control and power in the hands of a few commodity giants. Cargill, the largest player, has already acquired 113 smaller companies and now controls 75 to 90 per cent of the global trade in grains.

A study by non-profit ETC has shown that over the years just four corporations control 60 per cent of the



agrochemical markets and just two companies have 40 per cent control over the seed markets. It will therefore be interesting to know how the G-20 expects to make the agricultural supply chain inclusive.

In one of my earlier columns, titled: "India should use G-20 Presidency to rebuild food security, agri narrative" (Bizz Buzz, Feb 17) I have explained at length the implications of enhanced digitalisation, artificial intelligence and climate smart agriculture. I also believe in technology, but to avoid the risk of being repetitive, the overt emphasis on technology as the saviour is not going to be helpful for the simple reason that technology is actually a major part of the problem. While a magical technological package is being proposed, and with billionaires financing a global campaign to build up a narrative as if technology has the solutions, in reality the technological giants see a huge profit here given the proprietary control it can yield.

Nevertheless, fighting climate change is a two-way process. A lot of learning has to come from farming communities in the developing countries, which have, over the centuries, demonstrated the skills to live with nature. Instead of dismissing this as a sign of backwardness or of failure in applying the principles of modern scientific and technological prowess, much headway can be made if we appreciate, recognise and learn from the communities that had lived in tune with environment. Let's not be ashamed to learn from the communities in the developing world.

This reminds me of a dinner meeting I had several years back with the then British Minister for International Affairs, Hillary Benn. I was invited to a

London meeting, which the Minister was having with leaders of the civil society. These stakeholders were discussing what initiatives Britain could undertake under DFID to promote sustainable farming practices in India. While everyone came up with a lot of suggestions, and when asked if I could also list a few expectations that Indian farmers would have from DFID, my answer was very simple. "I don't understand how is Britain qualified to suggest sustainable farming practices to India when its own agriculture is devastated. With hardly one per cent population remaining in agriculture, and that too faced with huge environmental consequences, my suggestion would be to instead to learn from the Indian farmers," I replied in a matter-of-fact tone.

Let there be a two-way channel for building sustainable agriculture practices. This of course was not acceptable to most of the civil society leaders present. While I acknowledge that what I said did hit the white supremacy (as I could feel), what surprises me is that the G-20 agriculture deputies too feel obligated to promote the agenda of the developed countries. They can instead propose and build up on the inherent strengths of the developing countries, where communities over the centuries have lived in peaceful coexistence with nature and environment.

India can, and should, take a lead in rewriting the climate agenda for sustainable agriculture. It can't leave it to a team of agriculture deputies.

*(The author is a noted food policy analyst and an expert on issues related to the agriculture sector. He writes on food, agriculture and hunger)*



# Punjab govt sets up panel to look at alternative crops to paddy

Punjab Chief Minister Bhagwant Mann on Thursday said he has formed a committee under the chief secretary to look at alternative crops that require less water compared to paddy. Mann said sowing of the paddy crop over the years has led to several problems including depletion of underground water table and issues related to stubble burning. He said he has formed a committee under the chief secretary which will meet farmers in different villages and see which crops consume less water and bring more income to farmers as a replacement of paddy. The committee will submit the report to him, he said in a video message. The CM said his government was taking steps to promote basmati, cotton, moong and pulses. He said his government wanted to increase the area under the cotton crop. The CM said from April 1, canal water will be made available for irrigating cotton crop up to tail ends. He said 33 per cent subsidy was being given on cotton seeds which are certified by the Punjab Agricultural University (PAU).



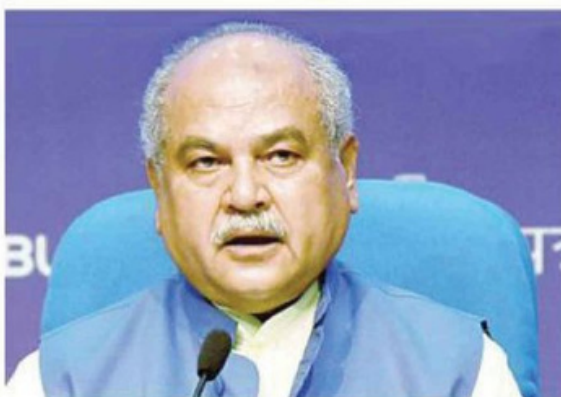
# Agriculture minister launches 'DigiClaim' for claim disbursement through National Crop Insurance Portal

STATESMAN NEWS SERVICE  
NEW DELHI, 23 MARCH

Union Agriculture Minister Narendra Singh Tomar today launched a National Crop Insurance Portal's digitised claim settlement module, called DigiClaim, under the ambit of the Pradhan Mantri Fasal Bima Yojana (PMFBY).

With the launch of the module, claims will be disbursed electronically, which will benefit the respective farmers of six states. Now, the automated claim settlement process will be an ongoing activity to ease all insured farmers' lives and provide them with a sustainable financial flow and support.

Speaking on the occasion, Tomar said it was a matter of pride for the Agriculture Ministry to have taken a revolutionary step in ensuring that farmers can receive claim amounts digitally in a time-



bound and automated manner, thereby making them self-reliant and strong.

With the launch of a DigiClaim Module, insurance claims totaling Rs 1260.35 crores have been disbursed on 23 March 2023 to insured farmers in the states of Rajasthan, Uttar Pradesh, Himachal Pradesh, Chhattis-

garh, Uttarakhand and Haryana with the click of a button. The process will continue as and when the claims are released.

Tomar also mentioned that to date Rs 1.32 lakh crore claim amount has been disbursed to the insured farmers under PMFBY. He also took special note of the 'Meri

Policy, Mere Haath' ongoing campaign and observed that the campaign has been monumental in enhancing the awareness around PMFBY at the grassroot level.

The minister said the government was closely working with all exited states from the scheme and had had discussions with their senior officials in which Andhra Pradesh and Punjab are making a comeback to the scheme, which shows a shining example of corporate federalism. The governments of Telangana, Gujarat, Bihar, West Bengal and Jharkhand have also been approached to rejoin PMFBY and several discussions have been under way. Out of these states, Telangana and Jharkhand have indicated their willingness to come back under PMFBY.

In the current system, there have been several instances of insured farmers' claims

being delayed due to a variety of factors. Taking cognizance of farmers' welfare and expediting the claim disbursement process of valid crop loss claims, the Ministry of Agriculture and Farmer's Welfare has come up with the DigiClaim Module. With this, now farmers' claims will be processed directly to their respective bank accounts in a transparent and accountable manner. This technology has been enabled through the integration of the National Crop Insurance Portal (NCIP) and the Public Finance Management System (PFMS).

This would directly impact the claim reversal ratio, which is expected to go down with DigiClaim. Another noteworthy feature of this digital advancement is that farmers would be able to track the claim settlement process on their mobile phones in real time and avail the scheme's benefits.



# Govt plans to double down on rice, millet stocking amid heat threat to wheat yield

Zia Haq

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**NEW DELHI:** The central government, aware of the high chances of heatwaves over food-bowl states and their potential impact on the wheat harvest, will get by with enough stock of rice and millets to meet the country's food security needs, according to procurement plans put in place.

The government aims to procure 34.1 million tonne of wheat at federally determined prices. Even if rising temperatures do impact wheat output, as they did last year, estimates are available on the extent to which yields could drop, an official said, seeking anonymity.



**The Centre aims to procure 34.1 million tonne of wheat at federally determined prices.**

To tide over any shortage, the government has doubled down on paddy purchases and has asked states that grow millets to draw up elaborate networks to buy the hardy cereals. Millets have been at the centre of India's

campaign this year to promote their consumption globally.

Until March 1, the government has bought 71.3 million tonne of paddy, paying farmers ₹1.4 lakh crore in support prices, according to official data.

Authorities have targeted to purchase 76.6 million tonne of summer-sown paddy (equivalent to 51.4 million tonne of rice). Of winter-sown paddy, they plan to buy 15.8 million tonne (equivalent to 10.6 million tonne of rice). Together, the government's paddy stockpile is expected to be 90 million tonne, official projections show.

A heatwave will surely cut wheat yields but the government's food-management plan

hinges on careful allocation of rice, wheat and even millets to meet the country's food security needs, which includes free grains for 800 million people, the official said.

Last year, state purchases of wheat were abnormally low at 18 million tonnes, down nearly 58% from the previous year after a disastrous spell of heatwave cut output by 2.5% to 106 million tonnes.

The country is watching out for extreme weather as both the India Meteorological Department and private forecasters have predicted high chances of a heatwaves in March through May that could roil the farm economy amid rising prices of staples such as rice and wheat.

# India to gain from EU proposal to hike residue cap on rice fungicide

**SOME RELIEF.** European Food Safety Authority moots raising maximum residue level on tricyclazole to 0.09 mg/kg

Subramani Ra Mancombu  
Chennai

The European Union proposes to raise the maximum residue level (MRL) for tricyclazole in rice to 0.09 mg per kg from 0.01 mg per kg after finding that the raised level is unlikely to cause any risk to consumers.

The European Food Safety Authority (EFSA) has proposed the hike in the level of tricyclazole in rice after concerns over allowing the higher limit had been sufficiently addressed.

The proposal is now expected to be ratified by the European Standing Committee on Food Chain and Animal Health in May.

## INDIA'S DEMAND

The decision should encourage Indian rice exporters as the fungicide residue's presence has been a concern for shipments to the EU. However, India has been seeking an MRL of 1 mg/kg for the chemical.

Tricyclazole is a fungicide that is used to control the blast disease in rice. Tests carried out by Japan-



**SAFETY MEASURE.** Tricyclazole is a fungicide that is used to control the blast disease in rice.

ese scientists on mice are reported to have led to decreased body weight gain and increased organ weight and others in the rodent's liver.

EFSA said Corteva Agriscience had submitted an application to Italy's competent national authority, which is the rapporteur Member State (RMS) of the EU, to set an import tolerance for the active substance tricyclazole in rice.

According to trade experts, Italy is one of the EU members that has been un-

happy with the EFSA regulations since it is a significant producer of rice.

## EVALUATION RESUBMITTED

The RMS drafted an evaluation report in accordance with the EU regulations, which was submitted to the European Commission and forwarded to the European Food Safety Authority (EFSA) on April 26, 2018.

"The RMS proposed to establish MRL for rice imported from Brazil at the level of 0.09 mg/kg," it said.

In turn, the EFSA identi-

fied the gaps in the evaluation and the RMS submitted a revised evaluation report on October 7, 2022.

"Based on the risk assessment results, EFSA concluded that the short-term and long-term intake of residues resulting from the use of tricyclazole, according to the reported agricultural practice, is unlikely to present a risk to consumer health," the authority said.

Hydrolysis studies conducted to investigate the effect of processing on the nature of tricyclazole

demonstrated that tricyclazole "is stable". "As the proposed use of tricyclazole is on imported crops, investigations of residues in rotational crops are not required," EFSA said.

## IMPACT ON FEED

As by-products from (husked) rice, rice bran may be used for feed purposes, a potential carry-over into the food of animal origin was assessed.

The calculated livestock dietary burden did not exceed the trigger value of 0.1 mg/kg dry matter (DM) for all relevant animal species.

"The relative contribution of tricyclazole residues from rice hulls to the total livestock exposure was insignificant, and therefore, animal commodities were not further considered in this application," EFSA said.

The EFSA concluded that "the proposed use of tricyclazole on rice will not result in a consumer exposure exceeding the toxicological reference values and therefore is unlikely to pose a risk to consumers' health".



# Govt directs agencies to procure onion from farmers as prices crash

## AGENCIES

NEW DELHI, 8 MARCH

The government has directed its procurement agencies to immediately intervene in the market for the purchase of Kharif red onion and for simultaneous dispatch and sale to the consumption centres in the wake of reports of their falling prices in the mandis.

It directed the National Agricultural Cooperative Marketing Federation of India Limited (NAFED) and the National Consumers Cooperative Federation of India Limited (NCCF) to procure onions from farmers.

To address the challenges of falling prices, the government has a Price Stabilization Fund for the procurement and storage of onion as a



buffer to keep the supply chain smooth during the lean seasons.

The Ministry of Agriculture and Farmers Welfare on Tuesday evening said in a statement that NAFED in last ten days purchased around 4,000 tonne onions at a rate above Rs 900 per 100 kg from the farmers directly.

There were reports that the staple vegetable was fetching as low as Rs 1-2 per kg in Lasalgaon mandi -- India's largest onion market.

NAFED, according to the ministry's statement, has opened 40 procurement centres where farmers can sell their stock and get their payment online. NAFED has made

arrangements for the movement of the stock from purchase centres to Delhi, Kolkata, Guwahati, Bhubaneswar, Bangalore, Chennai, Hyderabad and Kochi.

The estimated production of onion during 2022-23 is around 318 lakh tonne, surpassing last year's production of 316.98 lakh tonne.

"Prices remained stable due to consistency in demand and supplies as well export potential. However, the month of February saw a decline in prices of red onion, particularly in the state of Maharashtra where the modal rate dropped to Rs.500-700/ql. The experts attribute this fall due to overall increased production in other states, reducing the dependence on the supplies from the major producing

district of the country i.e. Nashik," said the statement.

Onion is sown in all the states, however, Maharashtra is the leading producer with a share of around 43 per cent, Madhya Pradesh 16 per cent, and Karnataka and Gujarat contribute around 9 per cent of national production. It is harvested thrice a year, with cropping seasons reported during Kharif, late Kharif and Rabi.

The harvest of rabi is most important as it contributes nearly 72-75 per cent of national production and is harvested from March to May months. The shelf life of the Rabi harvest is highest and stored worthy whereas the Kharif and late Kharif crop is for direct consumption and not store-worthy.

## VARAHA

# Sustainable farming through the sale of carbon credits

### Startup uses new tech to measure oil's carbon storage potential

SUDHIR CHOWDHARY

**IS THE CLIMATE** crisis solvable? Even though the odds might not be in our favour, the management team at cleantech startup, Varaha, is in combat mode to reverse climate change. It reckons that globally, over 500 million smallholder farmers are affected by climate change. Currently, there is no financial incentive for smallholder farmers to adopt agricultural practices that reduce greenhouse gas (GHG) emissions and improve carbon sequestration.

Varaha is incentivising smallholder farmers to follow regenerative agriculture practices by creating high-quality carbon credits that augment their income while also reducing their operating costs. In other words, this cleantech startup is fueling nature-based cli-

## THE STORY SO FAR

- A tech-enabled carbon credits startup
- Creates carbon offsets from nature-based solutions
- Incentivises farmers to follow regenerative agriculture practices

mate innovations to bend the arc of emissions towards net zero.

Recently, Varaha raised \$4 million in seed funding, led by Orios Venture Partners, alongside participation from Omnivore, RTP Global, Better Capital, and other angel investors, including Kunal Shah. But first, what's up with the name? 'Varaha' is an avatar of the Hindu God Vishnu who saved the Earth by lifting it out of the cosmic ocean and restored it back to its place in the universe.

Based out of Gurugram and Bengaluru, Varaha was founded in 2022 by Madhur Jain, Ankita Garg, and Vishal Kuchanur. It is currently working across six Indian states and has signed MoUs with several institutions. More specifically, this tech-enabled carbon credits startup is modernising carbon markets with diverse climate action projects.

"Varaha's tech platform creates fully-traceable, high integrity, carbon offsets from nature-based solutions. The sale of such offsets will catalyse climate positive activities, augment the income of smallholder farmers and rural communities, and increase biodiversity," said Jain, the company co-founder & CEO. With the undeniable impact of climate change, purchasing carbon credits to offset emissions will soon become a necessity for all commercial entities. Varaha addresses this large market of identifying, authenticating, and making the credits available for purchase in domestic or global markets by working with India's farmers.



# Agriculture and employment

The farm sector produces less 'output', but 'adds more value' — that is why it is able to support 45% of the country's employed labour force. But it is necessary for India to have fewer people in agriculture.



HARISH DAMODARAN

TWO RECENT sets of data released by the National Sample Survey Office (NSSO) and the National Statistical Office (NSO) offer insights into the process of structural transformation in the Indian economy, especially in relation to the agriculture and manufacturing sectors.

Economists refer to structural transformation as basically a compositional shift that entails transfer of surplus labour from agriculture to sectors where productivity (output per worker) and average incomes are higher — particularly manufacturing and modern services.

The NSSO's latest annual Periodic Labour Force Survey (PLFS) report for 2021-22 (July-June) shows the farm sector's share in the country's employed labour force at 45.5%. That's down from 46.5% in 2020-21, but still higher than the 2018-19 low of 42.5%. Clearly, the effects of the pandemic-induced economic disruptions, which had forced a reverse migration to the farms, haven't fully subsided.

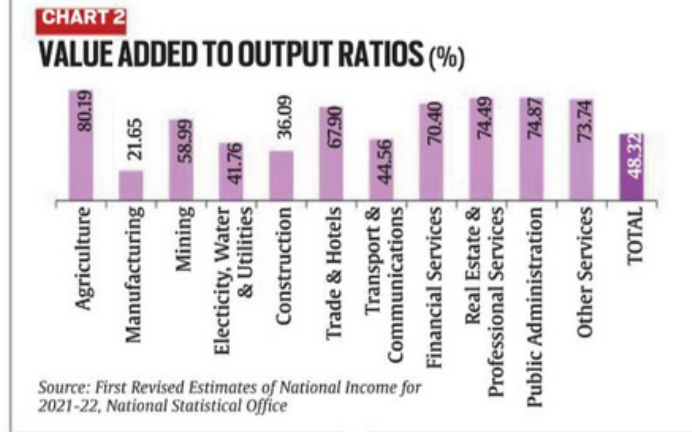
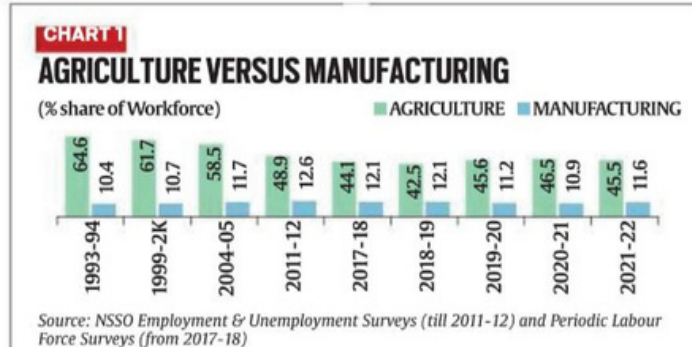
## Stalled transformation

Chart 1 shows the share of agriculture in the total workforce over a longer time period, based on previous years' PLFS reports (also called 'Employment and Unemployment' surveys until 2011-12). That share fell from 64.6% in 1993-94 to 42.5% in 2018-19.

The biggest decline, from 58.5% to 48.9%, happened between 2004-05 and 2011-12. During this seven-year period, the workforce engaged in farming registered, for the first time in India's history, a fall even in absolute terms — from 268.6 million to 231.9 million. The share of the labour force employed in manufacturing too, peaked at 12.6% in 2011-12.

Since 2011-12, this structural transformation has slowed, with the share of agriculture in employment not falling fast enough and, in fact, rising after 2018-19. The share of manufacturing has dropped behind even that of construction and trade, hotels & restaurants.

In 2017-18, the latter two sectors accounted for 11.7% and 12% of the total workforce respectively, as against manufacturing's 12.1%. But in 2021-22, manufacturing's share, at 11.6%, was



below that of construction (12.4%) as well as trade, hotels & restaurants (12.1%).

In other words, structural transformation hasn't just slowed — it has stalled, if not reversed. There is not much labour transfer taking place from farms to factories. The jobs that are getting generated outside agriculture are mostly in construction and low-paid services, whose share has overtaken that of manufacturing. The construction sector has now become the second-largest employer after agriculture. Five years ago, it was at No. 4, after agriculture, manufacturing and trade, hotels & restaurants. Today, manufacturing has been relegated to the fourth spot.

## Output vs. Value added

This links up with the second set of data, which are from the NSO's first revised estimates of national income for 2021-22, released on February 28. It also contains estimates of 'output' and 'value-added' by different sectors of the economy.

Output is simply the gross value of production by an industry or sector. For the economy, it would mean the total value of all goods and services produced during a financial year. However, production involves the use of inputs. Further, the inputs for one industry are the outputs of other industries supplying to it. To avoid double-counting, one has to, then, deduct the value of inputs or intermediate consumption from the value of output. Since the producer merely adds value to the inputs that he uses, economists consider gross value added (GVA), and not gross value of output (GVO), as a measure of aggregate production.

One way to assess how much value an industry or sector actually creates in the process of production is by looking at the ratio of GVA to GVO. GVA, to repeat, is GVO at current prices minus the value of intermediate consumption. Chart 2 shows these ratios for various sectors in 2021-22, based on the NSO's latest revised estimates of national income.

It can be seen that value addition is the highest in agriculture. For every Rs 100 worth of produce coming from Indian farms, Rs 80 is the value generated by those owning and working the lands. In 2021-22, the GVO from agriculture, forestry & fishing was estimated at Rs 50.71 lakh crore. After deducting the value of intermediate consumption (Rs 10.05 lakh crore), the GVA for the sector worked out to Rs 40.66 lakh crore.

On the other hand, value addition is the lowest, at just over a fifth, for manufacturing. Although the GVO from manufacturing (Rs 156.90 lakh crore) was more than three times from agriculture, the value of intermediate consumption, too, was over 12 times (Rs 122.93 crore) higher. As a result, the GVA by manufacturing, at Rs 33.97 lakh crore in 2021-22, was way below agriculture's.

"Purchased inputs are very little in agriculture, unlike manufacturing. The value produced comes mostly from the land rather than the seeds, fertilisers, pesticides, diesel and electricity that farmers consume," explains Pronab Sen, former Chief Statistician of India.

## Link with employment

High value-addition is a key reason why agriculture is able to employ so many people. The sector's share in GVO — the total value of all goods and services produced by the country — was only 11.4% in 2021-22. When measured in terms of value-added or GVA though, the share rose to 19%. It was the other way round for manufacturing: its share in overall GVO was as high as 35.4%, while being just 15.8% relative to GVA.

However, even taking into account high value-addition, a sector generating 19% of income — accruing to the primary factors of production, namely the owners of land (farmers), labour (agricultural workers) and capital (lenders) — cannot support 45% of the country's population.

Moreover, the GVA-GVO ratio is not a measure of productivity. An agriculturalist may be adding more value to every unit of input he consumes than a manufacturer. But productivity is a function of output per worker or per unit of land — which is low in agriculture compared to modern manufacturing and services. It explains why the average farmer earns less than his urban counterpart. To earn more, the farmer's productivity has to go up — which means producing more on the same land with fewer hands.

At the end of the day, there's no escaping the fact that India has too many people in agriculture. They need to be enabled to find employment in other sectors, which will, in turn, raise agriculture's productivity.

# Agri dept seeks more carrying capacity of water channels for irrigation

Gurpreet Singh Nibber

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**CHANDIGARH:** The agriculture department has taken up with the irrigation department to increase capacity of water channels for irrigation purposes in the Majha belt as one-third of the water flowing from the Upper Bahri Doab Canal (UBDC) for watering of fields was getting waste.

Out of 8,200 cusecs water in UBDC for irrigation purposes, 2,700 cusecs go waste, as the water channels could only hold 5500 cusecs. The matter was

highlighted by local bodies minister Inderbir Singh Nijjar who represents Amritsar (South).

"4.15 cusecs of water is required to irrigate 1,000 acres of land which means with 5,500 cusecs, 13.25 lakh acres could be irrigated," said an officer in the agriculture department. UBDC originates from Ravi at Madhopur headworks and takes water to different district of the Majha belt of the state including Pathankot, Amritsar, Gurdaspur and Tarn Taran through its distributaries Tung Tal, Lahore Branch, Kasur drain, Nakhahu Nullah and Sarkhi Nullah.

"We must use entitlement in the UBDC and strengthen our water works and take water to the tail end even if farmers are not using it," suggested Nijjar, adding that at the end the water should be left to percolate underground so as to recharge the sub soil levels. Canal water according to him is better for irrigation in comparison to the underground water, while the government is motivating farmers to use canal water. He said there is abundant canal water.

In Punjab farmers use 73% of underground water for irrigation purposes and rest 27% from

the canals. With electricity on agriculture supplied to the farmers free of cost, they depend on the tube-wells and have tilled the water channels into their fields.

According to a chief engineer rank officer of the state irrigation department, works of strengthening of canal in Majha belt is underway which would take water for irrigation. There is scheme of taking piped water to the farms and there is subsidy of 90% given to the farmers and only 10% is to be contributed by the farmers. Officers revealed that the state government has offered to contribute 10% also.



Out of 8,200 cusecs water in UBDC for irrigation purposes, 2,700 cusecs go waste, as the channels could only hold 5500 cusecs. AP



# JUDICIOUS USE OF PESTICIDES IN AGRICULTURE

## CROPTALK

**P**esticides are biologically active substances, being widely used in agricultural production to prevent or control insect pests, diseases, weeds, and plant pathogens in an effort to reduce or eliminate yield losses and maintain high product quality in terms of damage free produce. These are likely to cause acute and chronic adverse effects on human beings, cattle, pets, and pollinators if not used properly. Presence of pesticide residues in the different components of the environment is one of the most serious impacts of non judicious use of pesticides. Though residues are bound to appear

on the commodities where they are applied, it is necessary that the commodities meant for consumption should not contain residues at levels harmful to human health

**Modes of Exposure to Pesticides:** There are four ways pesticides can be taken into the body. These are: oral (ingestion by mouth), dermal (contact with the skin), inhalation, and ocular (through eyes) with dermal being the most common type of exposure. Exposure through residues in the various components of environment including in food, risks of operational exposure to operator and other workers in vicinity are likely to cause acute and chronic adverse effects on human beings and other animal

## AGRIWEATHER



The Chandigarh centre of India Meteorological

Department (IMD) has forecast isolated rainfall in Majha, Doaba and east Malwa regions of Punjab and north Haryana and south-southwest Haryana on Monday. Weather is expected to remain after that for the next three days in both the states.

fauna. Following precautions can help in minimizing the extent of exposures to the risks of pesticides.

*(By Pushpinder Kaur Brar, Smriti Sharma and Balpreet Kaur Kang, Department of Entomology Punjab Agricultural University, Ludhiana)*

## PRECAUTIONS IN THE APPLICATION OF PESTICIDES

### BEFORE APPLICATION

- Purchase pesticides only from registered dealer and see Batch No., Registration number and Date of expiry on the labels.
- Purchase only required quantity of pesticides for single operation in a specified area and keep pesticides in labeled/ original containers only.
- Pesticides must be stored away from the reach of the children and livestock.
- The pesticide storage place must be well protected from sunlight and rain. Mark the area/ cupboard where pesticides have been stored, with a warning sign.
- Pesticides should never be decanted into food containers, drinking bottles or unmarked containers or transported along with food/ fodder.

### DURING APPLICATION

- The pesticide application decision must be need driven, and can be based on Economic Threshold Level wherever available/ applicable.
- Do not tear open the pesticide bags, but cut them with knife.
- Never leave pesticides unattended in the field. Vulnerable people, such as children, the elderly and immunosuppressed people should not handle pesticides.
- Wear clean protective clothing before handling pesticides.
- Avoid the contamination of skin. If body gets contaminated with a pesticide, wash immediately with soap and water.

### AFTER APPLICATION

- After tightly closing the containers, return the unused pesticides to the store.
- Empty containers should be distorted/ mis-shaped to prevent its any subsequent use by another one.
- Never leave pesticides in the application equipment. Spray it on the barren land and do not pour it into irrigation canals/ channels, ponds, wells or streams.
- Wash the empty pesticide application appliance first with detergent and water, and then rinse it thoroughly with plenty of water. Water contaminated in these processes should be disposed of over the barren land.
- Take bath with soap and plenty of clean water. Wash clothes separately.

Write to us at [crop.talkTOI@gmail.com](mailto:crop.talkTOI@gmail.com) with your views, suggestions and feedback



# ICAR makes pitch for MSP on millets

**RAVINDER SOOD**

**PALAMPUR, MARCH 11**

The Indian Council of Agricultural Research (ICAR) wants state governments, including Himachal, to provide the minimum support price (MSP) for millets to farmers to encourage them to grow these.

TR Sharma, Deputy Director General, ICAR, inaugurated a brainstorming session on mainstreaming native agro-biodiversity of north-western Himalayas with special emphasis on millets at CSK HP Agriculture University here.

Addressing scientists,



**GRAINS TO BE PART OF MID-DAY MEALS**

- Tech available to enhance production of millets by 225%
- Area under millets declined 75% in past 70 years
- Millets to be included in mid-day meals to provide nutritious food

farmers and other stakeholders, he said technology was available to enhance production of millets by 225 per cent

although the area under millets had declined by 75 per cent in the past 70 years. He said millets would be included in mid-day meals to provide nutritious food to students and enhance the income of farmers.

He said a major project of the ICAR on agro-biodiversity was yielding good results. Collection and conservation of landraces and wild species was crucial to developing climate-resilient crop varieties. He said besides underutilised crops, the ICAR was working on bio-fortification of varieties such as wheat, containing a high amount of zinc.

CONTINUED ON PAGE 6

# IFFCO and Coromandel to make Nano DAP for 3 years



Fertiliser cooperative major IFFCO and Coromandel International Ltd (CIL) will manufacture Nano DAP for a period of three years. A notification in this regard was issued on March 2, Minister of State for Chemicals and Fertilisers Bhagwanth Khuba said in his written reply to the

Lok Sabha on Friday. Di Ammonium Phosphate (DAP) is the second most widely consumed fertiliser after urea in the country. The minister further said IFFCO has informed that it is setting up a Nano DAP plant at its Kalol unit, Gujarat with a production capacity of 2 lakh bottles of 500 ml per day. "Nano DAP will be available in the market across the country after commencement of commercial production," he added. On its benefits, the minister shared that preliminary field trials were conducted by IFFCO and CIL on select crops in select institutes of Indian Council of Agricultural Research (ICAR). The report has indicated that with the use of Nano DAP as seed treatment and foliar application, there is a possibility of saving of granular DAP (Di Ammonium Phosphate) conventionally applied, he said.

# TN policy to boost organic farming

## Baseline Survey To Identify Potential Areas

**Julie.Mariappan**  
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Chennai: Against the backdrop of application of chemical fertilizers affecting soil health, new pests and diseases causing crop loss and pesticide residues denting export prospects, Tamil Nadu government on Tuesday unveiled an organic farming policy.

The policy aims at providing single window system and online registration process for organic certification of farm lands. The government would carry out a baseline survey in all districts to identify potential areas for organic farming and would set up crop-based clusters of organic farmers in potential districts.

## NEW CROP OF PROGRAMMES

- Single window system to simplify certification procedure and online mode for registration
- Dryland clusters already created will be developed into organic clusters
- Specific districts will be selected in the first phase on the basis of topography for organic cultivation. The rest

will be covered in a phased manner

- Organic certification department's accreditation for livestock and poultry products, apiculture, aquaculture, mushroom cultivation and poly greenhouse production
- A gene/germplasm bank to preserve traditional cultivar seeds of all crops

Tamil Nadu ranks 14th in the country in organic farming with 31,629 hectares of organic farm land. It includes 14,086 hectares of organic certified area and 17,543 hectares under the process of certification. The state ranked 11th in production of organic food in 2020-21. It produced 24,826 tonnes of organic food, out of which 4,223 tonnes was exported, fetching Rs 108 crore revenue. "The certifying authority

will guide the farmers to get certificates under the Participatory Guarantee System and National Programme on Organic Production. PGS will be encouraged to cater to the domestic market," the policy said. The state will encourage setting up of laboratories for pesticide residue analysis in accordance with the standards of National Accreditation Board for Testing and Calibration Laboratories.

As pesticide residues can get on to organic produce of neighbouring lands, the state government prefers a cluster-approach for organic farming. "The policy is based on a lot of consultation with the stakeholders over a period of one-and-a-half years. Cluster-based approach is the way to succeed. We are planning to implement it in a phased manner or else there will be negative impact," agriculture secretary C Samayamoorthy told TOI.

The plan is to develop existing dryland clusters into organic clusters and create organic zones by integrating clusters. From crop planning to production of on-farm inputs, processing, transportation and marketing, many activities will be entrusted with the clusters. The state assures establishment of a supply chain for export through such clusters.

The government is also keen on incentivising orga-

nic farmers. Bio-fertilisers and bio-inputs would be provided at subsidized rates. The policy outlines popularisation of integrated organic farming and season-based cropping system and diversification. Self-help groups and farmer producer organisations would be roped in to prepare on-farm inputs like panchagavyam, jeevamirtham and vermicompost. Renewable energy sources will be encouraged in the farms and testing of off-farm inputs will be strengthened. Research programs would be taken up by agricultural institutes for development of organic practices for all major crops. "Organic farming has low yield and the government should handhold farmers in marketing. Government institutions, hospitals, anganwadis and noon-meal centres should use organic produce," said P R Pandian, president of the coordination committee of All Farmers' Associations.

# Urge Centre to declare rubber as agri produce: KC(M)

Kottayam: LDF constituent Kerala Congress (M) urged the state government to unanimously pass a resolution in the assembly demanding the declaration of rubber as an agricultural produce by the central government. Such a move is essential to save the rubber farmers out of the present crisis, said party chairman Jose K Mani.

Addressing a meeting of

rubber farmers here on Friday, Mani said that not adding rubber to the agricultural produce category even after north Indian crops like jute and cotton were changed to the category of agricultural products is a blatant violation of federal principles.

Mani also urged the Centre to raise the support price of rubber to Rs 250 using the huge revenue generated from the

import duty of rubber. The crores of rupees received as import duty of rubber is entirely entitled to the farmers, he added. KC(M) had submitted a memorandum to the LDF government before the presentation of the state budget urging to raise the support price to Rs 250 from the existing Rs 170. However, the LDF government did not increase the support price. TNN



## '15L farmers have not paid a rupee in power bills in 5-8 yrs'

Mumbai: Pointing out that 15.2lakh farmers had not paid a single rupee in power bills in 5-8 years, deputy chief minister Devendra Fadnavis said on Tuesday that they needed to settle at least their current dues. Responding to the Opposition's demand for a waiver on power bills of farmers in the state assembly, Fadnavis said, "We are not taking a harsh stand,

and we are not insisting that past dues be settled. But farmers need to at least pay their current bills," he said. He said electricity arrears from the agriculture sector amounted to Rs48,689 crore. Fadnavis said the state planned to push solar power in rural areas. "We have planned to reach a target of 8000MW in solar power, for which we need to create a capacity of 12,000MW," he told the state assembly. He said 90,275 farmers had benefited from solar power after feeders were introduced. "We plan to introduce at least 30%, if not 40%, solar feeders to create our targeted capacity of 8,000MW by 2025," he said.—Priyanka Kakodkar



## BJP to woo UP farmers to score in co-op society polls

### COOPERATIVES MATRIX AND ITS BENEFITS

Total Primary Societies **46,772** Central societies **244**

Apex societies **50** Total electors **1,72,88,818**

Total registered electors **1,27,24,740**

**POLLS TO BE CONDUCTED FOR:** Minimum 9 Board of Directors. They would subsequently choose a chairman and a vice-chairman



#### FACILITIES PROVIDED BY COOPERATIVES

- Primary Agriculture Credit Society provides loans to farmers, repays regular loans upto ₹3 lakh at interest of 3%. The state govt reimburses the difference amount due to lower rate of interest and actual rate of interest
- UP Cooperative and Village Development Bank provides long term loans for agriculture and non-agriculture sector
- Urban Cooperative Banks of the State provide consumer, housing, vehicle and business loans
- To save farmers from middlemen, agricultural produce of farmers is purchased by cooperative society and provides remunerative prices to them. Wheat and paddy is purchased by the cooperative society under the price support program of the state government.
- Additional storage capacity is being created to enhance the present storage capacity of cooperative society. Under this, warehouses of 100MT and 250MT are being constructed
- Fertilizer and seed distribution

Source: UP Rajya Sahkari Samiti Nirvachan Aayog

# Farmers say talks with govt 'positive', halt march

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Nashik: The farmers' "long march" from the city to Mumbai halted in Thane following a "positive dialogue" between the agitators and the state government on Thursday.

Though the farmers did not spell out the outcome of the meeting, CM Eknath Shinde said all information on the dialogue would be shared on the floor of the assembly on Friday. "The talks were positive. The government has taken note of all the demands raised by the ('long march') organisers. We will issue a statement in the House on Friday. I hope that this stir will then be withdrawn," Shinde said in Mumbai.

CPI(M) and All India Kisan Sabha are leading the "long march" that started from Nashik on March 13 involving thousands of farmers and tribal people. The



Pic courtesy: CMO

The farmer leaders said the talks with the government on Thursday continued for two hours

aim of the march is to highlight the farmer and the tribal population's problems.

Jiva Pandu Gavit, former CPI(M) MLA from Suragana, said, "Our meeting with CM Shinde and deputy CM Devendra Fadnavis in Mumbai lasted for over two hours and was positive. We will not issue any statement about the assurances we have got from the two leaders."

He said, "The government will share the details and the minutes of the meeting with the MLAs and us, based on which we

will decide our future course of action."

Citu national vice-president and senior CPI(M) leader Dr D L Karad said, "Our march will now not proceed to Mumbai. We have reached Vasind in Shahapur taluka of Thane district. The farmers will stay put at Vasind till we receive the minutes of the meeting and the details are shared with the MLAs."

The agitating leaders said if the promises were made in the house as per the negotiations, the demonstration would be called off.



# How to beat wheat inflation



## ASHOK KK MEENA & CHANDRASEN KUMAR

Respectively, chairman & MD, and deputy general manager, Food Corporation of India. Views are personal

The success of PMGKAY and Open Market Sales Scheme (Domestic) for wheat in warding off a steep rise in wheat prices due to short supply should offer policy cues to other countries

FOOD PRICES IN general, and that of wheat in particular, rose sharply because of disruptions caused due to the pandemic coupled with the start of the Russia-Ukraine conflict as two countries account for a quarter of the world's wheat supply. But India not only ward off distress among its poor citizens due to food scarcity, it also managed to control the spike in wheat prices.

Though 2022 retail inflation in India remained higher than RBI's upper target bound of 6% till about September—with a peak of 7.8% in April—India was much better placed compared to many developed economies that had to face double-digit inflation coupled with economic slowdown. India's total cereal production increased from 285.28 million tonnes (mt) in 2021-22 to 288.03 mt in 2022-23, even when wheat production declined marginally from 109.59 mt to 106.84 mt.

Sensing an opportunity for profit via export of wheat, private traders purchased substantial quantity during the rabi marketing season of 2022-23. Total purchase by government agencies was only 18.8 mt against the normal average procurement of 35 mt. Later, due to the prospect of a lower domestic supply, the Centre banned the export of wheat on May 13, 2022, but by then, about 5 mt of wheat had already been exported.

Much before the World Bank advised nations, in June last year, on taking proactive steps to control spikes in food

prices, the Centre had already taken a pragmatic policy decision in the form of Pradhan Mantri Garib Kalyan Ann Yojna (PMGKAY), giving additional 5 kg free food grains to about 813 million covered under the National Food Security Act (NFSA). About 112 mt of additional food grains, allocated at an estimated cost of ₹ 3.9 trillion from April 2020 to December 2022, were delivered through the supply network of the Food Corporation of India (FCI) and allied agencies. This made almost every needy family completely secure in terms of foodgrains and kept basic food inflation under control.

Though the retail inflation had come down during October and November 2022, it bounced back in December 2022 and showed an upward trend in January this year. One major source was steep rise in prices of wheat and wheat flour/products. Wheat prices generally rise from December to March because, unlike rice, it is harvested and sold by farmers only during the rabi marketing season within a window of about three and a half months from mid-March to June. But the rise in wheat prices this year has been phenomenal. It could be attributed to excessive profit expectations by private traders as they had pro-

cured substantial quantity due to prospects of exporting wheat at higher international prices, but had to hold it due to the ban on wheat exports.

Concerned over the sharp rise of wheat- and wheat-product-prices, the Centre decided to intervene in the open market by releasing 3 mt wheat from central pool stocks, which has been increased to 5 mt as on February 21, 2023. Market intervention in case of a

steep price rise is one of the mandates of FCI. The open sale of wheat by FCI is called Open Market Sales Scheme (Domestic), or OMSS(D). To control the rising prices without hurting any stakeholder, the policy design has two main strategies—to ward off hoarding of purchased wheat from open sale by large traders and to send an appropriate signal to market players

that the wheat purchased under open sale must be made available to domestic consumers immediately.

Thus, the open sale has been made competitive through the e-auction platform (m-junction) with a reserve price. The quantity of wheat to be purchased has been kept between 10-3,000 tonnes. To ensure competition, 300,000 tonnes of wheat has been reserved for institutional buyers, who can purchase wheat directly from FCI at reserve prices

without participating in e-auction, subject to the rider that they will sell wheat products at a capped price. Besides, 200,000 tonnes have been reserved for state governments, which can take 10,000 tonnes of wheat for selling to consumers. A weekly auction is conducted for lifting/delivery from as many as 620 locations spread across 23 states in the country to a large number of small and medium traders and flour millers with an easy registration process. This process of e-auction shall continue till a new crop arrives.

As on March 5, 2023, FCI has already conducted four e-auctions and sold 2.34 mt to more than 1,100 registered bidders. About 1.8 mt of wheat has already reached the market. Reserve prices have fallen to ₹2,150/mt and ₹2,125/mt for fair average quality (FAQ) and under relaxed specifications (URS) quality wheat, respectively, so that the maximum benefit is passed on to consumers as soon as possible. As a result of the open sale, market prices of wheat and wheat flour have cooled down by 15% to 25% within four weeks. It is expected that retail prices of wheat all over the country should now remain within ₹23-₹25/kg with a suitable profit margin. The success of PMGKAY and OMSS(D) for wheat in warding off a steep rise in wheat prices due to short supply is a good policy lesson for other countries of the world.

**The OMSS focused on preventing hoarding of wheat bought under the scheme and driving traders to make such wheat to available to the consumers urgently**

# Activists decry Centre's U-turn on banning toxic pesticides

## 27 pesticides identified, but 24 dropped from the list

BENGALURU, DHNS

Three years after proposing to ban 27 pesticides, identified as health hazards by an expert committee, the Union government has made a U-turn by leaving out 24 of them from the banned list.

The original notification had listed the cause for banning each of the 27 pesticides,

ranging from endocrine disruption, carcinogenic impurities, highly toxic, toxic for aquatic organisms, birds, honey bees, contamination of DDT and other reasons.

The Pesticide Action Network (PAN) on Friday noted that the Ministry of Agriculture and Farmers' Welfare has gone back on its ban decision without giving any explanation.

The draft notification, issued in May 2020, said the Central government held a consultation with the authorities and was satisfied that the "use of 27 insecticides is likely to involve risk to human beings and animals". The notification proposed a ban on the import, manufacture, sale, transport, distribution and use of those pesticides, including acephate, atrazine, Benfuracarb, and Thiram among others. A month later, the government amended the draft to allow the production and export of pesticides.

PAN slammed the latest amendment to the draft notification published on February 16, which decides to ban only

three of the 27 pesticides. Eight have been left out for "label claim change" while 16 others have been dropped without any reason.

The four-member expert committee, led by Anupam Varma, reviewed a total of 66 pesticides before submitting its report in 2015. The report recommended a complete ban on 13 pesticides, a review of 27 others in 2018 and phasing out of six by 2020 among other measures.

In a letter to the Joint Secretary of the Agriculture Department, PAN India said that among the 16 pesticides that are left out, four have been classified as highly hazardous

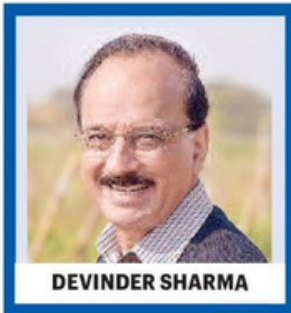
by international institutions, including the Joint Meeting of Pesticide Management which advises WHO and FAO. The remaining 12 fit the highly hazardous criteria of PAN International, it added.

PAN India chief executive officer A D Dileep Kumar urged the ministry to ban all 27 pesticides without delay. "We expect the ministry to stand by the findings of its expert committee and that it will base its final decision on independent, global and scientific evidence and the concrete experiences of the farmers, not the self-serving and profit-motivated statements by the chemical industry," he said.



# Only stringent **agri market** regulations can bring relief to all stakeholders

Beleaguered farmers should be assured of Maximum Retail Price (MRP)



DEVINDER SHARMA

AROUND five years after the earlier march that took them from Nashik to Mumbai, farmers in Maharashtra have once again embarked on a long march to put pressure on the government to yield to their demands. This time their 17-point demand charter also includes a financial relief of Rs 600 per quintal to onion growers.

A few days after an irate farmer had put his onion crop on fire, and farmers across the region had complained of a crash in wholesale prices, with most of them getting less than Rs 300 to Rs 400 per quintal of onion, it was enough of a provocation to hit the streets, all over again. What was being offered in the mandis, was not enough to even cover the cost of production. The demand for an additional relief of Rs 600 per quintal I expected to give them a cushion to combat the low market prices.

Travelling through parts of the Nashik district last week, I met a number of farmers who wanted to give up farming if the prices remain despicably low.

"It is better to be a labourer these days," a visibly upset onion farmer had told me. A day later, addressing a farmers' convention at Karanjad village in Satna tehsil, I urged them to ask for a guaranteed price for food crops as well as for vegetables, fruits, pulses and oilseeds.

"Imagine if the onion price had an assured MSP, onion farmers wouldn't have been forced to throw onions in the fields or in nalas as this would have enabled them to recover their cost of pro-

duction," I explained.

Farmers need to understand that the illusion of free markets that has been dangled before them for the past 75 years has failed to increase their income. This is essentially because agricultural supply chains are so structured that while all other players in the chain walk away with profits, it is only farmers who are left in misery. This phenomenon is just restricted to Indian farmers but prevails even in the United States and Great Britain. While in America, the share of farmers in the eventual consumer price has been declining steadily, a recent study in UK has shown that farmers received hardly one per cent of the profits that agribusiness companies make in the sale of half-a-dozen products of daily use.

If the onion price in the retail market is hovering between Rs 25 to Rs 30 per kg, I see no reason why farmers should be incurring huge losses given the low wholesale prices. At an average of Rs 3 per kg per farmer and Rs 30 per kg for consumers, what the middlemen walks away with is nothing short of a kill. And onion is not an exceptional case.

Take the case of potato. Right from West Bengal to Punjab, in the entire potato cultivation region, prices have been on a steep decline. This year, farmers are getting an average of Rs 500 per quintal.

So is the case with tomato. Telangana, Chhattisgarh and Uttarakhand farmer-slament that a decline in prices is forcing them to abandon the ripened crop in the field. It is no longer economical to go for plucking and transporting the produce to markets!

The price debacle for cauliflower, cabbage, coriander, lady finger and brinjal is no different. Moreover, the slump in prices is not only particular to the 2023 crop harvest season. Every other year, there are numerous reports of farmers throwing their produce in rivulets or leaving it for the cattle.

This reminds me of a study on crop diversification in Punjab conducted by Dr. S.S.Johl, an eminent agriculture economist and formerly chairperson of the Commission for Agricultural Costs



& Prices (CACPC).

He categorically stated that if the production of fruits and vegetables in Punjab were to go up by a mere one per cent, it could lead to an unmanageable glut. This report was published in the early 1980s. In the past 40 years, while there has been enough talk of crop diversification in Punjab, I don't think any effort has gone into investing in infrastructure to cater to the anticipated glut in fruits and vegetable production.

Similarly, at the national level too, there has been no tangible improvement in managing surpluses. If it were so, I see no reason why millions of farmers would have suffered (and continue to) the consequences of a frequent crash in farm prices. After producing a record surplus, and that too after incurring huge costs, the severe hit a price crash results on the farm livelihood is something that has never been valued. In reality, the price crash that we are now witnessing is nothing short of bloodbath on the farm.

Although many people believe that the three contentious farm laws that have been withdrawn after the prolonged farmers protest would have addressed the issue, the reality is that the laws if implemented, and if the global experience is any indication, would have further accentuated the farm crisis.

A recent study entitled: "Profiteering across the economy - it's systemic" by the UK-based Unite Investigates, states that the top eight food manufacturers made a combined profit of 22.9 billion pound sterling in 2021. The top four food manufacturers increased their profit margin by 23 per cent in 2021 over the profits earned in 2019 despite

Telangana, Chhattisgarh and Uttarakhand tomato farmers lament that a decline in prices is forcing them to abandon the ripened crop in the field. It is no longer economical to go for plucking and transporting the produce to markets! Moreover, the slump in prices is not only particular to the 2023 crop harvest season. Every other year, there are numerous reports of farmers throwing their produce in rivulets or leaving it for the cattle

soaring costs and job cuts. This is happening at a time when the farmers' share in profits is either dipping or remains frozen.

In India, the organised retail promises to provide farmers and consumers a better price by removing several layers of middlemen. But even now when onion prices are so low, the consumer price remains almost equal to what is being sold by hawkers.

What is needed therefore is a two-pronged approach. On the one hand, we need to provide an assured and guaranteed price for the farm produce. This will ensure that the farmers do not suffer when prices dip. Secondly, the time has come to also fix a Maximum Retail Price (MRP) for agricultural trade. This will ensure that the consumers are not cheated. That is why I have been repeatedly asking for developing a mechanism whereby food prices operate within a price band. Farmers should get at least 50 per cent of the end consumer price.

Using technological innovations on the horizon, including digitalisation and artificial intelligence, the time is ripe to bring agricultural markets under a tight regulation.

*(The author is a noted food policy analyst and an expert on issues related to the agriculture sector. He writes on food, agriculture and hunger)*

## Crop protection procedure sans chemicals, pesticides developed in Kerala

THIRUVANANTHAPURAM

A team of researchers from Kerala has come out with a procedure of protecting crops by strengthening their immune system in a natural way without using hazardous chemicals and pesticides.

The team led by S. Manjula at the Rajiv Gandhi Centre for Biotechnology (RGCB) here has conducted the study on pepper plants and it has shown enormous promise for protection and

better yield of pepper crop.

Manjula said there is convincing evidence to prove the potential of 'priming' or 'sensitising' in protecting pepper plants from the deleterious effects of 'foot-rot'.

She pointed out that Glycol Chitosan (GC), a water soluble, non-toxic polymer known to induce plant defence, was used in the study to 'prime' the leaves of pepper plants.

"It was observed that GC treatment offered protection from the severity of 'foot-rot'

disease and caused a significant delay in the appearance of symptoms. The priming effect was manifested through enhanced expression of critical genes of the plant immunity pathways," said Manjula, adding that diseases and pests pose serious constraints to sustainable yields of commercial black pepper.

"Increasing the efficiency of the plant's immune system would reduce the need to rely on unsustainable pesticides," said Manjula. The

findings of the study were recently published in the journal 'Frontiers in Plant Science'.

RGCB Director Chandrabhas Narayana said it is an important research with implications not only for pepper plants, but also for several other plantations. "It is sustainable and inherently ecological as defence priming has huge potential to significantly reduce the use of high-risk pesticides and synthetic chemicals," said Narayana. ☺





# Three new varieties bring 'berry' good news to grape farmers

PAVAN KUMAR H HUBBALLI, DHNS

Three new varieties of grapes that can withstand adverse weather and promise more yield have been developed by researchers, a development that will come as a boost to farmers eyeing more income.

The University of Horticultural Sciences (UHS), Bagalkot, and ICAR-National Research Centre for Grapes based in Pune, Maharashtra, are behind the new varieties

'Manjira Kishmish', 'Manjira Midika' and 'Manjira Shama'.

Four others, part of the 23 varieties of grapes currently in development, are in the final stages of testing and could soon be introduced in the fields, according to Sateesh Pattepur, Assistant Professor of Fruit Science, UHS.

Pattepur said the varieties would be resistant to sudden changes in climate, minimise use of chemicals and also have a higher shelf life.

Farmers in Maharashtra were first off the blocks and



started experimenting with the new varieties last year, while growers in Karnataka didn't take it up early as they were wary of the results.

Manjira Kishmish can replace the most popular 'Thompson seedless', as the former has a higher level of

sweetness, better colour and even berry growth that is suited for both preparations of raisin and tabletop fruit.

Sanjeev Nandrekar, a Bagalkot-based grape grower who has grafted Kishmish varieties on his two acres of land, said many grape growers in Maharashtra have started reaping the benefits.

"Scientists claim that the new varieties yield higher quantity and better quality of grapes in less time than the tried and tested Thompson seedless," he said.

# Livestock sector can boost demand for millets

Focus on improving crop-livestock integration is crucial for bridging the fodder deficit, enhancing animal nutrition and ensuring our food & nutritional security. Strengthening the quality seed chain for dual-purpose varieties, frontline demonstrations on making hay/silage from green biomass and forging market linkage of farmers with the feed industry should also be among the priorities. Promoting start-ups with tech backstopping for preparing millet-based cattle feed can spur production of these super crops.

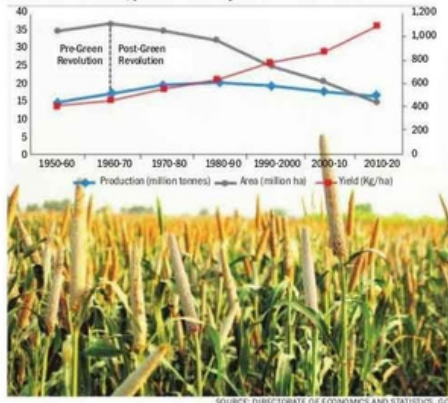
AMARSHI CHANDRAAN BISHWA BHASKAR CHOUDHARY

MILLETS are believed to be among the first crops domesticated by mankind; hence, they are often called the super crops of our ancestors. They include three major (sorghum, pearl, finger) and six minor crops (barnyard, proso, foxtail, kodo, broomtop and little). Till about 60 years ago, millets were the major grain grown in India. Before Green Revolution, millets made up around 40 per cent of all cultivated grains (contributing more than wheat and rice). The changing dietary pattern, coupled with government policies that favoured rice and wheat production to ensure food security, led to a sharp decline in millet acreage and its production. Reportedly, the present area under millets is 50 per cent lower than that during 1960 and the share of millets in the total foodgrain basket is only around 6 per cent.

The deepening climate crisis and environmental stresses have heightened the need for crop diversification by promoting climate-smart crops. Acknowledging the role of millets in responding to nutritional, agrarian and climate challenges, the UN declared 2023 as the International Year of Millets (IYM).

It is heartening that sincere efforts are being made across the world to raise the demand for millets. Notably, India produces 80 per cent of Asia's and 20 per cent of the world's millets. Our millet exports touched \$30 million in 2020. Efforts are also being made to educate farmers about better millet-growing techniques and mainstreaming millets in the agricultural production system. However, there is a

Decadal mean area, production and yield of millets in India



long way to go to incentivise the farmers, the majority of whom are resource-poor, to produce millets on their marginal lands. Showcasing health benefits of millets may not be enticing for farmers to take up the millets-cereals with poor productivity potential (with national average of around 1.2 tonnes per hectare) in place of rice and wheat (yield of around 3.5-4 tonnes/hectare). Therefore, the creation of additional demand for millets in the livestock sector — a source of livelihood for two-thirds of the rural populace — would be a balanced way to make this crop popular among farmers. This is particularly important for a country like India where feed and fodder deficit has been identified as one of the

major constraints in achieving the desired level of livestock production. The recent reported shortage in green fodder, dry fodder and concentrates is 11.24 per cent, 23.4 per cent and 28.9 per cent, respectively. Studies show that sorghum is an excellent dual-purpose crop. All plant parts have economic use due to 'whole plant' utilisation. Pearl millet is another promising crop for green fodder supply (up to 40-50 tonnes/hectare) especially during the lean period (summer months) of May to July. The crop has large stem, leaves and heads with a quick-growing aspect. Its fodder is low in hydrocyanic acid and oxalic acid and rich in protein, calcium, phosphorus and other minerals. Finger millet is nutritionally

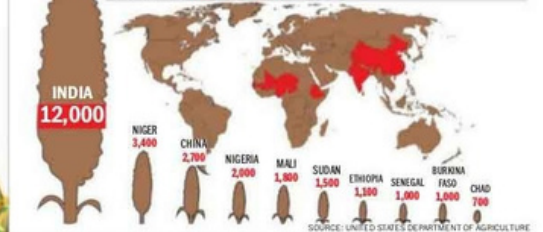
rich in terms of minerals, proteins and digestible fibres as compared to corn (maize) and hence could be fed to dairy cattle as a supplement to corn. The crop is also a good choice for making hay or silage — preserved form of green fodder. Likewise, proso millet has a nutritive value similar to that of other grains used for livestock feed and therefore can be used for calves, dairy cows and small ruminants without compromising on milk production. As millets uses less water per unit of forage production and tolerate heat as well as drought, their cultivation is economical in areas where environmental conditions, especially rainfall and temperature, are too harsh to grow other cereals.

The inclusion of millet grains in poultry feed has also gained momentum in recent years. Studies have indicated that the replacement of corn with pearl millet in broiler diet results in significant enhancement of the bird's growth and feed efficiency. In addition, feeding pearl millet to laying hens is believed to have additional benefits because the eggs contain higher omega-3 fatty acids and lower omega-6. Likewise, the use of millets as a feed ingredient in preparation of Total Mixed Ration (TMR) — nutritionally balanced diet for animals — economises nutrition management in small ruminant husbandry. Recuson improving crop-livestock integration through millet product systems, particularly in ecologically

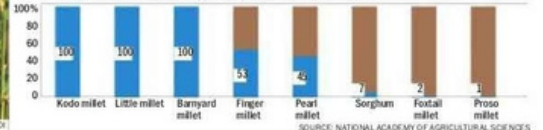
fragile manifold areas, would be crucial for bridging the fodder deficit, enhancing animal nutrition and performance, while ensuring our food and nutritional security. Strengthening the quality seed chain for dual-purpose varieties, frontline demonstrations on making hay/silage from green biomass and forging market linkage of farmers with the feed industry should also be among the priorities. Promoting start-ups with technical backstopping for preparing millet-based cattle feed can spur the production of these super crops in the long run.

Chandra is Director and Choudhary is a scientist at ICAR-Indian Grassland & Fodder Research Institute, Bikaner

Top-10 millet-producing countries in the world, 2022 (Production in 1,000 metric tonnes)



India's contribution to global production of millets





# Spurious seeds: 42 PD Act cases booked in '22

## 'Many Cases Not Proven; Only A Few Sentenced'

**Sribala.Vadlapatla**  
@timesgroup.com

**Hyderabad:** Chief minister K Chandrasekhar Rao has recently announced on the floor of the House that 42 Preventive Detention (PD) Act cases were booked against those selling spurious seeds in the previous year. He also warned seed traders from selling spurious seeds.

A quick scan reveals that in 2022, 276 cases were booked under the Seed Act 1966 in Telangana against the sale of spurious seeds. The threat of spurious seeds primarily affects cotton and chilli crops and Telangana has begun filing cases under the PD Act because many spurious seed sellers were repeat offenders.

The Seed Act only punishes violators with a fine of ₹500, but the crop damage, caused by the use of spurious seeds, is severe. And, an amendment, prescribing severe action, to the Act is pending in Parliament.

According to officials, the damage is so severe that using spurious seed reduces cotton productivity per acre to three quintals, down from 12 or 13 quintals. "Most far-

### 'CASES MUST BE AGAINST FIRMS'

- 276 cases booked under Seed Act 1966 against sale of spurious seeds in 2022

- Seed Act punishes violators with fine of ₹500

- Spurious seed reduces cotton productivity per acre to 3 quintals from 13 quintals, say officials

- Sources say stern action can be taken under PD Act but many cases not proven, only 13-14 sellers sentenced

- Cases should be against companies & not suppliers, says Kisan cell

- Majority spurious seeds imported from Gujarat, Tamil Nadu (cotton), Karnataka, AP (chilli)



mers suffer the damage but don't complain. Stern action can be taken under the PD Act. However, even in these cases, booked over a three-year period, many cases could not be proven and 13 to 14 sellers were sentenced," sources said.

State Kisan cell president K Anvesh Reddy said: "Farmers should be given compensation in case they were sold spurious seeds and the crop is damaged. And, cases should be booked against companies, but not suppliers."

Spurious seeds are those produced by companies that have not completed the required four stages of research and development. According to the Seed Act, all companies must obtain marketing licences to sell and these

licenses must specifically mention the brand's varieties. R&D stages include breeding, foundation, certification, and the fourth and final one, truthful label. Companies that have followed these steps for two or three years sell a variety of seeds with accurate labelling.

The Seed Act requires sellers to obtain a marketing licence for each variety, but they adopt shortcuts offering low-quality seeds.

Telangana has approximately 1,000 seed marketing licensees and a few dozen companies that were actively engaged in R&D.

The majority of spurious seeds were reportedly imported into the state from Gujarat, Tamil Nadu (cotton), Karnataka and Andhra Pradesh (chilli).



# States to get rewards for organic farming

Gireesh Chandra Prasad &

Puja Das

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NEW DELHI

The Central government has designed a scheme for rewarding states that push organic farming in a measure to cut ballooning subsidies for chemical fertilizers.

As per the plan, if promotion of organic farming by a state leads to a decline in the use of chemical fertilizers, then half the subsidy saved on that account will be transferred to the state, said Professor Ramesh Chand, member, NITI Aayog. The federal policy think tank worked with Central government departments on the modalities of the scheme.

Chand said the scheme is designed to check excessive and indiscriminate use of chemical fertilizers as part of the government's efforts to make farming more sustainable. Robust agriculture growth, price stability of farm produce, and sustainability are priorities for NITI Aayog in the farm sector.

"If there is any saving in fertilizer subsidy in any state,



Govt is working to monetize agriculture waste by procuring it from farmers and turning it into energy, said Ramesh Chand. MINT

compared to the average of last three years, whatever the amount is, half of that will be given to the state government concerned," Chand said.

There will be some conditions attached to how some of the funds have to be utilised by the state but the rest can be used as per the state's own choice.

The fertilizer subsidy burden has shot up sharply in the current financial year on account of the supply disruptions and price

escalation in global markets following the Russia-Ukraine war.

Although the government had originally estimated only

about Rs one trillion for making plant nutrients available to farmers at affordable prices in FY23, it later sought additional spending permission from Parliament. The

revised fertilizer subsidy estimate for this fiscal is around ₹2.25 trillion, as per budget documents.

**The scheme is designed to check excessive and indiscriminate use of chemical fertilizers, said Chand**

Finance minister Nirmala Sitharaman had announced in the budget for FY24 that a new scheme--PM programme for restoration, awareness, nourishment and melioration of mother earth (PM Pranam) will be rolled out to incentivize states to promote alternative fertilizers and balanced use of chemical fertilizers. Details were not announced in the budget.

The NITI Aayog member also said that the Centre is working with states to monetize agriculture waste by procuring it from farmers and turning it into energy. This would also help boost farmers' income, Chand added.

As a part of the Biodegradable Waste Management component under Swachh Bharat Mission (SMB-G), the Centre had launched GOBARdhan scheme in April 2018 to generate energy and income in addition to cleanliness by processing manure and whole agricultural waste materials such as straw, manure and crop residues in rural areas.

The scheme is being implemented under the SBM-G Phase II, primarily focusing on increasing farmers' income and turning biowaste into compressed biogas.

## Thermo-chemical upcycling of crop residues

IIT-Madras devises three clean means of extracting biochar, activated carbon, and syngas from farm waste

S Varunkumar

Extracting heat and making biochar (charcoal) from agri residues has been known to mankind for millennia. Recent innovations are helping do this in a clean and efficient way. Over the last eight years, our laboratory in IIT-Madras has been developing 'thermo-chemical' technologies to convert crop residues into value-added products.

Activated carbon is a highly porous form of charcoal. Porosity is the 'intrinsic surface area'. It is 1,500 sq m per gram for activated carbon, compared with about 20 sq m per gram for charcoal. Such high porosity is achieved by reacting high-temperature steam with charcoal (known as activation) — the steam strips away carbon from charcoal in the form of carbon monoxide, leading to microscopic pores and an increase in intrinsic surface area. Al-

though it appears straightforward, the activation step requires careful control of parameters.

Products of significantly greater value compared with heat energy and charcoal include liquid hydrocarbons, alcohols and ethers. Extracting these involves complex processes with multiple steps. The complexity arises because the carbon and hydrogen in agro-residues co-exist with oxygen as cross-linked polymeric chains made of cellulose, hemicellulose and lignin.

One way of making value-added products is by breaking down these polymeric chains into simpler units by exposing them to high temperatures and then assembling the simpler units in a specific order to form the required products. Catalysts are needed for the latter step. These two steps together are known as a thermo-chemical process; the 'thermo' refers to the use of high temperatures to break down the polymeric chains, and 'chemical' is a



**ACTIVATED CARBON.** Highly porous form of charcoal iStock.com

reference to the catalyst-driven assembly of the simpler units.

Yet another useful product is syngas, which is the end-product of the thermal breakdown of agro-residues in the presence of oxygen. That is, syngas is the product of the 'thermo-chemical' process minus the catalytic assembly. This process is popularly known as gasification. The useful part of syngas is carbon monoxide, hydrogen and traces of methane and other higher hydrocarbons; the rest is a mixture of carbon dioxide, water vapour and ni-

trogen, whose proportion depends on the source of oxygen used for gasification, namely, atmospheric air, enriched air (atmospheric air combined with pure oxygen), or a mixture of air, pure oxygen, carbon dioxide and steam. Steam is used to enhance hydrogen in syngas, while carbon dioxide is used to enhance carbon monoxide. Liquid hydrocarbons like gasoline and diesel, and alcohols like methanol and ethanol can be obtained through catalytic assembling with carbon monoxide and hydrogen as starting material.

We now have three processes for clean and efficient extraction of biochar, activated carbon, and syngas from agro-residues. The biochar process has been scaled up to one tonne per hour and is in commercial operation. The activated carbon and syngas processes are being scaled up.

The writer is Associate Professor, Mechanical Engineering, IIT-Madras



# Mahindra fully acquires MITRA Agro Equipments

The company's Farm Equipment Sector (FES) has increased its stake in MITRA Agro Equipments Pvt Ltd to 100% from the existing 47.33%

NEW DELHI

MAHINDRA & Mahindra on Monday said it has fully acquired MITRA Agro Equipments Pvt Ltd for an undisclosed amount.

The company's Farm Equipment Sector (FES) has increased its stake in MITRA Agro Equipments Pvt Ltd (M.I.T.R.A) to 100 per cent from the existing 47.33 per cent. As part of the acquisition, Mahindra has fully bought out Omnivore's stake in the business. The company, however, did not share financial details. "Mahindra aims to grow its farm

machinery business by 10-fold in 5 years and is making rapid progress towards achieving this goal.

The additional share purchase in M.I.T.R.A would aid Mahindra's growth and expansion into the growing horticulture market," Mahindra & Mahindra Farm Equipment Sector President Hemant Sikka said in a statement. Founded in 2012 by Devneet Bajaj, M.I.T.R.A is a leading player in high precision orchard sprayers, a brand for farmers growing fruits like grapes, pomegranate and oranges. The com-

pany has more than tripled its revenue from FY18 to FY22 and now employs over 200 people and has successfully started exporting its products globally.

After the acquisition by Mahindra, M.I.T.R.A plans to accelerate the expansion of its product portfolio alongside its network in India and overseas markets. "After eleven years of building a passionate team, more than ten innovative products, and a radical rural sales strategy, the journey of exiting M.I.T.R.A to M&M is gratifying," M.I.T.R.A Founder Dev Bajaj noted.

## Natural farming and water conservation show the way

BHARAT DOGRA

In Bundelkhand region spread over 14 districts of central India (in Madhya Pradesh and Uttar Pradesh), water scarcity has been a frequent constraint in rural development initiatives, so recent efforts to spread natural farming decided to start with water conservation. The results have been extremely encouraging, and many farmers including women farmers who have been prioritised are brimming with happiness and hope.

About 30 farmers of Elha village (in Manikpur block of Chitrakoot district, Uttar Pradesh) have gathered for a group discussion in the courtyard of a farmer, along with activists of a voluntary organization ABSS. One of the main subjects of discussion is - how far can the efforts of natural farming initiated about two years back progress?

Two farmers, Ram Bishun Yadav and Shiv Avtar Yadav, and an activist farmer, Gajendra Singh (from a nearby village) enter into a discussion on the progress achieved so far. In summary they say that a farmer getting two quintals earlier from a bigha of land has been able to get four quintals, increasing income from about Rs 2,000 to Rs 4,000. At the same time there has been a saving of Rs 2,200 per bigha by giving up expenditure on chemical pesticides and chemical fertilizers, as also less intensive use of irrigation. Dry fodder or bhusa availability has increased by about Rs 1,000. Thus they calculate an increased net income of about Rs 7,200 per bigha of land.

However, before we rush to optimistic calculations, we must add that these numbers apply to those who have done very well in the recent spread of natural farming, and not all have done as well. Secondly, this result was not achieved just from natural farming practices as it was preceded by the cleaning of the village's



main water tank, deposition of its fertile silt on fields as well as other water conservation efforts. Thus, the production increase is the combined result of these three factors - deposition of fertile silt, water conservation efforts (the taking out of silt resulted in increased rainwater collection in the tank and improved recharge) and natural farming practices based on better use of cow dung and cow urine, as well as various other improved methods based on local village resources.

Those who have taken up multi-layer vegetable production using organic methods are able to increase their production and income even more, and this too from very small plots of land. This can be seen clearly in Sakrauhan village of this block. Sarita and her husband Rajbohar are known for their very well-cultivated multi-layer vegetable farming in which over 15 vegetables are grown in such a way that their various plants are protective and helpful to the growth of each other. Sarita has already emerged as a leader in this movement of natural farming in her village, having established a natural farming centre where she stores sur-

plus improved organic manure and pest repellants prepared in improved, scientific ways from locally collected cow dung and cow urine.

In kitchen gardens, such cultivation is done closer to home on an even smaller scale and lower budget. This has been adopted by a higher number of women in improved ways, contributing much to improved nutrition. What people here highlight most of all is the health benefit they receive from organically grown vegetables and grains. Illnesses in families have reduced since we adopted natural farming, they say.

These encouraging efforts have been initiated by SRIJAN, a voluntary organization, as a part of a wider project called BIWAL for promoting sustainable development in the villages of Bundelkhand region. BIWAL's model combining water conservation and natural farming has given a new-found strength to many farmers and rural communities. Arunoday and Srijan voluntary organisations have collaborated to take this model to several villages of Mahoba district, with emphasis on women farmers and relatively weaker sections.

Chhitarwara village in Jaitpur block provides an example of a village that is humming with new creativity in the course of experimenting with natural farming. Arvind, a small farmer known for his many skills, was quick to turn his creativity in this direction. As we now have a low-cost technology based on improved utilization of cow dung and urine plus other local free resources, Arvind asked himself, whether it would not now become viable to tend the neglected piece of low productivity land more carefully? Once he and his family took up the challenge, they ended up increasing the production on this piece of land by almost three times, from 5 to around 14 quintals, using only organic inputs.

Several other farmers like Surtai and Chhadami have also achieved encouraging results from natural farming. This as well as the steep decline in the costs of those farmers who have adopted natural farming has attracted others. Most other farmers are at least trying natural farming on a part of the land, or discussing moving to this path soon. This important and very creative change within a short time has become a big discussion point in this area.

Another such village is Thurhat where Ramesh Dada has set up a natural farming centre which has become a hub for these activities and more specifically also a place where other farmers can buy low-cost organic manure and pest repellent.

Ramesh Dada says that the first one or two years are difficult while shifting to natural farming but after this the yield stabilizes and can also increase. However, the cost reduction and quality improvement of produce is achieved immediately. In fact, so important is the qualitative improvement, Ramesh said, that he was able to obtain almost double the normal rate for the entirely organic wheat produced at his farm, so that despite a small decline in yield his

income went up.

In these two villages as well as in Baura village of this block, the change has been facilitated by the removal of silt from tanks, leading further to deposition of fertile silt in fields and increase of rainwater retention capacity of tanks. In fact, Baura village suffered from acute water scarcity earlier and it was only after sorting this out that the prospects for natural farming's success also increased. Now this village has formed a tank management committee to carry forward water conservation work and subsequently they have removed silt on their own.

In Gaurihar block of Mahoba district, the challenge is considered to be bigger as this is one of the most backward blocks of Mahoba district. However, here the work of the BIWAL initiative, facilitated by a grant from Indus Ind Bank, has progressed well in more difficult conditions.

Keshkali of Churiyari village in this block is an example of a woman farmer who has come forward to make full use of new opportunities. She has set up a natural farming centre, taking up natural farming herself and motivating many others to do so. She says she had problems in the first year of natural farming, but now she is well established.

Vipin Tiwari is even more enthusiastic and says that he has been able to almost double production in some of his fields by carefully adopting natural farming practices. The progress in this village has been very encouraging and most farmers are now being attracted towards this.

In some other villages, like Bahera in Niwari district, water conservation has also been helped by digging pits called dohas in natural water channels so that rainwater remains longer in the pits for use by villagers and their animals.

The writer is Honorary Convener, Campaign to Save Earth Now. His recent books include 'A Day in 2071: Man over Machine' and 'Hindi Cinema and Society.'



ON THE JOB

# Employment in agriculture soars in Maharashtra



MAHESH VYAS

The total employment in Maharashtra has improved significantly since the pandemic. Over 3 million people gained employment in the state between September-December 2019 and September-December 2022.

The September-December 2019 period was when the 18th Wave and the September-December 2022 period was when the 27th Wave of the full panel of CMIE's Consumer Pyramids Household Survey was administered. The former was the last pre-pandemic Wave and the latter is the latest post-pandemic Wave.

The increase in employment over this three-year period was driven mainly by the addition of labour in the agriculture and industry sectors, and not in services. In fact, around 57.6 per cent of the increase in total employment in Maharashtra was due to employment growth in the agricultural sector alone.

The workforce — comprising persons who are employed — expanded by 3.1 million in the past three years. As a result, total employment in Maharashtra in September-December 2022 reached 45.5 million. In comparison, there were 42.4 million employed people in the pre-pandemic period of September-December 2019.

While this increase in employment over three years in Maharashtra is a positive, it was not commensurate with the rate of increase in the working-age population in the state at the same time. As a result, Maharashtra's employment rate, which measures the proportion of the population that is employed, fell from 41.87 per cent to 41.84 per cent in this period.

The largest provider of employment in Maharashtra is the agricultural sector. In September-December 2019, there were 18.7 million people employed in agriculture, amounting to 44.15 per cent of the total workforce in the state. The second highest share of employment, at 36.4 per cent, was in the services sector. There were a little over 15.4 million people employed in services in Maharashtra in September-December 2019. Industry accounted for a much smaller share of 19.4 per cent, employing 8.2 million people.

The sectoral distribution of the workforce in Maharashtra in September-December 2022 indicates that agriculture continues to be the dominant source of employment. In fact, a large share of the increase in total employment between September-December 2019 and September-December 2022 comes from a jump in employment in the agricultural sector.

The total employment in Maharashtra increased by 3.1 million between September-December 2019 and September-December 2022. Close to 1.8 million of these jobs were added in agriculture and 1.34 million were added in industry in this period. As a result, the expansion of the workforce in agriculture accounted for a rather high 57.7 per cent of the increase in total employment in Maharashtra. Industry accounted for 43 per cent of the



rise in total employment. In the services sector, on the other hand, there were 14,000 fewer people employed in September-December 2022 compared to three years ago.

The number of employed persons in agriculture rose from 18.7 million in September-December 2019 to 20.5 million in September-December 2022. This corresponds to a jump in employment in agriculture by close to 1.8 million. The share of agriculture in total employment in Maharashtra was 44.15 per cent in September-December 2019. It inched up to 45.07 per cent in September-December 2022 — a 0.92 percentage point increase.

The total workforce in industry expanded from 8.2 million in September-December 2019 to 9.57 million in September-December 2022. The respective shares in total employment were 19.43 per cent and 21.04 per cent. Therefore, in this period, the share of industry in total employment in Maharashtra

increased by 1.61 percentage points.

Within industry, the largest increase in employment between September-December 2019 and September-December 2022 was witnessed in the manufacturing sector. Around 1.28 million people were added to the employed pool in manufacturing, resulting in a total of 5.38 million employed people in this sector. In real estate and construction, employment increased by a small margin of 0.23 million between September-December 2019 and September-December 2022. In this period, the share of real estate and construction in employment in industry declined from 45.3 per cent to 41.39 per cent.

Compared to pre-pandemic times, there is little change in employment in the services sector in Maharashtra. There were around 15.41 million people employed in services in September-December 2022. This is a marginal decline in employment compared to 15.42 million people employed in this sector in September-December 2019. However, the share of services in total employment dropped considerably from 36.4 per cent to 33.9 per cent in this period. This suggests that fewer numbers of people are finding jobs in the services sector in Maharashtra, leading to a shift in employment to other sectors.

The movement of employment away from services in Maharashtra is largely in favour of agriculture. The share of agriculture in total employment increased by close to 0.9 percentage points between September-December 2019 and September-December 2022, while that of industry inched up by 1.6 percentage points. In the same period, the share of services in employment crawled down by 2.5 percentage points. The large shift of labour in favour of agriculture is an indication of distress in other sectors of the labour market in Maharashtra. The services sector, and industry to quite an extent, is unable to absorb the labour force into skilled jobs, forcing people to move in large numbers into more precarious sectors like agriculture.

The writer is MD & CEO, CMIE Pvt Ltd

## FY24 urea imports may dip by 33%

SANJEEB MUKHERJEE  
New Delhi, 23 March

The import of urea in FY24 might be 4-5 million tonnes, which is lower than the estimated figure of more than 7.5 million tonnes in FY23, trade and industry sources said.

The 33 per cent drop (assuming the import to be at the upper end of the band) anticipated in FY24 will be owing to increased domestic production capacities in new plants and the growing use of nano urea.

Of the estimated import in FY24, 1-1.5 million tonnes is under long-term contracts, sources said.

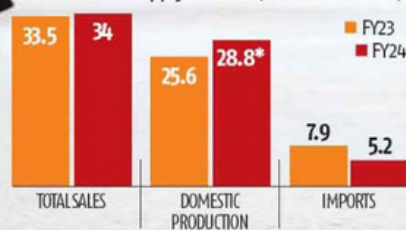
In FY22, according to industry sources, India imported around 8.1 million tonnes of urea between April and February. It was around 7.4 million tonnes during the same period this financial year.

According to trade and industry sources, in FY24 domestic production is expected to be around 30 million tonnes, up from the more than 28 million tonnes in FY23, while consumption is expected to be 33-35 million tonnes. Import will take care of the balance. "Consumption of urea will depend on how the weather



### THE EXPECTATION

Urea demand-supply scenario (in million tonnes)



Note: As on March 23, 2023

\*Domestic production might also rise to 30 million tonnes

Source: ICRA

and monsoon pan out in the coming months as any drop in acreage due to the El Nino impact could impact urea consumption," a senior industry official said. Urea is the most widely consumed fertiliser in the country, followed by diammonium phosphate (DAP). Its prices are heavily subsidised by the government. This financial year, between April and February, the production of urea is expected to be around 26.11 million, which is 14 per cent more than in the same period last year.

Sales, which include domestic consumption, were estimated at

34.17 million tonnes between April and February. Those were almost 6 per cent more than in the same period last year.

On Wednesday, Fertiliser Minister Mansukh Mandaviya said the country might not be required to import urea from the spot market to meet kharif demand. However, the urea imported under long-term supply agreements will come. He said there would be no shortage of fertilisers in the kharif season because domestic production and stocks would be sufficient to meet local demand.

However, he said, there would

be some import of DAP. Crop sowing in the kharif season starts with the onset of the monsoon. Paddy, cotton, pulses, and soybean are the major crops.

Giving details, Mandaviya said the estimated urea requirement for the kharif season was 18 million tonnes, while the availability would be 19.43 million tonnes, including an opening stock of 5.5 million tonnes as of April 1 and the production of around 14 million tonnes during the next six months.

The opening stock of DAP is 2.5 million tonnes and production is estimated at 2 million tonnes.



# Explain ban on just 3 pesticides: SC to govt

## Draft Notification Had Identified 27 Of Them

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**New Delhi:** The Supreme Court on Monday asked why the Union government decided to ban only three out of 27 pesticides its draft notification had identified for disuse even as the Centre said the continuous evaluation process on use of safe insecticide should not turn the court into a forum for producers to settle their business rivalry.

Dealing with a bunch of petitions demanding ban on over 100 pesticides still in use in India despite being banned in western world for their harmful effects on children, a bench headed by CJI D Y Chandrachud asked additional solicitor general Vikramjit Banerjee to explain the rationale behind choosing only three of the 27 pesticides to be banned. Banerjee said Centre in its status report has explained the process of evaluation and has nothing to hide. Taking a swipe at the petitioners for continuously expanding the list of pesticides to be banned in India, he said, "Different corporate houses produce different pesticides. The



Different companies produce different pesticides. The court should not be used as a forum for corporate warfare, the Centre said

court should not be used as a forum for corporate warfare."

"There is a robust regime in place to continuously evaluate the pesticides and their effects on human beings. Just because certain pesticides are banned in the USA, it does not mean these should be banned in India. Our climatic, soil and agricultural conditions are very different from the USA," the ASG said.

The CJI-led bench said the Centre's draft notification, on the basis of reports by committees headed by Dr S K Khurana and Dr T P Rajendran, had listed out 27 harmful pesticides. "The government had accepted

the recommendations and decided to ban them. What made you ban only three? We want to be satisfied about the nature of the process followed," it said. The ASG said the government has nothing to hide and would put the reports of the committees before the court. "But can the petitioners ask the Court to evaluate which pesticide to be banned, which is clearly the exclusive work of the government," he asked. Undeterred, the bench asked the government to file a fresh status report explaining the process and also place on record the reports of the two committees within four weeks.



# UP govt to launch millets project from Ayodhya

**Yogi govt is planning to spend Rs 100 cr to promote production and consumption of coarse grains in the State**

## AYODHYA

AYODHYA has been selected to launch the pilot project of the Yogi Adityanath government to promote production of coarse grains, including millets, in the state.

According to a spokesman, the state government is planning to spend about Rs 100 crore, as proposed by the agriculture department, to promote production and consumption of coarse grains in the state. The state government wants people to include coarse grains in their daily diet and it is preparing a blueprint to release grants and subsidies for setting up of processing units.

It would also help in achieving the target to double up the farmers' income since coarse grains require less water for irrigation, while their farm input costs are also economical in comparison to other crops

such as wheat and paddy. The state government is encouraging farmers to cultivate prominent coarse cereals, including maize, jowar, bajra (millets) and jau (barley).

Deputy director, agriculture, Om Prakash Mishra said: "About



1,200 hectare land has been identified in Ayodhya district in Sohawal and Pura Bazaar areas for the farming purpose. We have started giving technical support to farmers for the farming of coarse grains. The government will also provide quality seeds to them soon."



# If crop loss more than 75%, farmers to get ₹15K/acre

SANJEEV SINGH BARIANA  
TRIBUNE NEWS SERVICE

CHANDIGARH, MARCH 26

Following visit to different parts of the state for assessing the crop loss to farmers, Chief Minister Bhagwant Mann on Sunday announced a 25 per cent upward revision in the compensation for the crop loss to the farmers.

If the loss is more than 75 per cent, they will get 15,000 per acre and if the loss is between 33 per cent and 75 per cent, then the farmers will get Rs 6,750 per acre. The Chief Minister said labourers would be paid 10 per cent of the crop loss per acre. The CM also made an announcement of Rs 95,100 as the compensation for those who witnessed a total loss to their houses. Those whose houses suffered minor damages will be paid Rs 5,200.

Mann visited villages in Moga, Sri Muktsar Sahib, Bathinda and Patiala to assess the damage to crop due to rain.

President of the Bharti Kisan Union Balbir Singh Rajewal said, "Under the rules, a farmer, who suffer crop loss between 25 per cent and 50 per cent is given Rs 6,000 per acre, between 50 per cent and 75 per cent Rs 8,000 and for the total crop loss Rs 12,000 per acre. Farmers have been speaking for the amounts being less in comparison to their actual losses and the government should revise accordingly." Mann said the government was committed to safeguarding their interests against nature's fury.



Farmers examine the damage to their crop due to rain in Jalandhar. FILE

## MAXIMUM RELIEF ₹15,000 PER ACRE

- If loss is more than 75 per cent, they will get ₹15,000 per acre
- If loss is between 33 and 75 per cent, farmers will get ₹6,750
- Labourers will be paid 10 per cent of the crop loss per acre
- ₹95,100 for those whose houses were totally damaged
- Those whose houses suffered minor damages to get ₹5,200
- CM visits Moga, Muktsar Sahib, Bathinda and Patiala districts to assess crop damage

## Relief within 10 days: CM

MUKTSAR, MARCH 26

Chief Minister Bhagwant Mann today visited the Lambi segment and assured farmers that they would get compensation in 10 days for the losses to their crops due to rain.

The Chief Minister said the compensation would be given to the farmers through the direct benefit transfer (DBT) system in their bank accounts. He also announced that farm labourers and daily wage earners, who were dependent on wheat crop, would also get the compensation.

Besides, those who suffered loss to their livestock and buildings would also be cov-

ered under the special girdawari, he said.

"I have directed all Deputy Commissioners to give me the report of special girdawari within 10 days so that the compensation could be given by April 6-7. If someone has taken the land on lease, he/she will also get the relief. The district administration will ask the villagers about the cultivators. Teams, conducting special girdawari, will make an announcement in village gurdwaras," said Mann at Dabwali Dhab village here. Some farmers also raised the issue of the canal water supply. —TNS



# Overuse of fertilisers harming soil health in Karnal

PARVEEN ARORA  
TRIBUNE NEWS SERVICE

**KARNAL, MARCH 25**  
Overuse of chemical fertilisers coupled with less enthusiasm for crop diversification among farmers has led to degrading of soil fertility. This has become a major challenge for the farming community in the district, particularly in wheat and rice growing fields.

A data of the Agriculture Department revealed that the soil in the district was deficient in nitrogen, phosphorous and potassium.

The department has collected 2,17,527 samples in the current fiscal, of which 1,02,106 have been tested. A test report revealed that in the majority of samples, organic carbon was low, while nitrogen and phosphorous were low across the district. More than 90 per cent samples had nitrogen deficiency, while over 70 per cent samples were deficient in phosphorous, said Dr. Suren-der Tamak, Assistant Soil Conservation Officer (ASCO).

A majority of the samples were low in potash which indicated that the farmers were



Farmers spray pesticide on wheat crop at Kutail village in Karnal. JAVI KUMAR

Department collected 2,17,527 samples in current fiscal, of which 1,02,106 have been tested

not applying potassic fertilisers, due to which the soil was getting degraded from high to medium category.

Whereas, secondary nutrients such as sulphur was showing deficiency in small pockets. The iron deficiency was spreading very fast as the farmers were not supplementing any fertiliser of iron. Micro elements such as boron, zinc and manganese were found deficient in the small pockets,

he added.

"Use of chemical fertilisers is one of the major reasons behind the eroding of soil health. The farmers should avoid haphazard use of chemical fertilisers/pesticides. They should follow crop diversification, for which the government is also offering incentives," said the ASCO.

The district has 10 soil testing labs, where farmers can get their soil tested. A soil

health card is issued to the farmers under the Prime Minister's flagship programme, 'Soil health card' launched in February 2015 from Rajasthan, which aims at informing the farmers about the nutrient status of the soil along with the recommendations of fertiliser dosage for major crops to improve soil health and fertility, Dr Tamak said. Dr Aditya Dabas, Deputy Director Agriculture (DDA), said after the harvesting of the wheat crop, the farmers should cultivate dhaincha crop. The government was offering 80 per cent subsidy on the seed of dhaincha, which improved soil fertility.

The state government had also launched 'Mera Pani, Meri Virasat' scheme to promote crop diversification. The farmers should also adopt crop diversification as the state government gave an incentive of 7,000 per acre with the aim of reducing the area of paddy in the state and promoting maize, cotton, oilseed, pulses, onion, fodder crops, horticulture and vegetable crops, said the DDA.

## Former professor of Gujarat agri varsity develops irrigation, fertigation software

Subramani Ra Mancombu  
Chennai

A retired Gujarat Agricultural University professor has developed a software that can reduce the requirement for water and energy for different crops by nearly 50 per cent.

The Tamil Nadu Agricultural University (TNAU) has conducted studies with the software developed by Dr S Raman for micro-irrigation, particularly drip.

Raman told *businessline* that in one of the studies carried out by TNAU on turmeric at Velliangadu village in Coimbatore district's Karamadai block, the crop was irrigated for only 30-45 minutes in a day instead of two hours in two days. The crop experienced good growth with water being



distributed evenly and there was no excess irrigation of the plants.

### SCHEDULING

In the case of a demonstration on the banana farm in the same village, the irrigation was reduced by 50 per cent and its frequency was increased to daily. The G-9 banana crop recorded a yield of 40 kg against the normal 30 kg per plant.

Raman said he had de-

### NOVEL IDEA

The TNAU has conducted studies with the software developed by Dr S Raman for micro-irrigation, particularly drip

veloped the software for scheduling irrigation through micro irrigation and another for fertigation. The software works on the climatological approach of estimating the water requirement of the crops at different stages of their growth.

The requirement depends on whether they are grown in the open or greenhouse or net house conditions.

The software estimates the water requirement of the crop

based on district-level meteorological data. It can suggest the requirement of 65-70 agricultural and horticultural field crops and orchard crops, he said.

It assesses the water requirement for a particular day based on the effective rainfall a region receives and can be periodically modified, he said.

The usage of the software has resulted in saving water and energy and the government can divert such energy saved to other sectors, particularly industries, the former Gujarat Agricultural University professor said.

The farmer can bring and irrigate more area and this could reduce the attacks of pests and diseases, besides managing weeds. Returns to farmers will improve as a result.



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