

Far Eastern Agriculture

US\$15.00 (UK£9.00)

VOLUME 39 ISSUE 3 2021

Smart fertiliser management for better crop production

Poultry:

Innovative system to
measure eggshell strength

Livestock:

Recent developments
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How to accurately check
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Cover Image : Adobe Stock

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Printed by: Buxton Press

Printed in: June 2021

Far Eastern Agriculture

(ISSN 0266-8025)

Alain Charles Publishing
Serving the world of business

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Philippines launches campaign to increase rice knowledge

LEARNING TO IMPROVE rice production is now made more fun and interactive with the launch of a digital campaign dubbed “Palaywakin ang Galing: yunPALAYun” to promote the technologies and services of the Rice Competitiveness Enhancement Fund-Rice Extension Services Programme (RCEF-RESP).

Dr Karen Eloisa T. Barroga, vice-chair of the RCEF- RESP Technical Working Group, said that the campaign name – a wordplay of palay and palawakin (expand), signifies the RCEF-RESP’s purpose of spreading modern rice farming knowledge to enhance rice farmers’ skills. The other key word of the campaign name, yunPALAYun (a combination of palay and ‘yun pala ‘yun expression), is designed to teach farmers with the right farming technologies that can create significant yield increase and reduction in the cost of rice production.



The campaign will encourage farmers to avail of the trainings under RCEF-RESP to enhance their knowledge, skills, and interest in farming.

“We know that our Filipino rice farmers are already good but we want to expand their knowledge. We also want to expand the coverage of the RCEF Extension Programme so that it will also benefit farmer’s spouse, children, and also their farmworkers. We are also expanding our training methods because we don’t want to be limited to training room or farm school settings, but through various media including online,” Barroga explained during the online campaign launch.

BioMar announces a new RAS feed concept

BIOMAR HAS ANNOUNCED a new recirculation aquaculture system (RAS) feed concept, LARVIVA ORBIT, that aims to improve the efficiency of marine nurseries.

The concept will support an industry move of a prolonged time at hatchery for fry before they are transferred to sea. This will aid in the expected acceleration in the use of RAS technology in marine nurseries, and thereby support the development of hatchery businesses for marine fish species.

“We understand how challenging RAS operations can be, as this farming technology demands skilled manpower, extra attention to the fish, the system and the importance of specially designed feeds to accommodate the requirements and ultimately the success of RAS technology,” explained Joana Amaral, product manager for Marine Fish Hatcheries at BioMar.

Early-stage marine fry can be extra fragile to handle and have additional challenges with life at sea. During recent years marine hatcheries, primarily in the Mediterranean area, have experienced the need for increasing land-based



Image credit: Adobe Stock

The concept will support an industry move of a prolonged time at hatchery for fry before they are transferred to sea.

fry production. This resulted in a change of mindset and an accelerated shift from traditional flow through systems to more advanced technologies such as RAS specially for the nursery and pre-ongrowing phases.

Duravant acquires poultry processing equipment company Foodmate

DURAVANT, AN ENGINEERED equipment and automation solutions provider to the food processing, packaging and material handling sectors, has completed the acquisition of Foodmate, a leading manufacturer of poultry processing equipment dual-headquartered in Ball Ground, Georgia, and Numansdorp, the Netherlands.

The Foodmate brand of poultry processing machinery has been a competitive force in the full line processing of poultry for more than 15 years. With a strategic global footprint featuring manufacturing and engineering hubs in Europe, demo and showroom facilities in the US and the Netherlands and sales and assembly in the US, Foodmate’s customers are further supported by a local presence in 55 countries.

Foodmate’s deep engineering and development capabilities allow for the custom design of complete automated solutions from the weighing and grading of the poultry product, to the cutting and deboning process. Recognised for advanced technology around software for vision and grading capabilities using proprietary software, and R&D capabilities supported by deep application know-how, Foodmate continues to grow its global presence.

This partnership brings together two global engineered equipment leaders and extends Duravant’s ability to serve customers and partners in more than 190 countries worldwide within the food processing sector.



This partnership will serve customers and partners in more than 190 countries worldwide within the food processing sector.

DSM launches Sustell to improve profitability of animal protein production



Sustell enables farmers to accurately forecast the impact of sustainability measures on financial performance.

ROYAL DSM, A global science-based company active in nutrition, health and sustainable living has developed Sustell, a first-of-its-kind intelligent sustainability service that delivers accurate, simple and actionable farm-level solutions – to drive improvements in the environmental footprint and profitability of animal protein production.

DSM has developed Sustell together with Blonk, a recognised independent expert and leader in Life Cycle Analysis (LCA) and sustainability performance in the food and agriculture fields. The Sustell service is built around an Intelligence Platform that is connected to the Blonk APS-footprint tool, together with an 'Expert Centre' made up of a team of DSM and Blonk experts in LCA, animal nutrition and sustainability.

The Expert Centre partners with animal protein producers, assessing the baseline environmental footprint of their animal production using their actual farm and feed data rather than industry averages and proxy data sets, and then developing case-specific intervention scenarios known as 'what-if' models to make measurable sustainability improvements. In this way, Sustell combines an advanced, powerful sustainability calculation tool that utilises real farm data, with expert knowledge, tailor-made, practical solutions and business development projects to unlock the value of sustainability.

By providing deep insights into farm-level emissions Sustell opens new possibilities for the wider value chain, including the

ability to certify and incentivise sustainable farm practices. For example, retailers and financial institutions will be able to objectively manage the risks and opportunities relating to the environmental footprint of animal protein. In addition, Sustell enables farmers to accurately forecast the impact of sustainability measures on financial performance.

David Nickell, vice-president Sustainability and Business Solutions DSM Animal Nutrition and Health, said, "Sustell achieves the seemingly impossible – simplifying the complexity of measuring, validating and improving the environmental sustainability of animal protein transparently, scientifically, farm by farm, system by system. Animal farming companies and the associated value chain, have, for the first time, a powerful solution to measure, compare and improve the sustainability of animal protein."

Ivo Lansbergen, president DSM Animal Nutrition & Health, stated, "To sustainably feed almost 10 billion people by 2050 within our planetary boundaries, we must apply new thinking, technologies and business models. Together, we must shift away from criticising animal farmers for their environmental impact and instead help and support them by providing the tools and systems to improve the sustainability footprint of animal farming. In line with this ambition, Sustell is a service that will enable positive change for business and the environment – and help deliver on our purpose of creating brighter lives for all."

EVENTS 2021

JULY

21-23

V Connect Vietnam

Virtual

www.ildex-vietnam.com

AUGUST

2-7

Indo Livestock

Virtual

www.indolivestock.com

SEPTEMBER

3-5

AgriAsia India

Gujarat, India

www.agriasia.in

9-10

Sugarex Thailand

Khonkaen, Thailand

www.thaisugarexpo.com

9-10

Agri Expo Thailand

Khonkaen, Thailand

<http://agriculturethai.com>

OCTOBER

5-9

Meat Industry/AgroProdMash

Moscow, Russia

<https://ifw-expo.de/de/exhib/meat-industry-agroprod-mash-2020/>

13-15

Vietstock

Ho Chi Minh City, Vietnam

www.vietstock.org/en-us

18-20

EuroTier China

Nanjing, China

www.eurotierchina.com

FOOD OUTLOOK

THE FAO FOOD Price Index (FFPI) averaged 120.9 points in April 2021, 2.0 points (1.7%) higher than in March, and as much as 28.4 points (30.8%) above the same period last year. The increase marked the 11 consecutive monthly rise in the value of the FFPI to its highest level since May 2014. The April rise was led by strong increases in the prices of sugar, followed by oils, meat, dairy, and cereals.

The FAO Cereal Price Index averaged 125.1 points in April, up 1.5 points (1.2%) from March, resuming its climb after a short-lived one-month respite in March, and stood 25.8 points (26%) above its April 2020 level. With overall tightening maize supplies, on top of continued strong demand, maize prices stood 66.7% above their values one-year-earlier and remain at their highest level since mid-2013.

The FAO Vegetable Oil Price Index averaged 162 points in April, up 2.9 points (1.8%) month-on-month, driven by rising soy, rapeseed, and palm oil quotations more than offsetting lower sunflower oil values. International palm oil prices continued to rise in April on concerns over slower-than-expected production growth in major exporting



countries. Soy and rapeseed oil values climbed further too, underpinned by, respectively, firm global demand, including from biodiesel producers, and protracted global supply tightness.

The FAO Dairy Price Index averaged 118.9 points in April, up 1.4 points (1.2%) from March, rising for the eleventh consecutive month and lifting the index 24.1% above its value a year ago. In April, butter quotations rose,

underpinned by solid import demand from Asia, notwithstanding weaker internal demand in Europe. Skim milk powder prices increased due to high import demand from East Asia, induced partly by concerns over potential shipping delays amid limited spot supplies from Europe and Oceania.

The FAO Meat Price Index averaged 101.8 points in April, up 1.7 points (1.7%) from the slightly revised value for March, marking a seventh consecutive monthly increase and raising the index by 5.1% above the corresponding month last year. In April, bovine and ovine meat quotations rose, underpinned by solid demand from East Asia, amidst tight supplies from Oceania due to ongoing herd rebuilding and low inventories.

The FAO Sugar Price Index averaged 100.0 points in April, up 3.8 points (3.9%) from March and reaching levels nearly 60% above those registered in the corresponding month last year. The April rebound in international sugar price quotations was prompted by strong buying amid heightened concerns over tighter global supplies in 2020/21, due to the slow harvest progress in Brazil and frost damage in France.

Fighting global cattle tick challenge

OXITEC, A DEVELOPER of biological solutions to control pests that transmit diseases, destroy crops and harm livestock, has launched a programme aimed at the cattle tick, *Rhipicephalus microplus*.

Oxitec will work with Clinglobal, one of the world's largest science-based animal health service providers, incorporating Clinglobal's expertise in animal vector control practices.

As a species-specific approach to controlling pests, Oxitec's Friendly technology platform offers a safe, environmentally friendly, and sustainable solution, proven to significantly reduce target pest populations to very low levels.

CPF unveils plant-based MEAT ZERO

CHAROEN POKPHAND FOODS PLC (CPF) has announced that it has unveiled 'MEAT ZERO', a plant-based meat that is manufactured to feel, taste, and appear like real meat thanks to 'PLANT-TEC' innovation.



Image credit: Adobe Stock

MEAT ZERO will simultaneously penetrate markets in Asia, Europe and the US.

The new product, expected to appeal to health-conscious consumers, is affordable and available as ready-to-cook material and a ready-to-eat menu through convenience stores 7-Eleven and modern trade outlets across Thailand. Under the goal to attain the top alternative meat brand in Asia within 2022 and the world's top three within 2026, 'MEAT ZERO' will simultaneously penetrate markets in Asia, Europe and the US, taking advantage of CPF's customer base worldwide.

"MEAT ZERO is as tasty as real meat and consumers are barely able to tell if they are eating plants or real meats thanks to the outstanding achievement of CPF RD Centre which has worked closely with the world's leading research houses," said Prasit Boondoungprasert, CEO of CPF.

Indonesian government to promote the use of agricultural equipment, says report

ACCORDING TO KEN Research, the Indonesian government intends to increase national production of local agricultural machinery and has set aside US\$538mn for machinery development in Indonesia.

A new report by the company, titled Indonesia Agriculture Equipment Market Outlook to 2025, stated that the Indonesian government plans to invest in R&D - Rice science to further improve yields on available favourable land, while expanding rice production to frontier areas, where the rice plant must withstand harsher environments. Indonesian farmers are likely to increase the usage of disc plough on the farms over the long term. Working capacity of less than 40HP tractors with single plough is gaining traction for both dry and wet fields.

Demand for four wheel tractors will continue to arise from Sumatra and Kalimantan in the future, due to the above average farm holding size in these regions. Among product segments, combine harvesters are mainly demanded by a limited target audience and farmers and agricultural cooperatives and this particular trend is expected to continue in the near future.

Agriculture accounts for 14% of the nation's GDP, according to Indonesia's statistical department. The proportion is anticipated to increase in future leading to higher demand for agriculture equipment including both 2W and 4W tractors.

The report suggested that the overall agriculture equipment market is further expected to grow in the near future as both

existing companies and new entrants can focus on investment in 2W hand tractors/tillers; expansion in dealer network to widen their service capabilities; tie-ups between banks and private finance companies/institutions; focus on after-sales support services to gain customer attention; participating in agricultural exhibitions and other marketing initiatives. The market is expected to register a positive six-year CAGR of 6.1% and 5.7% in terms of sales value and volume respectively during the forecast period 2020-2025.

<https://www.kenresearch.com/agriculture-and-animal-care/agriculture-equipment/indonesia-agriculture-equipment-market-outlook-to-2025/409962-104.html>

Farmmi to develop agricultural supply chain

FARMMI has announced the establishment of Zhejiang Farmmi Agricultural Supply Chain Co. Ltd, leveraging more than two decades of experience in China's agriculture industry, to grow into a comprehensive service provider for the agricultural industry chain.

"As China's economy has grown, the country's agriculture industry has also continued to improve. Nevertheless, the industry still faces legacy inefficiencies such as transportation delays that lead to food waste, lagging information about customer needs that result in poor demand predictions and small profit margins in an industry that continues to rely heavily on labour," said Yefang Zhang, Farmmi's CEO.

The company plans to invest in companies with storage facilities that could extend its logistics network.

Agricultural products require an extensive supply chain, including storage and cold chain facilities, due to the freshness and quality control needed, which



Agricultural products require an extensive supply chain, including storage and cold chain facilities.

presents both challenges and opportunities. With the expansion of supermarkets, fresh stores, agriculture e-commerce and O2O (online to offline) platforms, the integration of online and offline retail channels presents an irreversible trend. Therefore, the company plans to expand its presence in smaller local and larger regional storage facilities, as part of its strategy to become a comprehensive service provider for the agricultural supply chain.

V-Connect Vietnam Edition: Gateway to ASEAN market goes virtual

The V-connect platform allows visitors to take networking online, with access to themed virtual lounges, webinars and group chats, through a laptop or smartphone.

VNU ASIA PACIFIC and their partners have announced the launch of a new digital B2B networking event, titled V-Connect Vietnam Edition, for ASEAN's Feed to Food Industry. Developed by VIV Team, the event will take place from 21-23 July and the digital forum will be open 24/7. The pre-event appointment for V-Connect Vietnam Edition starts on 21 June.

V-Connect Vietnam Edition Introduction

The V-Connect platform has converted the in-person B2B networking event into an online format, to suit the current business landscape. 'V' stands for VIV, the global brand name, and 'Connect' reflects the commitment of organisers to facilitating business networking, regardless of current restrictions. The management platform provides a progressive, web-based, smart phone-supported online ecosystem, optimised for all attendees to meet, network, and make deals. The V-Connect platform offers businesses a reliable, responsive and highly actionable platform to adapt, grow and prosper during the current global climate.

How Does it Work? V-Connect platform has been collocated with the main ILDEX Vietnam exhibition and/or standalone events. The V-Connect Vietnam Edition is the first digital platforms that will be introduced to the clients and customers of ILDEX Vietnam, between 21 July and 23 July. The features of the new platform include:

Meet Clients Across ASEAN - Visitors can set up meetings with relevant brands, intelligently selected by aligned business profile interests and elements. The exhibitors will enjoy three days of interactive, real-time live chat or video call meets with new buyers – as well as access to a powerful, integrated suite of lead generation tools.

Industry Immersion - The end-to-end platform unites thousands of industry front runners to engage, network and deal with one another. The digital platform allows buyers to attend 1:1 meetings and group webinars, present custom campaigns and enjoy brand exposure via on-platform sponsorship opportunities.

Learn & Network - Visitors can attend and present webinars, live stream conferences and visit themed virtual lounges that host group chats and allow access to unique meetings with industry experts, associations and stakeholders.

Cutting-Edge Platform - The V-Connect platform offers seamless access from laptop or smartphone with full app integration, without downloads. Its customisable digital showcase booths enable exhibitors to create unique online displays, featuring on-brand imagery, marketing collateral and more. Every event hosted on the V-Connect digital platform provides a new phase of online connectivity for the industry it serves (based on regional targets).

Global companies ready to serve the Asian Market

ILDEX Vietnam has lots of international companies in the livestock and



Image credit: ILDEX

ILDEX Vietnam will take place next year from March 16-18, 2022, at Hall A1-A2, SECC, Ho Chi Minh City, Vietnam.

aquaculture industries, that deliver the latest products and innovation, for solving the problem/challenges even during the crisis periods.

The representative from MORNINGBIO CO., LTD. (South Korea), said, "Despite ongoing uncertainties such as COVID-19, ASF and supply chain disruptions, we will continue to support our customers and ensure that our solutions and services help them maintain their profitability in these hard times. The customers depend on our solutions for better efficiency and performance as they see added value. Science is the most important value we deliver to our customers. We regularly share our trial information and research articles with our existing and potential customers for better support."

Nuno Furtado, event consultant, BRAZILIAN RENDERERS ASSOCIATION (Brazil), said, "This year, the Brazilian Renderers will work with technology and agility to connect partners. The purpose is to participate in the biggest events of livestock and aquaculture to show Brazil, with the strongest companies producing products for animal nutrition. It is a peculiar year to grow, because of the challenge that the world is facing, which also generates unique opportunities. The main purpose is to present Brazilian companies that produce animal meals and fats, used in animal nutrition, also hemoderivatives, plasma and gelatin of animal origins. The Brazilian products are produced with high technologic level that results in a product with security, quality and can be customised in accord with buyer needs. This all with good prices, transparency in negotiations, regulation and guarantees."

ILDEX Vietnam has been re-scheduled between March 16-18, 2022, at Hall A1-A2, SECC, Ho Chi Minh City, Vietnam. The decision has been made in view of the new COVID-19 clusters in Vietnam and with the deep concern for the health of the exhibitors and stakeholders. Social activities with more than 30 participants are currently banned and local authorities may impose stricter measurements in the coming months. ■

Those interested can pre-register for the digital networking event here: <https://www.online-register.org/ildex/>

Introducing the eGss system to measure eggshell strength

Novus International supports layer producers with an innovative system to measure eggshell strength.

ANIMAL HEALTH AND nutrition company Novus International, in collaboration with Dr Yuwares Ruangpanit from Animal Science Department, Kasetsart University, Kamphaengsaen Campus in Thailand, has developed and launched the Eggshell Grading and Scoring System (eGss).

This system consists of a specially designed box to illuminate the intact egg, giving it a translucent image. The grading and scoring of eggs are done based on the area of light that passes through eggshell and the evenness of light distributed across the shell surface.

The result or scores of the eggs is correlated to eggshell strength and shell thickness based on data from trials conducted by Kasetsart University. A poster of the scoring guide as well as a how-to video is provided to the completed kit. This could help Novus's layer customers in primarily evaluating eggshell quality to ensure more saleable eggs in their operations.

Cracked and broken eggs are leading challenges faced by layer producers affecting their performance and profitability.

Dr Yuwares Ruangpanit, said, "Sending eggs to laboratories pose several challenges since logistics and transit time affects the egg quality before they are even tested. Having a system such as the eGss box can support farmers and producers to test egg quality quickly and efficiently at their own site."

Having a system such as the eGss box can support farmers and producers to test egg quality quickly and efficiently at their own site."



The eGss system will allow producers to monitor their egg quality at site.

"This system will allow producers to monitor their egg quality at site, enabling them to respond quickly by adjusting nutrition and management to improve eggshell strength and thickness, two key parameters that can affect their profitability per day."

"This Egg Grading and Scoring System can also be useful for educational purposes. Students are able to use it for research and also expand the studies from eggshell quality and strength to more in depth studies on the effect of age as well as genetics."

Dr Dexter Abrigo, strategic marketing and technology director at Novus International Southeast Asia Pacific, commented, "We are happy to introduce a very useful and practical tool to our layer farmers which comes at a time wherein we want to improve egg shell quality, not only to increase the number of saleable eggs but

also to improve food safety. Collaborating with KU team led by Dr Yuwares has been instrumental in the development of this tool and we will be seeing more studies done with KU that will bring more insights in gut health through nutrition for the region."

Improving egg production

The Novus Egg Enrichment Programme offers solutions to help egg producers enrich their product and tap into lucrative niche markets. Supported by Novus nutrition, producers can deliver eggs with the qualities that today's consumers desire the most.

The products offered by the company to improve egg production include:

ACTIVATE which creates an environment that supports ideal microflora.

MINTREX that improves immunity and egg shell quality to increase the number of saleable eggs. ■

Image credit: Adobe Stock

Philippines agriculture production shrinks by 3.3% in Q1 2021



Image credit: Adobe Stock

There was an increase of 3.3% in crop production in the first quarter of 2021.

The value of agricultural production in the Philippines dropped by 3.3% in the first quarter of 2021, according to the Philippine Statistics Authority.

THE VALUE OF agricultural production in the Philippines dropped by 3.3% in the first quarter of 2021, according to the Philippine Statistics Authority (PSA).

The sharp decline was due to the reduction in livestock and poultry production, however, crops and fisheries recorded increases of 3.3% and 0.6%, respectively for the same period, it announced.

Livestock production, which shared 14.2% in the total agricultural production, contracted by almost a quarter. Hog, the major contributor for livestock declined by -25.8%, with poultry, which accounted for 13.3% of the total agricultural output, dropping by -7.4%.

"We expected the poor performance of the hog industry as our efforts to control the African Swine Fever (ASF) and repopulate ASF-free areas are yet to bear fruits," said the Philippine's Agriculture Secretary William Dar.

"We are aggressively taking steps to help

the country's swine industry recover from the ASF. These include the 'Bantay ASF sa Barangay' and its twin hog repopulation program," said Secretary Dar.

Joining the DA in the twin programme are the local government units, veterinary firms and practitioners, the academe, and the government's two main financial institutions – the Land Bank of the Philippines (LBP) and Development Bank of the Philippines (DBP) that are lending P30bn (US\$620mn) and P12bn (US\$250mn), respectively, to commercial swine raisers in ASF-free areas.

"We will continue to implement our

■ We are aggressively taking steps to help the country's swine industry recover from the ASF."

'Plant, Plant, Plant program' that is mainly focused on increasing our basic food commodities like, rice, corn, vegetables, livestock, poultry, and fisheries — comprising more than 70% of our agricultural GVA," added Secretary Dar.

"We have also included the coconut sub-sector, as we need to increase its contribution of 4% to total agricultural GVA, being the country's top export product."

In the PSA's report: *Value of Production in Philippine Agriculture and Fisheries*, duck and chicken recorded reductions in production by 11.6% and -11.2% respectively. Meanwhile, growths in production were registered for chicken eggs by 3.0% and duck eggs by 0.7%.

Fisheries contributed 13.7% to the total agricultural contribution. Double digit production growths were recorded for mudcrab (alimango) by 20.2%, skipjack (gulyasan) by 19% and slipmouth (sapsap) by 15.7%. At current prices, the value of agricultural production, which amounted to P484.8bn (US\$10.1bn), was higher by 8.2% from the previous year's three-month period. ■

Boosting amino acid digestibility in poultry diets

THE DSM|NOVOZYMES FEED Enzymes alliance has announced the commercial release of its breakthrough second-generation protease, ProAct 360.

ProAct 360 sets a new market standard in protease technology for poultry on three key fronts: feed efficiency, affordability, and sustainability.

This innovative feed solution delivers more consistent improvements in growth performance, along with improved matrix values for key amino acids and faster action. As its name suggests, ProAct 360 reflects a 360° understanding of the needs of poultry producers, and also of the challenges that poultry production can face with regard to environmental footprint.

ProAct 360 helps feed producers to be more flexible in their selection and use of raw materials, reducing the industry's reliance on soy and other major crops while at the same time helping to cut feed costs.



ProAct 360 offers improved returns on investment and its value proposition goes beyond the product itself.

It also significantly enhances the digestibility of protein, ensuring greater retention of nitrogen in the metabolism and therefore lower nitrogen emissions to

the environment.

With its enhanced potency, ProAct 360 offers improved returns on investment and its value proposition goes beyond the product itself. It includes a unique set of value-adding end-to-end digital services, ranging from raw material analysis to a sustainability calculator, that enables deeper insights and more informed decision-making.

Christie Chavis, vice-president at DSM Animal Nutrition and Health, observed, "ProAct 360 is our latest breakthrough technology in sustainability-driven innovation. Improving sustainability while reducing feed costs and supporting animal welfare is the key requirement for the animal protein industry today. The launch of ProAct 360 is an important proof point of our strategic initiative We Make it Possible, which is designed to deliver solutions that enable the transition to fully sustainable animal protein production worldwide."

BIOMIN announces participation in US\$11mn research project to improve animal health

LEADING ANIMAL NUTRITION and feed additive producer BIOMIN has announced its involvement in a four-year, US\$11mn EU-backed research consortium effort to address the challenges of pig and poultry production by creating a new technology to analyse animal-microbiota interactions at the microscale and produce 3D visualisations.

The Project 3D'omics, which involves 13 partner organisations from 11 countries and receives funds from the European Union's Horizon 2020 Research & Innovation Platform, is led by the University of Copenhagen in Denmark, and has the potential to improve the sustainability of animal production.

"Gut microorganisms have a systemic impact on many biological processes of farm animals. Because of this, understanding animal-microbiota interactions is recognised as one of the key steps to advance towards more efficient animal production, more sustainable procedures and to improve the welfare of animals," said Antton Alberdi, assistant professor at the Center for Evolutionary



Gut microorganisms have a systemic impact on many biological processes of farm animals.

Hologenomics, GLOBE Institute at the University of Copenhagen and 3D'omics project coordinator.

"The role of animal host-microbiota interactions is crucial to understanding gut health, and thus improving animal health, welfare and performance," noted Dr Christian Kittel, research programme director Gut Performance at BIOMIN. "We see continued interest in -Omics based tools that help our customers adopt precision animal farming, and we expect this interest to further increase in the future," he added.

Over the past several years BIOMIN has applied -Omics technologies to address animal/bird gut health and performance aspects on-site at commercial operations using portable sequencing devices and advanced analytics.

"As we continue to roll out microbiome analysis services for customers in more markets globally, we're looking in parallel five to 10 years into the future in terms of technological innovation at what these technologies could offer to the industry and our customers," stated Dr Kittel.

"We're excited to uncover the biological metabolic interactions and niche properties that shape an animal's gut microbial community and host health," commented Dr Mahdi Ghanbari, Scientist at BIOMIN.

"These insights have numerous potential applications, including the development of precision solutions to improve animal health, welfare and performance, understanding and addressing various pathogen challenges, and helping to inform the development of feed formulations," Dr Ghanbari observed.

Boosting crop yields with smart fertiliser management



Smart fertiliser management could be the answer to maintaining crop yields as climate change threatens agricultural productivity.

ACCORDING TO A recent study led by the University of Cornell entitled 'Anthropogenic Climate Change Has Slowed Global Agricultural Productivity Growth', climate change has resulted in global farming productivity falling by 21%, the equivalent of losing around seven years of farm productivity increases since the 1960's. This is a worrying statistic with the world population ever expanding and the demand for food matching it.

Institutions such as the IFA have pointed to fertilisers as one of the keys to confronting this challenge, as fertilisers allow for crops to better withstand the effects of climate change and can even help prevent further damage to our ecosystem. In an increasingly digital world many companies have begun introducing technological advancements to help maximise crop production through efficient fertilisation management. Modern management and automation systems can monitor a crop's growth and development

as well as important factors such as soil nutrients and then recommend and administer the correct fertiliser solution to ensure optimal crop output.

Pupuk Indonesia

One such company that has embraced the modernisation of fertilisers is PT Pupuk Indonesia. Through the introduction of its Agro Solution programme, Pupuk Indonesia aims to become more customer centric and follow technological trends to meet customer needs. Additionally, subsidiaries of the company are providing technology control and technical guidance to allow customers to embrace digitalisation.

At Hannover Messe 2021, Pupuk Indonesia took the opportunity to showcase

Fertilisers allow for crops to better withstand the effects of climate change."

their offerings such as Smart Production, a big data system that integrates pneumatic data and the Distributed Control System (DCS) with operational data resulting from maintenance, inspection and laboratory tests to provide an evaluation of the production process in real time. Also showcased was how the company implements Smart Distribution, an online fertiliser redemption system integrated with a warehouse and a stock and distribution monitoring system for loading and unloading optimisation.

Also demonstrated was the Precision Agriculture Platform for Oil Palm (PreciPalm), developed through Pupuk Indonesia's subsidiary PT Pupuk Kalimantan Timur, an innovative application which provides information on the nutritional conditions of the macro elements of oil palm land in the form of a digital map of the land processes from satellite imagery and mathematical models. The information is then processed to produce fertiliser recommendations for Nitrogen, Phosphorus, Potassium and Magnesium. It can also be used to monitor the nutritional condition of post-fertilisation plantations in real time. ■

CalMax for coffee: new product from Omex boosts yield and the brew



Image credit: Dr Terry Mabbett

Calcium nutrition minimises coffee berry drop and maximises the resilience of the coffee berry to pests and diseases. Dr Terry Mabbett reports.

FEW IF ANY farmers are faced with a more complex set of crop priorities than those who grow coffee. Crop yield potential is paramount but so is bean quality, including bean size and strength, and not to mention post-harvest, on-farm processing (wet or dry) of coffee berries and beans.

Required to achieve the green coffee commodity, they represent some of the most mechanically rigorous crop processing methods, and from which coffee beans must emerge physically intact. Last but not least is the flavour and aroma of the coffee cup infusion, largely governed by chemical profile of the roasted coffee bean but potentially prejudiced by off flavours caused by a wide spectrum of bean defects.

Coffee crop nutrition and the full gambit of essential plant nutrients play a pivotal part in achieving high yields of top quality coffee cherries and green coffee beans, but one nutrient, in particular, is

credited with an over-arching role in achieving these goals. This nutrient is calcium, which minimises coffee berry drop and maximises resilience of the coffee berry to pests and diseases, and the bean to a range of well-known commercial defects.

Calcium is rarely deficient per se as a soil

“Foliar sprays of calcium delivered under strict timing and concentration schedules allow crop nutritionists and plant physiologists to more accurately predict and pin-point the strengthening roles of calcium.”

nutrient, but maintaining sufficient levels of soluble calcium in the soil and in plant-available form is an entirely different matter. Laboured movement of calcium, within the soil and into plant roots, and up the plant as divalent calcium ions (Ca^{2+}) for use in the growth of shoots, leaves, fruits and seeds, is well established and appreciated. And the reason why savvy growers use foliar sprays of soluble calcium to boost low levels of plant-available soil calcium, and to maintain the tissue strengthening attributes which calcium can provide. Calcium is essential in the formation of cell membranes and plant cell walls. It has a specific and prominent role in cementing plant cell walls together, to form strong plant tissue, via the inherently gelatinous (adhesive) middle lamella composed of calcium pectate.

Foliar sprays of calcium delivered under strict timing and concentration schedules allow crop nutritionists and plant physiologists to more accurately predict and pin-point the strengthening roles of calcium. And the minutiae of how these are expressed in specific aspects of plant growth

and development, such as minimising coffee berry drop, resilience to pests and diseases and as a bulwark against bean damage and resulting bean defects.

Omex CalMax trialled on coffee in Vietnam

This is exactly what Omex Agrifluids set out to achieve with comprehensive research trials using Omex CalMax, a fully water soluble fluid emulsion product containing a range of essential plant nutrients – nitrogen, magnesium and a full profile of chelated micronutrients together with a high concentration of soluble calcium.

The research was carried out in Vietnam, the world's number two producer of coffee with over 1.5 million tonnes per annum. Ten trials were established in four coffee growing areas (Bao Lam, Di Linh, Lam Ha and Duc Trong) to determine the most effective rate of Omex Calmax in terms of extension growth, berry drop, coffee yield and bean quality. Omex CalMax was applied by foliar spraying to five-year-old Robusta coffee trees. Harvested ripe cherry was processed by the dry method using the sequential steps of sorting and cleaning, sun drying and hulling.

Omex CalMax was applied at three different treatment levels (3.75, 2.50 and 1.25 ml/tree) in multiple applications, starting at the end of March/early April which is post-main flowering stage and beginning of the 'pin-head' stage. Harvesting began in September and was completed by end of January/early February.

The three Omex treatments were compared with 'Farm Check' trees not receiving foliar sprays of Omex Calmax. Trees within the four different treatment categories were thus compared for a range of growth parameters, yield and bean quality. This included extension growth (new branch length), berry drop (per cent), coffee cherry yield, processed green coffee yield, size-grade of coffee beans and per cent bean defects (black bean, broken bean and mouldy bean).

Omex CalMax ticked almost all the boxes for increased yield and superior bean quality with the highest rate of CalMax (3.75 ml/tree) performing best in virtually all respects.

- Trees treated with CalMax suffered only a 1-2% berry drop and measurably less than the 5% of berries 'dropped' from untreated 'Farm Check' trees. Calmax treated trees accordingly supported a greater number of cherries in each cherry cluster compared with the untreated Farm Check trees. Average figures for cherries/cluster were: 24, 24, 21 and 13 for, respectively, the 3.75 ml, 2.50 ml, 1.25 ml/tree treatments and the untreated Farm Check trees. Five per cent berry drop is considered as an upper threshold level before a serious impact on yield sets in.
- Average yield of coffee cherry in kg/tree was significantly higher for the CalMax treated trees. Average yield performance of treated trees was CalMax 1.25 (19.23

kg/tree), CalMax 2.50 (20.66 kg/tree) and CalMax 3.75 (21.39 kg/tree). The corresponding weight of coffee cherry harvested from the non-treated (Farm Check) plots was 17.28 kg/tree.

- Green coffee bean yield was enhanced by foliar applications of Omex Calmax. Using standard conversion figures for converting fresh cherry into green coffee, the yield of beans/tree in kg averaged out at 7.71 kg, 8.71 kg and 9.06 kg/tree for, respectively, the 1.25 ml, 2.50 ml and 3.75 ml CalMax treatments. Average yield of green coffee beans per untreated (Farm Check) trees was 6.15 kg/tree.
- New extension growth rates were also heightened by treatment with Omex CalMax. New branch length in cm measured 25.67 cm, 30.67 cm and 33.67 cm for, respectively, the 1.25 ml, 2.50 ml and 3.75 ml CalMax treatments. Average new branch length for trees in the untreated (Farm Check) plots was 21.33 cm.
- Bean quality as measured by size also benefitted from foliar sprays of CalMax. Per cent of beans from trees treated with CalMax at 2.50 ml and 3.75 ml and caught by Screen No 13 was 85% and 83%, respectively. Screen No 13 is commonly used for assessments of Farm Average Quality (FAQ). Current on-shore trading benchmark in Vietnam lies between 75 to 80%. Percentages for the CalMax 1.25 and Farm Check (no CalMax) treatments were 79% and 78%, respectively.
- There were measurable and significant reductions in the incidence of some common defects of coffee beans from trees treated trees with CalMax, and with the 3.75 ml CalMax treatment coming out on top in this respect. Per cent incidence of 'Black Bean', Broken Bean' and 'Mouldy Bean' for the CalMax 3.75 ml treatment was 5.56%, 1.44% and 1.84%, respectively. Equivalent figures for untreated (Farm Check) trees were 5.99%, 2.08% and 2.04%.

Omex CalMax (3.75 ml/tree) demonstration trial

Following these preliminary results which showed Omex CalMax at 3.75 ml/tree as the best treatment, a 'Demonstration Trial' to confirm CalMax at this rate in providing significant commercial benefit for farmers was set up. The trial covered 12 sites spread across Dak Nong, Dak Lak and Gia Lai with the age of coffee robusta trees varying from nine to 23 years depending on the site.



New branch growth on coffee trees was enhanced by foliar sprays of Omex CalMax.

Image credit: Dr Terry Mabbett

Ten sprays of Omex CalMax (3.75 ml tree) were applied at 30 day intervals, starting on 15 April 2018 and ending after harvest which took place on 10 January 2019. A full comparative assessment of extension growth (average length of new branches), yield (fresh picked cherry and green coffee in kg), coffee bean quality (bean size and incidence of common bean defects) was made and results summarised.

The significant positive effect of Omex Calmax applied at a rate of 3.75 ml/tree on extension growth, yield and bean quality, compared with Farm Check coffee trees, was confirmed. And despite an 'across the board' reduction in yield for the 2018/19 season, compared with 2017/2018, due to climate and weather related factors.

Results can be summarised as follows:

- Average yield of coffee cherry picked from Omex CalMax treated trees at 16.16 kg/tree was 30.8% higher than

Using Omex CalMax on coffee brings benefits to the trees, elevates yield, improves coffee bean quality and increases profits for farmers."

12.36 kg/tree harvested from Farm Check plots.

- Use of standard conversion figures to convert fresh coffee cherries to green coffee beans showed the Omex CalMax treatment gave a 34.4% increase in green coffee yield on a per hectare basis – 4,060 kg green coffee/ha compared to 3,026 kg/ha for Farm Check trees.
- Bean quality, expressed as bean size, was similarly superior with 86.8% of beans from CalMax treated trees retained by Screen No 13 compared with 82.2% for

beans from Farm Check trees.

- Incidence of black beans (3.1%), mouldy beans (1.9%) and broken beans (1.0%) were less for harvests from Omex CalMax treated trees compared with Farm Check trees. Respective figures for beans harvested from Farm Check trees were 5.0%, 3.2% and 2.9%.

In consultation with Vietnam's coffee inspectorate, the researchers concluded the following: 'Based on coffee bean quality the price value of beans harvested from Omex CalMax treated trees could be reasonably expected to be 10 to 12% higher than beans harvested from the 'Farm Check' (untreated trees) and around 13 to 15% higher than the prevailing market price. They concluded by saying: "Using Omex CalMax on coffee brings benefits to the trees, elevates yield, improves coffee bean quality and increases profits for farmers."

Omex CalMax is widely used by coffee growers throughout the Asia/Pacific region. ■

AI solutions for real-world farming problems

ACCORDING TO NEW research by LogicPlum, disease in rice plants can result in no grain harvest; therefore, detecting disease early and providing expert remedies in a low-cost solution is highly desirable.



LogicPlum have now taken these deep learning approaches to the farmer's field.

The researchers studied a pragmatic approach for rice growers to leverage artificial intelligence solutions that reduce cost, increase speed, improve ease of use, and increase model performance over other solutions.

"Our recent publication demonstrates the unique capability of translating LogicPlum AI and machine learning into solutions that can support crucial global industries like agriculture," noted Damian Mingle, LogicPlum founder.

"With our recently published work, we aimed to keep things simple," said Amit Kumar, machine learning researcher at LogicPlum. "Farmers and growers weren't just having a hard time detecting disease correctly, but correctly knowing what to do next. That's something we can help solve, both academically and with practical applications. LogicPlum refuses to be defined by someone else's vision of what's possible. And, we have now taken these deep learning approaches to the farmer's field, putting them directly in the hands of farmers and administrators via smartphones – providing them real-time insights for cultural, preventive, and chemical methods that they can use."

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'Prevention is better than cure'



Image credit: Adobe Stock

China ranked the highest in total beef, pork, and livestock meat consumption in the Asia Pacific region.

According to a research report by Facts & Factors, the global animal health market revenue is expected to reach US\$87.07bn by 2026.

SOUTH ASIA IS a major dairy-producing region, accounting for 20-25% of global milk output, as recorded by Food and Agriculture Organisation in 2019, while India is the largest producer and user of milk, followed by China and Pakistan.

Meat consumption in India is estimated to have crossed 3.9 million metric tonnes in 2020; the figure is further expected to scale up to 145.7 million metric tonnes by 2030.

China was the highest consumer of total beef, pork and livestock meat in the Asia Pacific region in 2019. By 2030, the global consumption of animal-derived packaged foods is further expected to rise.

While on one hand, if the animal livestock market is being driven by the significant increase in global consumption of animal protein, it has also been plagued with the incidence of zoonotic and food-borne diseases. Several companies have come forward with products and solutions which guard human health against such diseases.

Evonik's gut health system solutions

Evonik has launched science-based system solutions for the gut health of broiler

chickens, laying hens and weaned to growing-finishing pigs. This integrated approach makes it possible to keep animals healthy without the use of antibiotics, and helps produce meat and eggs in a sustainable and economically profitable manner. Evonik's new system solutions include a tailored combination of its feeding concepts, amino acids, probiotics, services and consultations, depending on the individual needs and challenges of the customer.

"The challenges for farmers in increasing productivity while maintaining healthy animals are manifold, and can only be overcome with comprehensive solutions," said Dr Torben Madsen, head of the Sustainable Healthy Nutrition product line at Evonik. "Our new gut health system solutions provide the basis for solving those challenges."

Maintaining a healthy balance of microorganism living in the digestive system, is at the core of the solution. Among these, feeding is an important aspect that can stabilise or unbalance the microbiota. Environmental conditions such as heat stress, or the change in primary nutrient sources, such as piglets at weaning

from breast milk, also impacts the microbial balance.

The use of antibiotics or the presence of disease causing pathogens in the feed also has an immediate effect on the microbiota, resulting in morphological and functional changes occurring in the gut, which negatively affects digestion and nutrient absorption, and sometimes leads to reduced animal growth or even mortality.

"It is important to understand these complex gut systems and target them individually with the right solutions," said Dr Xu Wang, product manager for Gut Health Solutions at Evonik Animal Nutrition.

Boehringer Ingelheim's Ubroseal

Boehringer Ingelheim, a company that specialises in animal health, has recently updated its Ubroseal internal teat sealant to Ubroseal Blue. The new product is part of the company's mastitis portfolio, and will be available for purchase in selected countries worldwide.

Ubroseal Blue, has joined Ubrostar and Bovicalc dry, as part of the Boehringer Ingelheim Animal Health's dry cow management portfolio, to prevent new intramammary infections during the dry period. It allows easy and hygienic application, and features a blue colour that can be visibly distinguished from milk

during removal.

Dr Gerald Behrens, global head of Ruminants at Boehringer Ingelheim Animal Health, said, “The blue paste is a powerful differentiator. The addition of a blue colour to Ubroseal is a unique and exclusive feature that enhances farmers’ dry cow management practices. As it’s easier to distinguish the sealant from milk, producers no longer have to worry about unnecessarily sending a cow to the hospital pen.”

About 25% of quarters remain open one week after dry-off, creating an opportunity for infection to occur. Using teat sealants reduces the risk of new infection during the dry period. “The lives of animals and humans are interconnected in deep and complex ways. We know that when animals are healthy, humans are healthier too,” stated Behrens.

Consortium to combat the threat of infectious diseases

USAID has launched a consortium to

combat the threat of infectious diseases and antimicrobial resistance to human and animal health. The consortium, led by Cargill, including Ausvet, Heifer International, and the International Poultry Council (IPC), will improve livestock management.

The five-year, US\$33mn Transformational Strategies for Farm Output Risk Mitigation (TRANSFORM) consortium, intends to harness innovation to sustainably improve animal health, and bring about long-lasting changes within the livestock sector of Africa and Asia, and enhance global health security

As a farm-based initiative, TRANSFORM will prioritise the efforts to decrease the risks of antimicrobial resistance (AMR) and zoonoses that spread from animals to humans, such as food borne pathogens, anthrax, and Avian and swine influenza. Smallholder farmers are particularly vulnerable to transboundary animal diseases, with livestock being their main source of food and income, and

having limited access to veterinary services.

Cargill, Ausvet, Heifer International and the IPC will increase the capacity of the government, agri-businesses, and farmers to prevent such diseases.

Cargill will conduct nutrition and immune health trials on dairy, poultry, shrimp and swine operations in four countries throughout Asia and Africa, to better understand the role of holistic animal nutrition in reducing the threats of zoonotic diseases to human health.

Ausvet will expand its health information system to serve farms of all sizes in Indonesia and Vietnam. The group will collect real-time data and insights on disease occurrence, vaccination programmes, and antibiotic usage, which will increase profitability for farmers and governments. Heifer International will work with smallholder farmers in India and Kenya to improve biosecurity and animal health management, and help them increase their incomes. ■



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Salmonella variants in pigs pose different threats to animal health

A DNA study has revealed that *Salmonella* variants found in pigs pose different threats to human and animal health.

TWO CLOSELY RELATED variants of *Salmonella* Typhimurium – a major cause of gastroenteritis worldwide – have significantly different effects on pig health, a study by the Roslin and the Quadram Institutes has found.

The two variants, termed U288 and ST34, are particularly dominant in pigs and differed in the colonisation of the intestine and surrounding tissues and the severity of disease they produced, scientists found.

The U288 variant was responsible for causing a unique set of genetic changes, which occurred between 1980 and 2000. The research study suggests a close observation of these changes may lead to a better understanding of the variant and why it interacts differently with pigs during infections than when it is found in the food chain.

Findings from the study will help predict the risk that *Salmonella* variants may pose to animals and humans, as well as the development of accurate medical aids which can control or prevent such contaminations.

DNA changes

The study analysed the genetic makeup of *Salmonella* strains isolated from pigs and people over many years, to identify variants and understand how they evolved and behave.

The ST34 variant accounts for more than half of all *S. Typhimurium* infections in people, while the U288 variant is rarely associated with human infection.

Samples were collected from human clinical infections during routine diagnosis and animals during routine surveillance. The U288 variant evolved to acquire genes associated with antimicrobial resistance and variations in molecules linked to virulence. This variant grew more slowly in the lab and was more sensitive to stress associated

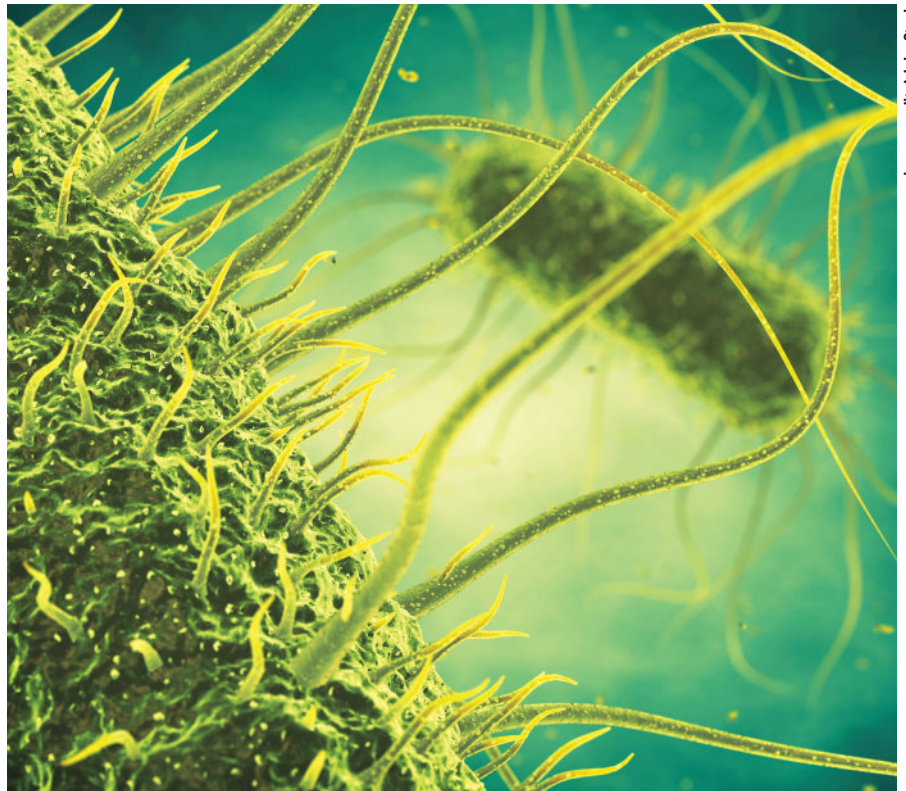


Image credit: Adobe Stock

The study analysed the genetic makeup of Salmonella strains isolated from pigs.

with dehydration, scientists observed.

The study, published in the journal *Communications Biology*, involved collaboration with the Earlham Institute, Public Health England and the Animal and Plant Health Agency. It was funded by the Biotechnology and Biological Sciences Research Council, part of UK Research and Innovation.

“We have seen these types of changes before in variants of *Salmonella* that have become adapted to specific host species and cause a more invasive disease.”

Professor Mark Stevens, Roslin Institute, said, “Understanding how variants of *Salmonella* emerge and pinpointing the genetic signatures responsible for adaptation to different hosts and the ability to produce disease will provide opportunities to improve diagnostics and surveillance. In turn, this will help to predict the risk that *Salmonella* variants pose to animal health and food safety.”

Professor Rob Kingsley, Quadram Institute and University of East Anglia, stated, “We have seen these types of changes before in variants of *Salmonella* that have become adapted to specific host species and cause a more invasive disease, including the type of *Salmonella* that causes typhoid fever in people but does not affect other species.” ■

—The Roslin Institute.

Grain handling and storage for successful farming

The rising demand for grain storage, increasing government support for grain silo expansion, and the growing adoption of safe grain silos and ancillary equipment are driving advancements to assist farmers and store operators.

BDC SYSTEMS LIMITED'S Moisture Monitoring System (MMS) is helping farmers/grain store operators overcome the perennial challenge of how to accurately and automatically check moisture content (mc) of wet grain. BDC's MMS sends emails and text alerts to registered contacts if the moisture content exceeds its predefined limit.

Andrew Head, BDC's managing director, said, "These latest developments meet the increasing demand for real-time information to be remotely delivered to farmers/grain store operators."

Pre-configured timings for the delivery of screenshots of the MMS' control panel highlighting mc details via email to any mobile device, mean that there is no longer the need for anyone to be on hand at the grain plant to manually check levels and make any necessary adjustments.

"The ability to remotely adjust grain dryer settings enables farmers/grain store operators to be confident that the dryer is optimised to ensure that grain enters storage at the right mc which ultimately leads to a significant decrease in energy costs," added Andrew.

Crucially, the MMS can be pre-configured to automatically send text alerts should the mc fall below pre-defined maximum and minimum levels. The necessary adjustments can be made remotely to restore mc to the required levels.

Using bespoke sampling units designed and developed by BDC, the MMS takes grain from both the incoming (wet) elevator and outgoing (dry) elevators. These samples are then processed through a multi-chamber duct incorporating a Sinar Technology



Image credit: Adobe Stock

BDC Systems' Moisture Monitoring System takes remote monitoring of moisture content of grain to next level.

moisture probe, specifically designed for this application. Live readings showing the mc of both samples, in a percentage format, are displayed on the control panel's screen together with a graph showing the moisture trend. Historical data is stored in the control panel's memory for future reference.

BDC's MMS can be monitored directly from the control panels of all new BDC's grain dryers but for anyone wanting to deploy the MMS with an existing drying system, a stand-alone control panel would be required.

Safety at the silos

Grain growers ordering new silos are encouraged to include ladders in their purchases to ensure safe access to storage systems.

Grains Research and Development Corporation (GRDC) grain storage extension specialists said many growers were tempted to save a few dollars by omitting the ladder from the order, but this could impact the functionality of the silo and make maintenance and monitoring more difficult.

GRDC grain storage specialist Ben White said in some instances, manufacturers were encouraging growers not to fit ladders, citing health and safety

risk exposure for the grower as well as ease of transport and construction.

"However, ladders are an essential silo feature allowing growers to inspect grain in 'the headspace' (between the top of the grain stack and the roof of the silo) where many grain storage problems are likely to first appear," White said.

"Insects are most prevalent in the warm grain in the headspace so regular inspection during grain storage is recommended.

"Access to the silo lid and inlet is also essential for the maintenance of seals and lid mechanisms. Without a ladder, alternatives include expensive specialist high-level access equipment."

White said that as an important feature of any silo, growers were advised to compare the construction quality and design of ladders which could vary between brands.

As a further safety precaution, ladder access should be stowable or locked to prevent unwanted access by children or untrained personnel.

For multiple silos constructed in a straight line, a single ladder with a top platform to provide access along the line of silos may be a feasible and more cost-effective option worth exploring with the silo manufacturer. ■

China and India driving tractor market growth in Asia-Pacific

The global agricultural tractors market was valued at US\$60.31bn in 2020 and is projected to register a CAGR of 4.4% from 2021 to 2026, according to Mordor Intelligence report.

CHINA AND INDIA lead in the number of tractors sold across countries. China has around 60.0% of its farm activities mechanised. Beijing included agricultural machinery in its 'Made in China 2025' campaign in 2018. The programme will help the country to produce most of its farm equipment domestically, which is expected to increase the sales of tractors in China.

The farm mechanisation level in India was recorded at 40-45% in 2017. The penetration of farm equipment is slow, as almost 80% of small and marginal farmers own less than five hectares of land in the country. The agriculture sector in India has witnessed a substantial decline in the use of animal and human power in agriculture sector. A large number of these are driven by fossil fuel operated vehicles such as tractors, diesel engines. This has resulted in a shift from the traditional agriculture process to a more mechanised process. Though the level of mechanisation in India is lower as compared to other developing countries like China and Brazil, it is certainly on growing phase.

To increase the mechanisation level, the Indian government is promoting 'Balanced Farm Mechanisation,' by providing subsidies on various equipment and supporting bulk

■ To increase the mechanisation level, the Indian government is promoting Balanced Farm Mechanisation."



Image credit: Adobe Stock

China has started focusing on the adoption of automated farming machinery through the introduction of driverless tractors.

buying through front-end agencies, which is expected to strengthen the tractors market during the forecast period.

In developing countries, the demand for lower HP tractors is high due to the low disposable income of farmers and high labour costs. Farmers prefer small and customised tractors for agricultural purposes, due to small farmland sizes. Moreover, lesser fuel consumption by small tractors helps to empower small and marginal farmers. The government of developing countries like India is promoting farm mechanisation by subsidising the purchase of equipment as well as supporting bulk buying through front-end agencies.

Automated farming machinery

China has started focusing on the adoption of automated farming machinery through the introduction of driverless tractors. Owing to it, YTO Group Corporation launched its first driverless tractor in 2017 and is planning to conduct mass production as per the market demand.

In order to boost the domestic production of farm machinery, the Chinese government framed a new agricultural machinery subsidy policy for the purchase of agricultural machinery, including tractors. The availability of abundant and cheap labor in India has largely confined farm mechanisation to tractors. The penetration of tractors in the country is higher in Northern India, particularly in Punjab, Uttar Pradesh and Haryana. Tractors are the largest segment in the Indian agricultural equipment category. India's tractor export market comprises African and ASEAN countries, and it exports an average of 60,000 tractors, annually.

The Indian government is also making efforts to mechanise agriculture. The government's goal is to increase the growth of the agriculture sector through its Rashtriya Krishi Vikasa Yojana (RKVY). The scheme is being implemented throughout India with 100% central assistance for increasing farm mechanisation in India's agriculture sector. ■

BKT launches new range of tyres for tractors and trailers

BKT HAS LAUNCHED a new size of tyres for the RIDEMAX FL 699: 525/65 R 20.5, which joins the existing 24 R 20.5. The brand's focus on innovation and sustainability can be observed in its latest products, which have been created keeping the needs of end users in mind.

RIDEMAX, from the BKT tyre range has been especially designed for transport operations, with tractors and trailers, in agricultural and industrial applications. It is stable at high speeds, and supports heavy loads to reduce transport cycles, and reduce rolling resistance, thus consuming less fuel.

The RIDEMAX range includes the following products for trailers: RIDEMAX FL 699, RIDEMAX FL 693 M, RIDEMAX FL 690 and RIDEMAX FL 690 IND. And the following tyres for tractors: RIDEMAX IT 696 and RIDEMAX IT 697 (M+S).

RIDEMAX FL 699, opens the Flotation range for agricultural trailers and tank trucks and has an all-steel structure to withstand a high load capacity decreasing the number of transport cycles. It also features reinforced bead that guarantees stability even at high speeds and ensures a comfortable ride with safety and control.

RIDEMAX FL 693 M provides excellent road handling, with a comfortable ride and self-cleaning properties. The D/E speed indices of the range stand for higher speeds when travelling on the road, which help in time saving. RIDEMAX FL 690 can be used for 75% of road operations for trailers and tankers, as it can carry heavy loads. Its twin tyre, RIDEMAX FL 690 IND, has been developed specifically for industrial trailers.

RIDEMAX IT 696 has a unique tread design that provides



Image credit: BKT

BKT focuses on innovation and sustainability.

excellent adherence for road applications, even in winters, as well as guaranteeing excellent self-cleaning properties, and low rolling resistance. It is particularly suitable for transport and maintenance applications, for its high speeds.

RIDEMAX IT 697 (M+S) on the other hand, represents the best option for tractors in winter operations. Due to the incisions in the tread, and the special compound, the vehicle can be driven in complete stability, with comfort and control. Compared to the 3,000 hours of an average tyre on the rear axle, BKT's RIDEMAX IT 697 (M+S) claims to have a shelf life that stretches beyond 4,000 hours.

RIDEMAX FL 699's new 525/65 R 20.5 size further enriches the BKT catalogue, which already features more than 2,700 products.

CLAAS TELEMATICS and CLAAS API offer field-specific data exchange

CLIMATE FIELDVIEW, THE flagship product of The Climate Corporation (Bayer's digital farming arm), and CLAAS TELEMATICS can now be connected through the CLAAS API (application programming interface) to enable easy data exchange for field-specific and site-specific documentation.

Reliable data flows are essential for precision farming. Successful fertiliser, crop protection and planting and sowing strategies depend upon access to accurate information about the previous years' yields and site-specific yield differences. To ensure easy access to this vital information, the FieldView platform and the CLAAS TELEMATICS portal have now come up with an option of connecting through the CLAAS API – which offers access to new data science capabilities, and ensures seamless transfer of harvest information, and insights from CLAAS TELEMATICS to FieldView.

Overview of API in Action

The Automatic Documentation add-on



Image Credit: CLAAS

CLAAS TELEMATICS also facilitates access to yield data and measurements.

option in CLAAS TELEMATICS facilitates driver-independent, field-specific and site-specific documentation – making it possible to obtain a complete overview of each field worked, and taking account of all the recorded parameters. In addition to machine data and consumption figures, yield data and measurements from NIR sensors, can also be documented. When a farmer or contractor connects their CLAAS TELEMATICS account to their FieldView account via the CLAAS API, the documented harvest values from the TELEMATICS system are retrieved and

sent to the FieldView user's inbox as posting proposals. From there, the user can then select the files they would like to sync with their FieldView account, and further process the complete field-related documentation in FieldView.

This type of connectivity allows yield values and yield maps from a CLAAS combine harvester to be used in FieldView to generate site-specific planting prescriptions or fertiliser maps for the upcoming season, which helps farmers increase their profitability, and actively manage risk, as well as save valuable time by gathering data and conducting analysis, all in one place.

Each user connects their two accounts and agronomic information is exchanged only between the accounts of FieldView and CLAAS TELEMATICS users who choose to enable the sharing. Farmers or contractors can also revoke the connection in the CLAAS TELEMATICS or FieldView portal, at any time and disable the data exchange.

Pöttinger's TEGOSEM and TERRASEM offer flexible sowing solutions

USING PÖTTINGER'S TEGOSEM 500 cover crop sowing unit alongside TERRASEM mulch seed drill allows users the additional benefit of a companion crop or micro-granule component, while seed drilling and depositing fertiliser.

TEGOSEM can feed the additional component directly into the metering system in the single shoot process, which allows fertiliser and micro-granules to be deposited directly with the seed. Surface application is used for companion crops such as grass and is carried out between the tyre packer and the coulter rail. This increases the degree of ground cover so that water losses are minimised.

Seed distribution on the TEGOSEM is pneumatic and can be controlled conveniently using the terminal.

During the single shoot process in TERRASEM additional components are added to the seed flow by the metering system. The DUAL DISC coulters prevent the seed and fertiliser or micro-granulate and additional component from bridging, resulting in optimum seed placement.

The seed is placed behind the tyre packer, using baffle plates for



Image Credit: PÖTTINGER

Seed distribution on the TEGOSEM is pneumatic.

proper distribution and the risk of fine seed drifting is prevented by spreading the seed close to the ground.

Metering in TERRASEM can be started and stopped at ease, using the central metering unit. Two different types of metering wheels can be used as standard, depending on the size of seeds.

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The carbon impact of fertilisers

Shawn Rana, an industry expert reviews the carbon impact of fertiliser and what this means for the future.

A LOT OF research has gone into increasing crop yields. The modern society would have had a hard time feeding everybody, if it did not have access to techniques and materials that can help increase the yield of certain types of crops. That has led to the growth of fertilisers. Yet, everyone needs to act responsibly to protect the planet. People are still ignorant about the adverse effect of fertilisers on the rising carbon footprint on earth.

The benefits and drawbacks of nitrogen fertiliser

Nitrogen fertiliser has been instrumental in increasing the production of individual crops on certain farms. On the other hand, nitrogen fertilisers are also one of the largest sources of greenhouse gas emissions. The production of nitrogen fertilisers does create carbon dioxide, which contributes to long-term climate change and global warming. It has led industry experts to reconsider the use of nitrogen fertilisers, and what it might mean for the industry moving forward.

The answer has always been in front of us

The three main types of nitrogen fertiliser in use today are ammonia, urea, and UAN. All existing large scale fertiliser producers convert most or all of their ammonia to Urea and/or UAN. These are considered 'value added' products and companies can

charge a higher price per unit of nitrogen for these value-added products. However, with the focus shifting to low carbon footprint fertilisers, it turns out that ammonia has the lowest carbon footprint fertiliser, out of the three types. Urea contains CO₂, which is then released at the farm level. UAN is made through a process that releases N₂O, which is 300 times more powerful as a greenhouse gas than CO₂.

Ammonia production does produce CO₂, but the molecule as fertiliser does not release CO₂ as the other two fertilisers. In addition, ammonia is more efficient and contains higher units of nitrogen compared to the others. The challenge for large fertiliser companies is that, their existing production assets are designed to convert as much ammonia into urea and UAN as possible, because that's what generates more profits.

Previously, little attention was paid to the carbon footprint of fertilisers and agriculture. The best news for ammonia today, is that it can be easily made with renewable electricity and water. Now, nitrogen fertiliser can also be made with near ZERO CO₂ emissions, which will release ZERO CO₂ emissions at the farm. This is a dream come true for the reduction of carbon in agriculture but it's a challenge for those companies which are already producing urea and UAN.

Corn is a major user of nitrogen fertiliser

According to Rana growing corn requires nitrogen fertiliser. A large proportion of N₂O emissions from agriculture stem from UAN nitrogen fertiliser related to corn. As a result, a lot of research has gone into trying to find other ways to fertilise corn and encourage growth without using nitrogen fertiliser. After all, if it is possible to use something other than nitrogen fertiliser, it may be possible to reduce greenhouse gas emissions without harming corn yields. According to experts such as Rana, this is one of the major focuses of the industry moving forward.

Future Forward

Ultimately, nitrogen fertiliser is still incredibly important when it comes to increasing the yield of certain types of crops. On the other hand, there are other types of fertilisers that might be just as effective.

If it is possible to take advantage of specific types of fertiliser that can reduce the carbon impact of farming, it might be possible to save the planet without having to harm crop yields in the process. But this could be difficult. On the other hand, the industry needs to adapt for the benefit of the environment. It will be interesting to see where the industry moves from here when it comes to the use of fertilisers based on nitrogen. ■

Nitrogen fertiliser is widely used to increase crop yield.





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