www.fareasternagriculture.com

Far Eastern Agriculture

US$15.00 (UK£9.00)

VOLUME 37 ISSUE 2 2020

Environmental sustainability in poultry houses

How to control anthracnose
on papaya plantations

Equipment:
Smart planting delivers a higher yield

Livestock:
Preventing disease outbreaks on farms

Event previews – p8

African Farming and Food Processing

Serving AGRICULTURE for 40 YEARS

First published in 1980, African Farming and Food Processing is the only magazine serving Africa's agricultural community.

Each bi-monthly issue contains a mix of independent editorials devoted to sustainable agricultural development, market intelligence, products, techniques and innovations across all agricultural sectors, as well as coverage of all the major exhibitions and trade events.

Gain unrivalled reach to key buyers and specifiers across the continent by advertising in the bi-monthly magazine, on Africanfarming.net or in the monthly newsletter.

AfricanFarming.net

Website Monthly Statistics:
12,003 Unique Visitors
10 minutes Average Time Spent on Site

E-newsletters

Circulation - 23,500+
The African Farming monthly e-newsletters can deliver your marketing message directly into decision-makers' inboxes!

Alain Charles Publishing
Serving the world of business

MENA Tel: +971 4 448 9260
ASIA Tel: +91 80 6533 3362
USA Tel: +1 203 226 2882
EUROPE Tel: +44 20 7834 7676

e-mail: comms@africanfarming.net
web: www.alaincharles.com
www.africanfarming.net

CONTENTS

Far Eastern Agriculture

Cover Image : Adobe Stock

Editor: Deblina Roy
Email: deblina.roy@alaincharles.com
Editorial and Design team:
Mariam Ahmad, Prashanth AP, Fyna Ashwath
Miriam Brtkova, Praveen CP, Manoj Kumar K
Nonalynka Nongrum, Abhishek Paul, Samantha Payne,
Rahul Puthenveedu and Louise Waters
Managing Editor: Georgia Lewis
Publisher: Nick Fordham
Magazine Manager:
Richard Rozelaar, Tel: +44 207 834 7676
Email: richard.rozelaar@alaincharles.com

India SATYANARAYAN NAIDU
+91 98 33055655
satyanarayan.naidu@alaincharles.com

Nigeria BOLA OLOWO
+234 8034349299
bola.olowo@alaincharles.com

South Africa SALLY YOUNG
+ 27 (0) 824 906 961
sally.young@alaincharles.com

UAE VISHNU VIJAYAKUMAR
+971 4 448 9260
vishnu.vijayakumar@alaincharles.com

USA MICHAEL TOMASHEFSKY
+1 203 226 2882 / +1 203 226 7447
michael.tomashefsky@alaincharles.com

Head Office:
Alain Charles Publishing Ltd
University House, 11-13 Lower Grosvenor Place
London SW1W 0EX, United Kingdom
Phone: +44 20 7834 7676 **Fax:** +44 20 7973 0076
Middle East Regional Office:
Alain Charles Middle East FZ-LLC
Office L2- 112, Loft Office 2, Entrance B, PO Box 502207
Dubai Media City, UAE
Phone: +971 4 448 9260 **Fax:** +971 4 448 9261
Production: Srinidhi Chikkars, Swati Gupta, Nelly Mendes and Arjun S
Email: production@alaincharles.com
Subscriptions: circulation@alaincharles.com
Chairman: Derek Fordham
Printed by: Buxton Press
Printed in: April 2020
Far Eastern Agriculture
(ISSN 0266-8025)

Alain Charles Publishing
Serving the world of business

BULLETIN

AGENDA

CROPS

POULTRY

AQUACULTURE

EQUIPMENT

Advertisers Index

Kirin Holdings initiates Supporting Coffee Plantations in Vietnam

AS PART OF Kirin Group Environmental Vision 2050, Kirin Holdings Co Ltd has initiated Supporting Coffee Plantations in Vietnam to get Rainforest Alliance Certification.

Rainforest Alliance Certification is an international certification system that agricultural activities by plantations are monitored and guaranteed in light of sustainable agricultural criteria by a third party certification organisation.

Vietnam ranks second to Brazil as a major coffee producer for the world. In 2019, the company imported around 30 per cent of the coffee beans from Vietnam.

The majority of coffee plantations in Vietnam are small in scope. Kirin Group is supporting Vietnamese farmers with agricultural training opportunities. These include helping farmers gain knowledge and skillsets on biodiversity, soil erosion, environmental changes etc.

According to the company, the support has started off with 400 smaller plantations. Plans are in discussion to support ways to reduce water risks in coffee plantation areas in future.

The company has been continuing similar initiatives for tea plantations in Sri Lanka since 2013.

Image credit: Adobe Stock

Vietnam ranks second to Brazil as a major coffee producer for the world.

JAAS and FAO to support sustainable agriculture and rural economies

THE FOOD AND Agriculture Organization of the United Nations (FAO) and the Jiangsu Academy of Agricultural Sciences (JAAS) have signed a partnership agreement to support smallholder farmers through technological innovation.

The collaboration will focus on developing sustainable, resilient and efficient food systems across urban and rural areas, and sharing knowledge and technologies with developing countries through FAO's South-South and triangular cooperation framework.

FAO deputy director-general Laurent Thomas said, "The partnership between JAAS and FAO will allow sharing of knowledge and expertise to support solutions and develop capacities for strengthening sustainable agriculture development in China, southeast Asia and Africa."

The partnership will focus on activities which promote rural revitalisation and stronger urban-rural linkages, paying special attention to rural areas and to marginalised farmers. The aim is ensuring food safety, achieving food security and reducing poverty in both urban and rural areas.

As part of the collaboration, FAO and JAAS will ensure that research, best practices and innovations in the fields of sustainable agriculture and mechanisation are widely shared, both with rural communities within China and with other countries with large agricultural sectors which would benefit from this expertise.

Image credit: Adobe Stock

The focus is on strengthening sustainable agriculture development in China, southeast Asia and Africa.

Korean livestock startup catches early bovine coronavirus

KOREAN SMART LIVESTOCK health care startup uLikeKorea has detected live bovine coronavirus cases in South Korea and Japan.

As reported in Business Korea, Kim Hee-jin, the company's CEO, explained that the COVID-19 concern is spreading between human, wild animals and livestock.

Hee-jin further added that uLikeKorea has released the bovine coronavirus data from the cows that have been treated and cured at an early stage on the farms in Korea and Japan using LiveCare bio-capsules.

According to Hee-jin, the calves are mostly susceptible to bovine coronavirus and the LiveCare bio capsules aim to monitor real-time temperature that connect to the company's artificial intelligence analysis software.

Cows in Korea's Hanoo farm in South Chungcheong Province and Japan's Wagyu farm in Nagoya showed a sudden rise in temperature, decreased amount of hydration and abnormal bowel symptoms through LiveCare capsules, which helped to detect bovine coronavirus at an early stage and implement antibiotic treatment, reported the source.

Image credit: Adobe Stock

According to Hee-jin, the calves are mostly susceptible to bovine coronavirus.

Nutreco announces Feed&Food Tech Challenge Finalists

Image credit: Adobe Stock

The competition acknowledges the best breakthrough innovations food and feed value chain.

NUTRECO HAS SELECTED 15 finalists for the Nutreco Feed&Food Tech Challenge (NFTC), in which 112 global start-ups applied by submitting their innovations to address critical challenges in the feed and food value chain.

The competition acknowledges the best breakthrough innovations within livestock farming, aquaculture and NFTC's new category, alternative food proteins.

Some of the finalists include Cultured Decadence, Bond Pets, Fumi Ingredients, Flying SpArk, Back of the Yards algae sciences, Fishency Innovation, eniferBio, Nanomik, Pando Nutrition, Poultrix, AgUnity and more.

The next phase of the competition would involve the finalists joining a three-day final event in The Netherlands, originally planned from 11-13 May 2020. Due to the COVID-19 concern, this final event will be rescheduled to a new date in autumn 2020.

The final event in the Netherlands in autumn 2020 will offer a dynamic 'greenhouse and pressure cooker' environment with a pitching competition and plenty of interaction with industry experts, fellow start-ups and an international jury. The new dates for the final event will be communicated in May.

Depending on the business concept, the winner will be rewarded with a suitable scientific (on-farm) validation trial, including a validation report and consulting through internal or external experts on topics critical for their business.

Avivagen secures largest-yet order of OxC-beta Livestock

AVIVAGEN HAS RECEIVED its largest-yet order for OxC-beta Livestock from UNAHCO, its long-standing partner in the Philippines.

The three-tonne order represents a 50 per cent increase from the previous largest order by UNAHCO and brings its total to date of OxC-beta Livestock to more than 18 tonnes.

UNAHCO's largest order of OxC-beta Livestock to date comes amid the ongoing coronavirus pandemic, a time when worldwide food production is under enormous stress. According to Avivagen, the product has critical impact on the health and productivity of food producing animals. OxC-beta is seen to be a safe and highly effective feed additive for swine, broiler and dairy feeds, with growing adoption in major production markets including Malaysia, Mexico, Thailand, Taiwan, Brazil etc.

EVENTS 2020

JUNE

22-24
Hi & Fi Asia-China 2020
Shanghai, China
www.figlobal.com/china

JULY

8-10
Indo Livestock 2020 Expo & Forum
Jakarta, Indonesia
www.indolivestock.com

9-11
VICTAM and Animal Health and Nutrition Asia
Bangkok, Thailand
www.victamasia.com

22-24
ILDEX Vietnam 2020
Ho Chi Minh City, Vietnam
www.ildex-vietnam.com

AUGUST

4-6
GMF 2020
Guangzhou, China
www.yljxz.com

17-18
Agriculture & Organic Farming
Tokyo, Japan
www.agriculture.agriconferences.com

26-28
INAGRITECH INPALM Asia
Jakarta, Indonesia
www.inapalm-asia.net

SEPTEMBER

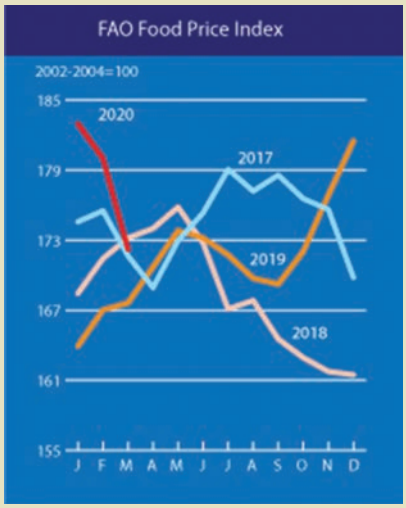
4-6
Agri Asia
Gujarat, India
www.agriasia.in

FOOD OUTLOOK

THE FAO FOOD Price Index (FFPI) averaged 172.2 points in March 2020, down 4.3 per cent from February, though still 2.7 per cent higher than in March 2019. The sharp decline in March marked the second month-on-month drop in the value of the FFPI, largely driven by COVID-19 pandemic-demand contractions.

The FAO Cereal Price Index averaged 164.6 points in March, down 1.9 per cent from February and almost at the same level as in March 2019, as export prices of all the major cereals, except rice, fell for the second consecutive month. Wheat prices averaged lower in March compared to February despite worries over COVID-19, which boosted trade activity, especially by countries in North Africa, and the imposition of some export limitations, albeit small, by the Russian Federation.

The FAO Vegetable Oil Price Index averaged 139.1 points in March, dropping by 12 per cent in one month and marking the lowest level since October 2019. The continued decline in March mainly stemmed from fresh falls in palm oil



prices– for the second consecutive month – which was fuelled primarily by plunging crude mineral oil prices and rising uncertainties over the impact of the COVID-19 pandemic on global demand. Soy and rapeseed oil prices were also affected by, respectively, higher than expected crushings in the USA and eroding demand for biodiesel in the EU.

The FAO Dairy Price Index averaged 203.5 points in March, down three per cent from February, declining for the first time after registering continuous increases for four months. In March, markets for milk powders were generally weaker, with skim milk powder (SMP) prices falling the most, followed by whole milk powder (WMP), cheese and butter.

The FAO Meat Price Index averaged 176.0 points in March, down 0.6 per cent from February, falling for a third consecutive month, though seven per cent above its level in the corresponding month last year. In March, international quotations for ovine and bovine meats continued to fall, reflecting large export availabilities, especially in Oceania.

The FAO Sugar Price Index averaged 169.6 points in March, down as much as 19.1 per cent from February. The significant monthly dip in international sugar prices was largely caused by the fallout from the COVID-19, as confinement measures imposed by several countries curtailed demand from out-of-home consumption.

Taiwan-Japan Fisheries Committee suspended for 2020

Image credit: Adobe Stock

The committee addresses mutual issues related to fishing rights.

FOLLOWING THE COVID-19 concerns, the Taiwan-Japan Fisheries Committee will not meet in 2020.

According to Taiwan's Ministry of Foreign Affairs (MOFA), the two countries have agreed to continue to use guidelines agreed upon during the committee's previous meeting held on 10 April 2019 in Tokyo.

Since its creation under the Taiwan-Japan Fisheries Agreement of 10 April 2013, the committee has met eight times and acts as the two countries' main platform for addressing issues related to fishing rights.

Indonesian startup raises US$17mn funding

INDONESIA'S AGRITECH STARTUP TaniHub Group has raised US$17mn investment to expand services to farmers by 2021. The investment brings the firm's total equity funding to US$29mn since 2016. The investment is an extension round of its Series A funding, co-led by Singapore Openspace Ventures and Intudo Ventures. Other participants in the round include UOB Venture Management, Vertex Ventures, BRI Ventures, Tenaya Capital and Golden Gate Ventures.

In 2019, TaniHub Group secured US$10mn in its Series A round of financing.

The company aims to address challenges in agricultural sector.

Image credit: Adobe Stock

Kerlink sensors to power rollout of automated stem-water measuring system

KERLINK WILL PROVIDE Israeli Saturas with LoRa-based sensors for automated irrigation control system.

Kerlink will supply Saturas's deployments with hardware and software such as its solar-powered WirnetTM iStation, WanesyTM Management Center, a solution for managing private IoT networks, and WanesyTM Network-as-a-Service.

Using Kerlink stations, Saturas' LoRaTM sensors will transmit processed data to central, automated irrigation-control systems, tailoring irrigation to crops' real-time needs.

"Precision agriculture, led by precision irrigation, is a vital and rapidly growing global business sector with an estimated annual growth rate of over 20 per cent," said Anat Halgoa Solomon, Saturas co-founder and CEO.

Image credit: Kerlink

Installation of iStation.

"Smart farming, or ag-tech, is one of the IOT's most important vertical markets but it needs the breakthrough innovations that companies like Saturas are bringing to fields and orchards to deliver on its promise," said Romain Weryk, Kerlink key account manager. According to Weryk, Kerlink's solutions are used in more than 120,000 installations in 69 countries.

Saturas, an Israeli startup, has raised about US$9mn, including a US$1.63mn H2020 grant from the European Commission in 2019, to support its miniature, tree-embedded sensor system that continuously measures stem water potential (SWP) of trees and vines.

Saturas is the first company to develop a system for measuring SWP automatically, replacing the cumbersome manual devices that fruit-tree and vineyard growers have used for decades.

Exeter researchers discover novel chemistry to protect crops from fungal disease

AS PATHOGENIC FUNGI pose a huge and growing threat to global food security, Exeter researchers have discovered a novel chemistry to protect crops from fungal disease.

A consortium of researchers from the University of Exeter, led by Professor Gero Steinberg, combined their expertise to join the fight against plant pathogenic fungi.

In a publication in the journal Nature Communications, they report the identification of novel mono-alkyl chain lipophilic cations (MALCs) in protecting crops against Septoria tritici blotch in wheat and rice blast disease.

These diseases challenge temperate-grown wheat and rice, respectively and so jeopardise the security of the two most important calorie crops.

The scientists' journey started with the discovery that MALCs inhibit the activity of fungal mitochondria.

Mitochondria are the cellular "power-house", required to provide the "fuel" for all essential processes in the pathogen.

By inhibiting an essential pathway in mitochondria, MALCs cut down the cellular energy supply, which eventually kills the pathogen.

These diseases challenge temperate-grown wheat and rice, respectively and so jeopardise the security of our two most important calorie crops.

Image credit: Adobe Stock

While Steinberg and colleagues show that this "mode of action" is common to the various MALCs tested and effective against plant pathogenic fungi, one MALC that they synthesised and named C18-SMe2+ showed unexpected additional modes of action.

Firstly, C18-SMe2+ generates aggressive molecules inside the mitochondria, which target life-essential fungal proteins, and in turn initiate a "self-destruction" programme, which ultimately results in "cellular suicide" of the fungus.

Secondly, when applied to crop plants, C18-SMe2+ "alerts" the plant defence system, which prepares the crop for subsequent attack, thereby increasing the armoury of the plant against the intruder.

Most importantly, the Exeter researchers demonstrate that C18-SMe2+ shows no toxicity to plants and is less toxic to aquatic organisms and human cells than existing fungicides sprayed used in the field.

COVID-19: 2020 events rescheduled due to global impact of the outbreak

IN THE UNPRECEDENTED global crisis due to COVID-19 pandemic, a number of agriculture and livestock events have been postponed in the Asia-Pacific region as well as across the globe. Here is a list of events that have been rescheduled in view of the ongoing situation:

ILDEX Vietnam 2020

VNU Exhibitions Asia Pacific has rescheduled the ILDEX Vietnam 2020 event from March to July 2020 due to the disruption caused by COVID-19 across the region.

ILDEX Vietnam, an international business platform for the livestock and aquaculture industries, will be held from 22-24 July 2020 at SECC, Ho Chi Minh City.

"We have been monitoring the COVID-19 situation closely over the past weeks. We have also been receiving multiple enquiries from exhibitors and visitors on the event with indicating their concerns on health and safety as well as the increasing of the travel bans and travel restrictions around the world," the organisers stated.

This decision was agreed on the advice of authorities and related associations. In addition, the exhibitor survey result indicated that 85 per cent of exhibitors would like to delay ILDEX Vietnam 2020.

VICTAM and Animal Health and Nutrition Asia

Following WHO's #39 situation report published on 28 February on coronavirus risk assessment for the regional level from high to very high, the management of VICTAM Corporation and VIV Worldwide have decided to shift the Bangkok event from March 2020 to 9-11 July 2020.

This decision has been taken after careful consideration and in the interest of exhibitors and visitors and, above all, to protect the health of all attendees.

Image credit: VICTAM

In July 2020, VICTAM and Animal Health and Nutrition Asia will focus on animal feed and health sectors.

Around 80 per cent of the exhibitors agreed with organisers that the postponement of the event is the best solution and have therefore confirmed the decision to move their participation to July 2020, trusting that the situation will improve during the next few months.

The objective remains the same, which is to realise the total animal feed and health event organised by VICTAM and VIV.

AGRITECHNICA ASIA and Horti ASIA 2020

DLG International and VNU Exhibitions Asia Pacific jointly announce that AGRITECHNICA ASIA and Horti ASIA 2020, scheduled to take place at BITEC, Bangkok, in May 2020, have been postponed to 14-16 October 2020 because of the COVID-19 crisis.

The coronavirus outbreak is now a global pandemic that has alerted all countries to take urgent precautionary actions. Travel bans and restrictions around the world have increased significantly. All these actions support the decision to postpone AGRITECHNICA ASIA and Horti ASIA 2020.

Livestock Philippines 2020, Feeds Expo Philippines 2020 and Aquaculture Philippines

Due to the recent and increasing travel restrictions impacting industry participation, Informa Markets in the Philippines, the organiser of Livestock Philippines 2020, in coordination with the Department of Agriculture and its supporting agencies has decided to postpone Livestock Philippines 2020, originally scheduled for May 2020. The event is co-located with Feeds Expo Philippines 2020 and Aquaculture Philippines 2020.

This decision is made in light of President Rodrigo Duterte's decision to raise Code Red Sub-level 2 and to approve the imposition of "Stringent Social Distancing Measures" in the national capital region (NCR).

In a press statement, the organiser stated, "Our team is currently working with venues and stakeholders to find the next best dates and solutions for our events. We will provide participants with timely communication as soon as possible." ■

"The decisions have been taken after careful consideration and in the interest of exhibitors and visitors and, above all, to protect the health of all attendees."

Anthracnose disease of papaya and its control

Symptoms of anthracnose begin to appear as the full fruit begins to ripen.

Anthracnose is one of the most important postharvest diseases in papaya. Dr Terry Mabbett reports.

PAPAYA *(CARICA PAPAYA)*, otherwise known as paw-paw, is native to Mexico and northern South America and now naturalised and cultivated throughout the tropical and subtropical regions of the world. Papaya is an important crop for both home consumption and export. India with six million tonnes of production is easily the world's biggest producer although Indonesia, Thailand, Philippines and Bangladesh do appear amongst the top 20 world producers.

Papaya plants exhibit several oddities. Two particular peculiarities are papaya plants being dioecious (male and female flowers on separate plants) and it showing cauliflory. This term describes the way in which the flowers, and therefore the fruit, are borne, which is directly on the main stem that is the case for cocoa.

> **"Anthracnose is the most important disease of papaya and caused by the fungus Colletotrichum gloeosporioides."**

Just as papaya has a 'global' distribution as a tropical/sub-tropical fruit crop, anthracnose is the most important disease of papaya and caused by the fungus *Colletotrichum gloeosporioides*. This is not surprising since the same fungal pathogen causes anthracnose disease in a wide range of other fruit tree crops including mango, avocado, citrus, banana and passion fruit. However, there is strong evidence to suggest that *Colletotrichum gloeosporioides* exists as individually different biotypes host-specific to particular plant and crop species.

Disease symptomology

Anthracnose infects leaves and fruits of papaya, but the latter are most severely affected by the disease and progressively so as the fruit matures. Initial symptoms are small and light-coloured spots which enlarge to become sunken with a water-soaked appearance. Individual disease-spots may increase to five cm in diameter or merge and coalesce with neighbouring spots to destroy the fruit through a rapid and all-consuming wet disease necrosis.

As the fruit ripens and the disease progresses to a mass of pinkish-orange or salmon-coloured fungal spores, it creates concentric ring patterns in the sunken lesions. Another frequent disease symptom is well-defined reddish-brown, irregular or circular spots about one to 10 mm in diameter and commonly called 'chocolate

spot.' With progressive fruit ripening, these 'chocolate spots' quickly enlarge to form circular, sunken lesions up to 20 mm in diameter.

Disease epidemiology

Spread of the disease and infection of healthy plants and fruits is heavily dependent on moisture from rainfall and when there is free water on the fruit surface and raised humidity. Disease incidence and severity is accordingly highest in those areas where relative humidity and rainfall are high and with atmospheric temperatures conducive to fungal growth and development. Optimum ambient temperature for this pathogen is between 18°C and 25°C.

> **"Disease incidence and severity is accordingly highest in those areas where relative humidity and rainfall are high."**

Spores called conidia (singular conidium) produced on structures called acervuli (singular acervulus) are dispersed in water splashes, water droplets and wind-blown rain. In the presence of free water with a minimum relative humidity of 97 per cent, spores landing on immature green papaya will germinate to form germ tubes to effect entry into and infection of the host. Specialised fungal cells called appressoria which form at the ends of the germ tubes generate a sufficiently high pressure to break through the cuticle (layer of lipid material on the epidermis) and epidermal cell layer using a so-called 'penetration peg' to establish the infection.

The infection will remain latent until the post-climacteric stage, a defining stage in fruit ripening, but as the fruit starts to ripen, the pathogen resumes growth to form the classic anthracnose symptoms. During growth and colonisation the fungus absorbs nutrients to form acervuli and spores and thus complete its life cycle. In tropical and subtropical regions where the growing season is essentially continuous, fungal growth and the disease cycle is repetitive. However, in the absence of a host plant the fungus can survive as a saprotroph by surviving on dead papaya tissue or other organic matter.

Disease management

Overall aim of anthracnose disease management for papaya is aimed at managing and minimising damage and yield loss rather than eradication of the pathogen, which given its widespread distribution across a large number of different host species is in practice impossible to achieve. Thus growers should adopt a programme of integrated disease management (IPM) which combines a broad range of cultural and chemical methods each targeted at the most appropriate time and hit the fungus at the correspondingly weakest points in its life cycle.

Site selection – Choose planting sites in lower rainfall areas and avoid areas with inherently high humidity due to standing water.

Cultivar selection – Plant cultivars (varieties) with established resistance or tolerance to anthracnose disease.

Mixed cropping – Planting papaya interspersed with non-hosts of such as breadfruit can help to minimise both the incidence and severity of anthracnose disease. Mixed planting patterns interfere with the water splash dispersal of spores to correspondingly reduce

Anthracnose in papaya fruit.

Image credit: Adobe Stock

Image credit: Dr Terry Mabbett

Green papaya fruits are particularly prone to infection during and after rainfall with free water on the fruit surface and high humidity in the air.

the pathogen population.

Crop sanitation – This involves removal of diseased fruits from the plant and fruits which have already fallen to the ground, to reduce the fungal inoculum load in the papaya field. In addition, the removal of dead leaves, weeds and debris from on and around the trees eliminates the pool of organic matter upon which the pathogen can survive as a saprotroph.

Moisture management – Always select a free-draining soil and avoid the standing water which invariably causes the higher humidity levels that aggravates infection and disease development. Similarly, increase plant spacing to encourage good air circulation and rapid drying of fruit surfaces after rainfall, thereby minimising the build- up of relative humidity in the papaya crop canopy.

Timely fruit harvest – Pick papaya fruits before they over-ripen and fall to the ground. Besides losing crop, these ripe, rotting fruits on the ground will simply add to the spore load in the environment.

Post-harvest disease management – An integrated programme including the use of post-harvest fungicides applied as sprays or dips with or without the use of coatings of food grade wax. Fruits should be stored and shipped in a well-ventilated environment to minimise humidity and at temperatures below 18°C to inhibit disease development. Remove any infected fruits promptly to prevent disease spread within the consignment of fruit.

> **Integrated disease management (IPM) methods hit the fungus at the correspondingly weakest points in its life cycle."**

Fungicide spraying in the field

Application of fungicides will be necessary, indeed essential, in situations where papaya is highly susceptible and prone to anthracnose due to conditions of climate and weather and because the cultivars grown lack disease resistance or tolerance.

A wide range of fungicides have been successfully used against this disease, including contact protectant fungicides which remain on the fruit surface to prevent infection and systemic curative fungicides which enter the plant to suppress established disease.

It is better to adopt a policy of disease prevention and crop protection by using contact protectant fungicides with good application technique in terms of spray timing and spray coverage. The most widely used, tried and tested fungicides are those which contain copper as the active ingredient. The mainstream copper fungicides in use around the world are tribasic copper sulphate, copper oxychloride, cupric hydroxide and cuprous oxide.

Recommendation for use of Nordox 75 WG, a wettable granule formulation containing cuprous oxide is as follows:

Start the control programme before the disease appears and apply repeat sprays at 10-14 day intervals. During periods of heavy rainfall reduce spray interval to five to seven days. Dosage rates are within three to six kilograms of fungicide product per ha with recommendations to use higher rates when conditions favour infection, disease spread and development. ■

Digital fertiliser product gets a boost with Bagtech solutions

The Bagtech Automation System allows fertiliser companies to control their own operation through the internet from anywhere in the world, ensuring accuracy and increasing productivity.

THE WORLD IS undergoing radical digital transformation, with the digital world and industrial production coming together. This cohesion is what the internet of things (IoT) and Industry 4.0 aim to bring about.

Benefits such as increased energy efficiency, flexibility, accuracy, simplified logistics processes and value chain optimisation explain why Industry 4.0 is a crucial topic of conversation within the fertiliser production industry.

As a company that continuously strives to exceed customer expectations, Bagtech continues to develop its products with the latest in digital technology.

"From basic level sensors, Servo controller, load cell amplifiers – right through to the central plant controller – all devices are connected to a high-speed industrial network and accessible via the internet," said Fred Coelho, CEO of Bagtech.

Image credit: Bagtech

Bagtech aims to produce customised products in small lot sizes.

Every product will have a digital twin in the future

The core of digitalisation is the vertical integration of business value chains and the horizontal integration of production, using internet services. The objective is the ability to produce customised products in small lot sizes.

In the future, every product will have a digital counterpart – a digital twin – which contains all information pertaining to the real product. Machines and plants will be able to change their parameters and settings without interruption, based on the type of product they are running, without any human intervention.

Accuracy is a critical factor for any fertiliser production facility. Inaccurate blends can have extremely detrimental effects on the soil they are applied to. The Bagtech team works constantly on continuous improvement of the equipment performance, bringing to customers the accuracy needed per hour, avoiding any divergences or losses on the customers' production processes.

Bagtech digital maintenance services run systems flawlessly

Waiting for something to fail before replacing it is not an option. According to Bagtech, replacing something before it fails means customer may not have used its full life cycle. Digitalisation allows for everything to be monitored, with data logged to the cloud servers, right down to a simple sensor. Perhaps the maintenance department would like a notification when a specific part has done a set number of cycles to schedule a replacement. This is digital maintenance.

Bagtech Automation System allows fertiliser companies to control their own operation through the internet from anywhere in the world. The system allows clients to insert custom fertiliser recipe to blend it accordingly, showing the full process of the fertiliser in the equipment in real time. The advantage of this system is that if something goes wrong with the product during the process of the plant, the software immediately notifies on the screen visualising information comprehensively for making informed decisions and solving urgent problems on short notice. Thus, to ensure safety, the plant stops working at the same time.

"In every industrial process, we have to think about all details when an intelligent system is created and applied: safety, accuracy and quality. At the moment, Bagtech is the leader in the fertiliser industry offering to the customer their business at their fingertips in real time," noted the company. ■

Managing internal climate conditions in poultry houses

As the majority of the people rely on poultry as a major source of protein supply, this has triggered the importance of suitable housing and environment management for the successful poultry farming business.

THE CORONAVIRUS PANDEMIC and the ongoing African Swine Fever (ASF) challenges in the pork industry could lead to potential growth in 2020 global poultry sector outlook. As coronavirus is seen to cause a global economic slowdown, poultry demand could benefit among the proteins, especially due to its price competitiveness, according to Rabobank research.

As the birds can be reared in free and indoor farming systems, it is crucial to manage the environment. Poultry require correct well management, ventilation, lighting, temperature and litter management.

According to a paper by Ayodeji Oloyo and Adedamola Ojerinde entitled *"Poultry Housing and Management,"* "Poultry housing design plays a vital role in the determination of the internal climatic conditions of the house for optimum health, growth and productive performance of the birds. Consequently, the type of poultry housing system employed by the proposed poultry farm is a function of the prevailing climatic conditions of the region where the farm is

Image credit: Adobe Stock

It is crucial to effectively manage poultry housing and environment.

located." (2019 Oloyo A, Ojerinde A. Published in [10.5772/intechopen.83811] under CC BY 3.0 license. Available from: http://dx.doi.org/10.5772/intechopen.83811.)

"While the open poultry house system has been adjudged a good method of housing in the tropical countries because of the simplicity of its construction, ease of heat management and minimal management cost, the controlled housing system is the most common in the temperate regions of the world."

Effects of internal climate conditions on chicken

Heat stress is a general problem in the poultry industry, especially in the production of chicken meat and egg. Heat stress is experienced by chickens when the environmental temperature equals or rises more than 26.7°C. At this temperature and beyond, the birds begin to pant and it can be detrimental to attaining the bird's optimum growth rate, hatching ability, egg size, egg shell quality and egg production. Heat stress has adverse effect on broilers comfort, growth rate, feed conversion and live weight gain.

The climatic factors of interest include temperature, relative humidity, air composition and velocity and lighting condition. The type of poultry housing system to be used is a major determinant factor in the type of management to be adopted in the poultry farm.

Naturally ventilated open housing system

The open poultry housing system is identified with the tropical region for its simplicity, economic implications and ease of management of heat generation. However, it is prone to the invasion of insect, rodents, birds and other small predators that can disturb the welfare, productivity and performance of chicken. To alleviate this problem, dwarf sidewalls are raised to the roof eaves with corrugated wire mesh to keep predators away. Gutters filled with insecticides to prevent the invasion of insects are built around the house.

"It is important to understand the effect of internal climatic conditions of the poultry house on the birds, how the birds respond to them and their implications on heat management."

According to the paper, the poultry house should be orientated in the east-west direction to reduce the exposure of sidewall to direct sun radiation. This is vital, because heat stress in birds can be hastened when they are exposed to direct solar radiation. Deep litter rearing may allow the birds avoid to direct sunlight, but this may lead to clustering or overcrowding of birds in an area of the house. Consequently, this makes cooling difficult and in severe cases this leads to stampede and even death.

The design must factor in the activities and services rendered by poultry farmers and professionals within the building. These activities may include transfer of chicken, feeding, de-pecking, waste management, vaccination, and so on. Therefore, longer pen house could be strenuous to maintain, especially when the activities are carried out manually.

Mechanically ventilated open housing system

The mechanically ventilated house provides more control over air exchange, wind velocity and wind direction. A mechanically ventilated system entails the use of either positive or negative pressure system.

The negative-pressure system, which is the most commonly used in mechanical ventilated house, expels air out of the building by fans through an air inlet system to create low pressure within the house. This allows fresh air to rush in through the same air inlet system.

The negative-pressure systems can be achieved through inlet or tunnel ventilation. The inlet ventilation system uniformly distributes exhaust fans and air inlets across the house whereas, with tunnel ventilation, exhaust fans are located at one end and inlet pipes at the other end. This provides the tunnel ventilation with an advantage of greater air speed, in turn creating more positive air exchange.

Types of inlet ventilation system include cross ventilation, sidewall inlet ventillation, attic inlet ventilation, air movement inlet ventilation, tunnel inlet ventilation etc.

Water is an essential commodity in poultry production

Nipple drinkers to provide cleaner water, reduce water spillage and labour for drinker cleaning have replaced the conventional open water system. According to the paper, chicken consumed more water when reared with a conventional open water system in an experiment that compared the conventional open water system to nipple drinking.

"It is important to provide and maintain the required ventilation to ensure that the poultry house is conducive for the birds to regulate their body temperature by sensible heat loss."

Lighting

Birds reared under yellow, green and blue light sources have been reported to have improved body weight compared to those reared under red and orange light sources. Birds reared under blue light show docile traits while those reared under red light were more active and aggressive. It was noted that the red light improved sexual activities in birds.

The paper has further cited that the compound annual growth rate of poultry protein between 2015 and 2025 is estimated to be more than 2.4 per cent. Asia, South America and Africa, characterised by rapid urbanisation, poverty and hot climate, recorded the highest growth increment in poultry production. ■

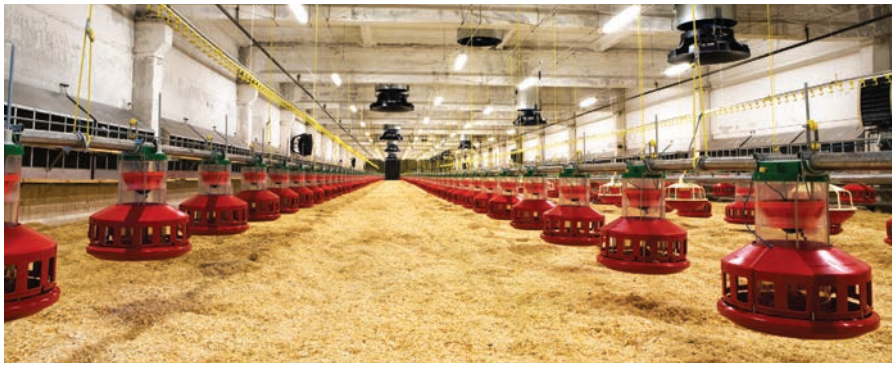


Image credit: Adobe Stock

The climatic factors of interest include temperature, relative humidity, air composition and velocity and lighting condition.

Smart planting delivers higher yields

Planting machinery offers advanced mechanised planting solutions that help in increasing precision agricultural practices.

PLANTING MACHINERY, A part of farm mechanisation equipment, is a bigger step in agriculture automation. Automation is revolutionising modern agricultural practices across the globe because of the need to increase in food productivity and agricultural product export competence.

Farmers across the globe are encouraged by the governments to invest in planting machineries as the traditional agricultural processes involve high physical labour. Technological advancement through government support along with heavy integration of precision farming is going to provide opportunities for future growth.

Automatic transplanters, planters, seedling planting machines, autonomous tractors, robotic crop maintenance equipment, automatic harvesters etc are gaining popularity as these achieve higher food productivity and substitute human labour, as compared to the conventional machines. Farmers are benefitted with decreased production cost, efficient information sharing between consumers and producers, increased farm yields, reduced food wastage and high financial sustainability.

A farmer with digital tablet controls an autonomous tractor on a smart farm.

Image credit: Adobe Stock

Global planting equipment market set for robust growth

According to London-based market research firm Technavio, the global planting equipment market is poised to grow by US$4.28bn during 2020-2024 at a CAGR of more than six per cent during the forecast period. The growing emphasis on farm mechanisation along with funding for the rising deployment of equipment and technologies for precision farming is anticipated to boost the growth of the market.

Another market research company MarketsandMarkets has noted that the planting equipment market is estimated at US$15.82bn in 2017 and is projected to reach US$21.43bn by 2022, at a CAGR of 6.27 per cent during the forecast period. The factors influencing the growth are better and increased usage of mechanised equipment in farming over handheld equipment, reducing arable land for agriculture which leads to the utilisation of the available land for better yield, shortage of labour and increased participation of corporate in the agriculture industry which lead to increase in agreements for contract farming.

Asia-Pacific planting machinery market

According to Mordor Intelligence, in the Asia-Pacific region, Australia and Japan are the major markets for planting machinery given to high land, mass usage and extensive, large scale farming practices. Penetration in India and China is crucial for market growth because of increasing penetration of farm automation.

The rising demand in countries like China and India drives the planting machinery market. Government subsidies, scarcity of farm labour, high farm income, farm consolidation and widespread usage of tractors are the factors driving the sales of planting machinery. ■

Biosecurity curbs disease outbreaks in the farm

Image credit: Adobe Stock

Shoes and boots are the most common carriers of manure, and therefore, the pathogen.

Increasing public awareness of the potential impact of livestock biosecurity threats is causing considerable infrastructural change globally.

ANIMAL BIOSECURITY REFERS TO the actions and measures taken to prevent diseases being introduced through animals into a specific geographic region. Biosecurity is a vital step in ensuring that the food supply is safe.

> **"Global markets are increasingly demanding biosecurity methods to stop the spread of pests and diseases."**

In biosecurity, effective measures are taken to keep pathogens from infecting populations, herds or groups of animals where they do not yet exist. The owner is responsible for protecting against the emergence of new pathogens among the herd and limiting the existing diseases outbreak.

A paper entitled *"Destination 2025: Focus on the Future of the Animal Health Industry"* has noted that the livestock sector has faced mounting pressure to meet rising demand for high-value animal protein, particularly in the developing world. The world's livestock sector is growing at a brisk pace, driven by population growth, rising incomes and urbanisation.

(Malik, R. M., Yawson, R. M., & Hensel, D. (2009). *Destination 2025: Focus on the Future of the Animal Health Industry.* St. Louis Park, Minnesota: Deloitte LLC & BioBusiness Alliance of Minnesota.).

According to the paper, increasing public awareness of the potential impact of biosecurity threats is causing considerable

Disease prevention steps:

- Reduce unnecessary traffic on the farm
- Provide clean and sanitised vehicles on the farm
- Keep record of the farm visitors
- Allow disposable footwear
- Keep other animals and strangers off the property

infrastructural change globally. Increased travel and trade practices create more biosecurity risks. Global markets are increasingly demanding methods to detect and stop the spread of pests and diseases by requiring "evidence of absence" and process certification before products enter the market.

"Increasing public awareness of the potential impact of biosecurity threats is spurring considerable infrastructural change globally. The task of analysing and managing relevant environmental risks to the health of humans, animals and plants, including monitoring food safety and security food defense, are likely to create new demands on animal health markets," noted the paper.

Global markets are increasingly demanding methods to detect and stop the spread of pests and diseases by requiring "evidence of absence" and process certification before products enter the market. Industry needs low-cost diagnostic tools to develop and implement collective surveillance systems regarding biohazards.

Biosecurity risks create need for solutions

Increased travel and trade practices create more biosecurity risks. Animal health products are routinely shipped thousands of miles, even halfway around the world, increasingly from small production facilities located on the outskirts of urban areas. Such peri-urban production raises the risk that exotic pests and diseases can develop and spread. Such operations frequently have higher density and intensity of production systems, limited ability to control access, and relatively inexperienced owners. Hobby farmers, for instance, may lack knowledge of important risk management practices or be unable to devote full-time effort to their farm operation

A paper published by Michigan State University Extension highlighted that when an illness is caused by a pathogen (a virus or bacteria), it can spread quickly through a herd or flock or from animal to human or human to animal. Some pathogens travel through the air (after a sneeze, for example) and some travel from pen to pen or even farm to farm on people's shoes or on the tools or equipment they move from one site to another.

According to the Michigan State University Extension, biosecurity CHIP principles could be practised to contain any diseases spread and to keep animals safe.

Image credit: Adobe Stock

It is crucial to keep animals and the equipment clean.

"Requiring all farm visitors to wear disposable plastic boots is a good biosecurity safeguard."

"C" is for cleanliness

Cleanliness starts with keeping animals and the equipment clean. Sharing grooming equipment is one of the most common ways that pathogens spread, because their surfaces can be easily contaminated with hair, dander and other debris. Owners should avoid sharing equipment with others at shows or other animal events without properly cleaning it between animals. If the animals will be sharing equipment such as trailers and feed and water buckets, owners should make sure that the items are safe and disinfected before using them.

"H" for history

The first step in disease prevention is to be as familiar as possible with the general animal health and management practices of the operation the owner is buying from. The owner should check with all visitors to the farm to see if they have travelled to an area that may be infected with a pathogen that could spread to the animals.

"I" for isolation

When new animals arrive on the farm, owners need to keep them separate from other animals for at least 14 days, and if possible, 30 days. This helps reduce the number of animals that would get sick if a newcomer brought a contagious disease into your facility. Additionally, owners need to keep clothes and shoes or boots separate. Diseases like the deadly Porcine Epidemic Diarrhea virus (PEDv) are spread via fecal matter. Shoes and boots are the most common carriers of manure, and therefore, the pathogen.

"P" for proper management practices

Proper animal management practices include observing the animals for signs of sickness, conducting appropriate vaccination programmes and providing proper animal nutrition.

Controlling visitors' access to areas where animals are housed and often travel is another important management practice. The owners should be sure that all the visitors' shoes and boots are clean before and after visiting any farm. Requiring everyone to wear disposable plastic boots is a good biosecurity safeguard. Some pathogens can travel on clothes and on humans. Therefore, owners need to take extra precautions if there is an animal disease outbreak in the area or anywhere the animals are travelling. ■

Innovad launches Myco-Marker: a pioneering mycotoxin service including blood biomarkers

Innovad's Dr Christos Gougoulias and Ben Letor spoke with Deblina Roy about the launch of Myco-Marker, a new service for evaluating the risk and measuring the exposure of mycotoxins in animals. This service is linked to the company's scientifically proven technology for mycotoxin prevention and stress relief.

Far Eastern Agriculture (FEAG): What is Myco-Marker and how is it evaluating the risk and measure of mycotoxins in livestock?

Mycotoxin Analysis in Feed: Looking only at the tip of the iceberg!

Determining mycotoxins in the feed is not adequate to assess their real impact in animal farming production. Up until now, mycotoxins are determined in animal production in feed ingredients and finished feeds. In that respect, feed analysis provides a rough estimate of the overall risk involved.

"Feed sampling on its own is problematic. Nearly 90 per cent of the error comes from the sampling itself whereas, only approximately 10 per cent is due to analytical error," said Dr Christos Gougoulias, head of innovation in Innovad, Belgium.

Myco-Marker: Do it differently – do it correctly

"The fact that we completely ignore the fate of the mycotoxins in the blood of the animals (via adequate biomonitoring) forms the heart of the problem," noted Dr Gougoulias.

Innovad, in collaboration with the University of Ghent, Belgium, has conducted research that validated state-of-the-art chromatography-based analytical methodology (LC-MS/MS) for the precise detection of mycotoxins and their transformation into phase one and phase two metabolites in the bloodstream of animals.

This has led to Myco-Marker, a novel diagnostic tool under patent, that detects with high analytical precision and sensitivity (via LC-MS/MS) a pool of 29 mycotoxins and their metabolites in the blood of chickens and pigs. This is combined with the precise analytical detection (again via LC-MS/MS) of crucial mycotoxins and their main fungal and plant conjugates in the feed.

Myco-Marker has been developed and deployed as a user-friendly service in the field. "The end user just needs to spot a smalldropof blood in an appropriate paper (FTA) card. There is no need for plasma separation or special procedures and tubes. These FTA cards have no import restrictions and we can receive samples from all over the world," explained Dr Gougoulias.

Correlating mycotoxin data

Up until now, nobody has correlated thepresence of mycotoxins in feed, with the actual levels of mycotoxins and their metabolites in blood (biomarkers of exposure) and, ultimately, with the true impact of mycotoxins to animals. "To capture the latter, Myco-Marker collects the health picture of the animals with the help of a detailed questionnaire. In the end, by recording all these elements we are aiming to build a database that could help us pull out meaningful trends," said Dr Gougoulias.

The Myco-Marker analysis revealed that the vast majority of the animals sampled were exposed to tenuazonic acid at concentrations between approximately 2.5 per cent and five per cent of the median concentration (82 ppb) that was reported last year, in a recent large-scale analysis study of multiple mycotoxins in finished pig feed.

FEAG: How is Innovad planning to promote Myco-Marker in Asia?

Innovad formally launched Myco-Marker at the IPPE (Atlanta, USA) and MVC (Moscow, Russia) trade fairs in the beginning of this year. During the Q1 2020, the concept was introduced to its global sales and distribution network.

Ben Letor, global sales director at Innovad, explained, "The introduction grabbed a lot of interest as the industry is eager to get a better grip on the risk and economic impact of mycotoxins on a farm. Myco-Marker fills a gap by supporting producers and veterinarians in identifying the problems and in their strategy to mitigate the situation."

The service is already introduced to specific clients and it is clear how it can contribute to each individual operation. To optimally benefit from the whole interpretation of the results of the service, Myco-Marker follows a very specific protocol.

A large part of Asia has a warm and humid climate. Such weather promotes the growth of moulds and toxins. The Asian animal feed has been widely affected by mycotoxins in combination with other stress factors. Innovad is launching the service across the whole of Asia, with a specific focus on South East Asia and the Indian subcontinent. The focus is on China as well.

FEAG: Is there any plan for further expansion in other Asian countries in the future?

"Innovad has a growing presence in Asia with its own offices in major countries in the region such as Thailand, Vietnam, Singapore. In fact, we are continuously investing in the appropriate resources to ensure that the company's solutions. The Myco-Marker service is easily available to the market to serve its needs," Ben Letor added.

Letor has provided an example. "Due to the forthcoming ban on Colistin in China, Innovad has aligned its strategy to meet the new demand from the Chinese pig industry for antibiotic alternatives. Our Lumance technology is being presented to address this growing need." ■

Health benefits of shrimp set to drive global growth

Although global shrimp farming has been affected by COVID-19, the market is expected to be driven by the health benefits of shrimp.

Many companies are harnessing artificial intelligence (AI) to improve shrimp production.

Image credit: Adobe Stock

THE GLOBAL SHRIMP market is expected to grow by US$7.6bn from 2019-2023, according to market research firm Technavio. This marks a significant market slowdown compared to the previous year's growth estimates, due to the impact of the COVID-19 pandemic in the first half of 2020.

As reported in the *Seafoodsource*, the spread of the COVID-19 virus has heavily impacted Asia'a major shrimp-producing nation Indonesia, resulting in a sharp decline of exports to China.

According to the investment information and credit rating agency ICRA, the Indian seafood industry may be impacted as global shrimp prices are expected to face pressure over the next few months with the trade adjusting to the changing demand dynamics in China, a major importer and consumer of farmed shrimp. ICRA has commented that global shrimp prices are set to face pressure over the next few months. According to the agency, the trade needs to adjust to the changing demand dynamics in China, a major importer and consumer of farmed shrimp.

However, healthy growth is expected to continue throughout the forecast period and the market is expected to grow at a CAGR of more than five per cent. The market is expected to be driven by the health benefits of shrimp. In addition, the rise in shrimp-based product launches is anticipated to boost the growth of the shrimp market.

GOAL survey expects to see further growth through 2021

According to the Global Aquaculture Alliance's annual Global Outlook for Aquaculture Leadership (GOAL) 2019 survey of production trends in shrimp farming, the industry showed signs of recovery in 2016 and 2017, resulting in a CAGR of 2.2 per cent for the period 2012 to 2017 – much lower than the 6.3 per cent rate estimated by the Food and Agriculture Organization of the United Nations (FAO).

GOAL respondents reported a surge in production in 2018 (+11 per cent compared to 2017) and expect to see further growth through 2021.

According to the GOAL survey, production has recovered since 2015, reaching 3.75 million MT in 2018 and potentially four million MT in 2021. Growth will be stronger in Vietnam and China, with predicted CAGRs of 4.6 and 3.9 per cent from 2018 to 2021, respectively.

"Respondents from India and Indonesia expect to see much less growth in their countries. Indonesia expects to produce 450,000 MT in 2021, 18 per cent less than the output reported in 2017. India reached a historic production level of 700,000 MT in 2018 but expects output to fall to 600,000 MT by 2021. Thailand should continue to recover from the impact of AHPND/EMS, albeit at a slow pace: production is expected to reach 330,000 MT in 2021, amounting to 56 per cent of the 2010 (pre-EMS) harvest," states the survey (Survey link: *www.aquaculturealliance.org/advocate/goal-2019-global-shrimp-production-review/*)

However, "diseases" has been identified by Asian respondents as the top challenge faced by the industry. "Feed costs" and "access to disease-free broodstock" were ranked as the second- and third-most pressing issues, respectively. "International trade barriers" came close in fourth place (up from eighth place in the 2018 survey), probably reflecting increased concerns about the ongoing trade disputes between the USA and China. "Market prices" was ranked as the seventh most important issue.

Digital technologies making inroads in shrimp farming too

To contribute to the projected growth and meet demand, many companies are harnessing artificial intelligence (AI) to improve aquaculture operations. Indian startup Aquaconnect is helping shrimp farmers to predict disease and enhance water quality with mobile app FarmMOJO. Using machine learning technology, the mobile app aims to improve farm productivity and traceability and help shrimp farmers manage pond water quality, feeding information, growth rate etc.

Sense-T has developed biosensors to analyse the level of oxygen and water temperature. Many Indian shrimp farms are using Sensorex technology to monitor dissolved oxygen levels and balance pH to create atmosphere for improved shrimp efficiencies and yields.

India-based Eruvaka Technologies' smartphone monitoring, cloud analytics and voice alert solutions are helping farmers to check water quality and monitor fish feed, thus reducing risks of shrimp mortality and increasing the quality of the produce. These solutions are used in eight countries and installed in 6,000 ha of shrimp farms globally. ■

FAO: Impact of the COVID-19 pandemic on food and agriculture

As lives and livelihoods are at risk from this pandemic, the UN Food and Agriculture Organization (FAO) is focusing on vulnerable rural and coastal populations whose agricultural and fisheries-based livelihoods are affected.

FAO is taking evidence-based interventions to shore up food security and people's livelihoods.

Image credit: Adobe Stock

Will COVID-19 have negative impact on global food security?

The disease is spreading quickly. This is no longer a regional issue – it is a global problem calling for a global response.

Border closures, quarantines and supply chain and trade disruptions could restrict people's access to diverse and nutritious sources of food, especially in countries hit hard by the virus or already affected by high levels of food insecurity.

However, there is no need for the world to panic. Globally, there is enough food for everyone. Policy makers around the world need to be careful not to repeat the mistakes made during the 2007-8 food crisis and turn this health crisis into an entirely avoidable food crisis.

Whose food security and livelihoods are most at risk due to the pandemic?

If COVID-19 cases, already present in most world regions, proliferate in the 44 countries that need external food assistance – or in the 53 countries home to 113mn people experiencing acute severe food insecurity, many of whose public health and social protection systems face capacity constraints – the consequences could be drastic.

FAO is particularly concerned about the pandemic's impacts on vulnerable communities already grappling with hunger or other crises – the Desert Locust outbreak in the Horn of Africa, insecurity in Yemen or the Sahel, for example – as well as countries that rely heavily on food imports, such as Small Islands Developing States, and countries that depend on primary exports like oil.

Vulnerable groups include small-scale farmers, pastoralists and fishers who might be hindered from working their land, caring for their livestock or fishing. They will face challenges accessing markets to sell their products or buy essential inputs, or struggle due to higher food prices and limited purchasing power. Informal labourers will be hard hit by job and income losses in harvesting and processing. Millions of children are already missing out on the school meals they have come to rely upon, many of them with no formal access to social protection, including health insurance.

What are the implications of the COVID-19 situation – now and in the future – for food production, agricultural and fishery/aquaculture supply chains and markets?

As of now, disruptions are minimal, as food supply has been adequate and markets have been stable so far. Global cereal stocks are at comfortable levels and the outlook for wheat and other major staple crops for 2020 is positive.

Although less food production of high value commodities (fruits and vegetables) is already likely, they are not as yet noticeable because of the lockdowns and disruption in the value chain

In the fisheries and aquaculture sector, the implications can vary and be quite complex. For wild-capture fisheries, the inability of fishing vessels to operate can generate a domino effect throughout the value chains in terms of supply of products, in general, and the availability of specific species. In addition, for wild-capture fisheries and aquaculture, problems in logistics associated with restrictions in transportation, border closures and the reduced demand in restaurants and hotels can generate significant market changes – affecting prices. As a result of the above as of April and May, we expect to see disruptions in the food supply chains.

How has FAO responded to the COVID-19 outbreak?

As part of its COVID-19 response, FAO's priorities are to

- Support developing countries to anticipate and mitigate the pandemic's impacts on their populations' food security and livelihoods
- Contribute to discussions on mitigating COVID-19's impacts on global food trade and markets
- Support countries and research institutions in ongoing investigations to identify potential animal hosts of the virus and reduce spillover effects to humans. ■

With kind permission from [©FAO] 2020 "COVID-19 pandemic – impact on food and agriculture" [http://www.fao.org/2019-ncov/q-and-a/impact-on-food-and-agriculture/en/] [Date accessed: 14 April 2020].

New Holland and Kongskilde present upgraded implements range at LAMMA 2020

NEW HOLLAND AND Kongskilde unveiled a host of implements at LAMMA 2020, held at the NEC in Birmingham from 7-8 January 2020.

The two brands provided a full range of implements for hay and foraging operations that includes front and rear mounted mowers as well as lateral and central pull trailed versions, mounted and trailed tedders, and side and central delivery rakes.

New Holland has entered the tillage business with soil equipment painted in New Holland tractor blue. First introduced was the six furrow PXV heavy duty fully mounted plough with variable width, as well as the RVM rotary tiller with gear side drive. The range includes new Side Mounted Combi Wheel and PL light plough.

New Holland Implements Duradisc F-300-01.

Image credit: New Holland

Products displayed include:

- Kongsklide VM22 gh–2B Diet mixer, with front cross conveyor, feeding to the left or right, wireless weighing system including a hand terminal and main terminal and fitted with a two speed gearbox which helps to reduce power consumption.
- Kongsklide FCT 1060 MD Forager harvester, with a folding discharge chute, 2.1m pickup, 24 blade rotor and inline pressure filter.
- New Holland PXVS5 5 Furrow Shearbolt plough, with side mounted combi depth/transport wheel, XLD bodies, rear disc and EG skimmers.
- New Holland Disccutter 320P Mower conditioner, with PE condition fingers, Topdry feature, vari-float suspension, hydraulic obstacle release and the option to transport vertically or horizontally to the rear.
- New Holland RVX 305 Rotavator, with quad speed gearbox, gear side drive to the rotor, adjustable rear trailing board and rear depth wheels.

Meyn quality grading system M2.0

MEYN HAS UPGRADED its quality grading system M2.0 with an aim to provide more hygienic design featuring LED lighting and advanced camera technology for high-resolution images of each processed bird.

In combination with the Meyn Connect M1.1 software, the grading process is set to be fully automated and tuned to the customer's product requirements.

In combination with the Meyn Connect M1.1 software, the grading process is set to be fully automated.

Image credit: Meyn

In a statement Meyn explained, "Images of each bird are analysed for colour, shape and texture in seven inspection areas in the front and 10 for the back. These results, in 15 measurement parameters, make it possible to distinguish seven grading levels, all preloaded in the software, where pictures of each bird are compared with the grading levels. The information can then be used consecutively for sorting lines before the next process step."

According to Meyn, the processor benefits from maximised yield by sorting the exact product according to the relevant parameters; maximised quality by grading and removing birds automatically; reduced number of inspectors and increased food safety by detecting and removing contaminated birds earlier and more accurately.

The Meyn quality grading system M2.0 is a modular system that can be extended with more modules. In addition, it allows data to be stored for a limited period of time for later performance and flock analysis.

Additionally, Meyn's product range includes Maestro Plus, solution for in-line automatic organ harvesting for a wide variety of line speeds and bird sizes. The tailor-made service contracts aim to reduce downtime to a minimum, including training for technicians and operators, technical support, scheduled maintenance, repair and equipment data analysis and even a full plant audit.

Research in Lao PDR benefiting smallholders

A TEAM OF researchers inspect samples of many different rice varieties at the Lao PDR Rice Research Center (RRC).

The RRC has identified more than 14,000 varieties of rice in Lao PDR – the greatest number of varieties of almost any nation on earth – and second only to India.

"Lao PDR might not be Asia's largest producer of rice, but the yields are impressive," said FAO director-general QU Dongyu. "The government estimates that up to one-million tonnes of rice are harvested each year. Impressive for a country of some seven million people."

Reader Information Service

Issue 2 2020

This is a free service, readers who wish to receive urgently further information about any product or company featured in the magazine, please complete this form and fax to: **Far Eastern Agriculture on +44 (0) 20 7973 0076**
or e-mail to: **feag@alaincharles.com**
or post to: **Far Eastern Agriculture, University House, 11-13 Lower Grosvenor Place, London, SW1W 0EX, United Kingdom.**

Name of product and/or company	Page No.

Name: .....
Job title: .....
Company: .....
Address: .....
.....
.....
.....
Tel: ..... Fax: .....
Your organization's product/service: .....
.....
.....
.....
Number of employees in your organization: .....
Signature: ..... Date: .....

Subscription form

I wish to subscribe to **Far Eastern Agriculture** for 1 year (6 issues) starting with the next copy.

Surface Rates:	**1 year:**	£57	US$111	Euro €93
	2 years:	£97	US$189	Euro €158
	3 years:	£129	US$251	Euro €210

☐ Enclosed is my cheque/draft for .....
(Cheques made payable to Alain Charles Publishing Ltd)

☐ Please invoice

☐ Please charge to Visa/American Express/Mastercard (please circle)

Card number ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Expiry Date ☐☐ / ☐☐

(please note we debit your account in sterling)

Name .....
Position .....
Organization .....
Address .....
..... Country .....
E-mail .....
Signed ..... Date .....

Send this form together with your remittance to:
Far Eastern Agriculture, University House, 11-13 Lower Grosvenor Place, London, SW1W 0EX, UK. Tel: +44 (0) 20 7834 7676 Fax: +44 (0) 20 7973 0076

Subscription order can also be made via the Internet: www.alaincharles.com or email at feag@alaincharles.com

Please TICK most relevant box

- ☐ 01 Government: municipal services, diplomatic, (UN, International Agencies)
- ☐ 03 Educational/Research Institutes
- ☐ 06 Commercial Services: banking, finance, insurance
- ☐ 08 Import/Export Agents and Distributors
- ☐ 09 Farms and Plantations
- ☐ 11 Food Processing: poultry, dairy, cereal, fruit, vegetables, etc
- ☐ 12 Aid Organizations
- ☐ 13 Agricultural Equipment and Material Manufacturers: irrigation, agro-chemicals
- ☐ 16 Others: please specify:

4. Type of produce

- ☐ 01 Rice
- ☐ 02 Grain
- ☐ 03 Fruit
- ☐ 04 Cocoa
- ☐ 05 Coffee
- ☐ 06 Cotton
- ☐ 07 Rubber
- ☐ 08 Palm Oil
- ☐ 09 Palm Kernels
- ☐ 10 Sugar Cane
- ☐ 11 Feedstuffs
- ☐ 12 Groundnuts
- ☐ 13 Vegetables
- ☐ 14 Cassava
- ☐ 15 Dairy Cattle
- ☐ 16 Beef Cattle
- ☐ 17 Sheep/Goats
- ☐ 18 Pigs
- ☐ 19 Poultry
- ☐ 20 Fisheries

Global grain harvest outlook is good

Due to the pandemic, people run to the markets in panic and stock up on flour, pasta and pulses. Demand for flour has increased by 80 percent in Italy, one of the countries most affected by the pandemic.

AS THE GOVERNMENTS are taking measures such as banning grain exports and suspending flour sales abroad to ensure their own food security in COVID-19 escalations, this could trigger a food crisis in the world, according to the United Nations (UN).

The UN Food and Agriculture Organization (FAO) noted that there may be disruptions in food supply chains in April and May.

The pandemic, which killed thousands of people, put tremendous pressure on the global food supply chain as well as the healthcare system. People run to the markets in panic and stock up on flour, pasta and pulses. Pasta and flour sales in France tripled compared to the same period of last year. Demand for flour has increased by 80 percent in Italy, one of the countries most affected by the pandemic.

While the supply-demand balance in the grain markets suddenly deteriorates, the governments are taking measures such as banning grain exports, primarily wheat and rice, and suspending flour sales abroad to ensure their own food security.

> **“Global harvest outlook is good in main grains including wheat and corn and there is enough food for the whole world.”**

However, there is no need to panic. Global harvest outlook is good in main grains including wheat and corn. There is enough food for the whole world. Not long before, what happened in the food crisis that broke out between 2007 and 2008 due to price increases in basic foodstuff is still in memory. Policy makers should not repeat mistakes made during that crisis. Steps to turn the health crisis into a food crisis should be avoided.

According to FAO chief economist Maximo Torero, “The worst that can happen is that governments restrict the flow of food. All measures against free trade will be counterproductive. Now is not the time for restrictions or putting in place trade barriers. Now is the time to protect the flow of food around the world.”

Torero said that people must work in a coordinated way to prevent a possible food crisis. “We must stay calm and have common sense for the sake of our families, loved ones and humanity. Let's not forget that we can overcome this global threat only with a global struggle.” ■

Now is the time to protect the flow of food around the world, according to FAO chief economist.

Image credit: Adobe Stock

Your business at your fingertips.

automation® system

BAGTECH

FERTILIZER MANAGEMENT AND HANDLING SOLUTIONS

www.bagtechint.com