

Far. Eastern Agriculture

US\$15.00 (UK£9.00)

VOLUME 38 ISSUE 6 2020

Scaling up post-harvest management

Crops:

Sulphur nutrition for tea

Promoting responsible
aquaculture

Rising demand for better
housing equipment



VIV Qingdao 2020 review - 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

Far Eastern Agriculture



Cover Image : Adobe Stock

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

India **VINAY NAIR**
 +91 98 86494082
 vinay.nair@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 **MURSHID MUSTAFA**
 +971 4 448 9260
 murshid.mustafa@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, P O 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: November 2020
Far Eastern Agriculture
 (ISSN 0266-8025)



BULLETIN

04 A round-up of major developments in the regional market



AGENDA

05 Developing a needle-free injection device for pigs



06 FAO Food Price Index in October 2020

CROPS

10 The importance of sulphur in tea crop nutrition



POULTRY

14 Optimising broiler performance and production with new technologies



AQUACULTURE

16 The impact of certified responsible aquaculture

ASC FARM LOCATIONS



EQUIPMENT

19 Recent advancements in post-harvest technology



Advertisers Index

| | |
|--------------------------------|----|
| AGRAGEX | 24 |
| Omex Agrifluids Ltd. | 11 |
| Termotecnica Pericoli SRL..... | 18 |

SMILE programme to help oil palm smallholders in Indonesia

THREE LEADING PALM oil companies, Kao Corporation, Apical Group and Asian Agri, have launched a new sustainability initiative to help independent oil palm smallholders in Indonesia improve their yields, obtain international certification and eventually secure sales premiums from the sale of certified palm oil.



Image credit: Kao Corporation

The companies are working to ensure traceability as far as oil palm plantation is concerned.

Known as SMILE or Smallholder Inclusion for a better Livelihood & Empowerment programme, collaboration exists between downstream producer Kao Corporation, mid-stream processor, exporter and trader Apical Group, as well as upstream producer Asian Agri.

The 11-year initiative seeks to continue building a more sustainable palm oil value chain by working with independent smallholders. Independent smallholders contribute more than 28% of Indonesia’s overall palm oil market. The collaboration recognises that independent smallholders are private business owners who are challenged to increase their yield and productivity but may neither have the knowledge nor the technical expertise to do so.

Symaga establishes office in Singapore

Symaga, a leading manufacturer of industrial silos, has opened an office in Singapore as part of an agreement with SCE Asia in Suntec City, Marina Bay. The company stated that with setting up of the new office, it would be able to be closer with its customers in the region and thus able to provide them with a better service.

The Belgian company’s headquarter in Asia is managed by Archit Newaskar.



Image credit: marcon/Phabag

The commercial and corporate support provided by SCE will help consolidate and expand growth in Asia.

Symaga’s trajectory in this market is consolidated in 2013 with the project of the first bulk port terminal in Indonesia. Over the last two years, significant projects have been added to Symaga’s portfolio. This includes a brewing plant in Myanmar, a new logistics terminal for a Japanese group and a wheat storage plant for one of the largest food groups in the world, Wilmar.

In 2019, the company had a remarkable year in the Asia region, with the supply of silos for the Indonesian company Batulicin, on Borneo island, a storage plant for Charoen Pokphan in Thailand, a brewery for San Miguel in Santa Rosa, a rice plant in Palembang for PT Buyung and a flour mill for PT Wilmar Nabati to be installed on the island of Java. In order to continue this growth, Symaga has now set up a physical office, which will allow it to understand and better respond to the needs of the region.

The commercial and corporate support provided by SCE will help consolidate and expand growth in Asia.

Hortiflorexpo IPM Shanghai 2021 to take place in April as scheduled

THE 23RD HORTIFLOREXPO IPM Shanghai, hosted by Shanghai Intex Exhibition Co., Ltd., will be held as planned in Shanghai from 15-17 April 2021.

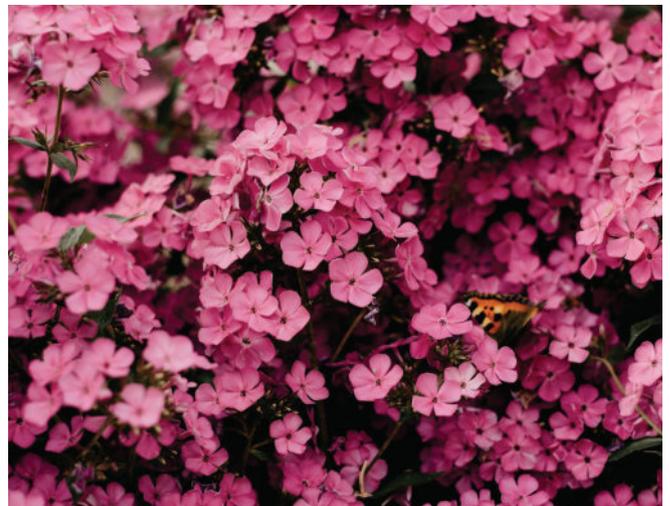
Through more than 22 years’ development, Hortiflorexpo IPM Shanghai has been well known as the prestigious flagship show of floriculture and horticulture industry in Asia.

In 2019, the show welcomed 52,362 visitors on site, bringing together almost 900 exhibitors from 30 countries and regions around the globe.

Hortiflorexpo IPM Shanghai 2021 will undoubtedly further subdivide the exhibition categories, enhance on-site experience and interaction, combine all aspects of flowers, horticulture, gardening and lifestyle, and provide international and domestic business opportunities and trade cooperation for exhibitors.

Chinese consumption is gradually recovering from a pandemic and COVID-related closure. According to the latest report from China Daily, the prolonged holiday that ended 8 October has given domestic consumption a fresh boost, with spending bouncing back to new heights as coronavirus impacts on the economy are likely to be further reduced.

While consumptions are booming, garden horticultural and flower consumptions are also recovering rapidly. A barometer of China’s floral industry, the largest freshly cut flower market in Asia has regained its hustle and bustle as the COVID-19 pandemic is brought under control.



The event will provide international and domestic business opportunities and trade cooperation for exhibitors. (Image credit: Irina Iriser/Pexels)

Boehringer Ingelheim to develop needle-free injection device for pigs



Image credit: liz west/flickr

This device will bring benefits to swine producers ensuring improved safety and efficacy of vaccination.

ANIMAL HEALTH SPECIALIST

Boehringer Ingelheim has partnered with Henke-Sass, Wolf, leading medical technology companies in Germany, to develop an innovative intramuscular needle free vaccine injection tool for pigs around weaning until the end of nursery.

This device will be available from December 2020 to swine producers in most countries globally under two different brands FreVAX (through Boehringer Ingelheim) and EPIG (through Henke-Sass, Wolf).

Stephan Lange, head of swine, Boehringer Ingelheim Animal Health, said, “FreVAX and EPIG fulfil the desire of swine producers to ensure the safety of pigs and people as well as the efficacy of vaccine

application by avoiding broken needles and reducing pathogen transmission while increasing vaccination compliance, animal well-being and data availability and management.”

FreVAX and EPIG replace conventional needle vaccination, ensuring smooth and painless intramuscular injections of one or two ml with no recoil, low noise level and direct feedback for the user through intelligent sensors and LED alerts.

These features have been incorporated to improve the vaccination experience for both the pig and the operator whilst offering vaccination compliance and reliability. In addition, the product also provides smart functions for data capture and transfer.

ILDEX Vietnam set for July 2021

ILDEX VIETNAM 2021, the eighth international livestock, dairy, meat processing and aquaculture exposition, will again open its doors to industry professionals and trade visitors from 21-23 July 2021. ILDEX Vietnam 2021 includes all groups of livestock management and meat processing. The show will occupy 10,000 sqm at the Saigon Exhibition & Convention Center. At the last ILDEX in 2018, the organisers registered 276 exhibitors from 28 nations with 8,711 trade visitors. ILDEX Vietnam is organised by VNU Exhibitions Asia Pacific Co.

ILDEX Vietnam has become the leading trade exhibition in the Asian region with a strong presence and ample business opportunities. Livestock experts and leading exhibitors have stated that it is the best marketplace and the best international business platform for the Vietnamese market.

For more information, visit: www.ildexvietnam.merebo.com/

EVENTS 2020

DECEMBER

3-5

TIFSS

Taiper, Taiwan

<https://www.taiwanfishery.com/en/index.html>

9-12

Foodexpo Vietnam

Online

<https://foodexpo.vn/>

14-17

Future Proofed Palm Oil

Kuala Lumpur, Malaysia

<http://www.futureproofedpalmoil.com/>

JANUARY 2021

27-29

Agros

Moscow, Russia

<http://en.agros-expo.com/>

FEBRAURY 2021

9-12

EuroTier

Online

www.eurotier.com

24-26

AGRI WEEK OSAKA 2021

OSAKA, Japan

www.agriexpo-osaka.jp/en-gb.html

25-26

PALMEX Malaysia

Kuala Lumpur, Malaysia

<http://asiapalmoil.com/>

MARCH 2021

3-5

China International Agrochemical & Crop Protection Exhibition

Shanghai, China

www.cacshow.com

FOOD OUTLOOK

THE FAO FOOD Price Index (FFPI) averaged 100.9 points in October 2020, up three points (3.1%) from September and 5.7 points (6.0%) higher than its value a year ago. The October value, the highest since January 2020, represented the fifth consecutive monthly increase. Much firmer prices of sugar, dairy, cereals and vegetable oils were behind the latest rise in the FFPI, while the meat sub-index fell slightly for the second consecutive month.

The FAO Cereal Price Index averaged 111.6 points in October, up 7.5 points (7.2%) from September and as much as 15.8 points (16.5%) above its value in the corresponding month last year. The FAO Vegetable Oil Price Index averaged 106.4 points in October, up 1.8 points (1.8%) month-on-month, thanks largely to firmer



palm and soy oil prices, while those of rapeseed oil declined moderately.

The FAO Dairy Price Index averaged 104.4 points in October, up 2.2 points (2.2%) from September, marking the fifth consecutive monthly increase and lifting the index 3.6 points (3.5%) above its value in the corresponding month last year.

The FAO Meat Price Index averaged 90.7 points in October, down slightly (0.5 points or 0.5%) from September, marking the ninth monthly decline since January, and standing 10.9 points (10.7%) lower than its value a year ago.

The FAO Sugar Price Index averaged 85.0 points in October, up 6.0 points (7.6%) from September and 7.2 points (9.3%) from last year. This increase reflected mostly the prospects of a lower sugar output in both Brazil and India.

Enhancing productivity in agricultural sector

CHINESE MANUFACTURER HYTERA stated that its radios could help improve productivity in the agricultural sector.

Mobile phone networks are problematic because coverage can be patchy in rural areas and mobile phones are rarely robust enough to cope with the outdoor environment.

On the other hand, a professional communication solution such as Hytera Digital Mobile Radio (DMR) provides an instant push-to-talk (PTT) solution, enabling groups of people to talk to each other at the same time to coordinate and synchronise farming activities.

Hytera DMR radios provide a high degree of robustness and weatherproofing against dust and moisture ingress.

They feature crystal clear audio noise-cancelling technology even in the noisiest farm environments. When required, radios can provide integrated GPS for location services and support man down and lone worker alarms to enhance farm workers' safety.

Thailand's EEC to become post-COVID-19 global food innovation hub

THAILAND'S HIGH-TECH EAST Economic Corridor (EEC), already positioned as a gateway to Asia, is aiming for a new post-COVID-19 role as an incubator of innovative food products to feed the world, officials said.

With its fertile farmland and abundant seafood resources, Thailand has long been one of the few countries that can produce far more food than it consumes. Nicknamed 'the kitchen of the world', and well known for its high-quality standards, Thailand last year exported US\$33bn worth of produce ranging from rice to ready meals to tropical fruits.

But with the UN predicting that global demand for food will rise by 60% over the next 10 years, and with COVID-19 disruption adding to food insecurity in many countries, the Thai government believes that it can further leverage technology, innovation and logistics to raise the food sector to even higher levels.

As part of a strategy known as Thailand 4.0, the government has designated 'food for the future' and 'advanced agriculture and biotechnology' among the 12 target industries to be prioritised in the EEC to

spearhead the transformation of the kingdom into a fully developed innovation economy.

The EEC, a zone of 13,000 sq km south and east of Bangkok, is the focal point of Thailand 4.0. The Eastern Economic Corridor of Innovation (EECi) will be opened in the heart of the EEC, where some of the most advanced research and development of the EEC will take place.

Two major components of the EECi will be Biopolis, an innovation centre for biotechnology, which will open in 2021, and Food Innopolis, a science park in which giant multinational companies and universities research, develop and innovate alongside 'agropreneur' startups and small and medium-sized enterprises. They will be complemented by Aripolis, specialising in automation, robotics and intelligent systems.

"The EEC's agricultural promotion plan encourages the use of technology, and smart farming to increase the area's full potential as a hub of tropical fruit production," said Dr Luxmon Attapich, deputy secretary-general of the Eastern Economic Corridor Office.

EuroTier 2021 goes digital



Image source: EuroTier/DLG

In view of the continuing uncertain international situation in conjunction with the coronavirus pandemic, EuroTier, the world’s leading trade fair for animal production, will take place on 9-12 February 2021 in a digital version.

THIS DECISION WAS reached by the organiser, DLG (Deutsche Landwirtschafts-Gesellschaft – German Agricultural Society), following extensive meetings with industry representatives, the advisory board and partners.

EuroTier offers exhibitors a broad offering and maximum flexibility with digital business packages while offering visitors an extensive technical programme and attractive networking opportunities. For 2021, DLG will also offer additional events and trade fairs on all aspects of the topics of animal husbandry.

“The increasing number of corona cases worldwide and the related restrictive travel guidelines for both exhibitors and visitors require flexible business solutions and information services, like those offered by EuroTier,” explained Dr Reinhard Grandke, CEO of DLG. “Our digital trade fairs are both international business platforms and

expert networks for the current issues of the animal production sectors.”

EuroTier as a digital platform

With digital company profiles, live events including chat and meeting functions, the event offers a broad range of communication and interaction opportunities for exhibitors and visitors. The digital technical programme with DLG Spotlights on the major trade fair topics of dairy, pig, poultry, and direct farm sales, as well as live discussions from the DLG Studio, provides the perfect setting for planning investments.

Additional DLG events in 2021

The DLG network will offer additional national and international trade fairs and industry events for animal production in 2021 as outdoor and indoor events with a safe business concept. These include:

agra 2021: The leading agricultural exhibition for Central Germany will take

place, 22-25 April 2021 in Leipzig and offers an information and exhibition programme for livestock holders.

DLG-Feldtage 2021: The meeting point for crop professionals will take place from 8-10 June 2021 in Erwitte (East Westphalia) on around 45 hectares of exhibition grounds and offers numerous advantages of an outdoor event in a region of Germany that is heavily influenced by animal husbandry.

Agritechnica 2021: The world’s leading trade fair for agricultural machinery, 14-20 November 2021, offers livestock holders a large number of exhibition and information services.

International trade fairs and conferences: Together with partners, DLG will provide information on topics and requirements of animal husbandry in the respective agricultural regions during numerous trade fairs and events, and offers exhibitors and visitors tailored-made business platforms. n

For more information, visit www.eurotier.com

A lively VIV Qingdao 2020 and a milestone edition for VIV in China



More than 10 high-level conferences were staged during the three days at VIV Qingdao.

Image credit: VIV Qingdao

The 2020 edition of VIV Qingdao, held over three days on 17-19 September in China, presented a vibrant show for the industry.

THIS YEAR THE event offered a valuable occasion to celebrate the 20 years of VIV presence in China.

Despite the COVID limitations in travelling, VIV Qingdao 2020 presented no less than 40,000sqm of exhibition space, with 352 featured companies covering the Feed to Food supply chain.

Over the three days at the Qingdao Cosmopolitan Exposition, the show welcomed a total of 16,557 professional visitors. At the same time, the global buyers joined virtually via the digital “Explore VIV” platform that registered 55,402 page views. The platform allowed all visitors to experience the show from afar, attend the webinars, listen to the “VIV Talk Show” interviews real-time and join interesting match-making activities. The online visitors reached out to the exhibitors in Qingdao from 30 countries, including China, Iran, UK, the Netherlands, Peru, Canada, Brazil, Germany, Japan, USA, the Philippines, Malaysia, among others.

More than 10 high-level conferences were staged during the three days at VIV Qingdao, attracting 3,369 visitors. The sessions included: the Global Pig Genetic Improvement Summit; the first China Animal Husbandry Antibiotic-Replace Summit; the third Farm and Food Integration Forum; and the VIV International Summit, which brought to the audience multiple themes such as disease monitoring and biosecurity measures on pig farms, sustainable solutions for animal waste treatment, China’s transition to cage-free egg production, efficiency and profit improvement on layer and egg, smart farming management and equipment innovation, and a session from the Global Dairy Farmers.

The online experience at VIV Qingdao

VIV Qingdao organising team introduced this year a series of webinars and online programmes before and during the show. The online trade match-making portal registered around 12,000 visitors and nearly

1,000 trade meetings were held on the platform before and during the exhibition days.

A unique match-making session dedicated to the development of business relations between China, on the supply side, and Ghana, on the demand side, named “Pig and Poultry Farming Online Matchmaking” and held on the first day of the show, was co-organised by VIV Qingdao 2020, Grand International Exhibition and Ghana China Trader. The session focused on breeding and hatching, animal health, nutrition, farm and house equipment, animal waste treatment, and other topics. Mr Jeremy Liu, director of VIV in China, together with the Ghana Agriculture Ministry officer, Mr Ma Chuang, vice secretary-general of Chinese Association of Animal Science and Veterinary Medicine (CAAV), and Mr Nicholas Forson, international relations manager of Ghana-China Trader all contributed to this insightful business match-making. Around 23 buyers from Ghana and selected exhibitors from China attended the online session. ■

For more information, visit: www.vivchina.nl

Sulphur brightens the brew for tea



Image credit: robnaw/Alamy Stock

Women picking tea leaves in Assam, North-East India.

Sulphur is an important nutrient and soil amendment product in the cultivation and growth of the tea bush, says Dr Terry Mabbett.

THE TEA CROP'S requirement for sulphur is very high at 16 to 26 kg/hectare (ha) per annum, but not surprising since tea grows naturally on volcanic soils created by the same geological processes that generate elemental sulphur.

The sulphur content of fresh green tea leaves should be maintained at 0.08% to 0.20% of total dry matter to achieve maximum yields for processing into high-quality tea products. 1.0t (tonne) of a finished tea product requires 5t of freshly picked leaves that will have extracted no less than 10kg of sulphur from the soil. Tea production, by its very nature, with regular plucking of the youngest and most nutrient-rich foliage, will deplete soil nutrients including sulphur without fertiliser application.

When averaged out over the entire tea bush, sulphur content of leaves at 0.08% to 0.20% is way down in the list of nutrients, but when the nutrient analysis is targeted on the third-youngest unfurled leaf, sulphur at 0.50% shoots up to rank equal third with

Up to 40% of the sulphur absorbed by tea roots is recycled into the soil as fallen leaves and pruning waste, but there remains a considerable shortfall.

phosphorus. These latter figures are clearly important given that tea pickers select new shoots comprising terminal buds (golden tips) and young leaves for processing into finest grade teas. Plucking the terminal bud, plus three leaves gives the highest yield of quality shoots and about 25% more than the bud plus two leaves. Shoots which include this third leaf process into premium teas with high concentrations of two important tea chemicals, polyphenols (tannins) and theine (tea caffeine).

Up to 40% of the sulphur absorbed by tea roots is recycled into the soil as fallen leaves and pruning waste, but there remains a considerable shortfall. Tea harvests weighing in at 3,000kg will have removed some 6-9kg of sulphur/ha/year from the soil, say researchers at the Tocklai Experimental Station in Jorhat India and home of the famous Assam teas. Field trials in this tea-growing area of North Eastern India showed soils could become seriously

depleted of sulphur through continuous picking unless appropriate fertiliser application was in place.

Sulphur deficiency

Sulphur shortfalls on tea estates are nothing new. Sulphur deficiency symptoms in tea bushes, commonly called 'sulphur yellows' or 'yellow disease', have long been recognised in tea growing areas around the world. Sulphur is central to plant nutrition. The nutrient is needed for the synthesis of sulphur-containing essential amino acids like cysteine and methionine and for the manufacture of chlorophyll pigments. When sulphur is in short supply chloroplasts break down and with it, the normal dark-green colour of healthy tea foliage.

Young leaves are the hardest hit by sulphur shortfalls. They develop an unhealthy-looking pale yellow colour and a general yellowing of interveinal areas. New shoots are smaller and internodes (distance between leaves) shorter due to a slow down in growth, which may be followed by general shoot necrosis when sulphur deficiency persists. Consequences for yield and quality of tea are severe, especially for new shoots comprising of a bud and 2-3 leaves selected and picked to manufacture

Young leaves are the hardest hit by sulphur shortfalls. They develop an unhealthy-looking pale yellow colour and a general yellowing of interveinal areas.

the finest grade tea. To make matters worse, leaf yellowing symptoms are exacerbated by lower temperatures. These are the very conditions experienced at night on the hillsides where tea is typically grown. Sulphur is known to enhance frost resistance of tea bushes.

'Sulphur yellows' has proved to be an ongoing problem in a number of major African tea-growing countries, including Kenya, to the degree that it demands dedicated sulphur fertiliser. Sulphur was traditionally provided incidentally via nitrogen and potassium fertilisers, such as ammonium sulphate and potassium sulphate with the Sulphur element in the molecule. With the need for sulphur recognised in the fertiliser industry, it has responded with the

design and development of sulphur fertiliser based on pure sulphur being formulated as pastilles and prills. The sulphur is degraded in the soil by Thiobacillus bacteria to form soluble sulphate that is absorbed by the root system of the tea bush.

However, the selective use of traditional fertiliser with a sulphur component may still be important. Researchers at the Tocklai Experimental Station reported how increased problems with sulphur deficiency could arise. And following replacement of ammonium sulphate (a sulphur-containing nitrogen fertiliser) and single super phosphate (a sulphur-containing phosphate fertiliser), when substituted with urea and rock phosphate, respectively, neither of which have sulphur in the molecule.

The extra benefit from applying sulphur fertiliser comes from sulphur's additional role as a soil amendment product to increase soil acidity during tea estate rehabilitation. The tea bush requires an acid soil with a pH between 4.5 and 5.5 and will underperform in soils that are too compact or alkaline.

Sulphur and tea quality

Everyone knows that correctly dosed and balanced fertiliser improves crop yield and



Selective plucking of the terminal bud plus three youngest leaves gives the highest yield of high-quality tea.

Image credit: Free-Photos/Pixabay



Sulphur deficiency hits hardest at young growth (terminal buds and first three unfurled leaves) selectively plucked for finest grade teas.

quality. The benefits are generally difficult to ‘pin-down’, but tea is different. The fresh green leaves are put through a series of exhaustive processes, including withering, rolling, fermentation and firing. This generates and consolidates a group of all-important chemicals that combine to determine tea quality through flavour and aroma, body, strength, colour and brightness of the liquor. Tea processing ends with the infusion to leach out the chemicals into hot water for assessment by expert tasters. Results from this ultimate test can be used to ‘pin-point’ the effect of growing conditions, including soil nutrient status.

This is exactly what has been done at Tocklai Experimental Station, where tea agronomists, food scientists and tasters have identified the significance and exact role of sulphur in tea quality. Field trials over a six-year period using a variety of sulphur sources, including gypsum (calcium sulphate), ammonium sulphate and micronised elemental sulphur gave positive responses, but only up to a certain level. Sulphur up to 40kg ha/year increased tea yield. About 20kg sulphur/ha/year was the most cost-effective treatment.

Colour, brightness, strength, body, taste and flavour of the tea liquor are adversely affected by sulphur-deficiency, but the Tocklai trials went further and related changes in these parameters to levels of specific chemicals in the leaves. The tea was produced by CTC (crushing, tearing and curling), the most commonly used method of ‘rolling’ in the Indian tea industry. Key tea chemicals were measured using biochemical analysis and HPLC (High-Performance Liquid Chromatography) of black tea liquors, and tasters from J. Thomas & Co Limited in Calcutta were used to assess organoleptic quality. Tasters’ scores at 74.0 for tea produced with 20kg sulphur/ha/year were by far the highest, 13.7 higher than no sulphur and a full 10.0 higher than 40kg sulphur/ha/year.

Other objective quality factors showed the same trend with brightness and total colour, responding positively to the application of sulphur fertiliser. Two group chemicals, called theaflavins and

“ The fresh green leaves are put through a series of exhaustive processes, including withering, rolling, fermentation and firing.

thearubigins, responsible for body, strength, taste, odour and the bright amber/red colour of quality liquor, were identified as keys to the quality status of tea. They were found in higher concentrations following sulphur application with 20kg sulphur/ha giving the best overall result. And there were marginal increases in the flavonol glycosides, such as rutin and quercetin and believed to have contributed to a brighter colour and enhanced flavour.

The contribution of sulphur to the bright, amber-red colour of quality black tea liquor is particularly interesting. Sulphur, in its common solid-state, is a yellow powder. On heating it melts to give bright, amber liquid which crystallises on cooling to produce amber crystals with colour and ‘shine’ and uncannily similar to that of the quality black tea liquor.

These findings can be related to original concentrations of polyphenols in fresh leaves, because theaflavins and thearubigins are produced by enzyme controlled oxidative reactions on polyphenols during fermentation. Polyphenols are heavily concentrated in the youngest growth, terminal bud (28%), smallest (first) leaf (28%), second leaf (21%) and third leaf (18%).

In summary, sulphur deficiency hits hardest at young growth (terminal buds and first three unfurled leaves) selectively plucked for finest grade teas. These have the highest concentration of polyphenols converted during fermentation by polyphenol oxidase enzymes into the all-important tea chemicals responsible for quality liquor. ■

Pioneering Plant Health **OMEX**

With over 40 years experience, OMEX is a trusted and reliable brand, exporting to over 80 countries

- **Highly concentrated** liquid foliar fertilizers
- **100% water soluble** for fertigation and foliar application
- **Full range of macroelement, microelement** and biostimulant formulations
- **Improves yield and quality**
- **Made in UK**

Manufacturer and exporter of innovative plant nutrient foliar fertilizers

Bio 20
A fully water soluble foliar nutrient formulation applied to fruit, vegetables and cereals for optimum yield and quality

CalMax
For perfect quality fruit and vegetables

DTP98

www.omex.com

Foliar feeding the Omex way – it's time for tea!



Potassium the so-called 'gatekeeper' nutrient is crucial for maintaining optimal plant-water relations.

As an evergreen bush crop with young shoots and leaves routinely picked, tea (*Camellia sinensis*) requires full and fast nutrition by foliar feeding, says Omex Agrifluids - a specialist in the design, development and delivery of soluble nutrient products.

TEA IS NATIVE to a large area of East Asia including Assam in North-East India, the world's largest tea-growing region by production, and where a full range of Omex products are used to maintain plant vigour and vitality of the world-famous Assam black tea leaf infusion. Tea growers on estates across Assam use the following combination of Omex products.

Omex Bio 20 – A formulation of macronutrients, magnesium+iron and chelated micronutrients all 'wrapped up' with a natural biostimulant sourced from seaweed. Omex Bio 20 is applied as a foliar spray. Omex Bio 20 is used first in the tea nursery to promote root biomass for maximum uptake and utilisation of water and nutrients. Follow up applications to young tea bushes help to alleviate physiological stress caused by abiotic and

biotic factors including high temperature, soil moisture deficit and pest and disease attack. Mature tea bushes benefit from Omex Bio 20 through enhanced plant health and vigour, translating into higher yields of a better quality leaf. As a foliar-applied spray Omex Bio 20 is effective during the wet season when soils are water-logged, and root absorption is inhibited.

Omex Kingfol Zn – A high analysis liquid suspension containing 70% zinc (w/v) is used for rapid correction of zinc deficiency which is common in tea growing regions, including Assam, because zinc becomes locked up in the soil. The recommendation is 0.25 to 0.5 L/ha as a foliar spray depending on the severity of zinc deficiency. Regular use reduces the incidence of 'banjhi' buds, a pair of leaves enclosing a dormant (inactive) bud or no

bud at all. Omex Kingfol Zn outperforms standard foliar spray applications of zinc sulphate (Zn SO₄) especially during attacks of red spider mite (*Oligonychus coffeae*).

Omex Foliar Boron – A high analysis solution of boron (15% w/v) used to boost recovery from attacks by tea mosquito bug (*Helopeltis theivora*) and/or to correct boron deficiency. The recommended rate is 0.5 to 0.6 L/ha as a foliar spray applied immediately after the attack by tea mosquito bug and at the first sign of deficiency symptoms. Omex Foliar Boron is the ideal 'rehabilitation' spray for tea.

Omex K41 – This is a water-soluble emulsion of macronutrients and sulphur containing an ultra-high (40% w/v) concentration of potassium. Potassium, the so-called 'gatekeeper' nutrient is crucial for maintaining optimal plant-water relations. Foliar application of Omex K41 improves tea leaf turgidity to produce heavier harvests of picked leaves and shoots. Omex K41 is especially useful when the tea is grown on sandy substrates where soil water deficits are most pronounced.

Omex Seastar F – Seastar F is a natural seaweed-derived growth stimulation product containing a range of physiologically active compounds including amino acids and plant hormones. Foliar applications assist in breaking bud dormancy especially during dry periods, thus boosting the growth of new shoots for heavier harvests of leaves.

Omex Kingfol Mg – This is another product from the Omex Kingfol range and containing 22% magnesium (w/v), which is the metallic element at the core of the chlorophyll molecule. Under plant stress conditions, tea leaves become hard and fibrous and unsuitable for picking. Application of Kingfol Mg as a foliar spray helps to soften the leaves while heightening leaf colour by enhancing chlorophyll content for improved photosynthesis and yield.

Omex Kingfol S – Kingfol S with 72% sulphur (w/v) improves the green colour and shine of tea leaves to give measurable increases in yield. The sulphur in Kingfol S also hones the quality of the black tea infusion because sulphur is a vital constituent of the chemicals responsible for colour, taste and aroma.

Omex 3X Emulsion – A fully water-soluble fluid fertiliser containing macronutrients and chelated



Tea grower in Assam using Omex products.

micronutrients with magnesium and iron. Foliar feeding with Omex 3X Emulsion improves chlorophyll content of leaves for bigger and faster breaking leaf buds and enhanced leaf colour. The improved plant vigour alleviates soil-associated stress, whether from waterlogging or drought.

OMEX Agrifluids Ltd is a specialist in the formulation and manufacture of innovative plant nutrient fertilisers,

exporting its products to more than 80 countries. Working closely with distributors to provide excellent technical solutions to growers, the product range includes foliar fertilisers, plant health promoters, biostimulants, seed treatments, organic fertilisers and soluble powder fertilisers. ■

For more information, visit: www.omex.com

Consumer support of farmers grows as a result of COVID-19 challenges: Cargill

A CARGILL STUDY found that most consumers are ready to rally around farmers in support of their efforts to put food on the tables around the globe. Consumer recognition of the challenges and expectations faced by farmers grew in the midst of the COVID-19 pandemic, as processing and transport bottlenecks, particularly in the protein industry, increased global food supply. In the latest Feed4Thought survey, Cargill found that almost one-third of consumers in the US, Brazil, Vietnam, and Norway have renewed appreciation for animal agriculture.

“Farmers and ranchers have faced tremendous pressures caused by COVID-19 supply chain disruptions. And those pressures came on top of the multitude of challenges farmers already faced as they worked to feed the world in a safe, responsible and sustainable way,” said David Webster, president of Cargill Animal Nutrition & Health. “When consumers experienced bare shelves at grocery stores, they were reminded of the critical role livestock, and aquaculture farmers play in global food security.”

Cargill found that 71% of consumers were concerned about the pandemic disruption of the food system and that two in three consumers recognised the increased pressure on animal farmers to

supply safe, affordable proteins since the beginning of COVID-19.

More than half of consumers say they feel positive about/appreciating farmers, with one third saying that their perceptions have improved compared to pre-pandemic ones. This high confidence and increased appreciation towards farmers suggest that COVID-19 can act as a catalyst to strengthen the relationship between consumers and farmers. This also leads to a growing recognition by consumers of the roles and responsibilities of farmers. Beyond the critical role of feeding the world, consumers also see farmers as natural resource managers (47%), animal welfare experts (42%), technologically knowledgeable (21%) and professional entrepreneurs (20%).

“On a day-to-day basis, farmers play multiple roles. They work to keep their animals healthy and free of disease, protect the earth’s resources and manage their operations sustainably, provide employment and run a profitable business,” Webster said.

The study suggests that respondents believe that technology can help farmers address the challenges they face. Of those surveyed, 29% would like farmers to prioritise technology that improves animal health and well-being, while 28% would like technology that improves overall food safety.

Optimising broiler performance and production

Poultry production has occupied a leading role in the agriculture industry worldwide, and the global poultry market is expected to rise at a considerable rate.

POULTRY IS A dependable source of protein supply and a majority of people in the poorest regions of the tropics rely on poultry production for this. Poultry production has occupied a leading role in the agriculture industry worldwide and although the sector is seen to be significantly affected by the COVID-19 crisis in the meat protein sectors, the global poultry market is expected to rise at a considerable rate.

According to the market research firm Research and Markets, the global poultry market reached a value of nearly US\$319.2bn in 2019, having grown at a compound annual growth rate (CAGR) of 5.5% since 2015, and is expected to grow at a CAGR of 6.1% to reach nearly US\$405bn by 2023. The market is expected to grow at a CAGR of 7.2% to reach nearly US\$465.7bn by 2025 and at a CAGR of 6.8% to US\$645.7bn by 2030.

The use of technology is helping poultry farmers to take data-driven decisions. The 3D imaging systems are used to optimise processes; solutions based on big data and predictive analysis increase revenues; robotics technology enhances farm management process; virtual reality increases farm efficiency and offers online delivery services to increase revenues.

Antimicrobial resistance (AMR) has sparked recent investment into bacteriophage technologies. Modern analytics and omics technologies have enabled screening and identification of bacteriophage candidates for a specific bacterial challenge, with significant feed and food safety implications. This emerging technology is already used in the animal food industry. In line with this, DuPont Animal Nutrition, a business unit of



Image credit: Adobe Stock

The use of technology is helping poultry farmers to take data-driven decisions.

DuPont Nutrition & Biosciences (DuPont), has partnered with Proteon Pharmaceuticals to bring the emerging bacteriophage technology to poultry producers in selected countries, strengthening DuPont's gut health solutions for poultry and helping to further mitigate antimicrobial resistance (AMR).

"Proteon Pharmaceuticals is a pioneer in bacteriophage technology used in animal farming. They have been developing this technology for more than 10 years. It has been tested in Europe and Asia and proven in terms of efficacy and stability," said Aart Mateboer, business leader, DuPont Animal Nutrition.

Kemin Industries has recently signed an exclusive agreement with Pacific GeneTech (PGT) to license PGT's TMH001 Eimeria vaccine for poultry. Tim Collard, PGT's CEO, stated the initiative is in line with promoting new and sustainable technologies for food security and safety. "Kemin sees great potential in the

marketplace for innovative vaccines and is dedicated to improving the health of poultry and livestock, which ensures the safety of our global food supply," said Dr Chris Nelson, president and CEO of Kemin Industries.

In August 2020, Aviagen's virtual Production Management course broadened the scope of knowledge sharing for the company even further than the long-running physical school. The virtual school is one of many ways Aviagen is leveraging technology to stay engaged and connected with customers during the current COVID-19 pandemic. The virtual school fostered lively discussions, idea exchanges and networking among participants, while offering the convenience of engaging with the content at their own pace, from their homes and offices in their respective time zones. It also encouraged relationship building, with the ability for students to chat back and forth, as well as comment on posts from classmates. ■

AGRAGEX brings Spanish machinery to Asian fields



Image credit: AGRAGEX

AGRAGEX is the Spanish Association of manufacturers-exporters of agricultural machinery and its components, greenhouses, crop protection, irrigation systems, livestock equipment, animal health and nutrition, forestry, biomass and post-harvest machinery.

FOR MANY YEARS Far Eastern countries have been treated with some disinterest from Spain, broadly for two reasons – distance and ignorance about that market.

Market research developed by AGRAGEX revealed that Spanish companies are releasing the opportunities and wide markets in Asia.

During the last 30 years, AGRAGEX has organised many international exhibitions and trade delegations, visiting nearly all Asian countries. Today, the association is an important contact for farmers from China, Japan, South Korea, Thailand, Vietnam, Philippines, Indonesia and Malaysia.

In 2019, Spain exported US\$140mn worth of agricultural machinery and equipment to Asia.

The association highlights the animal health and nutrition sector as the leading sector in the Far East, valued at US\$59mn. Every year, AGRAGEX's presence in VIV Asia in Bangkok has helped make its companies known among the livestock sector throughout the region.

The association also mentions crop protection products and equipment as an active sector in this area, valued at US\$45mn. Plant health and nutrition products are very well positioned in these markets, and farmers highly value Spanish agronutrients and biostimulants.

The plastic greenhouses made in Spain are also appreciated as a benefit to crops for water-saving and heat maintenance, among many other advantages. A proof of this is the excellent response that Spanish companies received during the Hortex show in Vietnam in March. Talking about the irrigation sector, the association underlines that the Spanish irrigation systems industry is a world leader. Due to water scarcity in the country, agronomics engineers have developed very sophisticated systems to save the valued resource, dosing the necessary quantity for each plant.

AGRAGEX – a non-profit organisation – is currently comprised of 108 associated companies spread out across the whole of

Spain and responsible for 90% of the Spanish exports within the sector.

In order to achieve its objectives, AGRAGEX carries out a number of different promotional activities, emphasising the following: direct trade delegations, group participation in major international trade shows, organisation of foreign buyers delegations to Spain, market studies and analysis, channelling of enquiries and requests as well as a variety of advertising activities in trade magazines.

Spanish agricultural equipment has a broad range of soil preparation equipment, manure spraying, seed drills, harvesting, machinery for fruit trees, olive trees and vineyards.

Spanish agricultural equipment is characterised by its quality and robustness, with a grade of technology at the same level as the world-leading companies.

Another attribute of the Spanish farm equipment manufacturers is their great adaptability to customers' needs; they are able to easily adapt to farmers' specific requirements. They can produce a small series of equipment attending markets which multinationals are unable to serve due to their inflexible production lines. ■

For more information, visit: <https://agragex.es>

Better hygiene and cleanliness with efficient housing

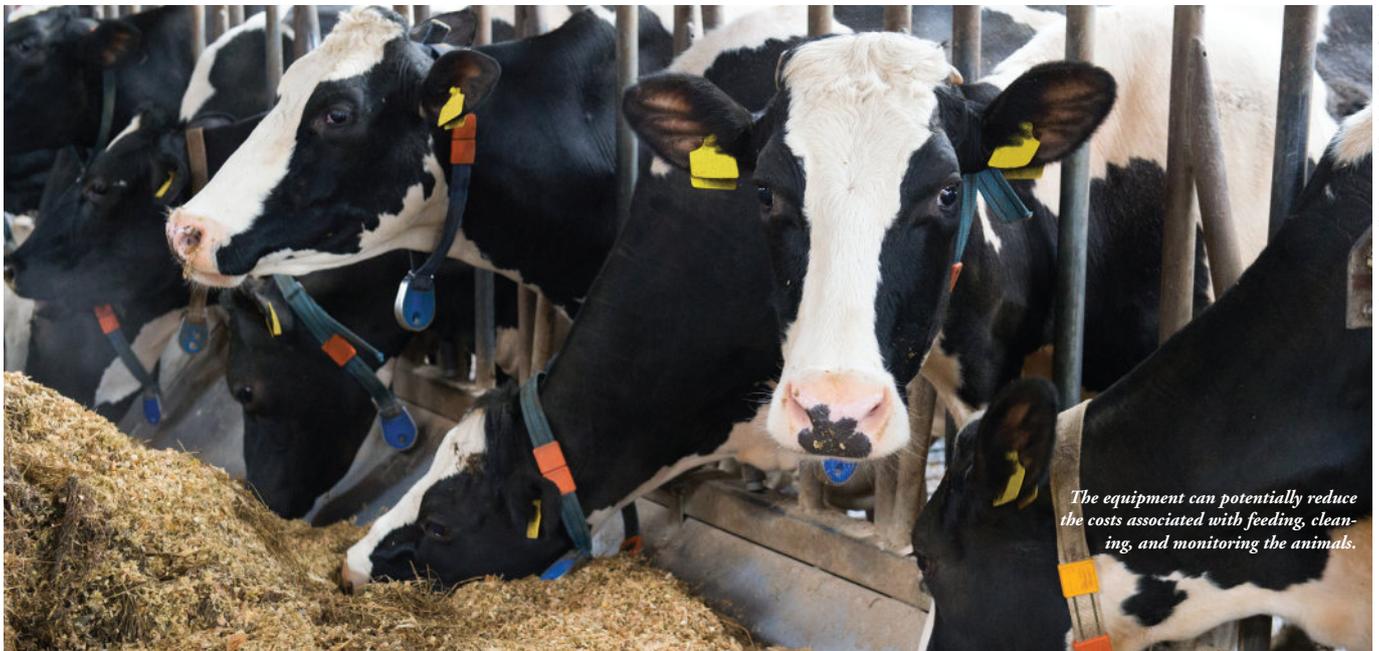


Image credit: Ivonne Wierink/Adobe Stock

The equipment can potentially reduce the costs associated with feeding, cleaning, and monitoring the animals.

Investments are being made by farm owners to automate dairy and poultry farms.

THE GLOBAL LIVESTOCK farm equipment market size is expected to reach US\$19.3bn by 2027, expanding at a CAGR of 3.4% over the forecast period, according to a report by Grand View Research.

The Asia-Pacific held the largest market share of more than 30.0% in 2019 and is expected to continue dominating the market over the forecast period as the region is home to significant market players.

Aggressive investments being made by farm owners to automate dairy and poultry farms are expected to drive the market over the forecast period. Increasing spending on agricultural equipment across the globe also bodes well for market growth. Market players are expected to introduce innovative livestock farm equipment based on the latest technologies, such as IoT and artificial intelligence, thereby contributing to market growth.

The housing equipment is expected to account for a substantial share of the market over the forecast period as housing or shelters continue being farm owners' essential requirement to accommodate domesticated animals.

The demand for tools used in domesticated animal farming is growing as the owners are increasingly opting for tools to increase the yield and augment revenues and to protect their domesticated animals from diseases by maintaining cleanliness and better hygiene. The equipment can potentially reduce the costs associated with feeding, cleaning, and monitoring the animals.

Developments in housing equipment

The benefits of parlour matting solutions

The installation of rubber matting in the milking parlour is something that many farmers should consider given the many benefits it brings, said livestock housing solutions provider EASYFIX.

EASYFIX has conducted research with Kingston Maurward Agricultural College UK under the guidance of Dr Nick Bell,

who has extensive knowledge and experience of lameness in dairy cows. The project measured animal behaviour in the parlour on concrete, and again with rubber installed. The major findings of the research were that cows on rubber were milked on average 27 seconds faster.

The main reasons for this are:

- Improved cow flow through the parlour: Average gait length for a cow on concrete is 600mm, Grass is 800mm and rubber is also 800mm, this more natural movement and increased step length will move cows through the system at a faster pace.
- Increased let down of milked: Cows are more relaxed standing on rubber than concrete.

The indoor pen system

Agri-Plastics, the calf housing specialists, has introduced the Ultra Flex-Pen - a versatile indoor pen system for individual or grouped calves. This versatile housing system was developed so that single pens could convert to a group pen simply by detaching a side panel. This innovative, stand-alone solution allowed calves to be

housed individually, then grouped when health permits. By keeping stress levels down, calves have a better chance to grow strong and healthy. They also learn how to socialise within smaller groups. Therefore, it helps ease the transition into a larger herd.

Pens need to be durable and strong, but also lightweight, so they are easy to move. So, Agri-Plastics developed the Ultra FlexPen. A new compression moulding process keeps the panels lightweight. Smooth surfaces and curved edges make it easy to clean. Ventilation is also very important, so a large rear rotary vent helps control airflow.

Auto Drafting by CowManager

Auto Drafting is the first fully automatic drafting integration solution released by CowManager, the leading cow monitoring company, and currently integrates with LIC's Protrack. This feature allows cows with a heat or health alert to be automatically drafted based on the animal's alerts. It saves farmers valuable time and reduces stress,



Image credit: toas55/Adobe Stock

EASYFIX research has shown that cows are more relaxed standing on rubber than on concrete.

especially during the breeding season.

The Auto Drafting technology removes the need to manually enter the cows requiring special attention. With the user-friendly Auto Drafting application, farmers are fully in control over which cows are drafted through alert filters and time schedules. Its integration with Protrack

makes it possible to draft cows to multiple directions, so that cows with a health alert are automatically draft left and cows with a fertility alert, to the right. This gives farmers the opportunity to work, breed and treat cows more precisely. It saves time, costs and can result in lower empty rates and improved general health of the herd. ■



**TERMOTECNICA®
PERICOLI**



EOC56

For over half a century
we have been taking care of your agricultural production.
Everywhere in the world.





pericoll.com

Advancing food innovation in Singapore

Bright Science & Technology Innovation Hub (Bright Science Hub), established by Royal DSM and Padang & Co., celebrated a milestone on 19 October as a resource partner of FoodInnovate, a multi-government agency led by Enterprise Singapore, a government agency that champions business development through innovation, establishing the country as a food and nutrition hub in Asia.

Anchored by DSM and powered by Padang & Co, Bright Science Hub was first established in November 2019 to connect technology startups, entrepreneurs and other partners to foster innovation that can deliver a positive impact in the Asia-Pacific region.

Leveraging DSM's network, technical expertise in emerging science and application centres, the Hub enables members to build their capabilities and accelerate product development, with the overarching purpose of promoting equitable access to healthy food and nutrition and enabling more sustainable food production within planetary boundaries.

Through the partnership with FoodInnovate, Bright Science Hub member companies can now access IncuBaker, Singapore's only shared kitchen endorsed by the Singapore Food Agency (SFA), to create new products and validate novel concepts at the adjacent IncuBaker Café. IncuBaker allows its members to focus fully on their products with IncuBaker responsible for the surrounding regulatory processes.

Anand Sundaresan, regional vice-president DSM Human Nutrition and Health, Asia-Pacific, said, "Bright Science Hub enables us to collaborate with startups and corporate partners, which is critical to driving innovation in the nutrition space.

Scaling up post-harvest management

Emerging technologies in processing and preservation are helping to gain an edge in reducing food loss and waste.

TECHNOLOGY AND INNOVATIVE techniques are playing an increasingly significant role in helping to reduce post-harvest losses.

During a global event in September 2020, marking the International Day of Food Loss and Waste, the FAO director-general Qu Dongyu, urged for stronger partnerships, more public and private investment in training for smallholder farmers, technology and innovation to step up the fight against food loss and waste.

“Innovative post-harvest treatment, digital agriculture and food systems and remodelling market channels offer huge potential to tackle the challenges of food loss and waste,” added Qu.

New advancements are proving to be game-changers in curbing food wastage, ensuring the safety of food as well as greater food security.

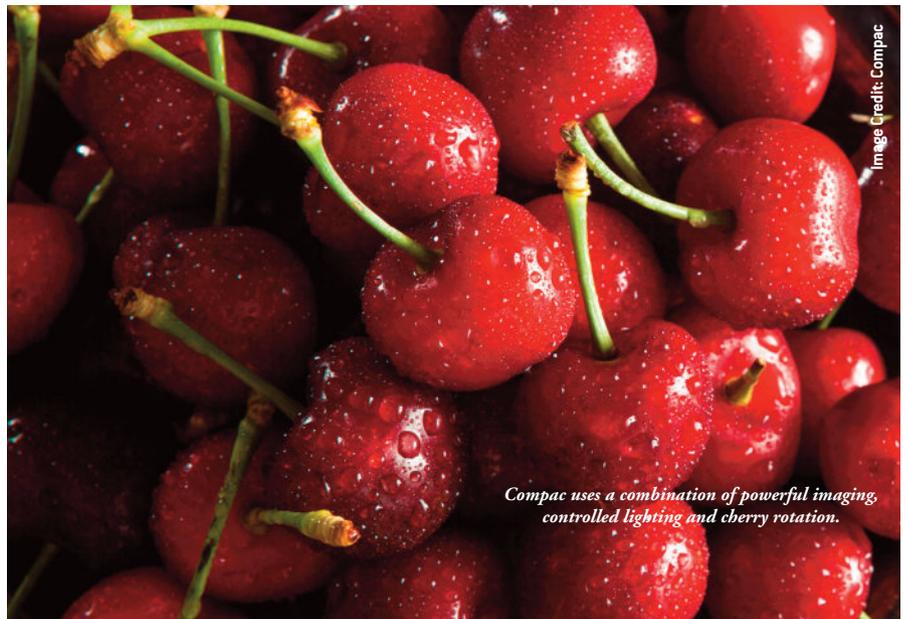
Sorting and grading

TOMRA’s Compac provides integrated post-harvest solutions and services to the global fresh produce industry. Compac’s InVision2 platform achieves extremely accurate and consistent grading for size, shape, colour and blemishes through a combination of powerful imaging using color and infrared technologies, controlled lighting and cherry rotation.

The company and its partners were able to successfully ship and install three turnkey cherry grading and packing lines in Turkey and a fourth one in Uzbekistan, just as the COVID-19 pandemic hit.

Bühler’s SORTEX FA series machines have helped European frozen food producer Fine Food to take advantage of high-resolution cameras and proprietary detection technologies to ensure maximum food safety.

Bühler’s SORTEX PolarVision



Compac uses a combination of powerful imaging, controlled lighting and cherry rotation.

Image Credits Compac

detection system combines the PolarCam technology and high definition InGaAsHD cameras.

Robotic grain monitoring

Start-up company Crover, based at STFC’s Higgs Centre for Innovation at the Royal Observatory in Edinburgh has developed a robot that can ‘swim’ through cereals and grains to take accurate temperature and moisture measurements to monitor their condition while they are still in storage. This data is then transmitted, via satellite communication, to the grain store manager.

Dr Lorenzo Conti, the founder of Crover, said, “The opportunity to work alongside astronomers, engineers, as well as 3D printing and prototyping experts has

▲ A robot developed by Crover can ‘swim’ through cereals and grains to take accurate temperature and moisture measurements.

been invaluable to our business and our mission to invent something that could help change the world for the better.”

Preservation technologies

The COVID-19 pandemic has enhanced the need for supply chain resilience.

‘Preserving the Food Chain’, a report by Lux Research, predicts developments across six segments of the value chain in the coming three years. On farms, integrated crop protection will become industry-standard, while post-harvest wax coatings will lose dominance to a mix of bio-based coating solutions. Within food production, biopreservation methods will achieve performance parity with conventional preservatives. Distributors will adopt digital tools more liberally to manage supply chains, and within homes, expect point-of-use sensors to flourish, driven by consumers’ concerns about the safety and reliability of purchased products.

“The penetration and adoption of biological and digital tools will play an important role in shaping the future of preservation tech,” said Harini Venkataraman, lead author of the report and research analyst at Lux. ■

Growing a new normal: Making consumables work for your bottom line

DLG is renowned in promoting the technical and scientific progress of agricultural and off-highway equipment.

SHELL AND DEUTSCHE Landwirtschafts-Gesellschaft (DLG) demonstrate total cost of ownership savings from testing Shell premium fuel and lubricants together and results include 2.7% fuel economy, 5.6% more load-pulling power, 100% injector deposit clean-up, and up to 2.83ha more as a combined efficiency benefit.

Maximising equipment utilisation in the demanding agriculture environment is a difficult job at the best of times, but with the impact of COVID-19 resulting in further cost pressures and tighter margins, there is much greater focus by agricultural workers to unlock efficiencies wherever possible. Increasing your output with fewer resources, especially in the current challenging economic climate, may seem more difficult than ever.

However, bottom-line gains can be achieved by focusing on variables within your control, such as your consumables - thus unlocking tangible efficiencies. The fuel and lubricants you select can significantly impact your equipment and in turn, your business performance.

To show this value, Shell collaborated with Deutsche Landwirtschafts-Gesellschaft (DLG) to demonstrate the total cost of ownership (TCO) savings and efficiency gains that can be achieved when using Shell premium fuel and lubricants together. Situated in Germany, DLG is renowned in promoting the technical and scientific progress of agricultural and off-highway equipment.

Stefano Mastrogiovanni, managing director DLG Test Service GmbH, said, "The Shell project has been a good opportunity for the DLG Test Centre because we have tested thousands of test cycles of tractors using our PowerMix, but now we have also tested for fuels and



Shell and DLG designed a new Power Take Off (PTO) testing programme.

lubricants."

The DLG team rigorously tested Shell FuelSave Diesel in combined use with Shell Rimula R6 LME Plus 5W30, against regular diesel and standard lubricants. The premium consumables were first put through DLG's PowerMix test procedure using test frames and parameters designed by an independent expert commission. Additionally, Shell and DLG designed a new Power Take Off (PTO) testing programme which combines a series of real-world measurements to verify the quality of premium fuels versus standard ones.

While there is a growing awareness across the agricultural sector of the benefits that either a premium fuel or a premium lubricant can have on equipment performance, the DLG test demonstrates the additional efficiencies that can be unlocked by combining the two. "Our test results have shown that Shell premium fuels and lubricants perform better than the standard products," stated Mastrogiovanni.

And indeed, the testing showed that using Shell's premium diesel and premium Shell lubricants together can deliver up to 2.83ha more as a combined efficiency benefit, a figure that could have significant cost-saving potential when viewed in light of the fact that diesel engines power more than two-thirds of all farm equipment.

The results also highlight the increased

productivity that Shell FuelSave Diesel can offer, with DLG measuring up to 2.75% fuel economy and 5.6% more load-pulling power when compared with regular diesel.

The ability to maintain engine efficiency while operating with heavy loads or on uneven terrain is vital for most agricultural businesses, particularly those that are consistently running at a high capacity. A key success factor here is the health of the injection system, particularly injector cleanliness.

Additionally, Shell FuelSave Diesel was able to achieve up to 100% injector deposit clean-up in less than three working days which can significantly reduce downtime and maintenance costs.

The Shell differentiated fuels and premium lubricants tested were awarded the DLG Quality Seal - a certification only given to products that have proven to meet strict criteria developed by unbiased test commissions. Being able to rely on products with performance proven under real-life conditions and by independent test experts will be key to ramping up operations as agricultural businesses become more accustomed to the impact of the pandemic, since the efficiency gains that once offered a competitive edge, may now be essential for survival. ■

*For more information, visit:
www.shell.com/commercialfuels*

CLAAS India launches next generation of CROP TIGER TERRA TRAC combine harvester

CLAAS INDIA, A 100% subsidiary of German agri-machinery conglomerate CLAAS KGaA, has virtually launched the next-generation of CROP TIGER TERRA TRAC combine harvester.

Launching the machine, Cathrina Claas-Muehlhaeuser, chairwoman of CLAAS Shareholders Committee, said, “CROP TIGER has been a success story for CLAAS in India, based on strong fundamentals of German engineering and local adaptation. The next generation of CROP TIGER TERRA TRAC is loaded with many new features that offer enhanced durability, performance and operator comfort.”

With many components of Cutter-bar and thresher housing now made up of Stainless steel, the new CROP TIGER TERRA TRAC is more durable and performance-oriented. TRACKMASTER vehicle tracking system allows the owner to monitor his harvester and get real-time information on location, engine hours, threshing hours etc right on his mobile or a laptop.

In case there is any clogging of the



Image credit: CLAAS

The new CROP TIGER TERRA TRAC sets new standards of harvesting technology in India.

feeder housing area during harvest, the operator can unclog the machine using Hydraulic Feeder Reversal system. With the access of the switch on the platform itself, the operator does not have to get down from the machine, thus saving valuable time and energy.

The Gull-Wing design of the side panels allows easy serviceability of the machine, especially the engine area. The operator has sufficient legroom with all the levers within easy reach and gets a clear view of the cutter bar. LED lights enable harvesting even in the darkest of working conditions.

Cloud-based DataConnect system goes live

THE CLOUD-BASED DATACONNECT system that enables the exchange of machinery data between CLAAS, 365FarmNet and John Deere is now commercially available, with further partners to follow soon.

DataConnect enables the exchange of essential machinery data between different platforms, to allow users to view all of their mixed-brand fleet information within the single data platform of their choice. Previously, viewing such information required duplicating effort by using each manufacturer’s corresponding but separate platforms or web portals.

The structure of this new direct cloud-to-cloud solution enables a seamless and automated data flow without any effort required by the customer. The real-time data exchange allows a live overview of the whole machinery fleet. Furthermore, DataConnect works without any additional hardware and software components and ensures secure data handling.



Image credit: CLAAS

Customers can view five different machinery data sets for their fleet.

With this new approach, customers can view five different machinery data sets for their fleet such as current machine location, historical machine location, fuel tank level, the status of the machine in the field, and machine speed.

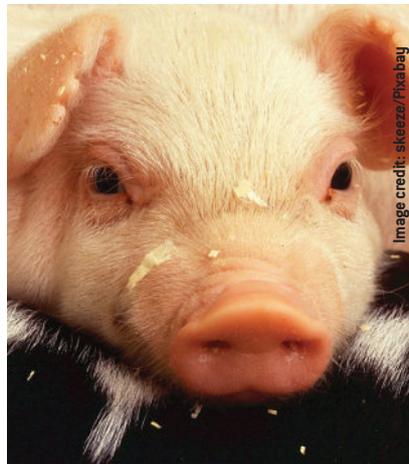
Customers can decide which company’s digital platform they prefer to use, to

display all the data. As soon as they are connected, other manufacturers’ machines appear automatically. Machines are either displayed with icons in the respective brand’s colour combination or are visible in the icon’s information panel. Further partners and functions will follow to a later date.

FAO and OIE kickstart global initiative to stop the spread of ASF

AS AFRICAN SWINE Fever (ASF) marches swiftly across countries affecting food security and livelihoods of some of the world's most vulnerable populations, the Food and Agriculture Organisation of the United Nations (FAO) and the World Organisation for Animal Health (OIE) are calling on all nations and partners to join forces to keep this deadly pig disease at bay under a new initiative.

The Global Control of ASF Initiative, launched under the GF-TADs umbrella, supports actors at every level to coordinate and strengthen control measures to minimise the impact of this complex and challenging disease. Bringing together governments, industry and specialists, FAO and OIE presented the initiative for the



The disease causes up to 100% fatality in wild and domestic pigs, and there is no effective vaccine.

first time on a global stage as part of a Call to Action event on 26-30 October.

The spread of ASF shows no signs of slowing down. The contagious disease has led to the loss of over seven million pigs in Asia alone, since sweeping into this region. More than 50 countries in Africa, Asia and Europe are currently affected, and the Americas are trying to prevent incursion into their territory.

FAO director-general QU Dongyu, said, "If not controlled, this disease will jeopardise progress towards achieving the Sustainable Development Goals." He continued calling on all stakeholders to take action to stop the spread of ASF, promote animal health and welfare, and safeguard the livelihoods of farmers.



Reader Information Service

Issue 6 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 | | 4. Type of produce | |
|---|--|--|---|
| <input type="checkbox"/> 01 Government: municipal services, diplomatic, (UN, International Agencies) | <input type="checkbox"/> 02 Grain | <input type="checkbox"/> 11 Feedstuffs | <input type="checkbox"/> 12 Groundnuts |
| <input type="checkbox"/> 03 Educational/Research Institutes | <input type="checkbox"/> 03 Fruit | <input type="checkbox"/> 13 Vegetables | <input type="checkbox"/> 14 Cassava |
| <input type="checkbox"/> 06 Commercial Services: banking, finance, insurance | <input type="checkbox"/> 04 Cocoa | <input type="checkbox"/> 15 Dairy Cattle | <input type="checkbox"/> 16 Beef Cattle |
| <input type="checkbox"/> 08 Import/Export Agents and Distributors | <input type="checkbox"/> 05 Coffee | <input type="checkbox"/> 17 Sheep/Goats | <input type="checkbox"/> 18 Pigs |
| <input type="checkbox"/> 09 Farms and Plantations | <input type="checkbox"/> 06 Cotton | <input type="checkbox"/> 19 Poultry | <input type="checkbox"/> 20 Fisheries |
| <input type="checkbox"/> 11 Food Processing: poultry, dairy, cereal, fruit, vegetables, etc | <input type="checkbox"/> 07 Rubber | | |
| <input type="checkbox"/> 12 Aid Organizations | <input type="checkbox"/> 08 Palm Oil | | |
| <input type="checkbox"/> 13 Agricultural Equipment and Material Manufacturers: irrigation, agro-chemicals | <input type="checkbox"/> 09 Palm Kernels | | |
| <input type="checkbox"/> 16 Others: please specify: | <input type="checkbox"/> 10 Sugar Cane | | |

BKT paves the way for sustainable agriculture

Latest-generation efficient tyres designed for every need: a further step towards smarter and greener development of the agricultural industry.

THE CONSTANT INCREASE in the demand for food and fodder due to exponential growth of the world population adds to the challenges of sustainable development of agriculture.

The need to increase productivity on the one hand and to guarantee food quality and security on the other has imposed new standards and requirements for agricultural machinery, which undergo continuous development and improvements relating to size, power and performance. It is therefore essential, that tractors and other agricultural vehicles and equipment can rely on modern, efficient tyres, using the latest technology, to help optimise sustainable operations in the field.

“There are various new technologies in the market which aim to increase productivity and efficiency in agriculture. At BKT we are researching solutions for tyres integrated with sensors and software for precision agriculture. For some time, we have had a range of products designed to guarantee the least possible damage to the soil and harvests,” said Piero Torassa, field engineer manager at BKT Europe.

BKT radial tyre range

AGRIMAX, created to satisfy the needs of agriculture 4.0, is characterised by the use of Flexion (IF) and Very High Flexion (VF) technologies, among which the AGRIMAX FORCE and AGRIMAX V-FLECTO tyres stand out. AGRIMAX FORCE is specifically designed for high power tractors (more than 250 CV). Thanks to the IF technology which has been revised by BKT, this tyre has a higher load capacity at lower pressures, compared to standards for tyres of the same size, benefiting the land, which is significantly less compacted.



V-FLEXA, a tyre designed for trailers, is equipped with VF technology and steel belts which strengthen the casing.

Image credit: BKT

AGRIMAX V-FLECTO improves the performance of the latest generation tractors, thanks to reduced soil compaction and higher load capacity (+40%) at the same pressure as a standard tyre of the same size.

Diverse functions

The right tyres are needed for numerous complementary agricultural machines, such as seeders, balers, plows and combine harvesters. The latter, for example, require high performance tyres which do not damage harvests.

The products in the special range for harvesters AGRIMAX TERIS have excellent flotation capacity to guarantee the best possible protection of the land and excellent harvesting performance, with the ability to support very high loads. In addition, AGRIMAX TERIS is particularly resistant to cuts and impacts due, for example, to the presence of stubble on the ground, thus guaranteeing a long lifecycle and reducing

vehicle downtime.

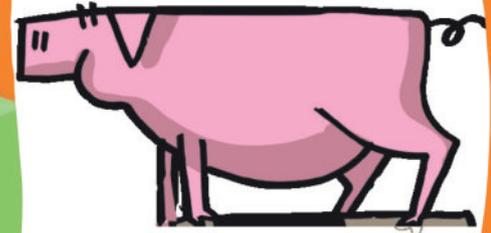
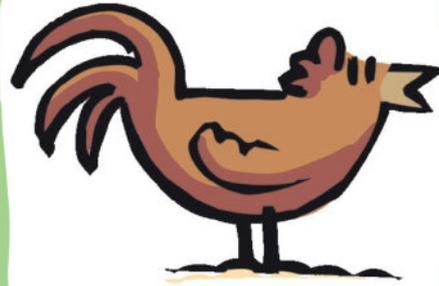
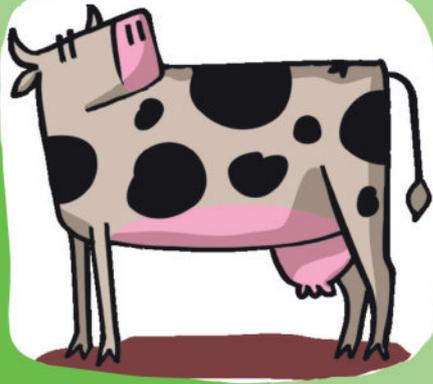
“Flotation is one of the essential characteristics in modern-day tyres, since it is very important to minimise the impact of the machines - which moreover are getting heavier and heavier - on the soil, thus avoiding damage to harvests. Equally important, however, is the tyre’s flexibility. It is to respond to and anticipate the most diverse and particular needs that BKT products are continuously developed and improved,” explained Torassa.

BKT tyres in the Flotation series FL 630 ULTRA, FL 630 SUPER, RIDEMAX FL 693 M and the latest V-FLEXA, a tyre designed for trailers, equipped with VF technology and steel belts which strengthen the casing, are examples of these innovative features.

More efficient and smarter machinery as well as tyres with advanced technology have a pivotal role to play in making agriculture more sustainable. ■

PROUD TO BE A FARMER

Spanish Technology Without Borders



Feeding systems

Feeders & drinkers

Turn key farms

Climate control systems

Hot air blowers

Conveyors & Distributors

Ventilation systems

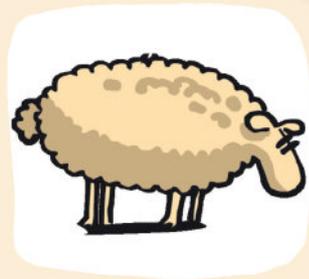
Electric Fences

Milking machines

Silos for grain

Desinfection & hygiene

Feed & Aditives



40 YEARS OF EXPERIENCE



2.700 MILLION USD EXPORTED



WORKING IN MORE THAN 110 COUNTRIES



WWW.AGRAGEX.ES

MADE
IN
SPAIN



AGRAGEX



EUROPEAN UNION

EUROPEAN REGIONAL DEVELOPMENT FUND A WAY TO MAKE EUROPE



ICEX