

Far Eastern Agriculture

Cuprous cover

Tobacco plants get copper protection



Rise in feed innovations - p23



John Deere's new 3E series - p35

China to lead seafood exports

Mitigating rodent attacks on farms

Global oil palm industry gets a boost

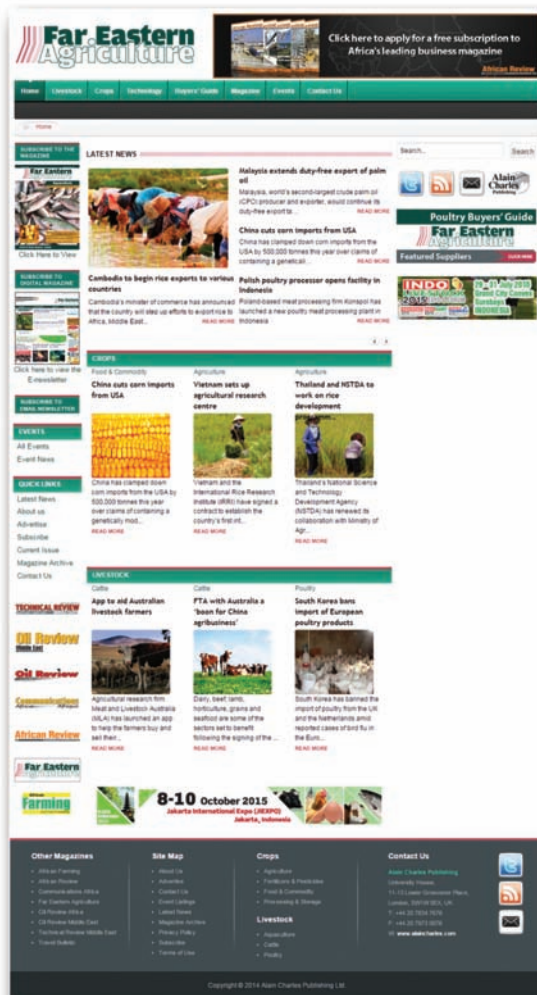
Green banana starch for weight loss

Lush forests for climate conservation

Far Eastern Agriculture

Asia's only broad based agribusiness magazine

- Animal Feeds • Poultry
- Livestock • Aquaculture
- Crops • Machinery & Equipment
- Processing
- Exhibition Calendar & Market News



FarEasternAgriculture.com
Website-Monthly Statistics
 600,341 Page Impressions
 42,551 Unique Visitors

ABC audited Circulation figures
 Audited average circulation
 Jan 13 to Dec 13 ; 6,194

E-newsletters
 Average Circulation: 8000+
 The Far Eastern Agriculture
 monthly e-newsletter can
 deliver your marketing
 message directly into
 decision-makers' inboxes

Sign up for the FREE fortnightly e-newsletters on
FarEasternAgriculture.com

The magazine that offers you market news and up to date information on new products and innovations; everything from broiler breeding technology to second hand machinery. All this in addition to practical articles which will help you make the most of your business.

For more information, please visit **www.fareasternagriculture.com**



ABC audited circulation
guarantees your advertisement
will be seen throughout Far East

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: post@alaincharles.com
web: www.alaincharles.com

Bulletin

- 4 A round-up of key developments in the regional market

Agenda

- 6 Philippines' agriculture and livestock witness growth; FAO reveals growth of global aquaculture; Vietnam to increase seafood import from Indonesia; Australia biggest beef supplier to Japan; Malaysia increases coral reef exports; Cambodia rice exports on the rise

Events

- 9-16 Review of VIV Asia 2015 and Asia Choco Congress; Preview of VICTAM and Indo Livestock 2015 Expo & Forum

Livestock

- 17 Healthy layers for economic egg production
22 Surge in poultry and livestock due to use of antibiotics

Crops

- 26 Tracking the Panama disease in bananas
30 Reviving herbal therapy in the Philippines
33 Ozone protection for papaya

Equipment

- 34 China building large tractors
36 Big Dutchman's latest offering to boost pig production



21



Ancient potion to fight superbugs

32



Malaysian pineapple for multiple markets



Audit Bureau of
Circulations - Business
Magazines

Advertisers Index

Abbi-Aerotech B.V.	9	Evonik Degussa GmbH	11
AGCO Australia.....	40	Goizper Sociedad Cooperativa	15
AWILA Anlagenbau GmbH	7	Impex Barneveld b.v	38
Ayurvet Ltd	24	Omex Agrifluids Ltd.....	27
Compact Seeds and Clones SA	35	SCHAUER Agrotronic GmbH	23
DIEC	5	Technical Systems (Pty) Ltd	17
Eurofeed Technologies S.p.a.....	33	Unipoint AG	38

Far Eastern Agriculture

Managing Editor : Rhonita Patnaik - Email: rhonita.patnaik@alaincharles.com

Editorial and Design team: Prashant AP, Hiriya Bairu, Sindhuja Balaji, Andrew Croft, Thomas Davies, Ranganath GS, Prasad Shankarappa, Zsa Tebbit, Lee Telot and Ben Watts

Publisher: Nick Fordham

Publishing Director: Pallavi Pandey

Magazine Sales Manager: Richard Rozelaar, Tel: +44 207 834 7676, Fax: +44 207 973 0076
Email: richard.rozelaar@alaincharles.com

Country	Representative	Phone	Fax	Email
China	Ying Mathieson	(86)10 8472 1899	(86) 10 8472 1900	ying.mathieson@alaincharles.com
India	Tanmay Mishra	(91) 80 6684483	(91) 80 40600791	tanmay.mishra@alaincharles.com
Nigeria	Bola Olowo	(234) 8034349299		bola.olowo@alaincharles.com
UAE	Camilla Capece	(971) 4 448 9260	(971) 4 448 9261	camilla.capece@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

Production: Charlie Burns, Priyanka Chakraborty, Nikitha Jain, Nathanielle Kumar, Donatella Moranelli and Sophia White - Email: production@alaincharles.com

Subscriptions: circulation@alaincharles.com

Chairman: Derek Fordham

Printed by: Times Printers Private Limited

Printed in: June 2015

Far Eastern Agriculture
(ISSN 0266-8025)

www.fareasternagriculture.com

Middle East Regional Office:

Alain Charles Middle East FZ-LLC
Office 215, Loft 2A
PO Box 502207
Dubai Media City, UAE
Phone: +971 4 448 9260
Fax: +971 4 448 9261

**Alain
Charles
Publishing**
Serving the world of business

Thailand's CP Foods to invest US\$500mn in India

WITH AN EYE to double its turnover to US\$1.2bn, Thailand-based billion Charoen Pokphand (CP) group's Indian arm will be investing US\$500mn in the next five years. CP Foods India is also setting up four poultry feed plant in the country and currently has a turnover of \$505mn. The company said that it is looking to spend the investment on setting up farm, feed and quick service restaurant in India.

Sanjeev Pant, senior vice-president for food business at CP Foods India, noted that the company will fund 30 per cent of the US\$500mn and the balance would come through bank loans.

Pant said that they would be focusing on region wise expansion in India, as they have to put in place their own feed mills, poultry farms and processing plants to service the outlets. CP Foods has seven feed mills and poultry farms in India in states like Karnataka, Tamil Nadu and Pune and a processing facility in Bangalore.

'Cattle feed to shape Vinamilk's M&A activities in 2015'

VIETNAM'S LARGEST DAIRY product company Vinamilk, which is listed as the second biggest stock on the Ho Chi Minh City Stock Exchange, will set aside US\$186mn for mergers and acquisitions (M&A) this year, mainly in the animal feed sector. "Multinational companies today expand their operation by M&A. Therefore, acquiring other firms is also part of Vinamilk's growth strategy," said Mai Kieu Lien, chairperson of the company, adding that it was critical to retain its current market position in the segment. The company has finished the acquisition of the US-based peer Driftwood Dairy, which generated a 460 per cent growth in profit last year. Holding 80 per cent in the overseas processor, Vinamilk has integrated its sales of some US\$120mn. The firm also revealed that it is negotiating with two foreign partners to establish a milk powder factory in Europe.

Malaysian poultry producer to set up biomass plant

POULTRY PRODUCER CAB Cakaran Corp Bhd has signed an MOU with Japan's New Chemical Trading Co. Ltd and Seri Kedah Corp Sdn Bhd in March 2015, to establish a biomass power generation business. The plant will produce fertiliser as a by-product through the incineration of chicken droppings. Under the MoU, two joint venture companies will be formed, the first being a JV company between New Chemical Trading and Seri Kedah (JV1) for the licensing of specific technology and know-how related to biomass power generation. JV1 will be responsible for the maintenance servicing for the processing facilities and equipment, as well as the marketing of the fertiliser. The plant will be designed by Japan-based Nangoku Kousan Co. Ltd. The second joint venture will be incorporated by all three parties where the business will be focused on biomass power generation and selling it. Under JV2, CAB Cakaran will hold 51 per cent share, while the remaining 49 per cent will be held by Seri Kedah and JV1.



The plant will produce fertiliser as a by-product through the incineration of chicken droppings

Jansen Poultry Equipment expands Asia team

JANSEN POULTRY EQUIPMENT has appointed two new Area Managers in Asia — Eric Brawner and Niranchai Tripati — to strengthen its presence and support services to all poultry farmers in the region. will support the team of Jansen Asia. Brawner will be overseeing Indonesia, Malaysia, Japan and Taiwan operations. An experienced veterinarian who has extensive farm production experience, having come from one of the largest integrators in the Philippines, he also has substantial export sales background in farm equipment sales.

Tripati will take charge of the South Asian region and is a seasoned export sales and trading manager coming from his experience in a number of top agri-companies in Thailand. His network of influence lies in the various countries of South Asia specifically India, Bangladesh, Sri Lanka and Pakistan.

Indian firm in tie-up with Myanmar bank for finance

SLCM LTD., WHOLLY-owned subsidiary of Sohan Lal Commodity Management Pvt. Ltd and agri-logistics and warehousing group, has tied up with CB Bank in Myanmar for collateral Financing aimed at providing agri-financing solutions to farmers, processors, traders, exporters and importers across Myanmar. The company would undertake sampling, testing, grading, assaying, fumigation, aeration and quality certification of the commodities. The bank will offer farmers to pledge 60 per cent of their commodities, which will be stored at SLCM warehouses for a stipulated period at an annual interest rate of 13 per cent. SLCM has announced this association in line with their expansion plans in Myanmar and is expected to double its presence from current four locations in the country. Sandeep Sabharwal, Group CEO, said, "Our output has been very encouraging and the way in which we are seeing a paradigm shift in Myanmar's economy and policies, we are determined to further explore the region and fourfold our presence there."



Sandeep Sabharwal, Group CEO, signs the deal in Myanmar

Evans Vanodine gets Queen's Award in UK

EVANS VANODINE HAS won Queen's Award for Enterprise for business success in the UK. The award was presented in the International Trade category, which recognised outstanding overseas sales growth over the last three years. The company currently exports to 72 countries worldwide, with a further 10 countries serviced by licensed manufacturing units overseas. Over the last three years, new sales territories have been added such as New Zealand and South Africa, said the company. Evans Vanodine reportedly bases its overseas sales strategy around expansion of its distributor network and the company uses international exhibitions and trade shows.

EVENTS 2015

JUNE

9-11	VICTAM International 2015	Cologne, Germany	www.victam.com
11-13	VIV Turkey	Istanbul, Turkey	www.vivturkey.com
15-16	5th International Conference on Asia Agriculture and Animal	Madrid, Spain	www.icaaa.org
24-26	Livestock Philippines 2015	Pasay City, The Philippines	www.livestockphilippines.com

JULY

13-15	4th International Conference on Agriculture & Horticulture	Beijing, China	www.agriculture-horticulture.conferenceseries.com
29-31	INDO LIVESTOCK 2015 Expo & Forum	Surabaya, Indonesia	www.indolivestock.com/index.php

AUGUST

19-20	Aquaculture Roundtable Series (TARS 2015)	Hanoi, Vietnam	www.tarsaquaculture.com
-------	--	----------------	--

SEPTEMBER

17-19	SIMA ASEAN	Bangkok, Thailand	www.sima-asean.com
21-23	Livestock Asia 2015	Kuala Lumpur, Malaysia	www.livestockasia.com

OCTOBER

8-10	ILDEX Indonesia 2015	Jakarta, Indonesia	www.ildex.com/indonesia/indo-visitor.html
10-12	4th Poultry and Dairy Fest	Lucknow, India	www.dairyfest.in
11-14	4th Leman China Swine Conference/ 2015 World Swine Industry Expo	Nanjing, China	www.lemanchina.umn.edu

NOVEMBER

8-14	Agritechnica 2015	Hanover, Germany	www.agritechnica.com
------	--------------------------	------------------	--


cracklessegg™

PERFECT EGGS. EVERYTIME.

Reduce cracks in eggs
up to 10% on the first use

Replica Casing mimics
the eggs in the laying
and packing processes



Make data driven decisions
on equipment settings,
purchases, and maintenance

Agent for Asia Pacific Region
DIEC SINGAPORE PTE LTD

21 Serangoon North Ave 5
#03-04, Ban Teck Han Building
Singapore 554864

Contact: sales@diec.com.sg
TEL: (65) 6546-8861
FAX: (65) 6546-8862


MASITEK
www.masitek.com

Food Outlook

THE FAO FOOD price index averaged 171 points in April 2015, down 2.1 points (1.2 per cent) from March and 40.5 points (19.2 per cent) below its level in April 2014. Dairy prices fell most, but sugar, cereals and vegetable oil prices also declined. By contrast, meat values rose in April, their first increase since August 2014. The April average puts the FAO Food Price Index at its lowest level since June 2010.

The FAO cereal price index averaged 167.6 points in April, down 2.2 points (1.3 per cent) from March and nearly 42 points (20 per cent) below the corresponding month last year. Wheat prices continued their decline in April, influenced by large supplies and slow trade activity, as many buyers await in expectation of even lower prices in the coming months. Maize quotations changed little compared to March, with stronger import demand being offset by prospects for more than ample supplies. Rice prices moved marginally lower, on subdued demand.

The FAO vegetable oil price index averaged 150.2 points in April, down 1.5 points (or one per cent) from March. The slide was driven by palm oil, the key commodity in the index. International palm oil quotations continued to ease as higher than expected output in Indonesia and Malaysia coincided with weak global import demand. Global soy oil prices, on the other hand, increased slightly, reflecting concerns about slower than usual farmer selling and renewed strikes in

South America. Prices for sunflower seed oil strengthened amid falling world production and export supplies.

The FAO dairy price index averaged 172.4 points in April, down 12.5 points (6.7 per cent) from March. Milk powders and butter were the main commodities affected. The price weakness affecting the sector reflects a favourable opening to the April-March dairy year in the EU, combined with the abolition of the milk quota system, which raised expectations of abundant export supplies. Dairy prices were also influenced by uncertainty over the level of China's purchases during 2015 and continued import prohibitions imposed by the Russian Federation.

The FAO meat price index* averaged 178 points in April, up three points (1.7 per cent) from its revised March value. The main causes of the rise were higher prices for bovine and ovine meat from Oceania, where herd rebuilding restricted exports. Pork prices also showed some upward movement, while those of poultry were lower. For meat overall, moderately higher import demand in China, Japan, the USA and Vietnam is the main factor underpinning the market.

The FAO sugar price index averaged 185.5 points in April, down 2.4 points (1.3 per cent) from March and reaching its lowest level since February 2009. The decrease was mainly fueled by reports of higher than expected sugarcane harvesting in Brazil, the world's largest producer and exporter of sugar.



Also, India's recent announcement it would raise sugar import tariffs from 25 percent to 40 percent, in a bid to support falling domestic prices, weighed on international sugar quotations. Persistent weakness in the Brazilian currency (Real) against the US dollar also kept the FAO sugar price index under pressure.

- Unlike for other commodity groups, most prices utilised in the calculation of the FAO meat price index are not available when the FAO Food Price Index is computed and published; therefore, the value of the meat price index for the most recent months is derived from a mixture of projected and observed prices. This can, at times, require significant revisions in the final value of the FAO meat price index, which could, in turn, influence the value of the FAO food price index. Much lower USA export prices resulted in downward revisions of the meat price index for January (6.7 points) and February (three points).

Philippines' agriculture and livestock witness growth in Q1 2015

THE PHILIPPINES' BUREAU of Agricultural Statistics (BAS) said that farm production increased 1.78 per cent in January to March period, 0.66 per cent faster in the same three months last year.



The crop sub-sector, which accounts for half of total agriculture, grew by 1.65 per cent year-on-year, as rice and corn production hit records, the bureau revealed.

The growth is owed to an expansion in the areas planted to both staples, as well as to higher yields. At 18 per cent of farm production, rice was the country's top crop, followed by corn at eight per cent.

The livestock and poultry sub-sectors, however, turned in the highest growth rates in Q1 2015. Livestock production, which comprised 16 per cent of farm output, increased 3.23 per cent year-on-year. Hog production, which at 13 per cent of total farm output is the largest segment of the livestock, grew by 3.77 per cent, faster than 2014's 1.25 per cent.

Poultry production, comprising 15 per cent of total farm output, grew by 5.42 per cent this quarter. Chicken production, which accounts for 11 per cent of agriculture, increased 5.2 per cent.

Only the fisheries sub-sector shrank this quarter. Accounting for 15 per cent of total farm output, the production dropped by 2.5 per cent, BAS noted.

However, amid higher production overall, farm gate in the Southeast Asian country prices fell by 3.37 per cent on average.

Global aquaculture production on the rise, FAO reveals

World aquaculture production is expected to grow by another five per cent in 2015, according to the latest biennial food outlook report from the FAO.

In 2014, overall fish production is estimated to have grown by only one per cent to 164.3mn tonnes, boosted by a five per cent expansion of aquaculture to 74.3mn tonnes, which compensated for a two per cent contraction in wild fish output to 90mn tonnes. 2014 was also the first year in which human consumption of

aquaculture products exceeded that of products from wild fisheries.

The aquaculture supply in 2015 is likely to see a small rebound in wild catches from the 2014 El Niño-related shortfall, to 90.6mn tonnes, and a further five percent growth in aquaculture production to 78mn tonnes.

As a result, fish production is forecast to reach 168.6mn tonnes in 2015, up 2.6 per cent from the previous year.

Strong demand from the USA and EU have underpinned international fish trade through 2014 and the start of 2015, FAO report suggested.

Consumer demand for fish remains brisk, with more people worldwide appreciating the health benefits of regular fish consumption. Direct human consumption, which accounts for more than 85 per cent of all uses, is now projected to grow by two per cent.

Fish deliveries to emerging markets also were strong, despite some weakness in countries such as Brazil and Russia, which faced economic slowdowns and sharp currency devaluations. However, Japan's buying interest has been tepid with seafood consumption now stagnating.

Fish international prices remained at relatively high levels in the course of 2014, although subject to fluctuations depending on individual species.

As a result of the firm prices and sustained volume growth, the value of fish trade is estimated to have reached a record US\$143.9bn in 2014. However, the value of trade is forecast to grow only modestly to US\$144.5bn in 2015, on anticipation of a stalling volume of trade and steady world prices.

Last year was the first time when human consumption of aquaculture products exceeded that of products from wild fisheries



Vietnam seeks more seafood from Indonesia

VIETNAM IS LOOKING to increase its fisheries imports from Indonesia, according to industry sources.

"We imported US\$8.9mn worth of seafood during the first four months of this year. This was almost half of the US\$17.32mn fisheries products that we imported from Indonesia during the same period in 2014," Vietnam Embassy first secretary Trung Truong Xuan said.

According to the general department of Vietnam Customs, last year Indonesia exported US\$43.98mn worth of seafood to Vietnam.

According to Xuan, Vietnam, with a population of 95mn, could become a major market for Indonesia's fisheries products.

"Vietnam has been buying shrimp from Ecuador and India. Now,

Vietnam wants to buy our shrimp but we don't have enough stock. Many shrimp farms closed down recently," businessman Thomas Darmawan told *The Jakarta Post*.

Vietnam's Maritime Affairs and Fisheries Ministry director-general Saut Hutagalung said recently that during the first three months of this year, exports of fisheries dropped by 15 per cent to US\$970mn.



Besides shrimp, Vietnam is also interested in buying seaweed, crabs and ornamental fish from Indonesia

Hutagalung revealed that the total fisheries export volume declined to 246,000 tonnes during Q1 2015 from 263,624 tonnes during the same period in 2014. The value also declined to US\$970mn from US\$1.06bn during the same time.

Last year, Indonesia's total fisheries exports reached US\$4.63bn, below the government's target of US\$5.65bn.

LOOKING FOR FEED MILLS?

ASK **AWILA** *We have the Solution*

from smallest compact units for farm use

to automated milling mixing units....

to complete feed plants with pellet production....

from grain siloplants....

to turn key commercial feed plants

Planning, design, and erection of turn-key feed mills, grain storage plants, mineral and vitamin dosing and premixing systems, pasteurizing systems, Production of intakes, conveying/storage systems for raw materials, mills, mixers, pellet presses, pellet coolers, oilmills, conditioners, control systems

AWILA Anlagenbau GmbH
Dillen 1
49688 Lastrup
Germany

Tel.: +49 4472 892 0
Fax: +49 4472 892 220
email: info@awila.de
Internet: www.awila.de

AWILA Workshops Germany

Australia to overtake USA as Japan's biggest beef supplier

AUSTRALIA IS SET to become Japan's biggest beef supplier as a trade deal drives shipments towards a four-year high.

Imports of Australian chilled beef rose eight per cent in Q1 2015 and may reach the highest since 2011 while shipments from the current biggest importer USA drop to the lowest in three years, according to Tatsuo Iwama, executive director of Japan Meat Traders Association. The rising inflow of Australian meat to Japan's US\$2.6bn beef market is the result of decreasing tariffs triggered by a bilateral agreement that went into effect in January, he said.

According to *Bloomberg* report, the continent's expanding market share will spur the USA to reach a similar deal with Japan, its biggest beef and pork buyer, according to Makiko Tsugata, an analyst at Market Risk Advisory Co. in Tokyo.

Japan and USA have been in talks for months to strike a bilateral agreement, which would pave the way for the 12-country Trans-Pacific Partnership. US President Barack Obama is seeking fast-track trade negotiating authority from Congress.

"Lower duties for Australian products are attractive to Japanese meat importers and beneficial to local consumers. The USA beef industry needs an early conclusion of TPP talks to regain equal footing with Australian exporters," Iwama added.

"Australia's market share is expected to increase as Australian beef gains a competitive advantage over USA beef because of lower tariffs," the report noted.

Prime Minister Shinzo Abe and Australia's Premier Tony Abbott had signed the accord in July 2014, under which Japan agreed to gradually lower tariffs on Australian chilled beef to 23.5 per cent over 15 years from 38.5 per cent. They are currently at 31.5 per cent after two rounds of cuts.



Lower duties for Australian products attract Japanese meat importers and beneficial to local consumers

Duties on frozen beef will be halved to 19.5 per cent over 18 years.

Chilled-beef imports from Australia climbed to 27,723 metric tonnes in the three months of 2015, while those from the USA fell 27 per cent to 12,913 tonnes, according to Japanese Ministry data. Shipments from Australia this fiscal year will be the highest since reaching 132,549 tonnes in the year ended March 2012, Iwama said.

Australia overtook the USA in 2002 as the top supplier to Japan's beef market after a government ban following the discovery of mad-cow disease in USA cattle in 2003. The nation shipped 281,706 tonnes to Japan in 2014, accounting for 54 per cent of the overseas supplies, while the USA made up for 36 per cent, Japanese government data show. Japan relaxed trade restrictions on USA beef a decade later in 2013.

Malaysia to boost coral reef exports

MALAYSIA HAS THE potential to be a major exporter of coral reef with its 3,600 km, or 1.27 per cent, of the world's coral reef's location representing more than 540 species of hard corals.

Minister of agriculture and agro-based industries Datuk Seri Ismail Sabri Yaakob said that coral reef exports from Malaysia were still small coming from Sabah and Sarawak while Indonesia controlled 90 per cent of the world coral reef exports, followed by Philippines and Vietnam.

"The department of fisheries Malaysia has conducted market research and we found that there is high interest abroad for Malaysian coral reef.

"As a result, 70 companies from Europe, USA, Russia, Japan and China are interested to get decorative products made from Malaysian



coral, while exports quota has also been approved to conduct business transactions at international level."

Ismail made the announcement after the signing of the MoU for the development for the propagation of coral in Pulau Bidong Project by Terengganu, department of fisheries Malaysia, Malaysia Terengganu University and Yayasan Coral Malaysia.

Ismail said his ministry has allocated US\$746,495 to ensure the success of the project.

Terengganu Menteri Besar, Datuk Ahmad Razif Abdul Rahman said the state government would conduct specified research before opening more space for agro tourism sector in Pulau Bidong after this.

Cambodia rice exports increase in first four months this year

CAMBODIA EXPORTED OVER 200,000 tonnes of rice in the January-April period, up 67.2 per cent from the same period last year.

According to the Secretariat of One Window Service for Rice Export, China was the largest importer, buying more than 66,000 tonnes of Cambodia rice, followed by France with 23,000 tonnes, *Thai News* reported.

However, the government's ambition to export one million tonnes seems to be encountering obstacles. Business people in the rice sector lack the investment capital while farmers lack proper technical support.

Besides traditional customers, Cambodia is looking for new markets with the aim of increasing rice export.

Farm produce, particularly rice, is a priority in Cambodia's export policy. However, the country is facing difficulties in processing equipment to enhance rice quality. Cambodia also has to compete with other major exporters such as Thailand and Vietnam.

For three consecutive years, Cambodia has been producing the world's highest quality rice — Kun Pidou. This may give a chance to promote natural, agricultural products, especially rice, in the regional and international markets on a larger scale.

VIV Asia 2015 registers high visitor and exhibitor ratings

Far Eastern Agriculture was present at the three-day show in Bangkok, which exhibitors rated 8 out of 10, while visitors gave an encouraging 8.5 out of 10

ASIA'S LEADING INTERNATIONAL feed-to-meat exhibition VIV Asia witnessed leaders in the agriculture, livestock and fisheries industries participate in the three-day show held at the Bangkok International Trade Exhibition Centre (BITEC) from 11-13 March 2015.

Show manager Ruwan Berculo said, "VIV Asia 2015 has exceeded our expectations. We wanted it to be a show that was relevant to everyone in Asia and also to the milk, aquaculture, meat and egg businesses as well as its established theme of feed to meat. This was most definitely achieved." Livestock is a thriving export market in Thailand, with Russia, The Netherlands, Japan, USA and China being core export markets.



The egg industry received a fillip by the decision made by the International Egg Commission to conduct its leadership forum in Bangkok

Official show statistics said that there were more than 38,000 visitors at BITEC for VIV Asia. There were more than 800 exhibitors from 120 countries spread across seven halls. Specifically, there were business leaders from animal protein companies from every single Asian country, said show organisers VNU Exhibitions. Major exhibitors included Jansen Poultry Equipment, Biomin, Big Dutchman, Andritz Feed and Biofuel, DSM and Hellmann Poultry Equipment among others.

Largest number of visitors from Thailand

The top 20 countries at the show were Thailand, India, Vietnam, Philippines, China, Malaysia, Indonesia, Bangladesh, South Korea, Pakistan, Taiwan, Sri Lanka, Myanmar, Japan, Singapore, The Netherlands, Australia, Egypt, USA and Cambodia, with a total of 21,723 visitors. There were 16,699 visitors from Thailand alone – the highest in the show, followed by India with 2,164.

Conferences and seminars draw crowds

Conferences drew 3,496 attendees, with popular ones being Aquatic Asia Conference, Biogas Conference, Dairy Tech Conference, Pork Production Summit and Pet Health and Nutrition Conference. Aviagen, Biomin Singapore, Hamlet Protein, Bayer Thai, ADDCON Asia as well as government agencies and educational institutions made presentations.

Poultry remains key focus, pork production gains prominence

Though poultry dominated the show, the egg industry, in particular, received a boost by the International Egg Commission (IEC) as it conducted its Asian leadership forum in Bangkok. Organisers seek to conduct the event alongside VIV Asia in 2017. The pork production industry's regional appeal gained traction, with 40 per cent of visitors involved in farming reported having pig-producing interests.

Aquatic Asia

The Aquatic Pavilion featured innovative products for sustainable fish and shrimp farming. Conferences were held on various topics such as feed, ingredients, additives, health management and advanced technology to boost the industry. □

HEATING SYSTEMS



MIRAGE INFRARED HEATERS

- No dustfilter
- 100% efficient radiant heat
- Operating between 0,5 - 5,5 kWatt, 1,4 bar
- Automatic control



HOT-AIR BLOWERS

- Stainless steel
- High air volume
- Natural gas, propane, LPG, diesel
- 10-30-50-80-100 kWatt



ABBI-AEROTECH

The Netherlands
Tel. +31-184-711344 Fax +31-842-103733
Info@abbi-aerotech.com www.abbi-aerotech.com

Biogas plants an effective solution for Southeast Asian farmers



Agricultural biomass is used as basic feedstock for anaerobic digesters

BIOGAS PLANTS ARE soon finding a prominent place in the agricultural plans laid out by farmers worldwide. Due to the vast range of economic and ecological benefits a biogas plant has to offer, several farmers are setting them up as an additional source of revenue.

At VIV Asia 2015, there were a series of discussions held on this topic, where experts, researchers and industry leaders highlighted the growing importance of biogas plants in the greater ecological picture. A discussion titled on biogas production was headed by Pruk Aggarangsi and Marcello Barbato. Aggarangsi is the deputy director of Energy Research and Development Institute-Nakorping, renowned for decades of biogas developments in Thailand and Southeast Asia. Barbato is the country manager of Envitec Biogas in the Philippines. Aggarangsi initiated the discussion where he spoke about how 3,600MW of power can be harnessed from Napier grass, based on the

Alternative Energy Development Plan (AEDP) for Thailand.

The two speakers also discussed the various kinds of livestock biogas models such as Fixed Dome, Covered Lagoon, Plug Flow, Hybrid Digester and CSTR — all of which have been launched from 1984 to 2012. According to them, fresh biomass yield from napier grass over two months could be around 500 tonne ha per year, energy maize could provide up to 100 tonne ha per year and rice straw could give nearly 20 tonnes ha per year.

In Southeast Asia, there is a growing awareness towards this concept, said Barbato. Wastewater biogas is supported through direct subsidies in Thailand, while Malaysia is very active on this front due to government intervention. In Indonesia, Philippines, Vietnam and Cambodia, biogas harnessing is very popular especially since electricity tariffs are high.

Animal health care firm Zagro showcases fully-loaded Thailand office to VIV Asia visitors

ASIA PACIFIC'S LEADING manufacturer of crop care and animal health Zagro was present at VIV Asia that was held in Bangkok from 9-11 March 2015. The company exhibited at Hall No 103 in stall D054, where business partners and visitors engaged with the Zagro team to learn more about their business.

A highlight for the Singapore-based company was when they invited visitors and potential business leads to their fully-functional Zagro Thailand Limited office. Business partners and guests from India, Pakistan, Bangladesh, Sri Lanka, Taiwan, Philippines, Thailand, Indonesia, Egypt, UAE and Morocco were present.

The company's animal health sales and technical team celebrated their success in the market, as they showcased the company's new and existing products. The company is a leader in producing premix products and even supplies protection to animals in the form of creative agrisolutions. Leading brands include ectoparasiticides, Neocidol and Steladone — all recognised by farmers around the world. In addition, Zagro also provides a range of crop solutions such as soil conditioners, fertilisers, plant growth regulators, plant extracts and biofertilisers.



The Zagro team present at VIV Asia, held at BITEC

Alltech urges global food community to innovate and inspire

INNOVATION WAS THE buzzword for Alltech at VIV Asia 2015. The company conducted the Alltech Innovation Day, whose theme was *What if nutrition kept in pace with our genetics?*

Alltech chief innovation officer Aidan Connolly chaired a session that included experts who discussed the future of feed, animal and food production. There were more than 100 attendees from 12 countries present at the session, held at Grande Centre Point Hotel Terminal 21 in Sukhumvit, Bangkok.

Connolly discussed Alltech's AGP-free programme called Seed-Feed-Weed, which enhances flock performance by lowering risk of wet litter and antibiotic resistance. Recently, fast food chain McDonald's announced that it would stop the use of human antibiotics in its chicken. Connolly highlighted this development at the session and drew parallels to Alltech's own measures to reduce dependence on antibiotics for chicks. The company feeds three billion broilers globally using Alltech's antibiotic-free programmes.

An equally interesting topic was that of nutrigenomics. Alltech's nutrigenomics research scientist Daniel Graugnard spoke about the



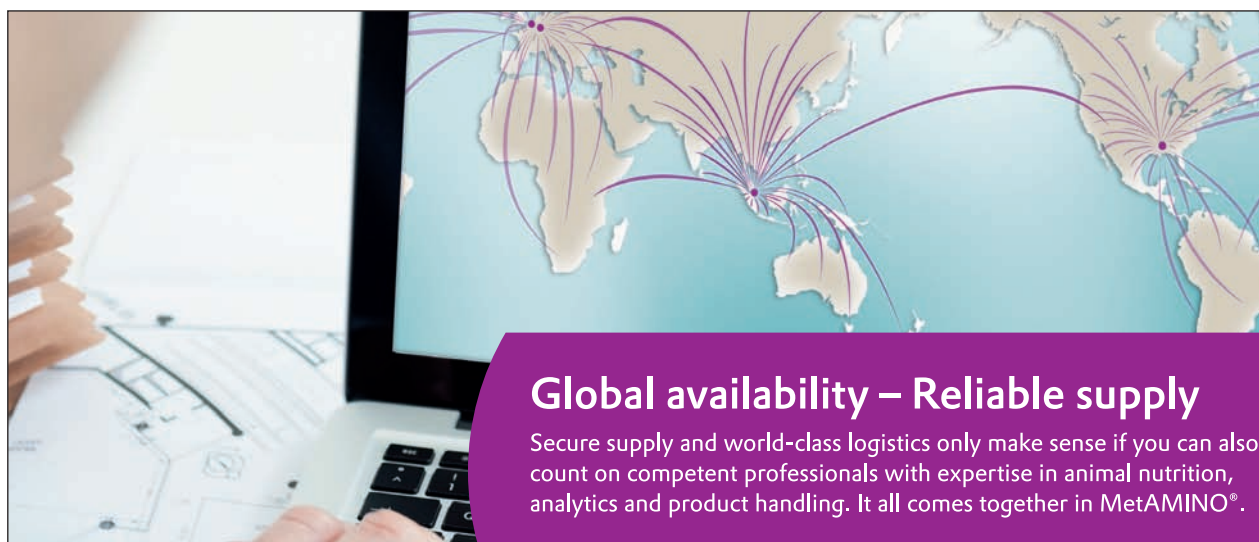
Aidan Connolly, chief innovation officer and vice-president of corporate accounts at Alltech

future of the field, highlighting the significance of nutritional programming, including prenatal nutrition, foetal programming, finishing diets for

better feed efficiency and targeted transitional diets.

With innovation as its mainstay for the show, Alltech's executive stressed on the importance of new technologies and ideas that would revolutionise agri-business. According to Alltech Asia Pacific vice-president Matthew Smith, the food industry should take a cue from the late Steve Jobs, who aimed to sell dreams, not products.

At the show, Alltech's booth was buzzing with visitors who were keen to explore the company's heavy metal survey, which revealed that 30 per cent of the almost 500 samples tested were contaminated with at least one heavy metal above acceptable EU levels for arsenic (As), cadmium (Cd) and lead (Pb) – the highest in the history of the survey. Alltech global director of minerals Steve Elliott stressed on a total replacement programme (TRT) that could overcome challenges associated with traditional inorganic mineral nutrition strategies. The Alltech TRT programme has demonstrated performance can be maintained or improved with a lower cost and can be used up to six times lower than commercial levels. Alltech is also using TRT to address meat quality issues, especially woody breast.



Global availability – Reliable supply

Secure supply and world-class logistics only make sense if you can also count on competent professionals with expertise in animal nutrition, analytics and product handling. It all comes together in MetAMINO®.

Evonik – Simply Efficient™

MetAMINO®

animal-nutrition@evonik.com www.evonik.com/animal-nutrition

Evonik. Power to create.



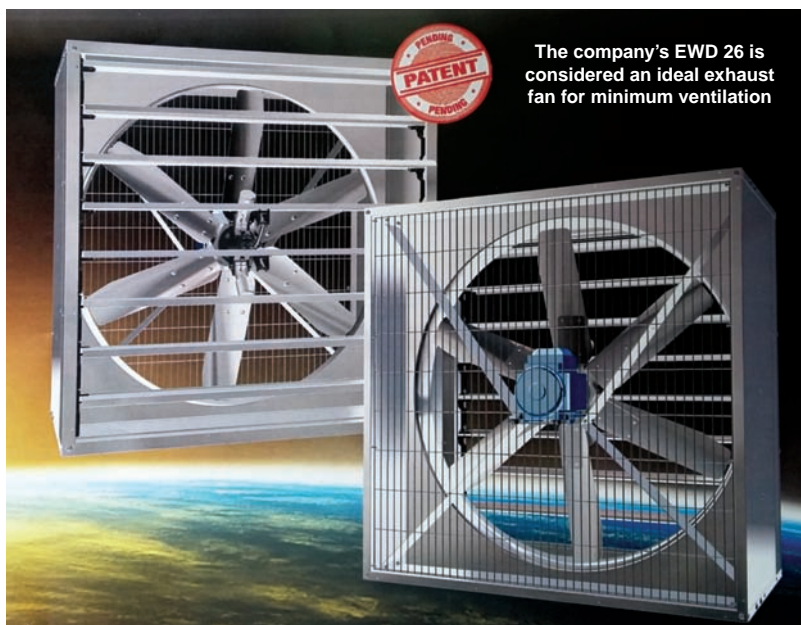
Termotecnica Pericoli's new Mexico office to be expanded this year, says director

ITALIAN MANUFACTURER OF heating, cooling and ventilation devices Termotecnica Pericoli launched the Pericoli Centro America S.A. de C.V. in Querétaro, Mexico, and the office will be further expanded this year, said Mauro Pericoli, director of the company. Mexico offers a number of advantages and opportunities due to its strategic central location between the large North and South American markets along with many other macro factors, making it an advantageous location for the new utility. The office will function as a local extension of the Pericoli sales and customer service centre in Albenga, Italy as well as for the Malaysian operation. The new office will provide customers with sales, customer service and technical support in regional business hours, and in Spanish as well as English. Its fully integrated with the main factory/administration data processing systems and can operate as an effective extension, providing greater service and support with shorter lead and reaction times.

At VIV Asia 2015, the company also discussed their growing presence in R&D, as well as their plans to improve presence in China.

In addition, the Italian equipment maker elaborated on the use of their latest collection of patented exhaust fans. The new EWD range has three models EWD 26, 31 and 37 – focused on the use of direct drive motors in appropriately-sized fans to maximise characteristics and advantages of direct drive motors, a new propeller blade design and the introduction of a newly-patented shutter mechanism. The overall increase in efficiency of the new range of extraction fans is the combination of increased airflow (almost 15 to 20 per cent) and reduction in power consumption (six to 35 per cent) through innovative engineering and in-house testing during the development and design stages.

Termotecnica Pericoli also showcased their new ACF circulation fans. These provide 20 to 25 per cent increase in thrust, a 10 per cent increase in airflow and capacity and a decrease of five to 10 per cent in energy consumption. During the recent Bess Lab independent performance verification process, the ACF21/26 were rated in the top five per cent of all competitive fans.



Delacon presents Biostrong Forte and Actifor at VIV Asia 2015

PHYTOGENIC SOLUTIONS PROVIDER
Delacon made its presence felt at VIV Asia 2015 in Bangkok, by presenting two products

for poultry and ruminants. The Biostrong Forte combines Biostrong 510's effects with short and medium chain fatty acids. The product

helps fight common intestinal challenges that are found in antibiotic-free production – it allows nutrient digestibility, improved feed efficiency and reduces noxious gas emission. Biostrong Forte adds a complex of esterified fatty acids to control and reduce critical intestinal health challenge periods in a bird's life. Studies have revealed that using Biostrong Forte reduces feed conversion rate by four per cent, and increases average body weight by two per cent. The product has been launched in the USA market, and is under the registration process in Malaysia and the Philippines.

In addition, the Actifor range for ruminants was also presented at the show. Due to the strong demand in the ruminant sector, Delacon showcased the Actifor® Pro, now Actifor® Boost and Actifor® Power, which have entered the Asian market. The entire Actifor® product line solely contains natural substances like essential oils, herbs and spices, and is specifically designed to improve feed efficiency, performance and health of ruminants. The three products are in different stages of approval in different countries.



At VIV Asia 2015, visitors flocked Delacon's booth to understand concepts behind new products and feed additives

Asia Choco Congress 2015 uplifts mood in the region

THE ASIA CHOCO Congress, that was held 21-23 April 2015 in Singapore, provided the best platform for senior leaders and decision makers from international businesses, associations, governments and NGOs to explore future opportunities.

In Asia, Indonesia is the third largest cocoa producing country in the world and remains the largest in Southeast Asia region. With confectionery and other cocoa products seeing strong growth in the region, increasing cocoa production locally is most important to meet this demand. The country has also enjoyed increasing investment in processing facilities in the country since the Indonesian government's implementation of the export tax on raw cocoa beans in 2010.

As political, environmental and economic challenges put pressure on the industry, cocoa and chocolate leaders seek new market strategies to grow their businesses and maximise yields across the value chain. According to organiser IMAPAC, with only three countries producing 69 per cent of the world's cocoa, the market is easily affected by supply shortages if production is reduced by weather or economics. Furthermore, cocoa ingredients are predominantly used in confectionery. Hence, any downturn in demand due to higher prices or health issues such as obesity might have an impact on chocolate demand.

Despite the uncertain times for the cocoa industry, chocolate confectionery sales have been rising steadily since 2008, according to recent Euromonitor International analysis. Global sales for chocolate confectionery has risen to



According to organiser IMAPAC, only three countries producing 69 per cent of the world's cocoa including Indonesia

US\$111bn in 2014 and by 2019, sales are expected to reach US\$125bn.

Moreover, consumption demand for chocolate and other cocoa derived products is expected to continue increasing in developed countries in spite of economic stagnation. With disposable income rising among the younger generation in developing countries chocolate demand is expected to remain strong, with India and China's demand projected to grow with a CAGR of 12 per cent and seven per cent a year respectively.

The speaker profile included Jean-Marc Anga, executive director, International Cocoa Organization; William P. (Bill) Guyton, president, World Cocoa Foundation; Marc Donaldson, senior partner, On The Ball Consulting, Singapore; Lukas Jasman, COO, BT Cocoa,

Indonesia; Soetanto Abdoellah, chairman, head of research division, Indonesia Cocoa Board, Ministry of Agriculture, Indonesia; Indonesian Coffee and Cocoa Research Institute; Frank Mechielsen, policy advisor private sector, Oxfam Novib; Rick van der Kamp, senior operations officer, IFC, Indonesia; Jennifer E. Remoquillo, director, high value crops development Program (HVCDP), national programme coordinator, department of agriculture, Philippines; Phan Huy Thong, chairman, Vietnam Cocoa Committee, National Agriculture Extension Center; Cathy Pieters, director, Cocoa Life Programme, Mondelez International; Michiel Hendriks, director of sustainability, ADM Cocoa; Thomas Oberthur, director, IPNI Southeast Asia Program; and Johannes G.P. Jansen, senior agricultural economist, The World Bank, among many others.

SIMA-SIMAGENA 2015 brings agri-business innovations to the fore

SIMA 2015 WAS a resounding success with 238,848 professional visitors in five days. Held 22 to 26 February 2015 in Paris Nord Villepinte, France, the attendance at the agri-business show was same as that achieved in 2013.

As many as 1,740 exhibitors featuring in the show, a benchmark was achieved in the international show, according to the organisers.

For the first time SIMA launched 'Innovation First Area' that featured veritable ideas laboratory and included several events around innovation — the results of the work of French and international engineering schools on their view of the agriculture of the future, forecast scenarios until 2050 created by professional organisations, both agricultural and non-agricultural, portraits of innovative French and foreign farmers, along with the Innovation Gallery.

SIMA Innovation Awards 2015 saw companies like Claas, John Deere, Berthoud and Kverneland Group take away glories at the show.

Cattle breed show SIMAGENA was held along with SIMA, which is the first to organise a European open show for cattle. The event showcases animal husbandry and the quality of breeder farmers over several generations. The Charolaise, Aubrac, Blonde d'Aquitaine, Salers and Limousine breeds were in the spotlight.

A genes diffusion animal genomics presentation highlighting two breeds — Holstein



Cattle breed show SIMAGENA was held along with SIMA, which is the first to organise a European open show for cattle

and Charolaise — and commercial demonstrations of equipment was also part of SIMAGENA.

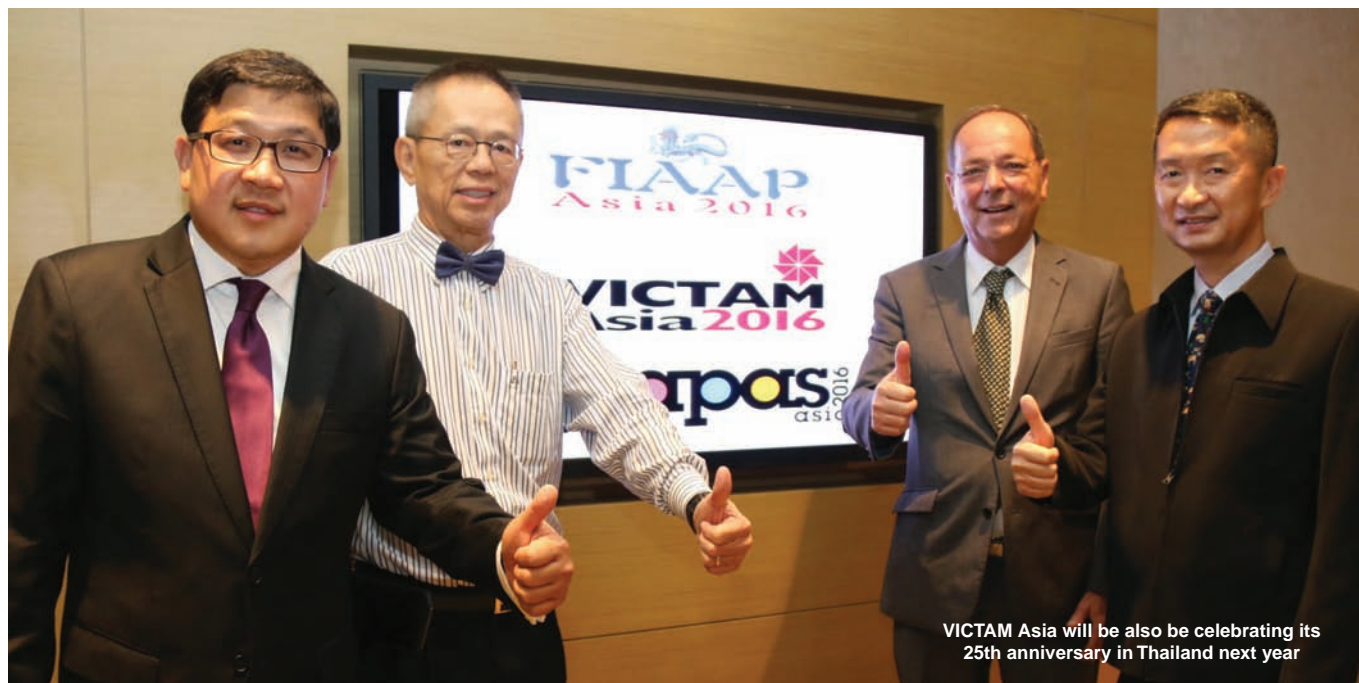
According to organisers, SIMA-SIMAGENA 2015 focused on innovation, with 600 new products shown this year by exhibitors and, more precisely, the new technologies spearheading precision agriculture.

Martine Dégremont, SIMA-SIMAGENA

exhibition director, said, "Many visitors expressed their interest and a possible intention to buy. This dynamic and positive SIMA-SIMAGENA show has renewed the confidence of all those involved in the sector and has given us a vision of the market that extends beyond the short term."

SIMA will next be held in Thailand in September 2015 and Algeria in May 2016.

VICTAM International completes 50 years in 2015



VICTAM Asia will be also be celebrating its 25th anniversary in Thailand next year

VICTAM INTERNATIONAL, WORLD'S largest and foremost international event for animal feed ingredients and processing technology, biomass pelleting systems, flour milling and grain processing, will be celebrating its 50th anniversary in 2015.

Cologne is now the home to three co-located exhibitions — FIAAP International, VICTAM International and GRAPAS International. The 2015 event will once again combine the trio and their respective conferences under one roof at Koelnmesse.

This is touted to be the largest show with 250 exhibitors coming from all over the world to display the very latest technology within the fields of animal feed production, flour milling and grain processing and

biomass pelleting. As with the Asian show, there will be a series of technical conferences on wide ranging subjects.

FIAAP exhibitors will be displaying ingredients and additives that are necessary for the successful formulation of animal feed, aquafeed, dry petfood and speciality feeds. The VICTAM exhibits will cover the latest technology and system used in the manufacture and processing of these animal feeds, aquafeed, dry petfood and speciality feeds. Also on display will be a large number of international manufacturers of biomass pelleting plants.

A large number of companies will be exhibiting the essential ancillary equipment that is so necessary for the smooth operation

of a feed mill, flour mill or a rice mill. The latter two will be profiled in the GRAPAS trade show as this exhibition covers grain processing, storage and transportation, flour and rice milling technology, as well as, pasta, breakfast cereal and extruded snack production. A large number of stands with ancillary equipment will also be on display.

FIAAP, VICTAM & GRAPAS International 2015 will be held from 9-11 June within Koelnmesse in Cologne, Germany.

VICTAM Asia will be also be celebrating its 25th anniversary in Thailand next year. The exhibitions and conferences will take place from 29-31 March 2016 at Bangkok International Trade & Exhibition Centre (BITEC).

Livestock Philippines 2015 will address investment challenges

FROM FARM TO fork, Livestock Philippines 2015 will serve as the perfect platform for global trade players to place investment opportunities in the local livestock, animal health and feed industries.

The event will take place in Manila from 24-26 June 2015 at SMX Convention Centre, Pasay City.

Hosted by the Department of Agriculture, Bureau of Animal Industry (BAI) and the National Meat Inspection Service (NMIS), the third edition of Livestock Philippines will also be held in conjunction with three significant events for stakeholders and businessmen to meet the challenges of the Asean Economic Community (AEC) this year.



Benigno S. Aquino III, President of the Philippines, said, "The livestock industry, along with its allied fields, is a crucial partner of government in our mission to put safe, affordable and nutritious food on every Filipino table and also uplift the lives of our people in

the countryside. To achieve these goals, it is necessary that we modernise industry practices. We welcome this expo and conference, which brings to forefront the latest trends and innovations pertinent to your sector. My administration looks forward to seeing these improvements at work in farms, markets and factories across the nation."

The show will feature more than 200 exhibitors from over 20 countries including national pavilions from South Korea, Taiwan and China showcasing world-class products and innovations. Big players including Muyang, Belmont, Pristine, Gifts, Big Herdsman, Buhler, AFIMCOR and more will also be present, according to the exhibitor.

INPALME 2015 aimed at strengthening oil palm industry across the globe

INPALME (INTERNATIONAL PALM Oil Exhibition) 2015, organised by PT International Network, was held on 23-25 April at Medan International Convention Center (MICC) at Medan City, North Sumatra Province, in Indonesia.

Co-founder of the International Network Kisata Pindi said, "The demand for palm oil products will continue to increase every year. We can make use of palm oil for food and as a source of energy."

He added that about 3,000 to 5,000 visitors attended the event this year.

Indonesia is the largest crude palm oil (CPO) producer in the world, owning around 10mn hectares of palm oil plantation, more than 600 palm oil mills, around 120 refineries, besides palm kernel oil mills, oleo chemical companies and biodiesel factories. North Sumatra is the second largest palm oil plantation in Indonesia with around one million hectares of palm oil plantation while Riau Province is the largest with around two million hectares of plantation. Medan is the third largest city in Indonesia and plays a huge role in palm oil industry in the country.



INPALME 2015 saw palm oil related sectors converge at one venue

According to organisers, INPALME was attended by world palm oil society including producers, consumers, supporting industries, academicians, scientists, analysts, researchers and government and private players.

Some of the Indonesian companies present included Anglo Eastern Plantation, ANJ Agri / Austindo, Asian Agri / RGM Group, Astra Agro Lestari, Bakrie Sumatera Plantations, Barito Pacific, Benua Indah, Bima Palma, Bumitama Gunajaya Agro (BGA), BUMN Plantations (PTPN), BW Plantation, Capella Group, Cargill Indonesia, Cisadane Raya, Darmex Agro /

Duta Palma, Medco Agro, Minamas Plantation, Minanga Ogan, Musim Mas, Paya Pinang, Perdana Sawit Mas, Permata Hijau, Provident Agro, Salim, Sampoerna Agro, Saraswanti, SMART (Sinar Mas), Sungai Budi, Triputra Agro Persada, Wilmar; Malaysian firms include Asia Oil Palm Sdn Bhd, BBC Group, Bell Group, Boustead Plantations, Cepatwawasan Group, FELCRA, FELDA, Genting Plantations, Hap Seng Plantations, IJM Plantations Bhd, IOI Corporation Bhd, Kulim (Malaysia) Bhd, QL Plantations Sdn Bhd, Rimbunan Hijau Group, Sawit Kinabalu Group, Sime Darby, Taiko Plantations, TDM Berhad, Teck Guan Holding, Tradewinds Plantations, United Plantations; Thai firms namely Southern Group, Srijaroen Group, Univanich Palm Oil PCL were present; Filipino companies including Filipinas Palm Oil Plant and Agumill Inc. From India, companies like Oil Palm India Limited, Gokul Refoils & Solvent, also took part.

The event also saw the participation from African countries like Côte d'Ivoire, Liberia, Ghana, Nigeria, Gabon, Cameroon, DR Congo, Sierra Leone, among many others.

MATABI

YOUR PARTNER
FOR ACCURATE SPRAYING



EVOLUTION 16 & EVOLUTION 20 SUPER

offer the best solutions for **CROP PROTECTION**:

Cotton, Coffee, Cocoa, Palm Oil, Sugar Cane...

We guarantee a large range of applications for herbicides, insecticides and fungicides, **with increased efficiency and accuracy**, thanks to our **pressure regulator and range of nozzles/accessories**.



TEAT SPRAYER, specifically conceived for ANIMAL HEALTH

To be used in milking processes, in the prevention of mastitis, lowering somatic cell counts and avoiding cracked teats.



iK

BY EXPERTS
FOR EXPERTS



IK 12 BS & IK 1.5

your partner for **PUBLIC HEALTH** applications

Professional Sprayers to fight against:

Malaria, Dengue, Chagas, Chikungunya, Leishmaniasis, Yellow Fever, Ebola, Cholera... in compliance with the most demanding International Standards for spraying equipment.

 **Goizper Group**

Tel. + 34 943 786 000
goizper@goizper.com

www.goizper.com

Indonesia's biggest livestock show to bring back the best



More than 12,000 trade visitors and delegates are expected to attend the expo and seminars

BACK FOR THE 10th time, the biggest international livestock event in Indonesia, INDO LIVESTOCK 2015 EXPO & FORUM, will be held on 29-31 July at Grand City Convex, Surabaya, Indonesia. This exhibition will be held in conjunction with Indo Feed Expo & Forum, Indo Dairy Expo and Forum and Indo Fisheries Expo & Forum.

Hosted by the directorate general of Livestock and Animal Health, Ministry of Agriculture, Indo Livestock 2015 Expo & Forum is a must-attend event for decision-

makers and buyers in livestock and animal health industry across Asia.

More than 12,000 trade visitors and delegates are expected to attend the expo, seminars and technical presentations, besides Indo Livestock Award show and Socialization for Animal Protein Consumption (SDTI-Milk, Meat, Egg, Fish) in 2015.

Over 400 exhibitors from 40 countries will participate in Indo Livestock 2015 Expo & Forum. Indonesia, China, Taiwan, Thailand, USA and Europe have confirmed their

participation as country pavilion in this exhibition.

The show will bring together all the trade buyers representing integrators, farmers, feed millers, meat and egg processors, feed systems/equipment, veterinarians, importers, distributors and retailers to view the latest technology, update on the latest issues, networks and do business in livestock industries, especially in the Asia-Pacific region.

A total 8,263 trade visitors registered for the three-day event in 2013.

Grain and Feed Asia provided insight on region's feed market

IBC'S GRAIN AND Feed Asia is an ideal platform to understand the latest trends and developments in Asian markets.

Held from 3-5 June 2015 and supported by top regional and Indonesian decision makers and buyers, this was the first conference of its kind hosted in Indonesia that will gather an international audience.

Price, demand, policy intervention, weather, and many other factors continue to impact grain and feed markets. As Southeast Asian economies project consumption growth, they remain massive demand markets and opportunities are set to increase with ASEAN integration.

Putting the spotlight on the Asian region as a whole, the two-day



conference focused on consumption trends, demand outlook, trade opportunities and investment partnerships.

Given current consumption rates, Indonesia could import more than 10mn tonnes of wheat per year in the coming five years.

The country's corn imports rose by 22 per cent in 2014 and consumption growth will increase to 13.8mn tonnes by 2018, with demand mainly driven by the increasing need for animal feed. The rice imports are expected to be 1.3mn tonnes from January to

December 2015. Indonesia is Asia's largest soybean market with domestic consumption close to 2.5mn tonnes.

Layers' rations must contain three to four per cent calcium needed for extra strong bones to cope with the stress and strains of egg production and laying (Image source: thieury/Shutterstock)

Healthy layers essential for economic egg production

Various factors decide the well-being of the mother and producers must tend to their flock with care

THE SUCCESS TO economic egg production is good hen welfare. If layers are selected with care and ensured proper housing, feed and protection against disease, it will lead to an uninterrupted high supply of good quality eggs.

It is imperative to maintain good layer management practice from first day. During the next 18 weeks, a careful and canny producer

will furnish its flock with warmth, space, dry litter, recommended vaccines, clean water and appropriate feed formulations so that chicks grow and graduate into pullets and finally into mature layers.

Feeding is all about providing correct rations at the right time and varying composition and amount with the rapidly changing requirements of growing, developing

birds. The starter diet for chicks up to eight weeks of age features high protein (20 per cent) and low crude fibre (five per cent) feed with coccidiostat inclusion.

As chicks move into ninth week, stage protein (18 per cent) and crude fibre (7.2 per cent) are reduced and raised, respectively. These so-called grower rations are generally quite cheap to purchase, but producers still need to guard against spiralling costs due to feed wastage, which is consequence of behaviour patterns in birds of this age and it is typically high. Feed wastage is minimised by



FATIQLESS™ AUGER

- The world's only chromium enriched auger: Fatigless™
- Pipe diameter: 45, 55, 75, 90, 108 and 125 mm



CORNER UNIT

- Synthetic bush requires no lubrication
- Durable transparent cover improves visibility during implementation



FEED CHAIN

- No twisting, vibrating or 'empty spots'
- Minimum of 12 kN tensile strength
- 3 Types of chain

Technical Systems

MARKET LEADER IN
FEED CONVEYING

www.technicalsys.com
info@technicalsys.com

MANAGING YOUR FEED DISTRIBUTION WITH FLEXIBILITY



A regular supply of top quality eggs can only be achieved by well-tended layers

making sure that feed troughs are not overfilled and that tube feeders are not fully open. Producers can make or buy feed troughs custom designed for spillage reduction.

Failure to control wastage may lead to feed losses of around 25 per cent and transform a potentially profitable egg production enterprise into a loss-making venture even before the first egg is laid. Birds will be ready for housing in the egg-laying environment at 18 weeks of age.

Biology of egg production

Before laying out the details of layer management, we must consider the basic biology of egg initiation, development and production. The developing ovary in the immature hen has hundreds of tiny yolks, some of which begin develop when the hen attains sexual maturity. The ovary will, therefore, contain yolks at sequential stages of development, which are the resources for forthcoming period of egg production.

Each yolk is encapsulated in a thin membrane called the vitelline membrane, around which is the follicle (sac) to provide nourishment and oxygen to the yolk via a network of tiny blood vessels. Seven to ten days after development begins yolks mature and slip out of the follicle and into the funnel shaped opening of the oviduct (egg duct) called the infundibulum. The yolk remains there for about 20 minutes and may be fertilised during this period if the hen has been mated. The egg now moves down to the magnum region of the oviduct where it receives layers of albumen secretion over a three-hour period. The next stage takes place in the isthmus region of the oviduct (75 minutes) where the two shell membranes are

formed around the albumen.

Finally it moves down and into the oval shaped uterus where more albumen and water are added to give egg its 'plumped' shape and a hard shell laid down around the soft egg material. This is the slowest process in egg production taking some 20 hours (18 hours for shell production) and is, therefore, the biggest single constraint on increased rate of egg production. Two eggs may be passed into the uterus at the same time leading to a 'double-yolker' or one egg with a hard shell and one without. This event occurs most frequently in young pullets.

Layer hen management

A regular supply of top quality eggs can only be achieved by well-tended layers. This, in turn, requires knowledge and patience by the farmer to ensure laying hens are well-housed, fed and watered and experience as little stress as possible. Successful management of laying flocks hinges on the following key basic factors: This article will consider the following:

- Housing and light management
- Feed and water management
- Heat stress and cannibalism
- Moulting and culling

Housing and light management

In the interests of disease management, layers' quarters, whatever the type, should be located at least 100 metres from houses where chicks and growers are being raised. Choice of housing is wide and includes intensive (battery cages) and semi-intensive (Californian type battery house, slatted floor housing, deep litter housing and the aviary type house). Producers should be aware that the textbook economic advantages of housing

layers in intensive battery houses are often outweighed by production losses due to stress.

For this reason many farms, where space is not restrictive, opt for the half inside/half outside system that reduces heat stress on birds during hot season months. Where land is plentiful and predators are not a problem, farmers can use the field ark that is moved onto fresh and clean parts of the pasture every day. In countries with high rainfall chickens can be kept on pebble yards, which are washed clean daily by rainfall.

Where appropriate the length of the artificial day used in the house can be manipulated to stimulate egg production. The artificial day may be lengthened in one step or by a series of steps until it is 16-18 hours, at which stage the maximum number of eggs laid in the shortest possible time should be achieved. More usually and sensibly, the natural lighting of the open type housing traditionally used in the tropics is augmented by two hours of artificial light, administered in two single hour periods, one in the early hours of the morning (0330) and the other in the early evening (1930). Comparative studies have shown this light regime, which is economical with electricity, compares favourably in production terms with the conventional programme of continuous lighting (natural and artificial) from 0330 to 2030.

Feed and water management

Feed and feeding advice for laying hens may seem contradictory. Feed restriction is essential, especially for heavier breeds, if hens are to start laying at the best time and in the best condition. At the same time general advice dictates birds should never be deprived of feed and feeders should never be empty.

Hens should start to lay no earlier than 22 weeks old and not too fat and not too young. If sexual maturity is attained too early, the length and quality of overall performance will suffer. Eggs will be fewer and smaller with more prolapses towards the end of the laying period. Such birds lack vitality, die earlier and are more likely to be culled. These problems can be avoided by carefully restricting feed at the right time and in the right way as advised for specific breeds by the farms that sell day-old chicks. Feed restriction should only be used under the following guidelines:

- Use expert advice from the breeding farm relating to the particular breed you have purchased
- Do not start before the birds are at least nine weeks old
- Supply feed in a restricted programme based on regular weighing of birds to obtain an accurate live-weight average for the flock
 - Weigh birds weekly
 - Sample one in ten of the flock; half from the front of the pen and half from the back
 - Take birds at random using a catching wire
 - Weigh at the same time each week just before feeding
- Provide adequate feeding space so that all

birds can feed at the same time

- Make feed change periods gradual. When 10 per cent of egg production has been achieved (at about 23 weeks) the flock should be on layers' mash
- Stop restrictive feeding if birds become ill or show symptoms of stress; return to feeding *ad libitum*

The mechanics of restrictive feeding are varied. Farmers can adopt a once a day feeding method and, if automated, replenish the troughs at night. Others may prefer to use the 'miss a day' method but this carries the risk of increased cannibalism due to the combined effects of boredom and hunger. This is overcome by offering extra rations based on high fibre cereals such as millet or using 'greens' that keep the birds 'happy' without adding the calories. Feed restriction practices can save the farmer up to 15 per cent in feed costs although potential savings should not enter into the equation when deciding whether or not to embark on this course. Reducing feed wastage (up to 12 per cent in laying flocks) is a safer and more sensible way of saving money.

Layers' rations must contain three to four per cent calcium needed for extra strong bones to cope with the stress and strains of

egg production and laying, and as a vital ingredient for production of the shell that is mostly calcium carbonate. Feed lacking in calcium must be boosted with supplementary supplies in the form of grit (for instance, oyster-shell grit). Rivers may have accumulations of fresh water mussel shells that can be used by local poultry producers as sources of supplementary calcium.

Producers must ensure that these high calcium levels are present in the diet well before (at least two weeks) laying starts. This timing coincides with the hormonal changes that allow extra calcium to be laid down in the bones, especially the medullary bone tissue from which calcium is mobilised for eggshell formation. Poultry require the full range of vitamins, nutrients and amino acids, but Vitamin D in particular has a crucial role in the metabolism of laying hens. Hens lacking in Vitamin D are unable to utilise calcium and phosphorous with serious consequences for bone tissue and eggshell.

Ample supplies of cool and clean fresh water are essential for laying hens, especially in the tropics where they will suffer with heat stress. Lack of water will result in loss of production and higher mortality risk. □

— By Dr Terry Mabbett

'Chicken and egg consumption can improve climatic conditions'

RESEARCHERS FROM SWEDEN'S Chalmers University of Technology have said that adopting a protein diet derives from poultry is a smart and inexpensive way to reduce impact of the climate change.

Over the past two decades, Europeans have increased their per capita consumption of beef by over 50 per cent. They have still not caught up with the USA, but the trend all over the world is the same: increasing number of people are eating more beef. This is a trend that counters to the goal of limiting the temperature increase to 2°C, their study showed.

"Cattle ranching is already responsible for 15 per cent of the greenhouse gas emissions that humans cause. The diet we are accustomed to in wealthy countries is not consistent with our climate goals," researcher David Bryngelsson, who recently presented his doctoral thesis on land use, food related greenhouse gas emissions, and climate change, noted.

Amongst other things, he has investigated various future scenarios to determine how the climate would be impacted if humans were to change their diet. People know that a vegetable diet results in less greenhouse gases. Bryngelsson's research showed that continuing eating animal protein could still make a major contribution to the climate — if beef is replaced with poultry and eggs, and cut down on milk and cheese consumption.

"Even people who eat an extremely protein-rich LCHF diet with chicken as the base make a greater contribution to the environment than vegetarians who consume a great deal of dairy products."

Technical improvements in the production chain can to a certain extent also reduce the food industry's climate impact, but cattle are still the biggest problem — they need a lot of feed and that they release methane as they ruminate.



The difference between chicken and beef regarding area requirements and greenhouse gas emissions is so great that there is no doubt that the chicken leaves a smaller carbon footprint regardless of production method

"Changing our consumption is the most effective way to reduce the impact food has on the climate, and my studies show that it would also make it much less expensive to reach climate goals on a global level compared to merely making changes in the energy and transport sector."

"Since around 70 per cent of all agricultural land is currently used to raise cattle, converting to a more energy-efficient diet of poultry would free up land for cultivation of for example bioenergy," Bryngelsson added.

— Science Daily

Stop rodent infestation in poultry farms

Poultry farms are excellent places for rodents not only to survive but to thrive, and it is necessary for one to take precautions to prevent them from invading the farm house

RATS AND MICE could be costing you a small fortune in feed and they increase the risk of a poultry house fire. Jess Campbell, Dennis Brothers, Jeremiah Davis, Jim Donald and Gene Simpson of the National Poultry Technology Center at USA's Auburn University offer their tips on effective rodent control. Poultry houses are warm in the winter, cool in the summer, provide plenty of food and water, have almost unlimited places to hide, and on some farms, have virtually no predators.

Rodents transmit diseases

Rodents can easily contaminate feed and water with urine and faeces. They carry diseases such as salmonellosis, colibacillosis, coryza, pasteurellosis, mycoplasmosis, haemorrhagic enteritis, hymenolepiasis, capillariasis, and ascaridiasis. Rodent control should be a part of the disinfection programme to eliminate disease carry-over.

Rodents eat feed

A single rat can eat as much as 19 kg of feed a year. Some experts say that for every rodent you see there are likely 50 or more that you do not see. So, if one rat eats 19 kg feed a year, then his colony is eating at least 950 kg of chicken feed every year at US\$300 per tonne, according to the research. Besides, rats eat breeder eggs too.

Damage by constant chewing

The upper incisor teeth of rodents continue to grow throughout their life and they must continually chew to keep their teeth from becoming too long, so they chew on poultry houses and equipment such as lumber, insulation, electrical and control wiring, ceiling material, curtains, and rubber tunnel door seals. They may be living in your generator shed and chewing transfer switch that can do serious damage to generators and transfer switches putting your farm at risk of a catastrophic electrical failure.

Rodents are elusive and nocturnal

Rodent infestations are not always apparent until we find the obvious signs of damage to the houses or equipment on the farm. There are literally hundreds of places they can hide from us. They may have a nest in the attic of a house, can burrow in the dirt pads, litter, and any small crevice and go unseen. Much of the damage that is done by rodents is done at night.

Rodents multiply very quickly

Rodents become sexually mature around two to three months of age with a gestation period of between 21 and 25 days. A single female may produce as many as 70 offspring that mature and colonise in a year. A single pair of rodents can infiltrate a poultry farm and establish a vast colony quickly and without being noticed. If you see one it is likely you are not dealing with just one mouse but an entire colony or more.

Rules of thumb

- Occasional sightings at night means 100 to 500



The first step is to make sure the farm is kept as clean as possible

- Nightly sightings and occasional daytime sightings means 500 to 1,000
- Several daytime sightings means 1,000 to 5,000

Successful Rodent Control

There are two basic steps to any successful rodent control programme:

Step 1: Eradicate existing rodents.

Install one bait station close to each corner of the generator shed and one under the generator.

Install bait stations a maximum of every 100 feet along exterior perimeter of all poultry houses. Some experts may suggest more frequent spacing of 80 feet.

Install approximately two bait stations inside every evaporative cooling plenum room (dog house).

Install two bait stations in every control room. Install one additional bait station around feed bins.

Loose rodent meal or block bait should be thrown into the attic from each attic access hole in both directions to increase baited area.

For houses that have a concrete or lumber ledge on the interior wall of the house, one bait station every 100-feet along the interior of the house may also be necessary.

Step 2: Keep the new rodents away

Once all possible rodents have been eradicated from the farm and there are no signs of rodent life, the next step is to do everything possible to keep other rodents from coming in.

The first step is to make sure the farm is kept as clean as possible. This includes eliminating brush and garbage piles, keeping garbage cans clean and having lids, keeping spilled feed cleaned up, keeping water from standing around houses, and keeping the grass cut short between and around all houses.

Control rooms should be kept clean and orderly and generator sheds should not have supplies piled up on the floor, especially around the generator.

Routinely monitoring and maintaining all rodent bait stations, meal baits and traps is the only way to successfully keep rodents from establishing a home on your farm and damaging your equipment.

At least four times a year, all houses must be inspected for possible places where rodents could or have entered the houses. Mice can gain access through and around evaporative cooling systems, damaged exterior metal, corrugations in metal, around doors, through curtains, through fans, through vents, through plumbing entrances, through feed auger entrances and any number of other places. □



Ancient potion helps modern medicine fight superbugs

10th century Anglo-Saxon manuscript reveals the successful method to kill fatal bacteria that affects livestock

The bactericide effect of the recipe is not due to a single ingredient but the combination of ingredients as well as the container material used to make the potion

Photograph: potion-livestock news

SCIENTISTS FROM THE UK's University of Nottingham have discovered that cow bile has anti-bacterial properties. The recipe found in a medieval manuscript Leechbook, believed to be from the 10th century AD, can fight Methicillin-resistant *Staphylococcus aureus* (MRSA), which is one of the most antibiotic-resistant bugs costing modern health services billions.

The Leechbook is widely thought of as one of the earliest known medical textbooks and contains Anglo-Saxon medical advice and recipes for medicines, salves and treatments.

Christina Lee, Anglo-Saxon expert from the School of English, worked with the microbiologists from University of Nottingham's Centre for Biomolecular Sciences to see the effects of the potion.

"Early results on the potion, tested in vitro at the university and backed up by mouse model tests in the USA are astonishing," researchers added.

The team now has good, replicated data showing that Bald's eye salve kills up to 90 per cent of MRSA bacteria in 'in vivo' wound biopsies from mouse models.

However, they believe that the bactericide effect of the recipe is not due to a single ingredient but the combination of other

ingredients as well as the container material used to make the potion.

The recipe calls for two species of *Allium* (garlic and onion or leek), wine and oxgall (bile from a cow's stomach). It describes a very specific method of making the topical solution including the use of a brass vessel to brew it in, a straining to purify it and an instruction to leave the mixture for nine days before use.

The scientists at Nottingham made four separate batches of the remedy using fresh ingredients each time, as well as a control treatment using the same quantity of distilled water and brass sheet to mimic the brewing container but without the vegetable compounds.

The remedy was tested on cultures of the commonly found and hard to treat bacteria *Staphylococcus aureus* in both synthetic wounds and in infected wounds in mice.

None of the individual ingredients alone had any measurable effect, but when combined according to the recipe the *Staphylococcus* populations were almost totally obliterated: about one bacterial cell in a thousand survived.

Lee said, "We were genuinely astonished at the results of our experiments in the lab. We believe modern research into disease can benefit

from past responses and knowledge, which is largely contained in non-scientific writings.

"But the potential of these texts to contribute to addressing the challenges cannot be understood without the combined expertise of both the arts and science."

Steve Diggle, who worked on the laboratory aspect of the project, added, "When we found that it could actually disrupt and kill cells in *Staphylococcus aureus* biofilms, I was genuinely amazed as biofilms are naturally antibiotic resistant and difficult to treat so this was a great result. The fact that it works on an organism that it was apparently designed to treat suggests that people were doing carefully planned experiments long before the scientific method was developed."

US collaborator Rumbaugh noted that MRSA infected wounds are exceptionally difficult to treat in people and in mouse models.

"We have not tested a single antibiotic or experimental therapeutic that is completely effective; however, this 'ancient remedy' performed as good if not better than the conventional antibiotics we used."

The group are now seeking more funding to continue work on this project, and hope that such work can help alleviate the pressing need for new anti-bacterial medicines. □



Antimicrobial consumption in chicken in Asia is expected grow by 129 per cent in 15 years

Poultry, livestock sector to see surge in antibiotic use

China and India were, in 2010, the only two Asian countries amongst the top five consumers of antimicrobials across the world and are projected to remain so until 2030

A FIRST-OF-ITS-KIND study estimates that global use of antibiotics will be 67 per cent higher between 2010 and 2030 to 105,596 tonnes, as agriculture intensifies to meet the growing demand for animal protein.

In fast-growing Asian countries, where antimicrobial consumption is projected to increase significantly, it will pose a serious challenge as these countries are currently experiencing the most rapid increase in demand for meat products, but regulations on antimicrobial use are lacking and surveillance information on antimicrobial consumption is non-existent.

In a paper published in *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, Simon Levin of Princeton University and co-authors from a number of international institutions explain that demand for animal protein for human consumption is rising globally and modern animal production practices are associated with regular use of antimicrobials, potentially increasing selection pressure on bacteria to become resistant.

The study estimates that the global average consumption of antimicrobials stands at 148 mg/kg for chickens. It says that in middle and low-income countries, rising income level has resulted in an increasing demand for animal protein. The researchers also estimate that the global average annual consumption of antimicrobials per kilogramme of animal produced was 45mg/kg for cattle and 172mg/kg for pigs, respectively.

They have addressed this gap by using Bayesian statistical models combining maps of livestock densities, economic projections of demand for meat products and current estimates of antimicrobial consumption in

high-income countries to map antimicrobial use in food animals for 2010 and 2030.

For Brazil, Russia, India, China and South Africa (BRICS), the study finds that the increase in antimicrobial consumption will be 99 per cent — up to seven times the projected population growth in this group of countries.

The researchers call for better understanding of the consequences of the uninhibited growth in veterinary antimicrobial consumption is needed to assess its potential effects on animal and human health.

When asked about the projections, Thomas Van Boeckel, an author of the paper, said, “Although the effect on humans is somewhat indirect, given the huge volume involved and the huge projected surge in consumption in the animal sector, we should be more cautious because this indiscriminate use of antibiotics is a waste of common resource.”

Method of estimation

The study mapped antibiotic consumption in 228 countries in food-producing animals. Estimates on antimicrobial consumption for this study were obtained from 32 high-income countries. These data were extrapolated to estimate antimicrobial consumption in intensive production systems in middle- and low-income countries. The underlying assumption for this study is that intensive farming systems are highly standardised and use similar quantities of antimicrobials across high, middle, and low-income countries. It is to be noted that the unregulated use of antimicrobials in the production of food-producing animals is recognised as one of the factors contributing to the development of antimicrobial resistance across the world.

Boeckel said, “The projections are based on

maps on livestock densities (segregated between extensive and intensive livestock) produced by International Livestock Research Institute (ILRI) and FAO.”

Ramanan Laxminarayan, another co-author, added that intensive farming practices can be very different between the USA and India with respect to hygiene, nutrition, herd health and genetic potential of the flock. There are wide variations in practices even within India and, therefore, their projections which apply to the entire sector are approximate.

What is driving consumption

In Asia, nearly half of the increase in antimicrobial consumption in food animals in 15 years is likely due to the shift in production systems. In addition, antimicrobial consumption in chicken in Asia is expected grow by 129 per cent. The total size of area where antimicrobial consumption occurs is currently greater than 30 kg per sq km and will grow by 143 per cent for chicken in Asia. This is primarily due to the expansion of the poultry sector in India alone where areas of high antimicrobial consumption (above 30 kg per sq km) are expected to grow by 312 per cent in 2030.

The study mentions that India is a country contributing to the overall share in the growth of antimicrobial consumption. The Asian nation is already facing antibiotic overuse in human medicine and a very high prevalence of antibiotic resistant bacteria (about 95 per cent of adults in India carry bacteria resistant to beta-lactam antibiotics). Widespread resistance may impact India more as India's bacterial disease burden is amongst the highest in the world and, thus, antimicrobials play a crucial role in limiting mortality and morbidity. □

Consumer demand in Asia Pacific region leading to better feed innovations

THE INCREASE IN demand for meat and dairy products in the Asia Pacific region has led to a need for using the best possible technology and animal feed methods.

According to a study by global food processing company Cargill, the Asia-Pacific region remains one of its top global priorities for the animal feed business.

With growing consumer demand for meat and dairy products in the region, livestock farmers and dairy producers increasingly seek higher yields, better quality and environmentally sustainable solutions for their operations.

Stoney Su, group director of Cargill's Animal Feed business in Asia Pacific, said, "Asia-Pacific is experiencing a surge in consumer demand for meat and dairy products, and this, in turn, presents an increasing need for quality animal nutrition solutions and applying the best technology.

"The goal is to ensure that the meat and dairy products that people put on their table are of the highest quality thanks to proper animal nutrition and welfare, as well as help



The most attractive opportunities are in China, India and Singapore

our customers increase their productivity and efficiency in a competitive market."

Research and Markets, in its recent report, said that consistent demand from Asia-Pacific for high-quality milk products, along with a preferential change from milk powders to dairy, makes dairy a dominant segment. Constant growth of the cheese, butter, and ice cream segments drives the market.

Low cost, high protein content and the acceptance by the vegetarian population

makes egg and egg-based products the most attractive animal protein. Moreover, most countries promote the consumption of eggs.

The research firm added that the most attractive opportunities are in China, India and Singapore.

The dairy segment includes drinking milk products, yogurt and sour cream, cheese, other dairy (dairy desserts, coffee whiteners, condensed/evaporated milk, cream) and ice cream.

The meat segment includes processed and raw form of poultry, beef, veal, and pork meat.

The egg segment includes eggs and egg products.

The key challenges, however, remain:

- The possibility of a food safety breach occurring within the food supply chain in the animal-based food products market
- Unavailability of land for expansion of livestock acreage in the region for the animal-based food products market
- Rising cost of feed ingredients is directly impacting the market prices of animal-based products

Compident ESF



Worldwide the #1 in electronic sow feeding!



Beijing Kingpeng
Global Husbandry Techn. Co LTD
www.jpqm.com



GSI Group Shanghai
www.gsichina.com



Schauer Agrotech GmbH
A-4731 Prambachkirchen
Phone +43 7277 2326-0*
www.schauer-agrotech.com

China predicted to become number one seafood importer

Analysts at multinational banking and financial services company Rabobank are expecting China to become a key destination for high-value seafood imports

CHINESE FIRMS ARE focusing their efforts on domestic demand, despite the country being a leading seafood exporter. China is currently one of the biggest players in the global seafood arena. The country is also a key importer of a number of other products, such as fishmeal to feed the country's large fish farming industry.

According to Rabobank's latest report, over the next few years China is still expected to be at the forefront of seafood exporting, although as the population becomes more affluent the import/export balance is set to shift.

"We expect China to increasingly import high-end seafood products in the future, while its seafood production industry will focus more on domestic demand, gradually stabilizing its enormous positive net trade position," Rabobank stated.

China has not only found success through its imports, the country's seafood exports reached nearly US\$20bn in 2013, double the number of exports recorded for Norway, which followed closely in second place. The country has surpassed all import regions except for that of the EU. Rabobank expects that it will not take long before the Chinese net export position begins to reverse.

"The drivers are all in place: a growing middle class—demanding higher value seafood from distant regions (e.g. salmon from Norway) — and rising labour and land costs that erode the competitiveness of exports," added the bank.

"In addition, Chinese producers are increasingly aware that the domestic market for products such as shrimp and tilapia offers better prices than the foreign market. In spite of this, between 2000 and 2013 Chinese exports have grown by an impressive CAGR of 15 per cent in value terms," the bank said.

"In the same period, imports have expanded slower than exports, and consequently, China's net trade position has expanded. However, we do not expect this dynamic to continue in the future."

China's growing demand for seafood has become widespread in recent years, with the country said to become a net importer for certain



China has become a key destination for seafood imports

commodities, such as shrimp.

The FAO reported in its 2014 issue of The State of World Fisheries and Aquaculture that China's seafood trade reached a total of \$19.6bn in exports and imports of \$8bn, a new record in 2013.

"China is, by far, the largest exporter of fish and fishery products. However, since 2011, it has become the world's third-largest importing country, after the USA and Japan," stated the FAO. Although this is partly due to its re-processing industry, the country's rising imports also reflect "China's surging domestic consumption of species not available from local sources," said the FAO.

Beijing has banned imports of whole salmon from three Norwegian regions, following concerns they carry infectious salmon anaemia (ISA). That ban represents one-fifth of Norway's salmon exports to China.

Chinese authorities have recently placed stricter controls for salmon from other regions of the Scandinavian country, aimed at identifying ISA and pancreas disease.

"We believe there is no risk that Chinese salmon will be contaminated by the ISA virus because fish products from Norway go directly to consumption," Norway's food safety agency said in a statement recently.



There is a reason why world is moving towards Healthy Animal Food Production

The secret is a centuries old science, now perfected to global standards by Ayurvet. An EU-GMP, ISO 9001-2000 certified company that makes natural feed supplements for farm animals, leading to healthier animals and healthier animal produce like no others.

Give Your Animal Boost of Good Health...
...Productivity and Profitability will come Naturally !



TRADITIONAL KNOWLEDGE, MODERN RESEARCH

SUPERLIV
Liver Formula for Better Protection & Production

MASTILEP
To Prevent, Treat & Control Mastitis

METHIOREP
Phytoadditive for Replacement of Synthetic Methionine

STRESROAK
Herbal Immunomodulator, Antistressor, Adaptogen & Performance Enhancer



AYURVET Limited: 6th Floor, Sagar Plaza, Dist. Centre, Laxmi Nagar, Vikas Marg, Delhi-110032, INDIA | Ph.: +91 11 22456992-4 Fax: +91 11 22456991; e-mail: pverma@ayurvet.com web: www.ayurvet.com

'Proper fish feed can help tackle EMS in shrimps'

FEED ADDITIVES MAY help to reduce the impact of early mortality syndrome (EMS) on shrimp stocks, according to a report from Minh Phu AquaMekong Shrimp Vet Laboratory in Vietnam and Nutriad International in Belgium.

EMS, more technically known as acute hepatopancreatic necrosis disease (AHPND), is a shrimp disease that is presently disrupting production in the major shrimp producing countries China, Thailand, Vietnam and Mexico.

Being caused by specific strains of *vibrio parahaemolyticus* (VP) that are difficult to eradicate from the production environment, AHPND will require a very different approach than the current strategies against white spot virus (WSSV) based on specific bio-security measures.

Avoiding early contamination through the broodstock and larvae, combined with continued control of the microbial populations particularly during the initial month of the cycle, will be crucial to control EMS.

The use of antibiotics to control microbial developments throughout the production

process is not desirable due to the risk for building up resistance and its rejection by legislators and consumers. The shrimp industry requires alternative ways to control the microbial ecosystem in production systems.

Sustainable approaches to modulate the gut microflora in shrimp include the use of a wide variety of natural compounds capable of modulating the microflora towards a favourable composition such as probiotics, organic acids, yeast extracts and phytobiotics. Synergistic effects between these different compounds are most probable, for example phytobiotics can enhance the establishment of probiotic bacteria and, therefore, enhance the



effects of probiotic inoculations in the production system.

Functional feeds containing gut health promoters deliver with every meal an adequate concentration of natural antimicrobial activities into the shrimp gut. These feeds are a key component of any strategy to prevent EMS.

However, the success of this approach will depend on the efficacy of the selected gut health promoter against the pathogenic bacteria involved in EMS.

The gut modulating feed additive ideally is heat stable and can, therefore, be easily incorporated into the feed at the feedmill and be present in every meal from the starter feed onwards, without requiring major adaptations of the production protocols at the nursery or farm.

Natural feed additives combining different action mechanisms against *Vibrio* species such as direct bactericide/bacteriostatic properties as well as Quorum Sensing inhibition properties at concentrations below MIC, are most promising to reduce the impact from EMS.

Scientists generate solar power from underwater

ELECTRICITY-GENERATING SOLAR cells have been created from the chemicals found shells of shrimp and other crustaceans for the first time. The shell materials chitin and chitosan are abundantly found and are significantly cheaper to produce than the metals such as ruthenium, which is similar to platinum, that are currently used in making nano-structured solar cells.

With these prototypes, researchers hope to dramatically decrease the cost of manufacturing photovoltaic systems compared to silicon-based solar cells or even other low-cost solar cells.

The efficiency of solar cells made with these biomass-derived materials is low but if it can be improved they could be placed in everything from wearable chargers for tablets, phones and smart watches, to semi-transparent films over window, researchers from Queen Mary University of London's School of Engineering and Materials Science said.

They used a process known as hydrothermal carbonisation to create the carbon quantum dots (CQDs) from the widely and cheaply available chemicals found in crustacean shells. They then coated standard zinc oxide nanorods with the CQDs to make the solar cells.



New techniques now mean that exciting new materials can be produced from organic by-products that are already easily available (Image source: BlueOrange Studio/Shutterstock)

Joe Briscoe, one of the researchers on the project, said, "This could be a great new way to make these versatile, quick and easy to produce solar cells from readily available, sustainable materials. Once we have improved their efficiency they could be used anywhere that solar cells are used now, particularly to charge the kinds of devices people carry with them every day."

New techniques now mean that exciting new materials can be produced from

organic by-products that are already easily available.

"Sustainable materials can be both high-tech and low-cost," added Magdalena Titirici, professor of sustainable materials technology at QMUL, said.

"We have also used biomass like algae for kinds of supercapacitors that can be used to store power in consumer electronics, in defibrillators and for energy recovery in vehicles," she noted.

Keeping pace with Panama disease in bananas

BANANA IS THE widest grown tropical tree crop and in terms of fruit production the biggest in tonnage at least. However, the pre-eminent position of dessert-type (eating) bananas within international banana trading should not over-shadow the importance of vegetable (cooking) bananas (e.g. plantains and Bluggoe bananas). These bananas represent an important staple high starch food for communities throughout the Far Eastern and Pacific tropical regions of the world.

Plants belonging to the genus *Musa* (banana) are susceptible to a wide range of fungal pathogens such as Sigatoka diseases (*Mycosphaerella* sp) which are routinely controlled by the application of fungicide. However, the most damaging fungal disease of banana is also the most difficult to control. Due to its systemically invasive nature and persistence in the soil *Fusarium* wilt disease of banana (Panama disease), caused by the fungus *Fusarium oxysporum* f. sp. *cubense*, becomes essentially outside the remit and scope of fungicide activity and application.



Plants belonging to the genus *Musa* are susceptible to a wide range of pathogens such as Sigatoka disease

Identification and development of different banana biotypes which are resistant to Panama disease appears to potentially be the most promising way forward. However, the polyploidy genetics of the genus *Musa* which makes plant breeding in banana particularly difficult, together with the genetic versatility of the fungal pathogen and its consequential ability to overcome established genetic resistance in the *Musa* plant host, means that in practical terms plant breeding to overcome Panama disease in banana could be a very tall order indeed.

All that said the bottom line for the economic production of bananas in the face of Panama disease is to keep the pathogen and disease out of the banana estate and plantation through adoption and maintenance of 'water-tight' hygiene and sanitation.

Pathogen and disease

Fusarium oxysporum f. sp. *cubense* is soil borne pathogen. It infects the root system and proceeds to colonise virtually the entire banana plant via the vascular system with the fungal hyphae even able to reach the leaves. Adding to the capability and capacity of this pathogen to establish as a long term and widespread disease is the production of spores called chlamydospores.

These thick-walled and resilient spores will survive in a resting or dormant state within the soil environment for decades until a susceptible banana plant is planted and grown nearby. At this point the spores will germinate to infect the roots and thereby proceed to cause a rapidly-moving, systemic disease that eventually kills the plant. Once the pathogen becomes established in the soil the site essentially is essentially unfit for the planting, growth and production of bananas unless they are resistant to Panama disease.

Prevention and control

The only way to proactively control the pathogen and eradicate Panama disease is by treating the soil with pesticides that kill soil-borne infections and which may subsequently be taken up by the roots and move systemically throughout the plant. However, due to collateral damage within the soil environment, and accompanying degradation of its long term integrity, their use in most banana growing countries of the world is prohibited. Various biological control methods are under investigation and development and are reported to be showing great potential. However, biological control is generally slowing-acting and less complete than control achieved using chemical pesticides.

Good hygiene and sound sanitation, including sourcing banana planting material from disease free areas and the use of disinfection at any point of disease risk – e.g. tools used for cutting banana plant material and footwear before moving from one area to another – continue to provide a basis for control.

'Big Mike' falls foul of Panama disease

How difficult it will be to design, develop and thereafter maintain resistance to *Fusarium oxysporum* f. sp. *cubense* in the *Musa* genus can be judged by looking at the progress of the pathogen and the fate of banana production since the disease was first identified in Latin America in the middle of the last century.

Up until the 1950's the prime banana cultivar for dessert fruit production was Gros Michel a triploid (AAA) cultivar of *Musa acuminata*, and colloquially called 'Big Mike'. My centenarian father-in-law in Trinidad (southernmost island in the Caribbean), where the Gros Michel banana was wiped out during this tropical New World epiphytotic of Panama disease in the mid-twentieth century, still waxes lyrical about the size, taste and flavour of this once famous but now virtually extinct dessert (eating) banana.

It was a strain of *Fusarium oxysporum* f. sp. *cubense* called 'Race 1' (and now virtually omnipresent globally) which wiped out the estates and plantations of Gros Michel bananas across Latin America and the Caribbean starting in the 1950s. Banana plantations were completely destroyed, abandoned and subsequently started afresh in areas that were still free of Panama disease.

However, due to insufficient understanding about the epidemiology of the disease, including its soil borne status and transference on infected planting material, the resulting lack of proper hygiene and sanitation meant new plantings were quickly infected causing the disease epiphytotic to spiral out of control.

The Cavendish banana replacement

A saviour came in the form of another triploid (AAA) cultivar called 'Cavendish' which proved to be resistant to Panama disease. Dessert banana producers began to adopt this new cultivar but at a 'high price' in other respects because Cavendish bananas proved to be more delicate in transport and therefore more prone to bruising.

Consequently the international banana production and marketing chain, including agronomy (growing), post-harvest ripening requirements, transport within the country of production from plantation to dockside and inter-continental shipping to the commodity's main

markets in North America and Europe, had to be re-designed to cope with this new cultivar with much different requirements. What's more in taste and size the Cavendish banana proved to be inferior to the Gros Michel banana.

The 'race' is on for resistance

The new status quo did not last for long because by the 1990's this versatile fungal pathogen appeared as a new and particularly aggressive race called 'Tropical Race 4 (TR4)' which set about destroying tens of thousands of hectares of Cavendish bananas across Asia. TR4 first appeared in Taiwan, subsequently spreading to mainland China and South East Asia, including the Philippines, Indonesia and Malaysia, and eventually into the banana growing areas of northern Australia.

The businesses and livelihoods of banana farmers and their families throughout the Asia Pacific region are threatened by TR4. Bananas are an important cash-crop for millions of people and this disease threatens to cause widespread poverty.

Making matters worse is that Panama disease is no respecter of national borders with its spread aggravated by ever increasing levels of international trade and globalisation. Panama disease can be transmitted via contaminated soil and water as well as more obviously banana planting material and harvested fruit. For these reasons the spread of *Fusarium oxysporum* f.sp. *cubense* to other important banana producing regions of the world like Africa and Latin America was always considered to be just a matter of time. TR4 appeared in the African country of Mozambique in 2013.

The only real hope for the future of banana production in the presence of Panama disease is the rapid identification of genes that will confer resistance to TR4, and the subsequent use of this genetic material in banana breeding programmes. However, intrinsic polyploidy in the genus *Musa* has always made plant breeding in banana considerably more difficult than for other tropical crop plants which do not show polyploidy.

Polyplody is the process and condition of genome doubling, tripling or quadrupling that gives rise to organisms with multiple sets of chromosomes. That said *Musa* is a very wide and varied genus comprising dessert bananas (AAA genome), plantain bananas (AAB genome) and other cooking bananas such as the Bluggoe group (ABB genome) among others. Scientists say there are innumerable wild type bananas out there in the environment which may possess resistance to *Fusarium oxysporum* f. sp. *cubense*.

Interest is now being shown in the use of genetic engineering to develop banana cultivars resistant to TR4. This will involve identification of specific genes from virtually any origin (even animals) and their subsequent insertion into the banana genome to produce a Genetically Modified (GM) banana totally resistant to Panama disease.

Much public disquiet and political controversy surrounds the use of genetic engineering in food crops, especially in countries of the European Union (EU) to where huge quantities of dessert bananas are shipped for consumption. For this reason genetic improvement by 'editing' which is claimed to achieve equivalent results without the introduction of 'foreign' genes into the banana genome may prove to be the more politically acceptable option. Genetic 'editing' involves the alteration, insertion or deletion of genes found in the natural banana genome.

The races of *Fusarium oxysporum* f. sp. *cubense* are:

Race 1: Attacks Gros Michel a triploid (AAA) cultivar of *Musa acuminata* but not cultivars in the Cavendish sub group of this AAA banana biotype; diploid (AA) varieties of *Musa acuminata* which are variously called 'Lady's Finger' and 'Sugar' bananas; tetraploid hybrids (AABB) of *Musa x paradisiaca* and called Pisang Awak in Malaysia

Race 2: Attacks vegetable (cooking) bananas such as those in the Bluggoe sub group and the Blue Java banana which are triploid (ABB)



Public disquiet and controversy surrounds the use of genetic engineering in food crops, especially the European Union (EU)

bananas of *Musa x paradisiaca*

Race 3: Attacks only *Heliconia* (a genus closely related to *Musa* and now widely used in the international plant and flower trade). Race 3 is not a problem on bananas

Race 4: Attacks almost all types of banana including Cavendish, the premier commercial dessert banana cultivar. Race 4 exists as two important strains which are:

- Subtropical race 4 and usually producing symptoms in Cavendish banana after a period of cold stress
- Tropical race 4 (TR4) attacks all *Musa* which are susceptible to Races 1 and 2, as well as bananas in the Cavendish sub group of triploid (AAA) *Musa acuminata*. TR4 represents the most important fungal disease threat to bananas worldwide □

– By Dr Terry Mabbett




Pioneering Plant Health

- Emulsion Fertilisers
- Plant Health Promoters
- Bio-stimulants
- Soluble Powder Fertilisers
- Seed Treatments




www.omex.co.uk

Saddlebow Road, King's Lynn,
Norfolk. PE34 3JA UK
T: +44 (0)1553 817500
E: Agrifluids@omex.com

Copper-bottomed protection for tobacco

COPPER AND TOBACCO are two of the world's traditional commodities with the former playing a crucial role in the successful production of the latter. Tobacco plants are attacked by a wide range of fungal pathogens from the seedling stage in the nursery bed to mature plants in the field bearing leaves ready for picking. Copper fungicides as salts of elemental copper are unrivalled in the range of fungal pathogens they can control as well as showing good activity against plant pathogenic bacteria. The divalent copper ion (Cu^{2+}) which is the active principle of copper containing fungicides is virtually unique in possessing this dual fungicidal and bactericidal action.

Often overlooked is copper's role as a micronutrient or trace element in plant nutrition. Trace elements are required in minute amounts in the tobacco plant's metabolism as vital 'co-factors' for the functioning of specific enzymes. For instance, copper is the co-factor for an enzyme called 'polyphenol oxidase' (PPO). This enzyme is known to play a role in photosynthesis with high PPO concentrations linked to disease resistance in crop plants. Copper as a micronutrient is only required in minute or trace amounts but without it tobacco plants develop symptoms of copper-deficiency and may even die.

Direct control of fungal and bacterial plant pathogens and the maintenance of plant health through these discrete nutritional actions at plant cell and tissue level are down to the divalent copper ion (Cu^{2+}). This positively charged particle (cation) is formed when metallic copper dissolves in aqueous media and increasingly so with more acid conditions (decreasing pH).

History of copper as a fungicide

Roots of copper as a fungicide go all the way back to the observations made by a French plant pathologist called Benedict Prévost in 1807, while the discovery of Bordeaux mixture (also in France) by Professor Millardet some 80 years later was clearly a milestone in the use of copper based fungicides. However, biggest breakthroughs in the development of modern copper fungicide chemistry and technology came in the twentieth century with commercialisation of particulate fixed copper fungicides. These copper compounds are described as 'particulate' because they are composed of individual discrete solid particles,



Crowded tobacco seedling beds are susceptible to heavy plant losses from damping off disease which can be controlled by using sprays of copper fungicide
(Picture courtesy: Alan Lowes, Omex)

and 'fixed' because the potentially active copper ions (Cu^{2+}) are 'locked up' in the molecules.

Fixed copper fungicides are 'insoluble' (sparingly soluble) salts of metallic copper which are sprayed onto the tobacco leaves to form protectant deposits that gradually release the fungicidal and bactericidal Cu^{2+} to provide long term protection of the leaves from infection by fungal spores and bacterial cells. Fixed copper fungicides are usually formulated as a wettable powder or a wettable granule both of which are easily dispersed and suspended in water for spraying onto the tobacco crop.

Fixed copper fungicide in the wettable powder form may also be used a fungicide seed dressing to prevent pathogenic fungi and bacteria, either on the surface of the tobacco seed or in the soil of the seedbed, from infecting and killing the germinating seed or the rooted tobacco seedling. The three mainstream particulate, fixed copper fungicides are cuprous oxide, copper hydroxide and copper oxychloride.

Broad global spread for tobacco

Tobacco remains an important cash crop in many countries throughout the world where climate and weather, soil and fuel resources are compatible with the growing and curing needs of Flue cured Virginia (FCV) tobacco and the light, air-cured Burley tobacco leaf. The following countries figure most prominently

amongst the tobacco producing/exporting countries of the world.

Flue-cured Virginia tobacco – India, Zimbabwe, Brazil and USA are the four big producers with annual productions of at least 200mn kg of tobacco per annum. Other significant producer/exporter nations with 50 to 100mn kg per annum include Indonesia, Philippines, Bangladesh, Pakistan, Tanzania and Argentina.

Light air-cured Burley tobacco – Biggest producer of Burley tobacco is Malawi followed by Brazil and USA all with productions of at least 90mn kg per annum. Other significant Burley producer/exporter nations include Thailand, Philippines, Bangladesh and Argentina all with productions of 20 to 30mn kg per annum.

Broad spectrum protection for tobacco

Protection afforded by copper fungicides/bactericides for tobacco is as broad and complete as you can get from one single pesticide. They protect tobacco seeds, seedlings in the nursery and tobacco plants at all stages of growth and development in the field from infection by fungal spores and bacterial cells. However, a copper fungicide/bactericide is purely protectant in action so it cannot control a disease once it is inside the living tissues and cells of the tobacco plant.

'Damping off' the classic seedbed disease of tobacco

Damping off of tobacco seedlings is the classic disease of the tobacco nursery. As the name suggests it thrives in the moist conditions required for tobacco seed germination and once established is able to spread 'like wildfire' in a typically crowded seedbed. Damping off is caused by a wide and disparate collection of seed-borne and soil-borne fungal pathogens which thrive in the wet humid conditions surrounding dense stands of soft succulent tobacco seedlings in the very earliest stages of germination and growth.

Principal pathogens responsible for 'damping off' in tobacco seedlings are several species of *Pythium*, including *P. debaryanum*, *P. ultimum* and *P. aphanidermatum*. These fungus-like pathogens target tobacco seedlings at soil level to produce a fast developing ring of

dead brown tissue across which neither water, nutrients nor soluble food can be transported. The seedlings fall over and rapidly rot into a wet, slimy and shapeless form. If uncontrolled the disease spreads out rapidly from its initial infection focus to leave circular patches of dead and rotting seedlings across the seedbed.

Seedlings at all stages of growth and development are susceptible but attacks occurring just after germination, on the smallest and most delicate seedlings, can wipe out whole beds of seedlings almost overnight and before the tobacco grower realises what has happened. Damping off disease develops and spreads most rapidly when the following conditions occur together.

- High humidity in the air above and inside stands of seedlings
- Insufficient air movement and ventilation caused by too dense stands of seedlings
- Persistence of globules of surface water on the stems, which is aggravated by over-watering and overly dense stands of seedlings

These conditions provide an ideal microclimate for fungal entry into the plant and also delay the thickening of cell walls thus offering easy penetration for the pathogen.

Fortunately, *Pythium* pathogens responsible for 'damping off' in tobacco are susceptible to copper-based fungicides. Sprays of cuprous oxide, copper oxychloride and cupric hydroxide are traditionally used to control this disease.

Four key field diseases controlled by copper fungicide

Copper fungicides can never be the panacea for all disease ills in field grown tobacco because the biocidal copper ions cannot enter the leaves or stems. This means they cannot 'get at' systemically acting diseases which grow and move internally in the plant. That said copper fungicide applied as a spray can be used to protect growing tobacco plants and especially the leaves against infection by a wide range of other pathogens including the quartet generally regarded as the main threats to tobacco worldwide. They are:

- Frog-eye caused by the fungus *Cercospora nicotianae* which is widely reported from most tobacco growing countries. Severe infections may almost cover the entire leaf surface on tobacco plants in the field causing a major weight loss due to the large proportion of necrotic and dead tobacco leaf tissue
- Angular leaf spot or wildfire caused by a plant pathogenic bacterium called *Pseudomonas syringae* pv *tabaci*. The disease is recognised by the highly characteristic symptoms on leaves comprising a distinct yellow halo surrounding a deeper yellow spot. The disease spreads rapidly during wet



Spraying a crop of tobacco using a hand-held CDA (controlled droplet application) sprayer (Picture courtesy: Micron Sprayers)

and humid conditions and hence the name 'wildfire'.

- Brown spot caused by the fungus *Alternaria alternata*. It is particularly prevalent on tobacco grown in warm climates and severe epiphytotic (epidemics) have been reported from tobacco growing areas of Africa. Typical lesions produced on leaves are essentially circular with a dark necrotic centre with an outer yellow halo in turn surrounded by a paler pre-halo area. Effect on yield can be high with up to 50 per cent weight loss in tobacco leaves.
- Blue mould is caused by the fungus like pathogen called *Peronospora tabacina* and is perhaps the most notorious leaf disease of tobacco. First reported in Queensland, Australia and subsequently spreading to USA and Europe, this downy mildew disease of tobacco leaf is regarded as a quarantine pathogen by those tobacco countries which claim not to have it. More than one major tobacco producer has found that its cured tobacco leaf exports to China have been curtailed or barred due to fears that the commodity might be contaminated with spores of the blue mould pathogen.

Cuprous oxide fungicide has the protective edge

A range of particulate fixed copper fungicides is used as foliar sprays for field grown tobacco but for reasons of chemistry cuprous oxide (Cu_2O) appears to have the 'edge' over the rest. Molecular weight comparisons show that on a weight (mass) for weight (mass) basis cuprous oxide has the highest proportion of active copper which translates into the highest levels of disease control achieved by a single fixed copper fungicide.

The molecular weight of cuprous oxide (Cu_2O) is 143.00 with 127.00 of this (88 per cent) accounted for by the combined mass of two copper atoms. Equivalent figure for cupric hydroxide ($\text{Cu}(\text{OH})_2$) is 63.5/97.5

(65 per cent) and for copper oxychloride [$3\text{Cu}(\text{OH})_2 \cdot \text{CuCl}_2$] 381.00/696.00 (55 per cent).

Mean particle size and particle size distribution of the formulation determines fungicide performance and efficacy. The total number of particles and their combined surface area (in a fixed mass of fungicide) increases with reduced particle size. This translates into superior mixing and suspension in water and more uniform coverage over the plant surface.

Particulate fixed copper fungicides show greater adhesion cohesion because the particles stick to the tobacco leaf surface with a greater force than they stick to each other. The smaller the particles the more uniform is the spray coverage and the greater the chance of particles landing on and adhering to the actual plant surface rather than another particle of copper fungicide. The larger surface area (relative to mass) of smaller particles means the spray deposit has more contact with the plant surface and greater adhesive forces to enhance spray deposit retention and resistance to weathering.

This was demonstrated at Centrilab in the Netherlands where simulated rainfall was applied to plants that had been sprayed with different fixed copper fungicides. Following simulated rainfall at 10mm/hour the retention of Nordox cuprous oxide (mean particle size $1.2\mu\text{m}$) was 80% of the initial spray deposit, compared with less than 40 per cent for cupric hydroxide and copper oxychloride with a mean particle sizes of around $3\mu\text{m}$. All particles in the cuprous oxide fungicide manufactured by Nordox (Oslo, Norway) were within the $1\mu\text{m}$ to $5\mu\text{m}$ diameter range with 80 per cent less than $2\mu\text{m}$ and 99 per cent less than $5\mu\text{m}$.

Sound and sure protection for tobacco plants

Almost 130 years have passed since copper fungicides were first used commercially but these simple salts of one of the world's oldest metal commodities still do the job of protecting tobacco, one of the world's most important crop commodities, from fungal and bacterial diseases. Protection for the tobacco crop is truly 'copper bottomed' and this extends from tobacco seedlings in the nursery to the full grown tobacco plant with leaves ready for picking.

The term 'copper bottomed' means 'sound', 'solid' and 'sure'. The term is derived from the days when ship's hulls were copper plated. Copper is not only fungicidal and bactericidal but also controls the growth of a wide range marine animals like barnacles which otherwise grow in great profusion on ships' hulls to slow down or even de-stabilise the sea-going vessels. □

– By Dr Terry Mabbett

Reviving herbal therapy in Philippines



BAR has launched its Indigenous Plants for Health and Wellness Program (IPHP) to help instill awareness of the potentials of unpopular and underutilised capacities of medicinal plants

The country is pushing to promote and develop local medicinal crops in order to increase home economy

ALBEIT THE RAPID spread of modernisation in the country, the Philippines remains a hub for traditional practices such as using herbs for medical purposes.

There are more than ten thousand varieties of indigenous plants in country but in a report by Ma. Eloisa Aquino of bureau of agricultural research (BAR), Philippine department of health (DOH) highly recommends ten varieties — akapulko (*Cassia alata*), ampalaya or bitter melon (*Momordica charantia*), bayabas or guava (*Psidium*), bawang or garlic (*Allium sativum*), lagundi (*Vitex negundo*), niyog-niyogan or Chinese honeysuckle (*Quisqualis Indica* L.), sambong (*Blumerabalsamifera*), tsaangubat or wild tea (*Ehretia microphylla* Lam.), ulasimangbato (*Pepperomia pellucida*), and Yerba Buena or Marsh Mint (*Mentha spicata*).

Therapeutic oils derived from other flora are also recommended by DOH such as

sampaguita (*Jasminum sambac*), patchouli (*Pogostemon cablin*), ilang-ilang (*Cananga odorata*), lemongrass (*Cymbopogon citrates*) and citronella (*Cymbopogon nardus* L.). The most popular oil that is also making waves in the international market is the virgin coconut oil because of its healing and beautifying effects.

The booming business of health spas in cities has heightened demand for natural herbs as well. Aquino writes that SPAmnia was already earning US\$24.3bn a year, posting a 7.9 per cent increase since 1999. The use of herbal plants is the main attraction of spas and thus, the surge for more use, promotion and development of indigenous plants.

As demand for health and products continues to rise, the government is exerting all efforts to develop the medicinal plants industry. BAR launched its Indigenous Plants

for Health and Wellness Program (IPHP) to help instill awareness of the potentials of unpopular and underutilised capacities of medicinal plants. The IPHP takes into consideration Philippines' biodiversity, specifically targeting the health-promoting plants other than conventional food crops.

According to BAR researcher Rita de la Cruz, IPWHP will identify indigenous species or sub-species of wild flora, which will be tapped also for its pharmaceutical and cosmetic purposes. Touted to be the only country in the ASEAN region to be identified as a biodiversity hotspot, de la Cruz said that the country is blessed with myriad of plant species, which contain phytochemicals proven to ward off fatal diseases such as cancer and heart ailments. Phytochemicals are also known to boost immune system as well as improve eyesight, skin and bone health. These phytochemicals can be found in edible plants but may not necessarily be consumed raw.



The booming business of health spas in cities has heightened demand for natural herbs in the Philippines
(Image source: Camille White/Shutterstock)

Evelyn Rodriguez, associate professor at Institute of Chemistry of the University of the Philippines-Los Baños, explained that many phytochemicals are reasonably heat-stable and most of them are not water-soluble meaning they are not appreciably lost during conventional cooking methods.

IPWH also includes culinary herbs, which are slowly gaining in the local market. Although reasonably small at the moment, de la Cruz noted that the growing market for organic products is favouring the demand for culinary herbs, reinforced by the desire to consume natural/organic products. The trend towards a greater variety of ethnic cuisine also offers a bright prospect towards a bigger market for culinary herbs as 'natural but healthy flavouring agents'. These culinary herbs include sweet basil, parsley, peppermint, rosemary, tarragon, thyme, oregano, fennel, cilantro, chives, black pepper and turmeric. These herbs are also processed into other value-added products.

Because of its health benefits, the government has enacted Republic Act No 8423 or the Traditional Alternative Medicine Act (TAMA) law authored by former Senator Edgardo Angara and signed into law by former president Fidel V. Ramos on 9 December 1997 where it has become a policy to develop the herbal industry with the aim to help reduce the

country's dependence on imported synthetic drugs as well as providing Filipinos access to affordable but effective products derived from medicinal plants.

Synthetic versus natural

In a column by Mary Ann Reyes of *The Philippine Star*, the pharmaceutical conglomerates have been funding a tri-media and PR campaign to link herbal medicines and food supplements with bacteria, a claim premised on an erroneous interpretation of the facts and without scientific basis.

Reyes also wrote that the propaganda of pharmaceutical companies threatens to undo and ruin decades of scientific research undertaken by the scientific community on medicinal plants.

She has emphasised that the term 'drug' should also be attributed to herbal plants under Republic Act No 7394 or the Consumer Act of the Philippines, which is recognised by the Philippine National Formulary intended for treatment, mitigation of disease symptoms, injury or any bodily defects. Reyes also refuted the information about plants containing bacteria which clinical tests prove that reputable brands of herbal remedies only have bacterial content well within and below the limits set by the DOH's Food and Drug Administration (DOH-FDA).

Herbal plants are also recommended for livelihood. Reyes cited that the department of labour and employment encourages that locals start a home-based business such as reflexology, cosmetology, production of bath soap, scented oils, herbal medication and skin health treatment.

Reyes also urged the DOH-FDA to check the quality and efficiency of the imported drugs that are entering the country. She cited the case in Lahore, Pakistan, where hundreds died and more were taken to the hospital after taking cardiovascular drugs. Reyes warned that this could happen in the Philippines if there was the lack of stringent law. She revealed that unlike other drug regulatory agencies in other countries, the local FDA does not even audit drug manufacturers. In contrast to other countries that audit foreign plants, the FDA is being negligent on this part but is injecting more pressure on small drugstores, which sell inferior drugs.

Reyes has, therefore, appealed to the Filipino government to encourage industry cooperation and consultation among the farmers, manufacturers, distributors and the scientific community in defending and promoting the herbal industry for the greater good of the local community in terms of healthcare and employment. □

— By Gemma Delmo

Japan to buy Philippines' new disease-resistant banana variety

JAPAN HAS ACCEPTED a new type of packaged bananas developed by Filipino growers to be resistant to the dreaded Panama disease.

Known to breeders as Giant Cavendish Tissue-Culture Variant (GCTCV-219), the new variety is resistant to *Fusarium wilt*, more commonly called Panama disease, and could, thus, be a potential alternative for the commercial Cavendish variety, which is susceptible to the destructive banana disease, according to *Manila Times*.

Agustin Molina of Bioversity International-Asia and the Pacific Office said that the new banana variety has gained acceptance in Japan because of the optimisation of harvesting time and ripening protocol, innovative four to five fingers cluster packaging and improved branding.

For the new variety to be accepted in the Japanese market, some innovations had to be made, Molina said, noting that the Japanese market requires full-hand packaging for which bananas must have compact and uniformly-curved fingers, the characteristics of the commercial Cavendish variety.

Initial observations showed that the GCTCV-219 variety has



The GCTCV-219 breed is an enhanced selection of another *Fusarium wilt*-resistant variety GCTCV-119

less uniform hand formation and its fingers are more spread than the commercial Grand Naine Cavendish variety. Hence, a small-cluster packaging for GCTCV-219, containing only about four to five fingers per cluster was initiated as a market strategy, giving the new variety a good packaging presentation.

In addition, it received 'sweeter' branding as compared to other varieties, allowing it an initial niche share in the Japanese market.

GCTCV-219 is now sold as premium Cavendish banana in Japan under brand Miyabi.

This endeavour was carried out by the Philippine Fresh Fruits Corporation and supported by the department of agriculture bureau of agricultural research (DA-BAR).

While Molina does not recommend GCTCV-219 as an immediate replacement for the current commercial varieties that are not yet affected by the disease and are still economically grown, the GCTCV-219 variety is a very good option in case the disease becomes out of hand and totally destroys a plantation.

Malaysia to push local pineapple in more international markets

MALAYSIA'S AGRICULTURE AND Agro-based Industry Ministry has announced that the government hopes to market the local MD2 pineapple variety to more countries.

Minister Datuk Seri Ismail Sabri Yaakob said that the pineapple variety had managed to penetrate international market with the latest in South Korea. "We hope that our MD2 will be able to be marketed to Japan and China soon as there are requests from them. This will give a boost to the local pineapple farmers.

"If this can be secured, we are confident that we will be able to assist our farmers in marketing their produce and at the same help increase their income."



The variety will soon be marketed in China and Japan

On marketing efforts in domestic level, he said among the efforts to assist farmers was setting up of more than 200 collection centres for farm produce nationwide.

Apart from that, he said that agro-bazaar outlets will also be upgraded to allow associations who were running them to also sell fresh produce there apart from the daily necessities.

"We have issued a directive to all traders at the 580 *pasar tani* (farmers market) nationwide to only obtain supplies for the produce directly from farmers by 1 June as currently there are some who are still getting supplies from wholesalers," he revealed, adding that the ministry aimed to have 1,000 *pasar tani* nationwide.

Indonesia and Cuba sign MoU for technology transfer in agriculture sector

THE INDONESIAN GOVERNMENT has signed an MoU with Cuba to support each other's development in the agriculture sector.

According to Agriculture Ministry secretary-general Hari Priyono, the partnership aims to develop human resources, technologies and regulatory frameworks in the agriculture sector, with a focus on learning from past accomplishments, like Cuba's competitive advantage in sugar, tobacco and biopharmaceuticals. "On one hand, Cuba excels in sugar production, while on the other, we are number one in palm oil

production. We will initiate a transfer of technologies, capacity building and joint studies aiming to benefit both countries, especially in farming and remote area development," Priyono added.

The secretary general also cited how Indonesia could learn how to increase the yield of local sugarcane, as the industry is still inefficient with low sucrose quantity extracted from sugarcane. According to ministry estimates, the average yield of sugarcane in Indonesia is only 7.5 per cent, whereas in Cuba it is 12 per cent. Cuban Ambassador to

Indonesia Enna Viant Valdes said that her country was updating sugar production technologies, which they could share with Indonesia. In return, Valdes hinted at the possibility of Cuba purchasing Indonesian palm oil to fulfil demand for its vegetable oil, which mostly comprised sunflower oil and soybean oil imported from other Latin American countries.

Cuba had also recently updated its economic model, including its Investment Law and Valdes said the country was open to Indonesian investors.

Using ozone to protect papaya

MALAYSIAN RESEARCHERS ARE developing an ozone treatment to protect papaya and other exotic fruits from diseases and decay during storage and transportation.

Post-harvest diseases reduce the value and quality of agricultural products, leading to economic losses for growers and producers. This



The technology could help maximise profits for producers while improving the safety and quality of agricultural products for consumers

is a major issue for agricultural countries like Malaysia, which exports papaya. Current technologies such as synthetic fungicides help minimise these losses, although potential risks to human health and the ecosystem restrict the use of such chemicals.

Led by Prof. Asgar Ali, researchers at Centre of Excellence for Postharvest Biotechnology at the University of Nottingham Malaysia Campus are currently exploring the potential of ozone as a safer alternative to synthetic fungicides. This technology could help maximise profits for producers while improving the safety and quality of agricultural products for consumers.

"It is saddening that current practices are too dependent on the use of synthetic chemicals — no doubt due to their effectiveness. But our health should come into consideration as well," Ali said.

To test the effects of ozone, the team exposed freshly harvested papaya to gaseous ozone for 96 hours and then stored it at cool temperatures for 14 days. The results showed that ozone-treated papaya had higher antioxidant activity and higher levels of ascorbic acid, beta-carotene and lycopene than untreated papaya.

Ali's team also found that ozone treatment can delay and decrease the incidence of anthracnose, a common postharvest disease of papaya, by inhibiting the growth of microorganisms on the surface of the fruit. Ozone is also effective at removing fungicide residues.

Further study confirmed that ozone has similar antimicrobial effects on freshly cut fruits and vegetables, which are generally more exposed to bacterial contamination during the cutting process.

Weight-loss starch from green banana

A FARMER IN TAIWAN'S Pingtung County, in collaboration with a Japanese expert, has successfully developed a starch made from green bananas that can facilitate weight loss. The product has hit the Japanese market, a cooperative in the southernmost county said.

The starch, which is not digested in the stomach or small intestine is touted as a miracle weight-loss cure, will also be made available on the Taiwan market in coming months, Pingtung Yunghsin Fruit and Vegetable Distribution Cooperative Chairman Chiu Yung-feng announced.

Chiu and Katsuaki Hayashibara, head of Japan's Vantec Corporation, have jointly produced starch from green bananas, according to Chiu.

The starch is a prebiotic, which can help improve digestion and the immune system. Prebiotics are indigestible substances that pass through the gastrointestinal tract and promote the growth of good bacteria in the lower bowel, according to Hayashibara.


Unlike other carbohydrates such as sugar and most other starches, the banana starch is not entirely broken down by the body but is digested like fibre, which means that it passes into the large intestine intact. According to media reports, this can aid weight-loss and is beneficial for weight management.

The starch has garnered a lot of attention at international food expositions in Taiwan and Japan since it is the first of its kind to hit the market, Hayashibara added.

The starch is also found in some other fruits, grains, legumes and vegetables, according to Chiu. The new business could help solve the persistent problem of a banana glut in Taiwan because of bumper harvests, Chiu added.



The banana starch is a prebiotic, which can help improve digestion and immune system



**IS AN ITALIAN COMPANY THAT
PRODUCES AND TRADES
FEED ADDITIVES ALL OVER THE WORLD!**

Animal Health & Nutrition Division

TECHNOLOGICAL ADDITIVES <ul style="list-style-type: none"> • ANTIOXIDANTS • ACIDIFIERS • GROWTH PROMOTERS • ENZYMES • MOLD-INHIBITORS • ANTIMICROBIALS • MYCOTOXIN BINDERS • HERBAM LINE 	COMPLEMENTARY FEEDS <ul style="list-style-type: none"> • NATURAL DIARRHEA PREVENTION • VEGETABLE PROTEIN CONCENTRATES • PELLET BINDERS • NUCLEOTIDES • ENERGISING
NUTRITIONAL ADDITIVES <ul style="list-style-type: none"> • ORGANIC TRACE ELEMENTS: - CHELPRO LINE • ENZYMES • VITAMINS 	SENSORY ADDITIVES <ul style="list-style-type: none"> • AROMAS
PRODUCTS FOR <ul style="list-style-type: none"> • FARM ANIMALS • PETFOOD 	

NEW

www.eurofeed.it info@eurofeed.it

Same Deutz-Fahr are building tractors of up to 270hp in their joint venture with local manufacturers Shandong Changlin

Chinese factories building large tractors

THE STEADY DECLINE in the number of tractor sales in Europe and North America, caused largely by the well-publicised trend toward purchasing larger machinery in these regions, has placed increasing importance on new, emerging markets.

Developing countries, with their hunger for mechanisation, offer a promising opportunity to make up some of the shortfall left by the western agribusiness, particularly if the long-term growth indicators are good.

As the world's largest and fastest growing economy, with a booming domestic market, access to cheap labour and low-cost component parts, China certainly seems to tick all of the boxes.

Expansion into the Chinese market does, however, present its own challenges. Despite the recent advent of some larger models, the domestic market is dominated by simple 25-50hp tractors, typically manual shifting, with basic controls.

The question for western manufacturers is whether to tailor their products to the predominant local spec, or persevere with the larger 'value' models popular in their traditional markets.

AGCO

AGCO invested US\$100mn in the construction of two new Chinese factories in 2009, the first opening in 2010 in Changzhou, building Eco-series three- and four-cylinder engines, primarily for locally built construction vehicles.

Last year, the launch of the first Massey Ferguson Global series tractors followed the construction of a new green-field assembly plant in Changzhou for low- and medium-power tractors, while the firm plans to open another facility at Daqing, northeast of Beijing, to build higher-horsepower tractors as well as harvest machinery.

In fact, the Changzhou plant is due to become the main facility for AGCO's global manufacturing network, supplying components and assemblies to other factories, including Beauvais in France.

CNH Industrial

Case New Holland (CNH) has been involved in China for at least 100 years and expanding 15 years ago by setting up two manufacturing joint ventures. These majority-owned tie-ups involve two local firms, and together, make New Holland the biggest Western player in the country.

The state-run Harbin Machinery Plant in Heilongjiang province involves final assembly of 100-180hp tractors, while the Shanghai Tractor and Combustion Engine Co manufactures power units up to 100hp.

CNH Industrial closed the US\$75mn Shanghai joint venture last year having built a wholly-owned manufacturing facility for Case IH and New Holland tractors and harvest machinery in Harbin.

Said to be the biggest agricultural equipment facility in northeast China, the new US\$100mn factory has an R&D centre to develop components and adapt existing products to the Chinese market.

John Deere

Deere has been manufacturing tractors in China's northeast since forming a joint venture with the state-owned Tianjin Tractor Manufacturing Company. The John Deere Tiantuo Co, 51 per cent owned by Deere, involved a US\$21mn joint investment to build 55-80hp tractors, with Tianjin-built products now going up to 135hp.

A drivetrain manufacturing and assembly plant opened in 2006 and a US\$60mn engine plant was completed in 2013 to make 50-220hp diesel engines for agricultural equipment.

Deere also widened its manufacturing footprint in China by spending US\$85mn in 2007 on Ningbo Benye, the largest tractor maker in southern China, in a move which allowed the firm to broaden its market appeal with Benye's 20-50hp product range. Another US\$80mn was spent on a new factory in Harbin, which came online in 2012, to produce medium and large tractors from 150hp upwards, plus combines and sprayers to supply the region's large crop farms.

Same Deutz-Fahr

A 2011 joint venture with Shandong Changlin marked Same Deutz-Fahr (SDF)'s second foray into China, after completing their first factory in 2009.

Located in the port city of Dalian, close to a new Deutz joint venture engine factory, the plant could build 6,000 tractors a year, but the business closed in 2012 following a change of policy and SDF has now entered into a partnership with Shandong Changlin.

The Chinese manufacturer is well-established in the walking tractor market and had started making full-size machines of up to 110hp.

The 50:50 joint venture combined the existing Shu-He tractor range with local production of higher-spec and higher-power Same and Deutz-Fahr designs, which have progressively moved up to around 270hp.

The partners planned a new factory at Linyi in Shandong province for 26-170hp tractors, inaugurated last year with the launch of the new 140-170hp range designed and built in China, along with a second facility in Suihua City to build higher horsepower Deutz-Fahr models. □

John Deere's upgraded 3E Series can handle agricultural chores with ease

US-BASED MANUFACTURER OF heavy equipment John Deere has upgraded its 3E Series compact utility tractor features for added convenience, comfort and ease of use.

According to the company, 3E Series models are manufactured for rural property owners, small-scale livestock operations, landscape contractors and grounds care maintenance providers who are looking for a machine designed to handle a variety of tasks.

John Deere product marketing manager Scott Schadler said, "The 3E Series is designed to make our customers' work easier. Their compact size, dependability and affordability make the 3E Series a versatile tool for loading, hauling, grading, digging, tilling and mowing.

"A hydrostatic transmission with Twin Touch pedals provides operators with simple controls to find the right speed for the job at hand. It is as easy as pressing a single foot pedal to go forward and another foot pedal to go in reverse. Automotive style cruise control is optional. Intuitive controls are colour-coded for easy operation."

A higher back seat provides more comfort for long days of work. A certified rollover protection structure (ROPS) is designed to provide easier storage, he added.



The 3E Series is compatible with a broad range of implements including mowers, rear blades and post hole diggers

"Without tools, the operator can manually fold the safety device down for easy parking in a garage or shed. The exhaust system was moved from the top of the tractors and now runs parallel to the ground for improved visibility and a cleaner look," noted the manager.

The tractors can be equipped with John Deere iMatch Quick-Hitch to allow faster hooking and unhooking of hitch-mounted implements.

OIL PALM VARIETIES



► Standard density (143 palms/ha)

- **Evolution** (Premium)
- **Spring** (Premium)
- **La Mé** (Standard)

► Stress tolerant

- **Kigoma**
- **Bamenda**

Tolerant to drought, low temperatures and some diseases

► High density varieties (160-170 palms/ha)

Themba, Challenger, Supreme, Evolution Blue and Avalanche

High CPO extraction rate (≥26%), lower harvesting costs and longer commercial life.

WE GUARANTEE:

- The highest quality
- 99.9% tenera purity
- The highest oil content
- Precocity and sustained high yields



www.asd-cr.com

BACKUP BY A SOLID RESEARCH PROGRAM, AND MOTHER-PALMS AND PISIFERAS OF DIVERSE ORIGINS.
TEL: (506) 2284-1120 FAX: (506) 2257-2667 P.O. BOX: 30-1000, SAN JOSÉ, COSTA RICA. E-MAIL: SALES@ASD-CR.COM

Big Dutchman's new products for optimum pig production

BIG DUTCHMAN HAS introduced an APT filter, which effectively supports pig producers in their fight against the porcine reproductive and respiratory syndrome (PRRS). The new PRRS filter is the first system for decentralised fresh air distribution and can thus be retrofitted in existing houses. APT 1500 is used with a positive pressure ventilation system and is designed specifically for wall inlets with an air capacity of 1,500 cu/m per hour. The filtered fresh air is pushed into the house by means of an integrated, energy-saving fan. The risk of infection is, thus, significantly reduced. APT 1500 was developed specifically for use in combination with the Big Dutchman wall inlets of the CL series. Its air capacity corresponds to the capacity of the inlets. An energy-saving fan, adjustable from 0 to 10V, is used.



The ventilation system can also easily be retrofitted for existing wall inlets

APT 1500 consists of the following main parts: Fan; pre-filter, which filters particles with a diameter of three μm and any remaining PRRS viruses adhering to them; and main filter: filters fine particles up to a diameter of 0.3 μm and any remaining PRRS viruses adhering to them. Another solution for modern pig management by the company is the computer-controlled dry feeding system DryExactpro that allows supplying each feed valve with an individual feed recipe. It can be completely integrated into the state-of-the-art BigFarmNet control software.

Other equipment to enhance pig productivity include the PigNic automatic dry feeder and the RainMaker cooling system for ideal climate conditions.

Aussie Pumps for farms run on Kubota's diesel engines

AUSSIE PUMP'S NEW range of high capacity three-inch and four-inch Kubota powered drought buster pumps offer fast self-priming with vertical lifts from creeks, rivers and dams of up to 8.4 metres.

Built around the popular Aussie Quik Prime design principles, the pumps are powered by Kubota's 9.5 hp OC95 electric start air- and oil-cooled diesel engines. It means that the engine runs cooler than conventional air-cooled engines, is quieter and provides an excellent fuel economy.

The pumps feature huge flows with the four-inch version delivering a whopping 1,600 litres per minute and delivery heads of up to 28 metres, ideal for fast filling water carts or transferring big volumes.

The three-inch model, built around the same basic pump design but with three-inch ports, delivers 1,300 litres per minute matched to a higher head of 30 metres vertical lift, which is 43 psi. Both the three-inch and four-inch pumps use both the same Kubota engine, match tested and approved.

Both pumps feature big, open high SG cast iron impellers suitable for passing small solids in suspension. Heavy duty mechanical carbon/ceramic seals are fitted as standard with Buna N Nitrile elastomers. The big Aussie gusher casings are made from high quality marine grade aluminium. Backed a five-year warranty, the engines come with Kubota's two-year warranty to be free of faulty workmanship or materials, said product manager Brad Farrugia.

The pumps come standard with super heavy duty galvanised steel roll frames and galvanised steel sub bases with anti vibration mounts. They are all carefully match tested to



Aussie Pumps 3-inch and 4-inch Kubota diesel powered pumps are engine match tested to ensure performance and smooth running even under load

Kubota's stringent requirement to ensure that the engines are not overloaded but rather are able to work well within their capacity.

"The Kubotas run as smooth as silk, even under load. The advanced cooling three Vortex system that combines oil cooled combustion chamber and air cooled cylinder really works. It's good for farmers and

contractors that the pumps are on the market at prices significantly lower than other air cooled diesel drive pumps.

"The Kubota's represent great value for money with their diesel fuel economy being matched only by the real economics of pumping large quantities of water at the lowest cost per litre of fuel," Farrugia revealed.

Far East a 'critical market' for Massey Ferguson

IN AUGUST 2014, Massey Ferguson launched a new range of tractors the MF4700 Global Series that has been the single biggest investment in the parent company AGCO's history. Massey Ferguson, however, has plans to take the concept of a utility tractor and re-engineer it from the ground up.

Initially, the range offered 72hp and 82hp tractors but in the coming months, the range will ultimately cover 62 to 132hp.

In addition, the Global Series project aims to build tractors for the Far East in the Far East, and in order to achieve this, a massive investment was undertaken – realised in the form of a new factory that was completed in China recently.

"It's taken the best brains in Massey Ferguson to design this brand new range of tractors and the factory to build them in," said Massey Ferguson marketing manager for the Far East David Alvarez. "These tractors are the result of a US\$350mn investment. They are developed specifically to provide an utterly dependable operation in a wide range of applications to meet the needs of Far East professional food producers."

The Far East region is seen as strategically critical for Massey Ferguson as building factories in the region fits well with the company's vision of

high-tech solutions for professional farmers.

So far, 36,000 hours of MF4700 testing has been completed. Testing was carried out in brutal conditions in an A to Z testing programme (from Arizona to Zambia).

The MF4700 series has the following –
MF4707, 72hp
AGCO POWER
3.3 litre, three

cylinder and the MF4708, 82hp AGCO POWER 4.4 litre, four cylinder. Engineers in France have developed a completely new 12x12 transmission with synchronised mechanical reverse shuttle.

The rear axle is "based" on existing, proven design with new inboard reduction units and oil-immersed brakes. An open-centre high pressure hydraulic system with a tandem pump and



The MF4700 is the first of a new range of tractors from Massey Ferguson that will top out at 132hp

Internal oil galleries keeps the oil paths short and makes maintenance simple. A fully-approved ROPS frame and sun canopy have been fitted as standard in Far East Markets. All controls have excellent ergonomics. An analogue instrument panel provides all the information the driver needs.

Bringing big data to farming in Indonesia

INDONESIAN LOCAL START-UP Collective Intelligence Agriculture (CI-Agriculture), subsidiary of analytical solutions provider Mediatrac, is bringing digital innovation to farming in the Southeast Asian country. The firm aims to capitalise on big data analytics technology to improve the welfare of farmers and are currently developing three products that can be used in the agricultural sector to improve productivity and efficiency.

According to CI-Agriculture's agriculture programme manager Hafiz Kalamullah, "We believe the latest technology is able to raise the dignity and welfare of Indonesian farmers to a better level again, as well as urban communities feel the benefits of the technology on all fronts. We hope that farmers in remote areas can go forward by utilising the latest technology."

CGIAR, as quoted by NPR, predicted in the 2030, there will be a drastic reduction in agricultural production in various regions of the world due to climate change. Smart farming or agriculture-based Internet of

Things (IoT) and big data analytics can be alternative solutions to reduce, even reverse this prediction.

Kalamullah also revealed that the firm is developing agricultural management systems by utilising big data analytics technology is based on the analysis of weather, soil sensor information, as well as satellite imagery and drones that can increase agricultural productivity. The system developed is assembled in three products namely Crop Accurate, Agritrack and Crop Insurance.

"The products work to increase the productivity and efficiency of agriculture via sensor technology, smart farming and the mobile application."

Crop Accurate

Utilising Crop Accurate sensor systems, drones, and remote sensing, farmers can collect data to be used by the smart farming systems. The system can guide the farmers assisted farming aggregator (target community banks, microfinance, community food producers or independent) so that farming can be more effective.

"The technology adopted is scalable so that sensors that are used to remain efficient for a large area. Periodically, agricultural data will be collected and analysed to predict crop yields and evaluating treatment plants. At each season, smart farming system analyses the data and recommend a better way of farming in the next planting season."

Agritrack

Agritrack system is an integrated information system for the supply chain of agricultural commodities. The system is designed to bridge the farmers, distributors, and buyers end commodity markets by utilizing a mobile application to enter the state of the real data supply, demand, and problems in the field at any point in the supply lines.



With the use of drones, agricultural data can be collected and analysed

Lush and green 'carbon sinks' need to be preserved

Tree farming can adapt better to climate change-related calamities, said Christoph Wilburger, coordinator of the IUFRO initiative

Forests play multiple roles – they provide nutrition, nurture several kinds of animals and can also go a long way in mitigating climate change. Preserving them is imperative to maintaining ecological balance, reveals research

NEW RESEARCH HAS revealed that forests may be the green investment with the richest returns for humankind.

While one study outlines the ways in which forests provide food, fuel, shelter and a safety net for more than a billion humans, a separate one confirms that a canopy of older, sturdier trees helps protect the saplings and juvenile growths against heat and drought.

A 60-member team of scientists have collaborated on a report titled *Forests, Trees and Landscapes for Food Security and Nutrition: a Global Assessment Report*, which has been published by the International Union of Forest Research Organisations (IUFRO).

"Large-scale crop production is highly vulnerable to extreme weather events, which may occur far more frequently under climate change," said Christoph Wilburger, coordinator of the IUFRO initiative. "Science has shown that tree-based farming can adapt far better to such calamities. We know that forests already play a key role in mitigating the effects of climate change. This report makes it very clear that they also play a key role in alleviating hunger and in improving nutrition."

Climate scientists regard forests as "carbon sinks" or agencies that soak up carbon dioxide from the atmosphere. This could help counter the rising levels of greenhouse gases released by the burning of fossil fuels.

However, forests also have a role in water storage and in protecting land from the forces of erosion. Forest fruits and nuts are an important nutrition source for many. The iron content of the dried seeds of the African locust

bean and raw cashew nut can match the flesh of chickens. Forests also shelter wild meat, fish and edible insects.

In developing countries, around 2.4bn households use wood and charcoal for cooking and heating, and forests deliver a multitude of ecosystem services such as supporting bees and other crop pollinators, delivering fodder for village livestock, and protecting streams and watersheds.

Worldwide, the lower the levels of prosperity, the higher the dependance on forests. In the Sahel region of Africa south of the Sahara, trees contribute on average four-fifths of household income – mostly through shea nut production.

But, expansion of agricultural land accounts for 73 per cent of forest loss worldwide. If forests keep people safe, what keeps a forest in leaf when drought, extremes of heat and the attrition of climate change are also an increasing threat? Solomon Dobrowski, of the Forest Landscape Ecology Lab at the University of Montana and colleagues report in *Global Ecology and Biogeography* that the regeneration of future forests could depend on shelter from the extensive canopy provided by the adult trees in mature woodland.

Juvenile trees are more shallow-rooted and vulnerable to high winds, intense sunlight, high temperatures and extended drought. Without a shady, protective canopy, they could suffer; and without juvenile trees, a forest could only decline. Professor Dobrowski said, "Extensive losses of forest canopy from disturbances such as severe wildfire will

amplify the effects of climate change."

A study by NASA and the US Center for Atmospheric Research, published in the Proceedings of the National Academy of Sciences, has suggested that forests absorb far more carbon dioxide from human sources – far more than they are given credit for. Its estimated that the forests are absorbing 1.4bn tonnes of human-derived CO₂ – a sizeable slice of the total global absorption of 2.5bn tonnes. If the tropical forests are left undisturbed, the trees should be able to go on reducing the rate of global warming by removing CO₂ from the atmosphere.

Lead author of the study David Schimel, a research scientist at the NASA Jet Propulsion Laboratory said, "This is good news, because uptake in northern forests may already be slowing, while tropical forests may continue to take up carbon for many years."

The question of which type of forest absorbs more carbon "is not just an accounting curiosity", added one of the paper's co-authors, Britton Stephens, a scientist at the National Center for Atmospheric Research's Earth Observing Laboratory in Boulder, Colorado. "It has big implications for our understanding of whether global terrestrial ecosystems might continue to offset our carbon dioxide emissions or might begin to exacerbate climate change."

The new study helps make direct comparisons of CO₂ uptake estimates from many sources at different scales, including computer models of ecosystem processes, atmospheric models and satellite images. ■

THE ALL-NEW MF4700 GLOBAL SERIES



MASSEY FERGUSON



MF4700 SERIES | 72 – 82 HP

- 3 and 4-cylinder AGCO POWER engines
- 12x12 synchromesh transmission with synchronised mechanical or power shuttle
- Footstep Operator Station or Semi Platform
- Range of wheel and tyre options available
- Electro-hydraulically engaged differential lock and 4WD available
- 2 Auxiliary spool valves

FROM MASSEY FERGUSON

A world of experience. Working with you.

For more information visit masseyferguson.com.au