

Far Eastern Agriculture

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VICTAM review - p9

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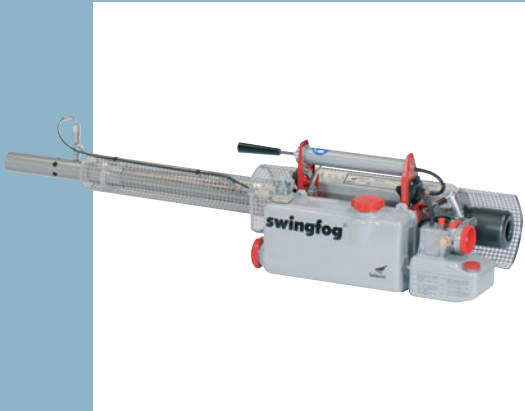
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Photo: Omex



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Decline in Vietnamese tuna exports

VIETNAMESE TUNA EXPORT has declined by 5.5 per cent year-on-year in Q1. According to the Vietnam association of seafood exporters and producers (Vasep), the exports have fallen to US\$98.5mn. Although Vietnam's tuna exports to China have an exponential rise this year, exports to traditional markets like the US, EU and Japan have fallen. Exports to the US have fallen by 4.4 per cent down to US\$36mn, while those to the EU and Japan have dropped by 14.3 per cent and 6 per cent to US\$24.2mn and US\$3.8mn, respectively. Scarcity of the fish, complex regulations on the import of natural tuna and food safety, origin and packaging requirements are some of the factors Vasep attributes to this decline. Under these circumstances, only companies that had their own fishing vessels or worked closely with fishermen could maintain exports to these markets.



Photo: pavel1964/Fotolia

Think BioRisk, think app!

THE BRITISH COMPANY, AHDB Pork, has launched 'Think BioRisk', an app designed to aid pig producers identify bio-security risks. This "hazard perception" video app is made up of a series of interactive video scenarios that demonstrate the best practices and common mistakes in pig production. Whenever a user sees an example of a health risk or bad bio-security, they can access support from the app. It works similar to the hazard perception part of a driving test. On completion, feedback is provided on both good and bad practice portrayed in the videos. Some examples of the training modules include visitors, vehicles, movements of people and livestock, pest control, medicine management and deadstock collection. The app aims to improve long-term protection of pig health and the industry by helping people identify the weak spots in bio-security.

Mangoes from Cambodia to Europe

CAMBODIA-BASED AGRO-INDUSTRIAL COMPANY Mong Reththy Group has delivered 13 shipments of mangoes, totalling 54,000 kg, to Europe this year. According to the company's spokesperson, the most recent shipment contained 4,500 kg of Aiwen and Keo Romeat mangoes. The company has stated that Cambodia is perfectly positioned to export mangoes to Europe in spite of expensive transport and stiff competition from neighbouring countries, including Vietnam and Thailand. According to the Cambodia's Ministry of Agriculture, more than 9,000 tonnes of mangoes were exported in 2015, with the majority being shipped to Vietnam. However, Eang Sophallet, spokesman for the ministry, claimed that many of last year's exports were destined for Europe, albeit indirectly. He said, "It is not the first time that Cambodia has exported these mangoes to Europe. Our mangoes are sent to Thailand and Vietnam to be checked for phytosanitary approval before being shipped to Europe."

New certification standard for seaweed

FRIEND OF THE Sea, the NGO that works in the certification of sustainable fisheries and aquaculture, has launched a new standard for the certification of seaweed from sustainable harvesting and farming. This is aimed at curbing overfishing of wild seaweeds, which apart from being a sought after crop is also a habitat for hundreds of ocean species. The core criteria of the Friend of the Sea



Photo: Hgalina/Fotolia

sustainable seaweed certification are no impact on critical habitat, water monitoring, chemicals and hazardous substances, energy management, social accountability and traceability. This criteria tries to address the threats of over-harvesting and loss of ecosystems that can be caused by the high demand for the crop. Currently China, Indonesia and the Philippines lead global seaweed production, which is approximately 21mn metric tonnes a year.

Thai rice prices hit two-year high

BENCHMARK THAI RICE prices have hit a two-year high as a result of widespread drought conditions in the region. The price of 5 per cent white rice is currently quoted at US\$424 a tonne, up from US\$397 in April, which is the highest rate since May 11, 2014. Prices are at their highest level since the Thai military seized power ago and ended subsidies on the grain in 2014. The surge in rice prices is attributed to lower global supply and the drought in Southeast Asia, which has affected crops in other rice producing countries including India, Vietnam and the Philippines. This has stoked demand for Thai rice exports. Thailand's commerce ministry head of foreign trade Duangporn Rodphaya stated that exports through mid-May were up by 18 per cent on the year at 3.9mn tonnes.



Photo: Peangdao/Fotolia

Events 2016

JUNE

18 - 22 **Food Taipei, Taipei** Taipei, Taiwan www.foodtaipei.com.tw

JULY

11 - 13 **Global Summit on Aquaculture and Fisheries** Kuala Lumpur, Malaysia aquaculture.global-summit.com

27 - 29 **Indo Livestock 2016 Expo & Forum** Jakarta, Indonesia www.indolivestock.com

17 - 19 **New INDO Fisheries 2016 Expo & Forum** Jakarta, Indonesia www.indofisheries.org

27 - 29 **Malaysian International Food & Beverage Trade Fair (MIFB 2016)** Kuala Lumpur, Malaysia www.mifb.com.my

AUGUST

25 - 27 **INAGRITTECH 2016** Jakarta, Indonesia www.inagritech-exhibition.net

26 - 2 **International Poultry & Livestock Expo** Bangalore, India www.iplexpo.com

SEPTEMBER

28 - 30 **IFT International Farming Technology Expo Jakarta** Jakarta, Indonesia www.farmingtechnology-expo.com

NOVEMBER

09 - 13 **EIMA International** Bologna, Italy www.eima.it

15 - 18 **EuroTier** Hanover, Germany www.eurotier.com

23 - 25 **Poultry India 2016** Hyderabad, India www.poultryindia.co.in

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Food Outlook

THE FAO FOOD Price Index (FFPI) averaged 151.8 points in April 2016, up 1.1 points (0.7 per cent) from March, but almost 10 per cent below its April 2015 level. A relatively strong rise in vegetable oil quotations coupled with a more modest gain in international prices of cereals more than offset a decline in dairy and sugar prices. The small increase in April represented a third month of gradual rise in the value of the FFPI.

The FAO Cereal Price Index averaged nearly 150 points in April, up 2.2 points (1.5 per cent) from March, but still down 10.4 per cent year-on-year. Maize quotations increased the most, influenced by weaker US dollar and spill over from soaring prices in the vegetable oils complex. However, favourable weather conditions and expected large supplies in the new season limited gains in wheat markets. On the other hand, rice prices were marginally down, under the pressure of falling Japonica quotations, which outweighed modest increases in the Indica and Aromatic rice segments.

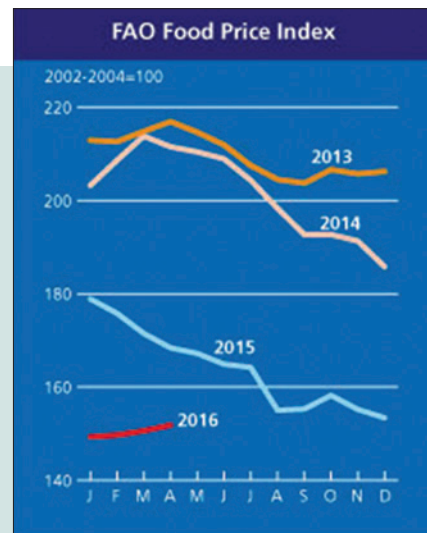
The FAO Vegetable Oil Price Index averaged 166.4 points in April, up 6.6 points (4.1 per cent) from March and representing the third consecutive monthly increase. The April rise was again driven by palm oil, the prices of which climbed to a 17 month high on concerns over a grim 2016 production outlook and a growing world demand. International prices of soy oil, the oil with the second-highest weight in the index,

also firmed due to less favourable 2015/16 production prospects in South America.

The FAO Dairy Price Index averaged 127.4 points in April, down 2.9 points (2.2 per cent) from March. Quotations for dairy products continued to be affected by ample world supplies and limited buying interest by traditional importers. As in the previous month, while prices for all dairy products fell, those of butter and cheese were the most affected, reflecting a build-up of stocks in the major exporting countries. World prices for Skimmed Milk Powder (SMP) have remained close to the EU intervention price, sustained by intervention purchases which have made stocks in the EU surge compared to April last year, a factor which has also lent a degree of stability to Whole Milk Powder (WMP) quotations.

The FAO Meat Price Index averaged 146.6 points in April, up 1.2 points (0.8 per cent) from March. The prices of pig and poultry meats were mostly steady, reflecting an overall balanced supply and demand situation. While they moved higher for sheep meat, the main notable change concerned the rise in bovine meat quotations, where restricted supplies and an up-tick in demand from the United States pushed up Australia's average monthly export prices to their highest level since October 2015.

The FAO Sugar Price Index averaged 215 points in April, down 3.8 points (1.7 per cent) from March. Last month's decline reflected generally



large export availabilities in Brazil, supported by a bumper crop (second highest on record) and expectation of reduced use of sugarcane for the production of ethanol in the country. However, the possibility of global sugar production falling short of the anticipated consumption for the second consecutive season limited the decline in international prices.

Unlike for other commodity groups, most prices utilized 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.

China leads global aqua feed production, shows survey

ACCORDING TO AN annual global feed survey conducted by US-based animal health company, Alltech, in 2015, China led global aquaculture feed production with 17.3mn metric tonnes, at an average cost per finisher diet of US\$850.

Vietnam and Norway were in the second and third places with 2.8mn and 1.789mn metric tonnes, respectively. However, the average finisher diets were much higher in cost, with Vietnam at US\$1,333 and Norway at US\$1,100.

The most expensive finisher diets were from the Asia-Pacific region, with Korea at US\$1,800 and Japan at US\$1,700. Nearly 50 per cent of survey responses indicated that their region's average aqua finisher diets were more than US\$1,000.

Following the feed survey and based on several industry requests, Alltech has completed a deeper dive into analysing the growing aquaculture feed sector and the increased finisher feed prices worldwide.

Alltech chief innovation officer and vice president of corporate accounts Aidan Connolly commented, "Aquaculture is the fastest

growing segment of the feed industry."

"According to the Food and Agriculture Organization, fish consumption now exceeds beef consumption per capita, and farmed fish now exceed wild caught. The scale of the industry is leading many policymakers to question practices and methods, particularly in regard to sustainability," he said.



Global feed tonnage is now at 995.6mn metric tonnes. (Photo: Christian Delbert/Fotolia)

Information for the survey was gathered from 131 countries and information was gathered in partnership with local feed associations and Alltech's sales team, who visit more than 32,000 feed mills annually. Shrimp accounted for 21 per cent of aqua feed production worldwide, with 82 per cent coming from Asia (India at 66, Thailand at 42 and Indonesia at 33 per cent). Salmon feed production took up 11 per cent of total aqua feed production, and Europe was the number one player in this species

sector at 52 per cent.

Alltech's overall 2016 survey estimated that international feed tonnage is now at 995.6mn metric tonnes, a 2 per cent increase over last year and a 14 per cent increase over the last five years.

Drive to improve South Asia's potatoes

INTERNATIONAL ORGANISATIONS, THE International Potato Center (CIP), global seed potato company HZPC and the Syngenta Foundation for Sustainable Agriculture (SFSA) have come together in a new partnership to develop better potatoes for tropical and subtropical conditions.

The organisations will combine their experience and resources to breed and select

potato varieties suitable for local markets in South Asia.

Under the new agreement, CIP and HZPC will focus on research and development. Both organisations will provide support in different areas of expertise. While HZPC will apply its strength in the commercialisation of potato varieties and seed potatoes, CIP will contribute its knowledge in the development of varieties for

sustainable production in the tropics. Both organisations will contribute potato germplasm to the endeavour.

The scientists will aim to bring together the best combination of traits from HZPC potatoes for temperate regions and CIP's varieties adapted for tropical lowlands. The five year breeding programme will aim to produce improved, market-preferred varieties will enable smallholders to increase their yields.

"We are excited to be a part of this effort to deliver improved tropical potato varieties that fulfil a need in all sectors and are resilient to biotic and abiotic stresses", said SFSA chief scientist Mike Robinson.

The partnership has also committed to contributing a percentage of the income from royalties to the benefit-sharing fund of the International Treaty on Plant Genetic Resources for Food and Agriculture. The treaty is an international agreement with 139 signatory countries with the aim to guarantee food security through the conservation, exchange and sustainable use of the world's plant genetic resources for food and agriculture.



The organisations will combine their resources to breed potato varieties suitable for South Asia markets. (Photo: 16:9clue/Flickr)

Ten metre wide mower launched

CLAAS HAS LAUNCHED the Disco 1100C Business, a new disc mower model, claimed to be the widest mounted mower combi in the market.

The mower has a working width of 10.3m. Its two rear mower units are mounted on telescopic arms that allow the working width to be altered from 9.40m up to 10.30m when used in combination with a 3m-wide Disco 3200 Profil front mower.

This flexible working width feature allows the machine to have a greater overlap on the front mower while working on hills or turning around corners and reduce the overlap when working in straight lines.

The telescopic arms of the Disco 1100C can be folded down to less than 4m height and 3m width, making it easy to transport. The mower can also be folded up to save space for storage and the units can be hydraulically locked and unlocked. The 1100C also comes with hydraulically folded protective covers, full disc speed monitoring and adjustable PTO speed. The new Easy on Board app now also allows it to be controlled via an iPad.

The Disco 1100 was launched along with five other mower models including the Disco 3150 and 2750, which have working widths of 3m and 2.6m, respectively. While the Disco 1100 would appeal to contractors and larger farmers, the other models cater to small and medium sized farmers who are looking for a straightforward mower that is easy to operate and can be used on smaller tractors.



The mower has a working width of up to 10.3m. (Photo: Claas)

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Jakarta gears up for Indo Livestock 2016

INDO LIVESTOCK 2016 Expo & Forum, Indonesia's international livestock trade show, will be back for its eleventh edition in Jakarta from 27 - 29 July 2016. The event will be held in conjunction with the Indo Feed 2016, Indo Dairy 2016 and Indo Fisheries 2016 shows.

Indo Livestock, one of the largest livestock shows in the region, is hosted by the directorate general of livestock and animal health, the Ministry of Agriculture of the Republic of Indonesia, every two years. This year, the event, which will be held at the Jakarta Convention Centre covering an area of 15,000 sqm, is expecting more than 15,800



More than 500 exhibitors from 36 countries will participate in the event. (Photo: Napindo)

trade visitors. Around 500 exhibitors from 36 countries have confirmed their participation at the show.

Organised by PT Napindo Media Ashatama, the event aims to be a hub where all players in the industry including feed manufacturers, integrators, farmers, veterinarians, food processors, research institutes, government and industry experts meet, exchange ideas and build partnership. It will create a platform for buyers to source for new equipment and for industry professionals get updates on the latest industry trends and innovations. The show will host exhibitors from all sectors of livestock management and meat processing.

Apart from the exhibition, the show will also include a series of seminars, more than 90 technical presentations and socialising opportunities for participants.

The venue will also play host to the Indo Livestock Industry Award. The award is conceived as a token of appreciation for institutions, companies and individual in the field of animal husbandry who have successfully contributed to the development of the industry in Indonesia.

Indo Livestock 2016 will also showcase a free B2B matchmaking facility for exhibitors and visitors, where entrepreneurs and business professionals are given an opportunity to identify and engage in potentially rewarding B2B cooperation and business partnerships. The show provides visitors and exhibitors the facility to register online to identify and arrange meeting with potential clients or businesses beforehand.

Vietnam's growing livestock industry welcomes ILDEX 2016

THE ORGANISERS, VNU Exhibitions Asia Pacific, have declared the 6th edition of ILDEX Vietnam, the international livestock and dairy meat processing, and aquaculture exposition, a success. The three-day event was held from 23–25 March 2016 at Ho Chi Minh City and saw participation from more than 7,328 visitors and 205 exhibitors from 30 countries. The show hosted exhibitors from a range of sectors including animal feed, animal husbandry, farm equipment, animal health, meat processing, breeding and genetics and slaughtering.

Compared to the last edition of the event held in 2014, there has been a marked growth of about 33 per cent in visitor attendance and 25 per cent rise in the number of exhibitors, according to the organisers. This could potentially be a reflection of expansion of the Vietnamese livestock and aquaculture industries. Vietnam is one of the fastest growing economies in the world and with population growth, changing dietary habits and rising income, there has been a rise in meat consumption in the country. According to the organisers, 2016 is forecast to be an important year for the international economics of Vietnam as a result of its participation in the ASEAN economic community (AEC).

Paolo Pandolfi from AZA International, Italy, who participated in the show, said, "I think that the Vietnamese market is one of the biggest in the pig sector. Here, mechanisation is in progress, but still far from other countries like Thailand. So most of the farms need to be renovated and this is a great opportunity for us."

ILDEX Vietnam aimed to drive the boom in the Vietnam livestock industry by stimulating more investments and new businesses and supporting existing players and provide a platform for international expertise in the sector to meet with local expectation. The event also hosted many seminar programs that explored current and future livestock industry in the region, highlighting specific areas of growth as

well as the latest technology developments. This year, the show dedicated three country pavilions for exhibitors from the United States, France and South Korea to showcase their products and services. This was received well by the visitors and led to many fruitful business interactions, the organisers report.

The show was executed with strong support from the Vietnamese Ministry of Agriculture and Rural Development (MARD) and the Ministry of Industry and Trade, the US consulate general, the consulate general of the Netherlands and the Nong Lam University.

The next edition of ILDEX Vietnam will be held from 14 - 16 March 2018 at Saigon exhibition and convention centre, in Ho Chi Minh City.



ILDEX Vietnam 2016 reported a 33 per cent growth from 2014 in visitor attendance. (Photo: VNU Exhibitions)

FIAAP/VICTAM/GRAPAS 2016: a review

The FIAAP/VICTAM/GRAPAS 2016 took place from 29 to 31 March earlier this year at the BITEC centre in Bangkok.

THE EVENT BROUGHT together many of the feed and grain industry's giants to discuss market trends, network and negotiate potential business deals among 223 exhibitors from more than 25 countries

The first day was closed with a Thai cultural programme and an award ceremony for the innovations presented at the event. These included Belgian company Huvepharma that won the animal feed technology and nutrition award, Singapore-based Kemlin Industries for the aquafeed innovation award and Eye-Grain Apps from Denmark that won the GRAPAS award.

There were a number of conferences organised at the event to cater to members from all the industries within the field. Aquafeed Horizons Asia discussed the trends in the aquatic industry. The FIAAP conference related to the animal nutrition industry and its current and expected developments. GRAPAS Asia had its own global milling conference that catered to the feed and milling aspect of the industry. The other conferences included Petfood Forum Asia, Biomass Asia and GMP+ Feed Safety Assurance.

According to the show organisers, the maximum interest was generated by the feed ingredients stalls followed closely by feed production technology. The other major areas of interest for the visitors included aquafeed ingredients and technology along with rice and flour milling ingredients and technology. The rest of the buzz was attributed to petfood ingredients and technology, storage and handling and biomass technology.

The ASEAN feed summit brought together senior feed regulators and



There was a substantial increase in the overall number of exhibitors and visitors this year. (Photo: VICTAM)

industry representatives from Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Thailand and Vietnam. During the discussions, a number of relevant issues were identified for further potential cooperation, including capacity development for feed safety, sustainability, efforts towards regulatory harmonisation, and standards development to facilitate trade and production at regional and international level. A number of issues from the above were identified for further potential co-operation, including capacity growth for feed safety, efforts towards regulatory coordination, as well as the need to work with all stakeholders on agri-food chain on common challenges.

This year's event also marked the retirement of VICTAM's general manager, Henk van de Bunt who had been with the organisation since its inception in 1991.

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Fungus fermentation turns palm waste into fodder

SCIENTISTS IN MALAYSIA are perfecting a method to produce high-protein animal feed from palm waste and fungi, offering a potential outlet for by-products of the controversial palm oil production.

Farmers often use agro-industrial waste, such as rice bran, as animal feed, but these crop residues lack protein, vitamins and other nutrients, according to a study.

The scientists from the University of Malaysia Perlis (UniMAP) used the fungus *Aspergillus terreus* to produce large amounts of protein through the fermentation of palm pressed fibre and palm oil decanter cakes, two types of palm oil milling residue.

“We opted to focus our research on palm oil agro-industrial waste



Malaysia is the second largest producer of palm in the world after Indonesia (Photo: Auro Queiroz/sxc.hu)

due to its abundance from this industry,” said co-author Zarina Zakaria, a biotechnology researcher at UniMAP, adding, “This approach is cheaper than adding micro-ingredients to the initial low-cost feed, the team says. It would also make use of waste from the flourishing palm oil industry.”

Fermenting the palm oil byproducts with the fungus for seven days at 32°C increased their protein content from 159 to 401 mg per litre for palm-pressed fibre, and from 146 to 493 mg per litre for palm oil decanter cake.

“Our research is still in its early stages, but with further testing it is possible to replicate the process using different types of agro-industrial waste with other strains of microorganisms,” Zakaria added.

Previous efforts have explored the potential of fermenting materials such as coconut dregs, orange waste, rice bran or banana peel, says the paper, published in the *Pertanika Journal of Tropical Agricultural Science* in February 2016.

In recent years, the UN Food and Agriculture Organization (FAO) has stressed the importance of using agro-industrial by-products as livestock feed, for instance by making ‘densified feed blocks’ from straw, noted Harinder Makkar, a feed expert at the FAO. However, there are hurdles ahead to turn the fungus fermentation method into a profitable way to produce animal feed on a large scale, Makkar added.

“The production of single cell protein through fermentation of agro-industrial by-products requires technical expertise and proper infrastructure. While the industry could implement it, this technique will most likely not be accessible directly for small farmers.”

— SciDev.net

New research can identify biomarkers for footpad dermatitis

IN A RECENT research study entitled ‘Identification of Biomarkers for Footpad Dermatitis Development and Wound Healing’, published in *Frontiers in Cellular and Infection Microbiology*, researchers from Novus International Inc. and the University of Arkansas developed a model to induce high-incidence of moderate footpad lesions in order to identify biomarkers for footpad lesion development and wound healing.

The identification of biomarkers for footpad lesion development and wound healing is helpful for understanding the pathology and etiology of FPD.

These biomarkers may also be helpful for developing strategies to intervene or prevent the development of footpad lesions, as well as promoting the wound-healing process.

Footpad dermatitis (FPD) is a type of skin inflammation which causes necrotic lesions on the plantar surface of the footpads in commercial poultry, with significant animal welfare and economic implications. Balancing the risk of FPD is difficult, and careful management of environmental factors and nutrition is required. The identification of biomarkers for footpad lesion development and wound healing is helpful for understanding the pathology and etiology of



Balancing the risk of FPD is difficult, and careful management of environmental factors and nutrition is required (Photo: skyangel/Pixabay)

FPD. These biomarkers may also be helpful for developing strategies to intervene or prevent the development of footpad lesions, as well as promoting the wound-healing process.

To identify biomarkers for FPD development and wound healing, a battery cage trial was conducted in which a paper sheet was put on the bottom of cages to hold feces and induce FPD of broilers. Day of

hatch Ross 708 male broiler chicks were fed the same corn-SBM diets and assigned to three treatments with eight cages per treatment and 11 birds per cage. Cages without paper were used as a negative control (NEG). Cages with papers during the entire growth period (D 0-30) were used as a positive control (POS) to continually induce FPD. Cages with paper during D 0-13 and without paper during d 14-30 were used to examine the dynamic of FPD development and wound healing (LWH). Footpad lesions were scored to grade (G) 1 to 5 with no lesion in G1 and most severe lesion in G5. Covering paper in POS and LWH induced 99 per cent incidence of G3 footpads on D 13. Removing paper from LWH healed footpad lesions by D 30. Representative birds with lesions most close to pen average lesion scores were chosen to collect footpad skin samples for biomarker analysis.

“With this research we now know specific mechanisms involved in the process of wound healing. This also pinpoints where to look for nutritional strategies to directly impact these mechanisms to improve the help of footpads in birds” commented Jeffery Escobar, executive manager of physiology research at Novus.

Probiotics in feed create healthier chickens, study reveals

RESEARCHERS AT USA'S Oklahoma State University's Robert M. Kerr Food and Agricultural Products Center, a part of the Division of Agricultural Sciences and Natural Resources, are studying the implementation of probiotics in chicken feed.

"The reason for the study was to help the food industry produce a healthier bird," said Patricia Rayas, FAPC cereal chemist. "When the probiotics are ingested, they try to outweigh the bad bacteria."

Rayas, along with Alejandro Penalzoa, visiting assistant professor, and Zorba Hernandez, postdoctoral visiting scientist, began studying probiotics in November 2014.

The research team received 300 broiler chickens, which were housed at the OSU poultry farm for 42 days. The broilers were split into four test groups to try different preparations of probiotics.

The team fed probiotics as a supplement in the chickens' diet by using a mixture of probiotic strains created by Penalzoa and a standard feed diet.

Probiotics are used to boost the immune system and serve the microbiota in defending bacteria.

"Our hypothesis was that the probiotics would improve the community of microbes in the gut of



Research has shown probiotics give broilers protection for intestinal integrity and helps the immune system. (Photo: byrev/Pixabay)

the broiler," Rayas reveals. "The broilers were then fed the probiotics two different ways — mixed in the feed and liquid administration."

The final step of the study was to process the chickens in FAPC's processing facility. Data was collected to calculate feed efficiency, and ground samples of the broilers were taken to the Cereal Chemistry Laboratory for further research.

Results showed in the first two weeks the broilers that were fed probiotics had an increased weight gain and lower death rate. When a broiler

gains weight, it gains muscle mass and produces more food, which in return increases potential profit and quantity.

"When the main objective is reached, the isolated probiotics may be useful for the poultry to produce chicken that is free of antibiotics and better-feed efficiency," Hernandez says.

Research has shown probiotics give broilers protection for intestinal integrity and help defend the immune system from unwanted bacteria.

"This research can bring health benefits to chickens and people by maintaining healthy microbial community in the intestine of the chickens," he says. "This would maintain healthier chickens and reduce the use of antibiotics. Additionally, the use of probiotics also can generate ecological benefits and increase the efficiency of feed conversion of the broilers," Hernandez notes.

Rayas adds, "Our hypothesis for the next research project is to use a spore-based probiotic that supports the balance of the micro ecology by simulating the colonisation of beneficial bacteria," she says. "This will improve the broilers intestinal health and enhance growth performance. In the future, we hope to create a mixture so the industry can maintain a healthier intestine for the chickens."



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Least Cost Formulation: knowing fat from lean

Richard Hebel, product manager for fat analysis at Eagle Product Inspection, looks at the role of fat analysis in achieving Least Cost Formulation (LCF).

MEAT PROCESSORS - FIRMS that convert meat from trimming into finished products such as sausages and hamburgers - are under increasing pressure to extract value from a process which offers notoriously slim margins. Changing availability and prices are a constant challenge, therefore the ability to react quickly is paramount and processors must work intelligently in order to do so. One of the methods commonly employed by modern processors is that of LCF, a mathematical optimisation technique that enables them to put together a formula or recipe at the least

cost or expense – specifically where that formula or recipe needs to meet certain technical parameters and constraints and where there is flexibility in ingredient use in meeting those parameters.

Let us take a sausage as an example. If you are making sausages and the specifications state that product must consist of 40 per cent protein, but must also contain a minimum of 70 per cent pork, there are a number of ingredients you could combine in order to achieve this goal. Besides the necessary pork, one or more other animal or vegetable proteins may be selected to achieve recipe targets. This

combination of recipe components and amounts provides flexibility in meeting recipe targets, where that flexibility can be exploited to enable use of inherently lower cost components. And with agile purchasing, this flexibility allows additional cost reduction via low cost spot buys of commodity products whose prices vary daily. LCF enables you to calculate the most cost effective way of purchasing, selecting and combining these ingredients in order to achieve your recipe goal.

LCF also allows processors to make best use of existing inventory. Using LCF calculations, processors can manufacture sausages, that best optimise yield value from existing stock. Since the largest portion of the manufactured product for meat processors is the meat itself, it stands to reason that this is where the attention should be focused.

Inline Fat Analysis enables and improves the reliability of LCF

Fat is a primary determiner of the cost of meat and the ability to measure fat content accurately is crucial to effective LCF.

Accurate fat measurement enables LCF, and this is where advanced x-ray technology comes into play. Modern in-line fat analysis (FA) systems using Dual X-ray Absorptiometry or DEXA technology, enables fat measurement of 100 per cent of the meat based on the differential absorbance of fat and lean meat content using two x-ray energy spectra. The combination of measuring all of the meat, and at accuracies better than $\pm 1\text{CL}$ (chemical lean), enables LCF control schemes to precisely meet blending targets at maximum yield.

Myriad benefits

The meat processing industry, in order to comply with stringent regulatory requirements, must make hygiene a priority. Food borne pathogens have been responsible for countless hospitalisations, even deaths, and the damage to a processor's brand reputation and financial health can be severe if they are identified as the source.

FA systems available on the market today are engineered to NAMI/EHEDG sanitary design guidelines. This makes them ideal to withstand



Meat processors constantly look for ways to optimise production.
(Photo: Eagle Product Inspection)

harsh washdown and sanitation protocols typically required within processing facilities to ensure sanitisation to a microbiological level.

FA systems are also capable of simultaneously detecting physical contaminants, such as glass shards, metal fragments and calcified bone, and measuring weight. The former is critical to ensure dangerous foreign objects do not make it through to the retail supply chain (or damage downstream equipment). The latter provides processors accumulated weight and weighted CL measurements in real time – giving them the ability to control a total batch to target CL at a given batch weight.

The FA system's ability to perform a wide range of tasks simultaneously, coupled with low ongoing costs to extend the lifetime value of the equipment, are key drivers to achieving a fast ROI.

The world before inline FA

Before inline FA became available, measurement techniques could be very accurate but at the same time almost irrelevant to the process of LCF. To expand a little, methods such as the Soxhlet reference method

would use the only choice available at the time – to take batch samples. If you take a 1,000 kg batch of meat, Soxhlet will require just 10 g for a single measurement, meaning that if you took that one sample and called it a true representation of that batch, you are basing your calculations on just 0.001 per cent of the meat. The 10 g measurement you took may be incredibly accurate, but as a representation it cannot be said to amount to anything close to true.

“Fat is a primary determiner of the cost of meat and the ability to measure fat content accurately is crucial to effective LCF.”

To take things further, let us say that two separate entities take 10 measurements each from the same 1,000 kg batch of meat, take them away and compute the averages. The results will still not match unless the batch of

meat was perfectly homogenised – which is all but impossible.

This kind of disagreement lies at the heart of fat claims and is a problem that is completely blown away by the introduction of FA. Since FA looks at 100 per cent of the meat, there can be no sampling errors as they are no longer necessary and, as an added benefit, there is no time spent in the laboratory and no wasted product that cannot be returned to the production line.

Past measurement methods have proved to be too crude to support robust LCF. With FA, what we have is a technology that enables LCF that can have a real impact on both productivity and profitability.

Conclusion

Meat processors who fail to take LCF seriously are likely to encounter commercial problems and compromise on yield. In line FA systems – through accurate fat measurement - enable meat processors to extract every ounce of process yield, and thus operating margin, from the product they process. This puts those that employ FA at a competitive advantage over those that choose not to, as the latter's LCF will not be as efficient as it could be. ■



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Eco-friendly aquaculture and agriculture centre for Malaysia

RAUB, A DISTRICT in the Malaysian city of Pahang, is set to benefit from a new aquaculture and agriculture centre, following the signing of a memorandum of understanding (MOU) earlier this year.

The MOU was signed by integrated water treatment specialist, Ronser Bio-Tech, Casabrina Vacation Villas, Shanghai Jiao Tong University (SJTU) and Japan's Asia Water Business Consultant (AWBC) to build the new centre at the resort in Raub. The university and AWBC will be the technology partners on the project.

Green technology will be a strong focus for the centre with Ronser CEO, Dr Pua Eng Teck, saying that it will use the Mass Bio System it developed, as well as leveraging AWBC's nano technology and SJTU's expertise in developing environmentally friendly technology for aquaculture and agriculture.

"To develop the aquaculture or agriculture industry, water quality is very important," said Dr Teck. He also said that the green technology planned for the project uses less



Aquaculture in Pahang, Malaysia, will get a boost. (Photo: Robert M/Flickr)

electricity and occupied a 20 per cent smaller area than conventional systems.

Felix Tee Yee Loh, managing director and owner of Casabrina Vacation Villas, which is the resort site for the project, is upbeat about how the centre will fit in seamlessly with the surrounding environment. The centre, which

will be located 60km from Kuala Lumpur, will "blend with the resort's tranquility" and help make Raub a major tourist attraction, according to Mr Loh.

The initial investment for the project is expected to be between \$64,000 and \$128,000.

Japanese fisheries recover well from tsunami devastation

FIVE YEARS AFTER a tsunami hit the east coast of Japan, fisheries in the Miyagi Prefecture are up and running and have celebrated an important milestone with the attainment of Aquaculture Stewardship Council (ASC) certification.

In March, the Shizugawa Branch of the Miyagi Prefecture became the first Japanese fish farming collective to achieve ASC certification. This followed an independent assessment by AMITA, a certification body based in Japan. The assessment was conducted against the ASC Bivalve Standard and the certification recognises the collective's responsible social and environmental practices.

The accredited farms are located just off

the Pacific Ocean coastline in the southern half of Shizugawa Bay, in Togura, Minamisanriku Town, in the Miyagi Prefecture's north-east. The area has a long history of aquaculture which dates back to 1899. Since then, many tsunamis have struck the area but the 2011 tsunami, which followed the Tohoku earthquake, was by far the most destructive.

"We are so happy about gaining this certification," said Toshio Sasaki of the Miyagi Fishery Cooperative. He said that members of the cooperative lost everything in the tsunami, including farming facilities and homes, as well as family and friends, but the surviving members gave the community the hope needed to start fishery operations again.

Before the 2011 tsunami, smallholders ran intensive family farms on small sea surfaces, but these proved to be overcrowded and unsustainable. Restarting production gave the cooperative the opportunity to introduce more responsible practices. To achieve this, the farmers worked closely with the World Wildlife Fund (WWF) to revive the seabed using best-practice methods. This included reducing production output by a third each year to establish more balanced production. To improve management of the farms and better utilise updated farming methods, the cooperative was formed.

Once formed, the cooperative was given a government grant to run a three-year pilot programme. At the conclusion of the pilot, the families were encouraged to manage their own farms in accordance with the newly learned farming methods.

Mr Toshio said that while not all families decided to stay in the aquaculture industry, those that remained decided to set up a sustainable farming area for future generations. Practices such as reducing production by a third have resulted in improved oysters, he added.

"They are succeeding by not only rebuilding their community, they are also improving it," said Haruko Horii, standards and certification coordinator for ASC.

A new dawn for Miyagi fisheries. (Photo: Daisuke Matsumura/Flickr)



FAO ready to help combat illegal fishing in APAC

THE ASIA-PACIFIC REGIONAL office of the Food and Agriculture Organization of the United Nations (FAO) has offered to assist countries in the Asia-Pacific region as they implement a new international agreement to address illegal, unregulated and unreported fishing (IUU).

Earlier this week FAO announced that 29 member countries and the EU had formally deposited their instruments of adherence, and the countdown to the entry into force of the Port State Measures Agreement (PSMA) was underway. On 5 June 2016, it will become the world's first legally binding international accord specifically targeting IUU fishing.

Countries from the Asia-Pacific region accounted for nearly one-third of those acceding to the agreement, including major seafood producing countries such as Thailand.



PSMA will dictate the actions to be taken to detect IUU fishing when ships comes to port. (Photo: M.V. Photography/Fotolia)

Collectively, the 29 countries and the European Union, which signed as a single party, have formally committed themselves through their instruments of adherence account for more than 62 per cent of worldwide fish imports and 49 per cent of fish exports, which were US\$133bn and US\$139bn respectively, in 2013.

IUU fishing is responsible for annual catches of up to 26mn tonnes, with a value of up to US\$23bn. It also undermines efforts to ensure sustainable fisheries and responsible fish stock management around the world.

"We are very encouraged that so many countries in the Asia-Pacific region have signed up to this agreement, particularly some of the major exporters like Thailand," said FAO Assistant Director-General and Regional Representative, Kundhavi Kadiresan.

Parties to the agreement from the Asia-Pacific region include Australia, Myanmar, New Zealand, Palau, Republic of Korea, Sri Lanka, Thailand, Tonga and Vanuatu.

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Diseases of the cucurbits

Commercial cucurbit crops including cucumber, courgette (zucchini), pumpkin, squashes and melons suffer from a range of foliar diseases and an integrated approach is required to control them effectively.



New leaves on cucurbit plants expand to many times their initial size in a matter of days, thus requiring more fungicide sprays.

TWO OF THESE diseases carry the word 'mildew' in the common name, although they could not be more different in both causal pathogen and conditions required for disease development. The two diseases are powdery mildew and downy mildew.

Powdery mildew is caused by a true Ascomycete fungus (*Erysiphe cichoracearum*), whereas the pathogen (*Pseudoperonospora cubensis*) responsible for downy mildew is closely related to the Phytophthoras. These Phytophthora and Peronospora plant pathogens were originally regarded as true fungi and placed in the class Oomycetes. However, they are currently called the Oomycota and are now within a much broader and wider group (Phylum Chromista) together with the algae. They are currently described as 'fungus-like'.

With regard to the conditions required to cause disease, the two pathogens are very different. Colonisation of cucurbit crops by *Erysiphe cichoracearum* resulting in powdery mildew disease is generally favoured by foliar dryness with no rain or free moisture (condensation or dew) on the leaf surface. The optimum temperature range is 21-26°C

although fungal activity is still recorded at temperatures up to 35°C.

Conditions for the 'unrestrained' activity of *Pseudoperonospora cubensis* are towards the other end of the temperature and humidity spectra. This pathogen likes it cool and moist with optimum conditions for sporulation around 15°C with 6-12 hours of free water present on the leaf surface, especially as dew.

Daytime temperatures in many warmer climate countries are unfavourable for the development of downy mildew disease but night-time conditions with characteristically lower temperature and higher humidity are often ideal. Downy mildew is common on a wide spectrum of outdoor-grown cucurbit crops but will just as easily develop in the greenhouse, if presented with the right conditions of temperature and moisture.

The fungal pathogen – *Pseudoperonospora cubensis*

Pseudoperonospora cubensis is an obligate parasite or biotroph, which means it requires the living plant host tissue to survive and

reproduce. As such, the pathogen requires cucurbit crops to be available throughout the year, or alternatively wild species belonging to the family Cucurbitaceae such as wild bitter melon (*Momordica charantia*). As such *Pseudoperonospora cubensis* will not survive long periods at sub-zero temperatures or severe drought simply because there will not be any host material left available, either cultivated or wild.

Asexual spores called sporangia produced by the pathogen are dispersed and disseminated in air currents (wind) to nearby plants and neighbouring fields often over long distances. Having alighted on a susceptible cucurbit host, the sporangia produce biflagellate zoospores that swim to and encyst on the stomata to form germ tubes. The appressorium (penetration peg) thus produced by the zoospore forms a penetration hypha which enters into the leaf tissue via the stomatal aperture. Hyphae grow through the leaf mesophyll tissue to produce haustoria which are specialised structures for transferring nutrients and signals between the host and the pathogen.

Disease symptoms will appear on the leaves 4-12 days after infection under optimum conditions for sporulation which are about 15°C with free moisture present on the leaf surface for periods of 6-12 hours. Sexually produced spores called oospores (thick-walled, resting spores) are produced but they are rare with a little known and poorly understood role in nature.

Disease cycle and symptoms

Pseudoperonospora cubensis causes chlorotic (yellow) lesions on the foliage which are naturally angular in shape, simply because they are bound and restricted by the prominent veins on the abaxial (lower) leaf surface of cucurbit crops like cucumber.

Close inspection of the underside of the leaf during humid conditions reveals a grey-brown to purplish-black coloured 'down' which is actually sporulation (spore production) by the pathogen. When viewed under magnification these sporulation sites on the abaxial surface of the leaf show acutely and dichotomously branched sporangiophores (stalks) bearing lemon-shaped sporangia.

Leaves will eventually turn necrotic and curl upwards and at this stage the disease is colloquially called "wildfire". Firstly because of how rapidly the disease develops and spreads but also because the leaves look as though they have been scorched by fire.

Symptoms shown by the leaves on watermelon and cantaloupe melon are different to those which appear on cucumber and pumpkin. Leaf spots on these melon crops are not typically angular and will turn brown to black in colour with an exaggerated upward leaf curling frequently occurring.

Irrespective of the type of cucurbit crop targeted by the pathogen, only the leaves are actually infected, although side-effects may impact fruit yield and quality. The two major effects of downy mildew are:

- Reduced crop yields and higher incidence of misshapen fruit (especially in cucumber)
- Significant numbers of sun-scalded fruit due to the loss of leaf cover because of the increased exposure of fruit to direct sunlight. Sun-scald is especially prevalent in watermelon and certain types of squash

Host specificity and pathotypes

P. cubensis isolates have a specific host range within the cucurbit plant family which means a particular pathogen isolate (population) will infect some cucurbits but not others. For instance cucumber and squash may be grown 'side by side' but only the cucumber succumbs to downy mildew disease. Pathogens which exhibit this type of host specificity are said to exist as a number of distinct pathotypes each



Cucurbit leaves generally present a well displayed and large leaf area for foliar spraying. The white spotting seen on the old leaves in the background is powdery mildew disease.

with its own particular host range. At least five different pathotypes of *P. cubensis* have been described in North America.

Management and control

Successful control of downy mildew requires an integrated approach with fungicide application essential. Cultivars showing host resistance to *P. cubensis* will provide the basis for disease management and should be used wherever possible. Cultivars resistant to downy mildew have been designed and developed for cucumber and cantaloupe melon and to a lesser extent for squash and pumpkin. And although the pathogen has been able to overcome resistant cultivars of cucumber these are still more effective than inherently susceptible cultivars in delaying the onset of infection.

Downy mildew is an aggressive and destructive disease of cucurbits and even when resistant varieties are grown satisfactory control is unlikely to be achieved without the use of fungicides. Fungicide application is essential especially in high risk areas, on susceptible crops and under conditions that favour pathogen activity and disease development. Both contact protectant and systemic suppressive fungicides are applied.

Protectant fungicides and especially fixed copper fungicides like cuprous oxide have always played an important role and part as stand-alone spray applications in the management of downy mildew on cucurbit crops. Copper fungicides must be applied prior to infection (i.e. before the spores land on the leaf surface) with repeat applications required.

Exceptionally short spray intervals (less than 5 days) are invariably required for the protection of exceptionally fast growing cucurbit crops like cucumber. In the tropics it is not unusual for field grown cucumber to produce one new leaf per vine per day which will subsequently expand by up to a factor of 30 within 7 days. Such an exceptional rate

and magnitude of leaf expansion effectively dilutes fungicide deposits to fungicidally inactive levels in just a few days thus presenting a foliar surface which is essentially unprotected against infection by the pathogen.

With effective spray coverage, copper ions (Cu^{2+}) dissolve from the fungicide deposit at a sufficient concentration to kill zoospores as they germinate, and before they have time to penetrate and gain entry into the leaf tissue to establish an infection.

Broad spectrum protectant copper fungicides such as cuprous oxide will also play a crucial integrated role in any fungicide spray programme that includes systemic fungicides. Many of these systemic, pathogen suppressive and site-specific action fungicides have established records of selecting resistant strains to their action within the pathogen population. Spray application of copper fungicides such as cuprous oxide can be rotated with applications of these systemic, suppressive, site-specific action fungicides to 'cover' and protect the latter against pathogen resistance development.

Early detection of the disease is important for effective pre-emptive action by fungicide application. Many cucurbit growers will invariably lose their battle against downy mildew before it even starts by waiting until they can clearly see the disease before initiating a programme of fungicide spraying.

Early detection of downy mildew and prompt preventative action by the application of protectant fungicide is imperative for the control of this disease. Disease forecasting systems have been developed to assist growers in obtaining the most appropriate timing for fungicide application. Forecasting systems track outbreaks of the disease using prevailing weather parameters and spore trapping devices to provide a forecast, or a risk assessment for future outbreaks. ■

- By Dr Terry Mabbett

Myanmar set to adopt climate-smart strategies in agriculture

MYANMAR'S CLIMATE-SMART AGRICULTURE (MCSA) Strategy has paved the way towards guided planning for national climate change adaptation and mitigation. Germanwatch's Climate Risk Index for 1994-2013 ranked Myanmar as the second most vulnerable country in the world, after Honduras. In May 2008, the category-4 cyclone Nargis hit, which has been called the worst natural disaster in the country's recorded history.

According to a World Bank report, Nargis severely affected the country's agriculture sector with losses equivalent to 80,000 tonnes of crops and damaging another 251,000 tonnes in storage, across 34,000 ha of cropland.

In Myanmar, 61 per cent of its 53mn people depend on agriculture for their livelihood. This, however, is being constantly threatened as the region experiences prolonged droughts, frequent floods, sea-level rise, and other weather-related natural disasters. Facing the unprecedented challenges caused by climate change seems daunting.

"Extreme climate variabilities are evident; natural disasters are increasing from year to

To tackle climate change, CSA focuses on three pillars — food security, adaptation and mitigation. (Photo: Skitterphoto/Pexels)



year, and human activities are compounding the negative impact of climate change," said Tin Htut, permanent secretary of the Ministry of Agriculture and Irrigation in Myanmar, during the recent launching of the strategy. "These bleak scenarios bear significant impacts on food production."

He emphasised that Myanmar urgently

needs to develop climate-smart agriculture (CSA) practices and technologies to boost agriculture and have more options for adapting to climate and lessening its effects.

Myanmar committed to applying CSA practices to contribute to regional food security and environmental protection during the 24th ASEAN Summit in May 2014.

Modern rice information system helps Philippines prepare for disasters

RELIABLE INFORMATION BASED on satellite data and ground observations can help the Philippines prepare for and mitigate the effect of recurring disasters, such as typhoons and El Niño on rice growing areas in Mindanao.

Since 2014, the Philippine Rice Information System (PRISM) has been providing the department of agriculture (DA) with timely seasonal data on rice area and yield and assessment of crop health and damage in the event of a typhoon, flood, or drought. In its first annual executive meeting on 31 March, PRISM presented its achievements and activities to a wider audience.

"PRISM uses remote sensing, crop modeling, cloud computing, and smart phone-based surveys for rice mapping and monitoring," said Alice Laborte, who leads the PRISM project at the International Rice

Research Institute (IRRI).

PRISM, one of seven projects under the Food Staples Sufficiency Program (FSSP), is a collaborative project between IRRI, Philippine Rice Research Institute (PhilRice) and the DA. The development and implementation of PRISM in the Philippines are funded under the DA's National Rice Program.

"Specifically, PRISM uses high-resolution synthetic aperture radar (SAR) imagery acquired throughout the rice growing season," Laborte said. "SAR imagery can be acquired day or night and even on cloudy days. This makes the technology perfect for monitoring rice growth and assessing damage to rice crops resulting from floods and typhoons."

"The rice maps derived from satellite images are being validated through field surveys where we enjoin and train local field technicians from the DA's regional field offices, local government units, and, in some cases, farmers to gather the data," explained Laborte. "This activity provides a way for us to assess the accuracy of PRISM products while helping to build the technical skills and capacity of our partners. Our rice maps for the 2015 wet season, for example, have an overall accuracy of 85 per cent, based on 2,223 validation points throughout the country."

From the 2014 and 2015 cropping seasons, 443 satellite images from across the country were acquired and used in rice area mapping and damage assessment. Some of these images were used to map flood-affected parts of Nueva Ecija where last year's Typhoon Koppu hit and to assess drought-affected areas in Mindanao since last year due to the prolonged El Niño.

To be continued by the DA beyond 2017, the PRISM project is a pioneering achievement as the Philippines is the first country in Southeast Asia to have such an operational system.



The information is based on data collected by project partners who use smartphone applications, which are useful tools for gathering and submitting the data to a server in real time. (Photo: IRRI)

Researchers improves crop performance with new biotechnology

WITH THE WORLD'S population exploding to well over seven billion, feeding the human race is getting even more challenging. Increasing the yield from crops such as wheat, maize, rice and barley is paramount to growing enough food.

In addition, crop production is now affected by stressors such as drought, climate change and the salinisation of fields—presenting obstacles to our future food supply.

Researchers with School of Life Sciences, University of Arizona, University of North Texas and with the USDA/ARS Children's Nutrition Research Center, Baylor College of Medicine, have discovered a way to enhance a plant's tolerance to stress, which in turn improves how it uses water and nutrients from the soil. These improvements increase plant biomass and yield.

The study's findings are published in the scientific journal, *Trends in Biotechnology*.

Associate professor at ASU School of Life Sciences, Roberto Gaxiola, said this discovery could be instrumental in agriculture and food security by improving crop sustainability and performance.

"We have learned how to modify the expression of a gene that codes for a plant proton pump," said



World cereal production in 2016 is set to amount to 2,521mn tonnes, just 0.2 per cent off last year's large output and the third-highest global performance on record, according to FAO's recent forecast. (Photo: Daniel Nanesco/Pexels)

Gaxiola, lead author of the study.

"This gene helps to move photosynthates — molecules made by photosynthesis in the leaves — to the places plants need them in order to grow better roots, fruits, young leaves and seeds. This gene is called type 1 H⁺-PPase and is found naturally in all plants."

Current agricultural methods often overuse fertiliser, causing environmental problems by polluting water with phosphates and creating dead

zones in oceans downstream. Over-fertilisation can also cause plants to have small roots — something that was not anticipated when fertilisers were developed in the early 1900s.

By changing how effectively a plant uses water and nutrients, farmers would be able to use fewer resources to grow their crops.

"Larger roots allow plants to more efficiently acquire both nutrients and water. We can optimise inputs while minimising environmental impacts. This is advantageous for our environment and for all consumers," Gaxiola added.

Altering the expression of this gene in rice, corn, barley, wheat, tomato, lettuce, cotton and finger millet caused better growth in roots and shoots, and also improve how the plants absorbed nutrients. These crops also saw improved water use and tolerance to salt. In finger millet, researchers also discovered an increase in antioxidants, but further studies would be needed to know whether this is the case with other crops as well.

Gaxiola suggested the next step is to further study this simple biotechnology in order to maximise its agricultural potential.

— *Phys.org*

Malaysia set to introduce crop insurance for farmers

MALAYSIA'S AGRICULTURE AND Agro-based Industry Ministry will soon introduce "crop insurance" to protect farmers from risks linked to climate change such as drought, diseases and floods.

"In its first phase, the crop insurance will cover only *padi*. Later, it will include other agriculture activities such as livestock, agro-food commodities such as fruits and vegetables as well as the fisheries sector," said minister Datuk Seri Ahmad Shabery Cheek.

The insurance, he revealed, would make the agriculture sector more attractive to investors and give the farmers peace of mind, knowing that they were protected from the risk of any unfortunate eventualities.

Shabery added that the ministry had identified strategies to increase export and control imports such as intensifying production and efficiency, enhancing the competitiveness of Malaysian products and developing import substitution, which included changing Malaysian lifestyles to create more demand for local products.

"We also import a vast amount of animal feed such as soy and maize. We will explore how these can be grown on our own farms."

The ministry would carry out a mid-term review of the National Agro-Food Policy (NAP) soon.

NAP outlines the directions for agro-food development from 2011 to 2020. It has generally taken into account the effects of climate change.

"Although the main reason for the mid-term review is to evaluate our current achievements compared to what we have planned before, new challenges such as climate change and new opportunities such as exports of our agro-food will also be considered," he said.



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Earth to Mars and back again

TECHNOLOGY USED TO develop a mobile rover platform used for exploration on Mars is now being employed in an agricultural monitoring system. The device is going to be used for testing soil quality at the University of Strathclyde.

UK Space Agency's International Partnerships Space Programme (IPSP) is funding the project for this device, known as AgriRover, an agricultural monitoring system consisting of a mobile rover platform with a robotic arm that carries a soil sensing instrument.

The feasibility of this device's agricultural operations will be tested out using an integrated, force feedback-controlled robotic system on the ground during the project. This phase will be carried out by the Strathclyde researchers working with partners in China and UK.

The Principal Investigator of the research at the university's department of design, manufacture and engineering management, Professor Xiu Yan said, "Advanced machinery has been used in agriculture worldwide for centuries but a range of factors are making innovation in this area more important than ever, including environmental considerations, demographic changes, urbanisation, sustainable farming, increasing competition and the need to provide food for a rapidly growing global population."

"Robotic technology will be a key technological enabler for precision farming and this project is a combination of frontier research programmes in space robotic technologies. It focuses on a unique soil sensing technology; it is also based on space instrumentation and the



AgriRover consists of a mobile rover platform with a robotic arm that carries a soil sensing instrument. (Photo: University of Strathclyde)

deployment of a UK-developed, intuitive master robotic control system," he added.

He said, "By harnessing space technology for a new application in farming, and engaging in a valuable research collaboration with China, this project will deliver many benefits around the world."

Drone sales to soar higher in Southeast Asia

UNMANNED AERIAL VEHICLES (UAV), more commonly known as drones, are quickly becoming the world's favourite electronic gadgets as they become cheaper and easier to use. This is especially true in this part of the world, where agriculture contributes to a large share of the GDP.

In the last couple of years alone, these little flying machines have increasingly gained utility and are now being used in a variety of industries. Apart from agriculture, they can be efficiently utilised in parcel or medical supplies delivery, construction and surveying and mapping. As a result, the research has increased which has in turn given rise to lighter, easier and more flexible units.



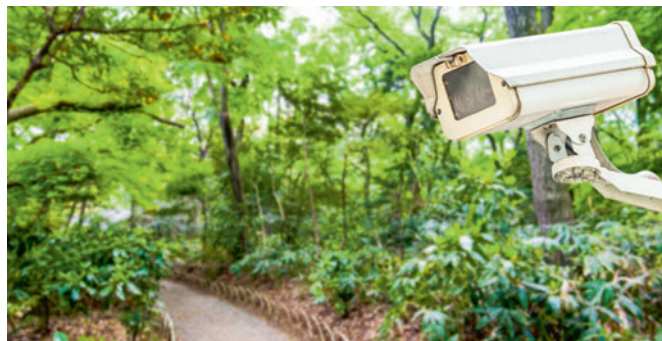
Drones are now being actively employed in different industries. (Photo: unten44/Flickr)

Colin Guinn, chief revenue officer of 3D Robotics commented, "We expect revenue from Southeast Asia to account for 20 per cent of our combined global revenue this year."

There have been innovations in the market to allow drones (agriculture related or commercial) to be even more accessible for usage. For instance, they equipment can be directly connected to an App or an operating system like Linux for control.

Smile, you're on CCTV!

MONITORING LARGE FARMS for trespassers has always been an issue for farmers around the world and fitting CCTV cameras around the farmyard is a good way to tackle the issue.



Picture for representative purposes only. (Photo: stnazkul/Fotolia)

Hampshire-based company Telemetricor has launched a long-range, real-time, motion activated wireless camera system that claims to be able to run on a couple of AA batteries for several months at a time. The system works over the radio network, so the company expects no issue with signal blackspots. Images are sent to the company's servers straight and then to an app on the farmer or landowner's mobile phone. Using the app, the police can be notified and provided the image as well. The GPS location and image could also be shared with other people. In the six-week trial conducted on a 4,000-acre estate to test out the app, it was able to catch three incidents on camera allowing the landowner to take action before any damage was done, according to the company.

The system itself is cheaper than conventional CCTV, says the company and doesn't have to be watched. It is a movable system and can be installed easily by the user himself.

Agricultural Buyers' Guide

2016

Section One - Listings by categories

Section Two - List of suppliers

Section Three - Contact details of agents in Asia

**PLEASE MENTION FAR EASTERN AGRICULTURE
WHEN CONTACTING YOUR SUPPLIERS**

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Exports

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Eurofeed Technologies S.p.A.
Leiber GmbH

Health Products

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Ayurvet Ltd.
BIOMIN Singapore Pte Ltd.
Eurofeed Technologies S.p.A.
Henke-Sass, Wolf GmbH
Meriden Animal Health

Milking Equipment

MIK INTERNATIONAL

Ventilation & Control Equipment

Termotecnica Pericoli S.r.l.

Veterinary Equipment

Henke-Sass, Wolf GmbH

Watering Equipment

Impex Barneveld b.v

Chemicals

Bio-Pesticides

Ayurvet Ltd.

Disinfectants

Eurofeed Technologies S.p.A.
iGrain

Fungicides

iGrain

Herbicides

Ayurvet Ltd.

Minerals

Avitech Nutrition Pvt. Ltd.
Eurofeed Technologies S.p.A.

Miticides

Ayurvet Ltd.

Crops

Backhoes

Optivite

Cleaning Equipment

Vibrafloor

Drilling, Planting Equipment

Special Nutrients

Grading

Sigur Agricultural Science and Technology

Grain Cleaning

Sigur Agricultural Science and Technology

Grain Drying

HG Link Global

Grain Handling

Sigur Agricultural Science and Technology

Grain Storage

Vibrafloor

Harvesters

AGCO Ltd.

Horticultural Equipment

Swingtec GmbH

Integrated Pest Management

Swingtec GmbH

Moisture Testing

iGrain

Processing, Oil Palm

AGCO Ltd.

Processing, Rice

HG Link Global

Ricemills

HG Link Global

Seed Processing

Sigur Agricultural Science and Technology

Sprayers, Hand

GOIZPER GROUP - Goizper Spraying Business

Sprayers, Knapsack

GOIZPER GROUP - Goizper Spraying Business

Sprayers, Rotary Atomizer

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Sprayers, ULV

GOIZPER GROUP - Goizper Spraying Business

Impex Barneveld b.v

Swingtec GmbH

Spraying Accessories

GOIZPER GROUP - Goizper Spraying Business

Spreaders

Sigur Agricultural Science and Technology

Storage Equipment

Vibrafloor

Tillage

AGCO Ltd.

Tractors

AGCO Ltd.

Feed

Additives

Anpario PLC
Avitech Nutrition Pvt. Ltd.
Ayurvet Ltd.
BIOMIN Singapore Pte Ltd.
Eurofeed Technologies S.p.A.
Kemin Industries (Asia) Pte Ltd.
Meriden Animal Health
Optivite
Unipoint AG

Aquaculture

Ayurvet Ltd.
Eurofeed Technologies S.p.A.
Leiber GmbH

Concentrates

Eurofeed Technologies S.p.A.

Conditioning

Van Aarsen International

Feed mills

Awila Anlagenbau GmbH
DSL Systems Ltd.
Muller Beltex b.v

Van Aarsen International

Grinding/Pelleting/Cooling

Awila Anlagenbau GmbH
Eurofeed Technologies S.p.A.
Van Aarsen International

Mixing

Awila Anlagenbau GmbH
Eurofeed Technologies S.p.A.
Van Aarsen International

Pharmaceuticals

Ayurvet Ltd.

Premixes

Avitech Nutrition Pvt. Ltd.
Ayurvet Ltd.
BIOMIN Singapore Pte Ltd.
Eurofeed Technologies S.p.A.
Van Aarsen International

Soya Protein

Eurofeed Technologies S.p.A.
HAMLET PROTEIN AS

Supplements

Ayurvet Ltd.
Eurofeed Technologies S.p.A.

Vitamins

Avitech Nutrition Pvt. Ltd.
Eurofeed Technologies S.p.A.

Pigs

Breeding Equipment

Technical Systems

Exports

Henke-Sass, Wolf GmbH

Feed

Ayurvet Ltd.
Eurofeed Technologies S.p.A.
Leiber GmbH
Muller Beltex b.v

Feeding Systems

Big Dutchman International GmbH
MIK INTERNATIONAL
Schauer Agrotronic GmbH
Technical Systems

Flooring

MIK INTERNATIONAL

Health Products

Anpario PLC
Ayurvet Ltd.
BIOMIN Singapore Pte Ltd.
Eurofeed Technologies S.p.A.
Henke-Sass, Wolf GmbH
Meriden Animal Health
Optivite

Housing

Big Dutchman International GmbH

Medicators

Impex Barneveld b.v

Pest Control

Ayurvet Ltd.
Swingtec GmbH

Ventilation & Control Equipment

Hotraco Agri b.v
Termotecnica Pericoli S.r.l.

Veterinary Equipment

Henke-Sass, Wolf GmbH

Watering Equipment

Impex Barneveld b.v
Lubing Maschinenfabrik GmbH & Co. KG

Poultry

Broiler Suppliers

Cobb Asia-Pacific
Technical Systems

Cages

Big Dutchman International GmbH
Technical Systems

Drinking Equipment

Big Dutchman International GmbH
Impex Barneveld b.v

Lubing Maschinenfabrik GmbH & Co. KG

Egg Grading and Packing

MASITEK Instruments Inc.

Egg Handling

Hotraco Agri b.v
Lubing Maschinenfabrik GmbH & Co. KG
MASITEK Instruments Inc.

Visceration, Portioning

Marel Poultry

Feed

Ayurvet Ltd.
Eurofeed Technologies S.p.A.
Leiber GmbH

Feeders

Big Dutchman International GmbH
Impex Barneveld b.v
Technical Systems

Flooring

Lubing Maschinenfabrik GmbH & Co. KG

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Health Products

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Ayurvet Ltd.
BIOMIN Singapore Pte Ltd.
Eurofeed Technologies S.p.A.
Henke-Sass, Wolf GmbH
Meriden Animal Health
Optivite

Medicators

Impex Barneveld b.v
Lubing Maschinenfabrik GmbH & Co. KG

Nest Pads

Impex Barneveld b.v

Poultry Stock

Cobb Asia-Pacific

Processing

HG Link Global
Marel Poultry

Slaughtering Equipment

Marel Poultry

Ventilation & Control Equipment

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iGrain

Termotecnica Pericoli S.r.l.

Veterinary Equipment

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Other

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Animal Health

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BIOMIN Singapore Pte Ltd.
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Henke-Sass, Wolf GmbH
Leiber GmbH

Biological Crop Protection

iGrain

Computerization

DSL Systems Ltd.
Hotraco Agri b.v

Evaporative Cooling

Termotecnica Pericoli S.r.l.

Fogging Equipment

Swingtec GmbH

Food Processing Equipment

Perten Instruments AB

Goat Farming

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Perten Instruments AB

Mould Inhibitors

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Pest Control

iGrain
Production Control
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MASITEK Instruments Inc.
Perten Instruments AB

Seed/Oil Crops

Muller Beltex b.v

Sheep Farming

MIK INTERNATIONAL

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Awila Anlagenbau GmbH
Vibrafloor

Sorting Equipment

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Sugar Cane Technology

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Ventilation

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Veterinary Instruments

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Water

Impex Barneveld b.v

Weighing Equipment

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New Zealand - Mike McNaught
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Sri Lanka - Jeroen Kremers
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Taiwan - Global Ace Trading Co.
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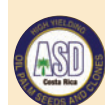
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E-mail: stordenmalm@perten.com

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Fax: +66 2 7171408
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Schauer Agrotronic GmbH

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Swingtec GmbH

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- electrically driven ULV aerosol generators
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In Vietnam, alternate wetting and drying in irrigated rice is helping farmers use less water, and lower emissions, without compromising yields. (Photo: xuanhuongho/Fotolia)

Call for reduction in agriculture emissions

Scientists have calculated, for the first time, the extent to which agricultural emissions must be reduced to meet the new climate agreement's plan to limit warming to 2°C in 2100.

SCIENTISTS FROM THE University of Vermont, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), and partner institutions estimate that the agriculture sector must reduce non-CO₂ emissions by 1 gigaton per year in 2030. Yet in-depth analysis also revealed a major gap between the existing mitigation options for the agriculture sector and the reductions needed – current interventions would only deliver between 21-40 per cent of mitigation required.

The authors warn that emission reductions in other sectors such as energy and transport will be insufficient to meet the new climate agreement. They argue that agriculture must also play its part, proposing that the global institutions concerned with agriculture and food security set a sectoral target linked to the 2°C warming limit to guide more ambitious mitigation and track progress toward goals.

"This research is a reality check," comments Lini Wollenberg, leader of the CCAFS Low Emissions Development research program, based at the University of Vermont's Gund Institute for Ecological Economics. "Countries want to take action on agriculture, but the options currently on offer won't make the dent in emissions needed to meet the global targets agreed to in Paris. We need a much bigger menu of technical and policy solutions, with major investment to bring them to scale." 119 nations included mitigation in agriculture in their Intended Nationally Determined Contributions submitted to the UNFCCC.

Agriculture (not including land use change) contributes an average of 35 per cent of emissions in developing countries and 12 per cent in developed countries today. Yet authors warn that efforts to mitigate emissions levels must be balanced with countries' need to produce enough food, particularly in poorer nations.

"We need to help farmers play their part in reaching global climate goals while still feeding the world," comments Professor Pete Smith, Theme Leader for Environment & Food Security at the University of Aberdeen and co-author of the paper. "Reducing emissions in agriculture without compromising food security is something we know how to do. A lot can already be done with existing best management practices in agriculture. The tough part is how to reduce emissions by a further two to five times and support large numbers of farmers to change their practices in the next 10 to 20 years."

To realise the 1 gigaton per year mitigation target for non-CO₂ emissions in agriculture set out in the paper, 21-40 per cent of mitigation could be achieved with known practices, such as:

- Sustainable intensification of cattle
- Efficient use of water through alternate wetting and drying in irrigated rice
- Nutrient management for annual crops, including efficient use of nitrogen and manure
- Relocating production to increase input efficiency

However, implementation would require massive investment, information sharing and technical support to enable a global-scale transition.

Even this effort will not be enough, according to the study. Much higher impact technologies and policies will be needed. Promising technical innovations on the horizon include recently developed methane inhibitors that reduce dairy cow emissions by 30 per cent without affecting milk yields, breeds of cattle that produce lower methane, and varieties of cereal crops that release less nitrous oxide.

Policies that support more ambitious mitigation include introducing more rigorous carbon pricing, taxes and subsidies; governments and the private sector adopting sustainability standards that include reduced emissions in agriculture; and improving the reach of technical assistance for farmers on locally relevant mitigation options, for example through cell-phone and web-based information portals.

According to the authors, focusing more attention to sequestering soil carbon, increasing agroforestry, decreasing food loss and shifting dietary patterns could all contribute significantly to reducing emissions from agriculture. However, much less work has been done on mitigation of emissions from these sources, so action is needed now to identify options and their impact. ■

- *phys.org*



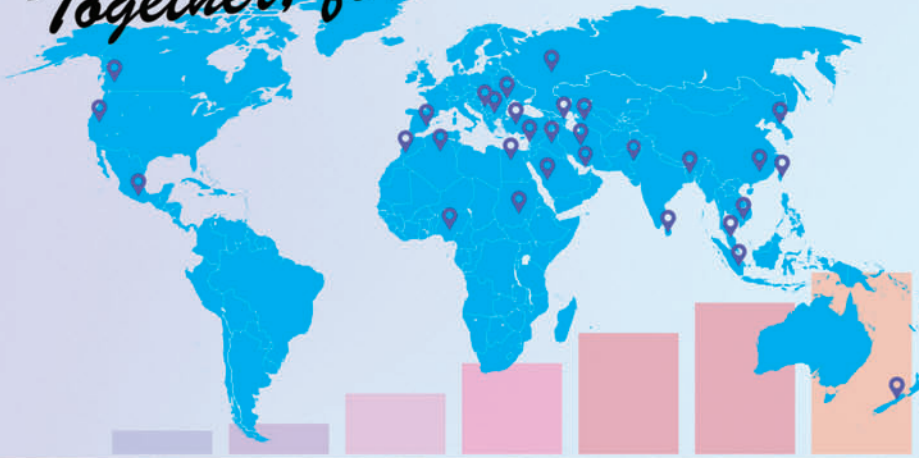
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