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and Food Processing

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## Farming Calendar 2019

### MAY

29-30 Biopesticides Europe Conference LONDON  
[www.wplgroup.com/aci/event/biopesticides-europe/](http://www.wplgroup.com/aci/event/biopesticides-europe/)

### JUNE

05-07 IFTEX 2017 KENYA  
[www.hppexhibitions.com/floriculture/2017/nbo](http://www.hppexhibitions.com/floriculture/2017/nbo)

19-21 Agritec Africa NAIROBI  
[www.agritecafrica.com](http://www.agritecafrica.com)

### AUGUST

14-16 Africa Dairy Conference and Exhibition NAIROBI

27-28 African Farming's 2nd Edition Agribusiness Summit ABUJA, NIGERIA  
[www.agroinvestmentsummit.com](http://www.agroinvestmentsummit.com)

### SEPTEMBER

16-18 Hortiflor Expo HARARE, ZIMBABWE  
[www.hortiflorexpo.org](http://www.hortiflorexpo.org)

23-24 African Farming's 2nd Edition Agroinvestment Summit LONDON, UK  
[www.agroinvestmentsummit.com](http://www.agroinvestmentsummit.com)

### OCTOBER

01-03 African Fertiliser Agribusiness Conference CAPE TOWN, SOUTH AFRICA

*Readers should verify dates and location with sponsoring organisations, as this information is sometimes subject to change.*

## African businesses urged to plunge in to the blue economy

AFRICA BLUE ECONOMY Forum (ABEF) is set to be held from 25-26 June in Tunis, aiming to raise awareness of the economic, social and environmental benefits of the blue economy.

The benefits of backing a blue economy, which covers a wide range of productive sectors that are crucial for the continent's sustainable development including fisheries, aquaculture, transport, energy, trade and tourism as well as extractive industries.

ABEF 2019 builds on the inaugural event in London last year which explored what the blue economy was.

It aims to explore the opportunities and innovations in emerging and frontier sectors of the blue economy and how they can help accelerate Africa's transformation, create jobs, sustain livelihoods and offer low-cost but impactful climate change measures.

## World Bank supports FAO's agri-recovery in Mozambique

THE JOINT FOOD and Agriculture Organisation (FAO)-government of Mozambique agricultural recovery plan aims to restore livelihoods in the country's central provinces in the aftermath of Cyclone Idai.

The effort aims to help more than 150,000 farming and pastoral households in the provinces of Manica, Sofala, Tete and Zambézia, which suffered some of the heaviest fallout after what was the most intense cyclone to ever hit southern Africa.

"The beneficiaries are among Mozambique's most vulnerable households, and desperately need to get back to their farms and start producing their own food again," said Olman Serrano country representative of FAO.

Under phase one of the plan, around 18,000 seed and tool packages have already been distributed to cyclone-affected farmers aided by funding from Austria and Belgium.

## AfDB to launch 17 new agribusiness projects in Africa

AFRICAN DEVELOPMENT BANK (AfDB) has announced the launch of 17 new projects funded by the Agriculture Fast Track Fund (AFT) in support of agribusiness small and medium-sized enterprise (SMEs).

The projects will be launched in eight African countries - Ghana (4), Tanzania (4), Burkina Faso (2), Malawi (2), Mozambique (2), Ethiopia (1), Nigeria (1) and Senegal (1).

The AFT Fund is managed by the Agriculture and Agro-Industry Department of the African Development Bank. It supports the development of a strong pipeline of 'bankable' agriculture infrastructure projects and assists African agribusiness SMEs in project preparation activities to ease their take-off.

The fund is supported by the governments of the USA (through USAID), Denmark (through DANIDA) and Sweden (through sida).

It finances the project development cost of a broad range of agriculture infrastructure, spanning the entire value chain from production to the market.

Target projects range from rural feeder roads to irrigation, agro-processing and marketing facilities and out-grower



The emphasis is on projects that contribute to the food security, income enhancement, job creation and livelihood of smallholder farmers.

Image Credit: Adobe Stock

schemes. The emphasis is on projects that contribute to the food security, income enhancement, job creation and livelihood of smallholder farmers.

The projects are being implemented in 10 eligible regional member countries (RMEs) of the bank such as Benin, Burkina Faso, Cote d'Ivoire, Ethiopia, Ghana,

Malawi, Mozambique, Nigeria, Senegal and Tanzania.

The overall Bank group vision for Agriculture and Rural Development is to strive to become the leading development finance institution in Africa, dedicated to assisting African regional member countries in their poverty reduction efforts.





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## AB Sugar invites ideas to tackle water loss in irrigation

IN PARTNERSHIP WITH the non-profit organisation WaterAid and the Centre for Industrial Sustainability at the University of Cambridge, UK-based AB Sugar has announced a global initiative to generate new ideas to reduce water losses from sugar irrigation.

The sugar company stated that all entries are to be submitted online in a 48-hour period during 19-20 June 2019. An expert panel of judges will select a winner who can potentially work with AB Sugar and its partners to test the viability of their idea in the field.

With the increasing threat posed by the depletion of water resources, the organisations involved in developing this pilot initiative trust the challenge will help stimulate new ideas.

## AfDB helps to create 35,000 jobs in agricultural SMEs

THE AFRICAN DEVELOPMENT Bank's (AfDB) project aims to support the employability and integration of young people in growth sectors (PAEIJ-SP) in Togo.

PAEIJ-SP has created a total of 35,000 jobs (14,290 direct and 20,940 temporary), well in excess of the expected 20,000 and particularly benefiting young Togolese.

"This is an exemplar project where the bank has demonstrated its comparative advantage for the promotion of agribusiness SMEs and the employment of young people in Togolese agricultural value chains. This project sets a benchmark for the Togolese government as far as youth employment is concerned," said Amouzouvi Kokou, project lead for the bank.

## Clinton Foundation and CIMMYT to improve Africa's maize seed access

CLINTON FOUNDATION AND the International Maize and Wheat Improvement Centre (CIMMYT) are launching a partnership to improve access by smallholder farmers to modern maize varieties and bolster food security in Malawi, Rwanda and Tanzania.

To be launched through the Clinton Development Initiative, the project aims to improve economic opportunity for farmers.

"Farmers in Eastern and Southern Africa face increasing threats to their livelihoods, including drought, insect pests and diseases. This partnership will improve farmers' access to modern crop varieties, the quality of their crops, opportunities to market the produce and food security for their families," explained Ariana Constant, director of the Clinton Development Initiative.

The seed varieties are all non-GMO, in keeping with regulations across Malawi, Rwanda and Tanzania.

"We are thrilled to join the Clinton Foundation in supporting smallholder farmers in Africa. Our commitment is to effectively deploy improved maize varieties, including drought and heat tolerant and disease-resistant varieties available to the Clinton Foundation's network of farmers," said Prasanna Boddupalli, director of CIMMYT Global Maize Programme and CGIAR Research Programme MAIZE.

"Beyond providing improved maize seeds, we will also collaboratively undertake



The partnership is set to boost production and offset the negative impact of climate-induced stresses.

varietal trials in the farmers' fields, track genetic gains in farmers' fields over time, and share the findings with the broader agricultural community in Eastern and Southern Africa," Prasanna added.

CIMMYT – the International Maize and Wheat Improvement Center – is the global leader in publicly-funded maize and wheat research and related farming systems. It

works with hundreds of partners throughout the developing world to sustainably increase the productivity of maize and wheat cropping systems, thus improving global food security and reducing poverty. The Clinton Development Initiative (CDI), aims to help support smallholder farmers and families in Africa to meet their own food needs and improve their livelihoods.

## AgDevCo announces organic cocoa investment in Sierra Leone

THE COMPANY INTENDS to make an investment in Tradin Organic to source organic cocoa directly from certified smallholder farmers in Sierra Leone, linking them to manufacturers in Europe, the USA and Asia.

AgDevCo's US\$3mn revolving facility is expected to allow Tradin to purchase cocoa at premium prices from up to 20,000 certified farmers.

The company's first investment in Sierra Leone is set to benefit a region that was severely affected by the 2014 Ebola outbreak. The crisis caused international cocoa companies to halt buying operations, leaving cocoa farmers with limited access to the world market.

With AgDevCo support, Tradin aims to develop a network of

farmer field schools to lift productivity by providing education on improved harvesting and fermenting techniques.

Through this investment, Tradin and AgDevCo hope to revitalise the cocoa sector in Sierra Leone where, despite enormous potential, cocoa export volumes have remained stagnant over the past decade.

AgDevCo is an impact investor specialising in agribusiness investments in sub-Saharan Africa. AgDevCo's portfolio consists of over 50 investments in production, processing and distribution.

AgDevCo is headquartered in London with representative offices in eight African countries.

Image Credit: Adobe Stock



# African Farming's 2<sup>nd</sup> Edition Agribusiness Summit



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## 'Natural resource degradation puts Tanzania's development goals at risk'

ACCELERATED DEGRADATION OF land and water resources, deforestation and biodiversity loss put Tanzania's development goals at risk, according to a World Bank report.

The report warns that the country has a rapidly shrinking opportunity to harness its natural resources against serious risks posed by rapid population growth, economic growth, increasing urbanisation and climate variability and change..

"The impacts of these factors are intensifying and have resulted in significant loss of ecosystems, competing demands for land and water, and environmental pollution," said Daniel Mira-Salama, senior environmental specialist at World Bank.

## AfDB's SAPZs poised to boost agriculture

SENIOR NIGERIAN GOVERNMENT officials and investors have endorsed the African Development Bank's special agro-industrial processing zones (SAPZs), describing the initiative as a pathway to Africa's agricultural revolution.

SAPZs are designed to concentrate agro-processing activities within areas of high agricultural potential in order to increase productivity and competitiveness. The initiative will provide millions of youth and rural men and women with employment and entrepreneurship opportunities.

"We need to make agriculture work again. It is with initiatives like this that we can truly create wealth and employment for our teeming youth population," said Nigeria's Minister of Agriculture and Rural Development, Audu Ogbeh.

## TOMRA Food continues expansion in South Africa

FOLLOWING TOMRA FOOD'S participation in Propak Africa 2019, one of the leading exhibitions for the packaging and processing exhibition, Norman Smith, area sales manager at TOMRA Food for South Africa, shares the company's further expansion plans.

Smith said, "Sensor-based technology is capable of processing large volumes of food and helps to identify and reject foreign materials from the process. This increased accuracy and efficiency delivers obvious advantages: our technology reduces food waste to a minimum, increases benefits, and delivers significant time saving compared to manual sorting. TOMRA Food machines are the most efficient way of sorting products and a smart investment."

"South Africa offers a world of opportunities. The mechanisation and automatising of the post-harvest processes is well underway in the country, and the challenge is now to keep the momentum," Smith noted.

The company aims to enable producers of fresh and processed foods to raise their quality levels. Its sensor-based sorting equipment can be used for a multitude of food applications, from fresh whole products to processed food.

The consumer trend towards healthy eating is boosting the global demand for nuts, and



South Africa is among the world's biggest exporters. A recent boom in demand for macadamias has created new opportunities, which South Africa's agriculture industry has taken up, with plantings having tripled in the years from 2013 to 2016 and industry projections forecasting a 40 per cent increase of NIS by 2020.

"For the South African producers to take full advantage of this growing market, high processing capacity and product quality will be essential, and TOMRA Food offers the best equipment for them," explained Norman Smith.

TOMRA Food focuses on designing and manufacturing sorters and graders of many different types and sizes, combining different sorting technologies such as colour cameras, near infra-red (NIR), spectroscopy and laser-detection.

The company aims to enable dried fruit, vegetable, fruit and potato producers to improve accuracy, efficiency and yields. Through digital transformation, data analytics are optimising machine efficiency, reducing operational costs and assisting food traceability.

## Bayer and Fair Planet partner to improve seed access in Ethiopia

BAYER AND FAIR Planet have renewed its commitment to the 'Bridging the Seed Gap' project for five years, aiming to improve food and nutrition security, provide economic opportunities for smallholder farmers in Ethiopia.

The project, developed by Fair Planet, facilitates smallholder farmers' access to seeds of high-quality vegetable varieties suited to local growing conditions.

Additional training on how to use these seeds sustainably and with minimal changes to traditional production practices helps the farmers improve their incomes based on significantly better harvests. The increase in income opens the door for better education and a better future for the next generation.

"As the leading company in the agriculture sector, we support small-scale farming all over the world," explained VK Kishore, head of vegetable seeds breeding and testing for Europe, the Middle East and Africa region at Bayer.

Dr Shoshan Haran, founder and operations manager of Fair Planet, said, "We identified vegetable varieties that can increase farmers' crop productivity five-fold while improving product quality and marketability."

According to Fair Planet, to date, more than 50,000 smallholder farmers' households in the project regions have produced more food due to better seeds and improved farming practices.



## Elanco to increase food security initiative in East Africa

ELANCO'S DR DMYTRO Radko, a trained veterinarian and poultry technical consultant from Germany, engaged with local poultry farmers on issues of animal health as part of the East Africa Growth Accelerator (EAGA) initiative in Kenya.

"The reality is that livestock disease remains a significant threat to achieving food security in the region. Currently, in East Africa, 25 per cent of protein from farm animals is lost due to animal illness," said Radko.

Salmonellosis and Mycoplasma in poultry are clear examples of the challenges farmers face with a reduction in the supply of high-quality protein and related significant financial losses.

This visit relates to an ongoing plan to impart knowledge and skills as part of a train-the-trainer programme, ensuring that capabilities remain within the local farming and veterinary community, and are current with changing global trends and challenges in poultry production.

Dr Radko's visit was planned in close collaboration with Ultimate Vetserve Limited, a vaccines distributor in Kenya, and focused on assessing farms on animal husbandry and management improvement areas. Poultry farmers and animal health assistants were trained on relevant disease topics like Newcastle disease and Mycoplasmosis as well as good vaccination practices.

## Ma'aden acquires Meridian Group in Africa

MA'ADEN WILL ACQUIRE an 85 per cent stake in the Mauritius-based Meridian Group, a move in which Ma'aden is set to extend its network of operations across southern Africa, from Malawi to Mozambique, Zimbabwe and Zambia.

"This acquisition marks a very important step in Ma'aden's strategy to build global distribution channels for our fertiliser products," said Darren Davis, president and CEO of Ma'aden.

As phosphate is used to produce fertiliser that is essential in replacing the phosphorous mineral that is removed from the soil when agricultural plants are harvested, the initiative aims to build one of the largest producers and exporters of phosphate fertilisers in the world, Davis added.

The agricultural industry can boost intra-Africa trade and investments, rapid industrialisation and economic diversification, sustainable resource and environmental management, and create jobs, human security and shared prosperity.

The southeast African market, is witnessing increased demand for phosphate fertilisers, expected to continue growing by five per cent annually over the next decade.



Image Credit: Ma'aden

In African economies, agriculture can prove to be a major contributing force priorities, such as eradicating poverty and hunger.

## Marel Poultry unveils new automation solution

IN ORDER TO intensify the automation level in a poultry processing plant, Marel Poultry has developed Q-Wing, chicken wing part grading and distribution solution.

Given the globally growing shortage of skilled labour, the solution is in response to demand from the market for higher wing yields and less manual labour.

To provide huge demand of chicken wing parts across the global market, processors need to have a focused wing cutting, batching and distribution process that produces both higher volumes and more consistent quality, with the least cost and hassle, explained the company.

Integrated into the ACM-NT cut-up system, the Q-Wing comprises a selection of wing cutting modules, an IRIS visual grading system, logistics and Innova controlling software.

Q-Wing aims to automate many manual operations and increasing wing yields in wing part sorting which is considered a labour-intensive process.

The IRIS camera system is seen to visually assess the quality of the wings in the line. "If, for example, only the left first joint is damaged, the left second joint can still be processed as an A grade item and so can all right wing parts. This will dramatically help secure consistent quality and raise wing profits," according to the company.

The logistic system comprises multiple conveyor belts, leading to separate packing stations for the different A grade and B grade drumettes, wingettes and whole wings. In addition, the Q-Wing is set to improve the assessment process, aiming to enable processors to assign maximum value to wing products.



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Teun van de Braak, product manager, Hendrix Genetics Layers talks to *African Farming* about growth and health management to enhance productivity of poultry.

# Pullet progress management vital for flock success

**G**ETTING PULLETS TO the correct weight by the end of rearing is fundamental in achieving good peak production, better persistency as well as shell quality. Monitoring and keeping records of pullets in poultry business is so essential to successfully achieving the right body weight.

Keeping track of the birds' records is a good management practice that allows the identification and solution of problems. Maintenance of proper records helps to compare it to the advised standards and to the information of previous flocks. When a problem has been identified, such as, the birds not developing according to expectations, it is possible to fix it in time. Identifying the cause and solution of a problem is an important part of the farmer's knowledge base and is likely to assist in preventing a recurrence of the problem. Next to the record-keeping sheets on mortality, growth and feed as well as water intake, an extremely useful tool is a diary to note down any occurrence of disease, repairs, vaccinations, treatments and response to treatments.

## Monitor growth

Development of the digestive tract, the immune system and the bird's frame is rapid in the first eight weeks of life. The body weight at five or six weeks of age is the most important determinant of pullet quality. Disease, poor nutrition or other



Image Credit: Hendrix Genetics

Identifying the cause and solution of a problem is an important part of the farmer's knowledge base.

**The best advice is to weigh the birds weekly from the moment that the day-old chicks arrive at the barn.**

stressors at this stage can have a permanent negative effect on the bird's ability to digest and absorb nutrients. Likewise, there may be a long-term impact on the immune system, making it more susceptible to disease. Bone calcification accelerates in the first few weeks of life and continues beyond the start of lay. Any

deficiency in growth or skeletal development may limit the potential calcium reservoir needed for egg shell strength later in the hens' productive life.

The best advice is to weigh the birds weekly from the moment that the day-old chicks arrive at the barn. The objective is to have a very high uniformity in order to facilitate flock management and stimulation. The weight distribution across the flock is an indicator of good management. In an ideal world, more than 90 per cent of the flock should fall within 10 per cent of the targeted body weight for that specific age. Large variations can be caused by the feed

**Table 1: Equipment requirement for rearing**

Age (weeks)		Floor		Cages	
		0-2	2-5	0-3	3-5
Ventilation	Minimum per hour/kg	0.7 m <sup>3</sup>	0.7 m <sup>3</sup>	0.7 m <sup>3</sup>	0.7 m <sup>2</sup>
Stocking densities	Birds /m2	30	20	80	45
	cm/bird			125	220
Water supply	Chicks/Chick drinker	75		80(1)	
	Birds /drinker	75	75		
	Birds/nipple	10	10	10(2)	10(2)
Feed supply	Birds/Starting pan	50		(3)	
	cm of trough feedersBirds	4	4	2	4
	Birds /Round feeder	35	35		

(1): Place an additional drinker per cage for the first week

(2): Make sure that all the birds have access to at least two nipples

(3): Spread sheets of paper over the cage bottom to last for seven days, remove the top sheet every day





A major indicator of the birds' health is obtained by monitoring the flocks' mortality.

regime, overcrowding and disease. The number of feeders and drinkers, feed distributions, next to the feed presentation are strong contributors towards ensuring uniformity. Under warm environmental conditions, Hendrix Genetics Layers recommends the equipment requirements mentioned in Table 1.

**In all production systems, signs of disease can be detected when the birds reduce feed and water intake, stagnate in growth, or undergo a change in appearance, behavior or activity level.**

#### Monitor health

In all production systems, signs of disease can be detected when the birds reduce feed and water intake, stagnate in growth, or when they undergo a change in appearance, behavior or activity level. A major indicator of the birds' health is obtained by monitoring the flocks' mortality, but unfortunately, a dead bird is often a sign that is too late. If the farmer is able to monitor and keep track of the earlier mentioned traits accurately, measures may be taken to prevent birds from dying. Monitoring and keeping track of the daily mortality can give a warning if things are going terribly wrong and can be used to alert the farmer or the veterinarian in case of infectious diseases.



It is important to be trained well in monitoring the birds carefully and to register the records and any deviations daily.

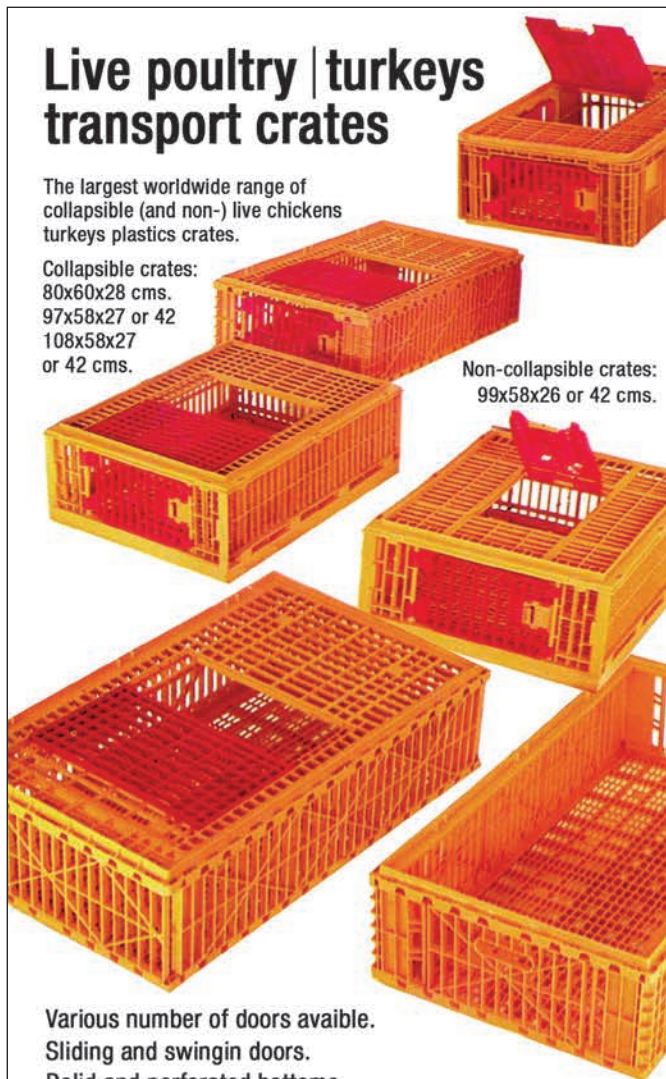
Both farmers and their staff play a critical role in looking after the birds and maximising productivity and therefore, profitability. As a large part of taking care of poultry is about routine checks on the birds and their environment, it is important to be well-trained in monitoring the birds carefully and to register the records and any deviations daily. This will allow the farmer and the staff members to get a better grip and to identify quickly any changes in the flock and in the birds' environment, such as broken equipment, mouldy feed or infectious diseases. To conclude, accurate administration of the day to day records will help in steering your flock and to interfere timely when needed, resulting in strong and robust pullets. **E**

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Dr Ceinwen Evans takes a look at some of the challenges within the animal production industry, that demand urgent attention.

# Improving poultry productivity

ACCORDING TO THE World Health Organisation, *Campylobacter jejuni* ranks as the top cause of food-borne bacterial diarrhoeal disease in the developed world, with chicken serving as the most common source of infection.

At one time, *Campylobacter* was thought to be part of a normal microbial community in chickens. However, it is now understood that birds have a strong inflammatory response to it. The infection causes diarrhoea, which can increase the risk of footpad lesions as the result of standing on wet litter. In addition to improved processing plant sanitation, on-farm strategies – such as biosecurity measures and litter management best practices – can also be used to help reduce the risk of human pathogen exposure.

Overall, antibiotic reduction has opened the door to rising and unpredictable pathogen challenges, including *Campylobacter*, leading to poor flock performance and livability.

In today's production environment, veterinarians have fewer weapons to fight disease challenges, live production managers are challenged to maintain consistency, and nutritionists are overwhelmed by the number of different feed options to test. It's clear that the removal or reduction of antibiotics is driving fundamental change within animal production, creating new challenges that affect both animal and human health.

## Search for alternatives

There has never been a more urgent need for a new approach to bridging animal nutrition and health with the demands of the consumer. Understanding the relationship between feed ingredients and compounds and their impact on the gut microflora is a crucial part of this approach, but it is proving to be a complex issue.

In fact, when it comes to evaluating the impact of nutritional intervention on animal

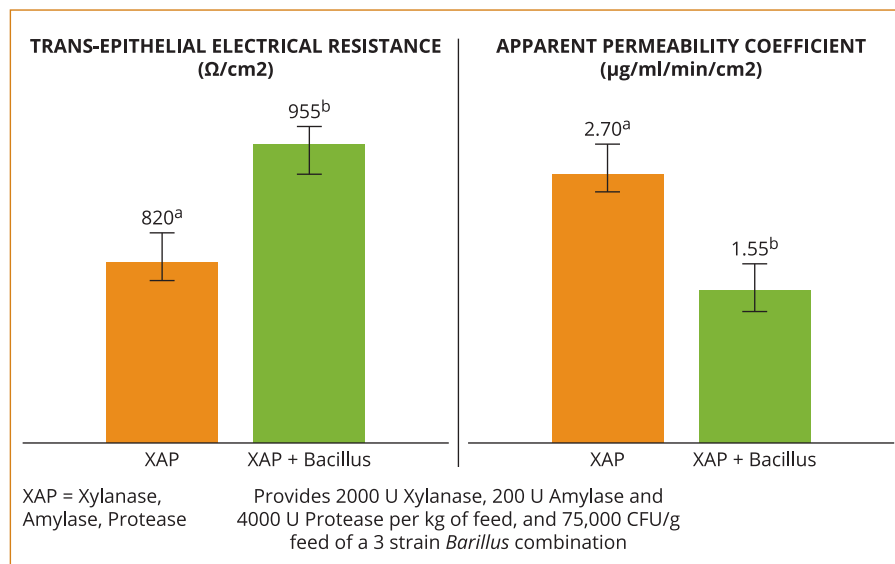


Figure 1 a,b - Syncra AVI improves TEER for enhanced intestinal health.

health, there remains significant room for improvement. Current tools for measuring the success of feed additives are still heavily reliant on traditional principles, such as feed conversion ratios (FCR) and average daily gain (ADG). In today's changing environment, producers need reliable measurements that can take a versatile approach – addressing both external measurements as well as the state of the bird's overall intestinal health and how it impacts health and performance.

## Fresh approach to gut health

A new approach addresses the relationship between animal feed composition and a healthy gut function, which is known to be a crucial factor in determining overall performance. Building on extensive, in-depth understanding of feed additive applications, this new field is poised to help researchers explore innovative synergies between diverse product groups, such as enzymes, betaine, essential oils and probiotics. This is a challenging task as it goes beyond simply identifying which product groups work well together. It addresses the unique variances

of each organism with the goal of understanding what specific organisms within each product do and how they work to complement each other.

When combined with proven data, this cutting-edge knowledge will enable the industry to learn how customised nutrition solutions can work within an animal's own ecosystem to address common gut health issues, with the ultimate goal of increasing the health, wellness and productivity of livestock. An example of this research in today's production environment is found in the unique enzyme and multi-strain probiotic solution of Syncra AVI and its impact on *Campylobacter jejuni* populations.

Syncra AVI combines xylanase, amylase and protease enzymes with a unique combination of *Bacillus* probiotic strains.

Xylanase breaks down the non-starch polysaccharides (NSPs) to release previously trapped nutrients ultimately reducing the levels of *Campylobacter* in the intestinal tract. The combined enzyme and probiotic mode of actions of Syncra AVI provide more available nutrients than single component additives, creating a more balanced gut microbiota.

One of the most common parameters to evaluate the intestinal permeability is trans-epithelial electrical resistance (TEER), which is the ability of semi-permeable tight junctions to differentially restrict free

**A new approach addresses the relationship between animal feed composition and a healthy gut function, which is known to be a crucial factor in determining overall performance.**



passage of water, ions and larger solutes based on size and charge, including bad bacteria. Syncra AVI was shown to improve TEER (and reduce permeability) when compared to enzymes alone (Figure 1).

**The combined enzyme and probiotic mode of actions of Syncra AVI provide more available nutrients than single component additives, creating a more balanced gut microbia.**

Applied, this means that Syncra AVI was also able to reduce the levels of *Campylobacter* in the intestinal tract and livers of challenged broilers fed a mixed grain diet. When fed at 200g per tonne compared to the unsupplemented control, the product was shown to reduce the spread of *Campylobacter* to liver tissue (0 per cent positive post-enrichment) and reduce the loads in the ileal mucosa (median of  $<1 \log_{10}$  CFU/g) (Figure 2).

Compared to the challenged control, Syncra AVI was shown to numerically reduce

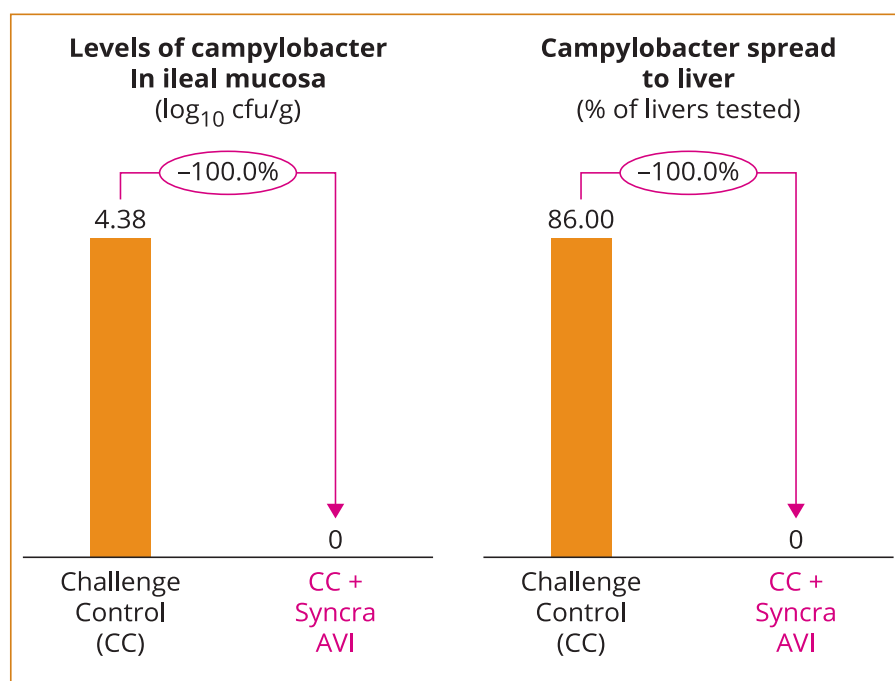


Figure 2 - The spread of *Campylobacter* to the liver decreased 100% 7 days post infection with Syncra AVI.

footpad lesion score by 16.2 per cent.

Through the exploration of innovative synergies between diverse product groups, producers will gain the knowledge

necessary to make strategic feed decisions that improve performance and to maximise commercial return by unlocking the full potential of feed. <sup>⑤</sup>



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Rising global demand coupled with sector regulation has boosted Kenya's macadamia production and earnings in the last few years.



Macadamia fruit

Image Credit: Mwangi Munero

## Mad about macadamia

**G**LOBAL TRENDS TOWARDS plant-based oil products as well as health-conscious consumers have anchored increased demand, boosting the earnings of farmers.

Macadamia nuts are rich in unsaturated oil, iron, manganese as well as vitamins A and B. They also have the cancer-fighting antioxidants. In the cosmetic industry, they are used as a face scrub.

In the last two years, price of macadamia nuts has shot up from Ksh 50 (US\$0.5) to Ksh 150 (US\$1.5) per kilo at the farm gate value.

Unpredictable earnings from coffee has endeared farmers to shift to less risky but lucrative crops such as macadamia- salvaging the fortunes of mostly smallholder farmers that live in the rainy central Kenya and western highlands.

**Kenya has about 200,000 small farms that currently produce an estimated 42,500 tonnes of in-shell nuts annually.**

Production is mainly done by over 11,000 smallholder farmers in 16 counties unlike in the market leaders, China and South Africa, where macadamia is grown through large-scale farming.

Kenya is the third largest macadamia producer with 20 per cent of the market share.

Regulation of the macadamia sub-sector has, however been the major catalyst for increased interest in the crop.

Previously, farmers would harvest the raw nuts and sell to brokers and smugglers across the borders- prompting rising thefts, low prices and demoralised farmers.

Banning of this practice has seen increased production of mature nuts from 11,000 metric tonnes to over 45,000 metric tonnes in the last decade.

The number of nut processors has also shot up from four in 2009 to 30 in 2018- indicating the increased prospects of the sector, according to the Nut Processors Association of Kenya (NutPAK), the umbrella body that brings together processors.

The government regulator, Agriculture and Food Authority (AFA) has also set the timelines for harvesting to safeguard the quality and curb entry of raw nuts into the market.

"Regulation and surveillance in crop areas deter early harvesting. Premature harvesting increased the losses of farmers since buyers leave some nuts during selection," observed Charles Muigai, NutPAK chief executive officer, lauding the government on its role in streamlining the industry.

NutPAK, whose members include 90 per cent of the processors, has also developed a code of conduct to ensure that its members harmonise the quality of nuts and safeguard Kenya's international market, according to Muigai.

Farmers have also been supportive of the increased regulation of the previously chaotic marketing.

"We are establishing nut collection centres in villages across Kenya to weed out middlemen who exploit farmers. The law prohibiting exportation of raw nuts has been a boon for us farmers," said Edward Maigho, the national chairman, Macadamia Farmers Association of Kenya, which links up 10,000 members.

Over 98 per cent of Kenya's macadamia produce is sold globally.

The major competition for Kenyan produce comes from China, South Africa, Malawi, Australia and Vietnam, according to NutPAK.



These nations have put in place harvesting practices as well as other code of regulations to also safeguard their market share.

Kenya has about 200,000 small farms that currently produce an estimated 42,500 tonnes of in-shell nuts annually.

But with the soaring demand of the nuts, farmers are increasing acreage under the crop.

According to Kenya's Economic Survey 2018, the area under macadamia rose to 16,153 hectares in 2017 compared to 15,512 hectares the previous year, leading to an additional production of 1.443 metric tonnes of nuts over the period.

The total value of the crop rose from Ksh 4.3bn (US\$43mn) in 2015 to Ksh5.1bn (US\$51mn) in 2017 due to rising global demand.

While the majority of the farms are located in the Mt. Kenya region in the counties of Murang'a, Kiambu, Nyeri, Embu and Meru, farmers in non-traditional areas are taking up the crop.

Farmers in Uasin Gichu, Elgeyo Marakwet and Nandi counties-traditionally Kenya's food baskets, known for their maize and wheat production- are moving to macadamia.

Even in traditional macadamia producing regions, there is an observable move to the crop.

"Macadamia farming is far better than coffee. It has fewer risks and overheads. Less bureaucratic marketing channels translates to better and more reliable returns," said Julia Wanja, a farmer in Mumwe area in Nyeri county and one of the pioneer macadamia farmers in the region.

AFA is also supplying at least three million seedlings to scale up production from the current production of 42,500 tonnes to about 61,000 tonnes in the next five years.

Aiming to reap from increased production, processors have created an installed processing capacity of 90,000 tonnes.

Global production is estimated to increase from the current 200,000 tonnes to 276,000 tonnes in 2020.

Experts say that a mature tree of macadamia can produce between 80 and 300kgs of nuts, although most farmers get a maximum of 50kgs, mainly due to poor crop husbandry practices and weak clones.

"Production of nuts depends on the amount of rainfall and will reduce especially where farmers have no access to irrigation water. An acre of land can hold up to 71 trees," noted Dunson Munene, a field operations officer at Afrimac Nuts company.

At present, only four of the 17 clones of macadamia (Macadamia intergrifolia) are recommended for commercial production in Kenya.

Research has shown that EMB-1, MRG-20 and KRG-15 are the most suitable for coffee and tea zones, close to the highland regions.

However, MRG-20 was considered the clone with a wide adaptability. KRG-15 has excellent yields of 80kgs per tree, 92 per cent grade 1 nuts and a 32.4 per cent kernel recovery.

It is recommended for growth in the main coffee zone, marginal coffee zone and sunflower maize zone.

A macadamia hybrid KMB-3 performs particularly well in the coffee/tea zone.

Seven new clones from Meru, (MRU-24 and MRU-25), Wondanyi (TTW-2), Embu (EMB-H and EMB-2) and Kiambu (KMB-4 and KMB-25) are being evaluated for adaptation in the main coffee or coffee/tea zone.

Seeds are pre-germinated by soaking in water for 72 hours before raising them in the nursery as seedlings.

Planting is done at a spacing of three metres by three metres. Seedlings should be weeded and shaded for quick establishment. Pruning should also be done in the formative and consequent years.

Manure should be applied for better yields. Few diseases and pests attack the crop, according to experts.

It takes three years for macadamia plants to start yielding nuts starting from 2kg per season when young to a maximum of 15-20kg when they attain seven years of age.

**"Macadamia farming is far better than coffee. It has fewer risks and overheads. Less bureaucratic marketing channels translates to better and more reliable returns."**

In recognition of the increased small-scale production of macadamia, Kenya has been selected to host the 9th International Macadamia Symposium in August 2021.

Held every two years, the symposium brings together experts, scholars, entrepreneurs and growers from around the world to share experiences and chart the future of the industry.

Meanwhile, macadamia growing in Uganda and Tanzania is still in the formative stages.

In Uganda, it is concentrated in the rainforests of the western region with farmers picking up seedlings from the local nurseries. Production is between 2 and 20kgs as the trees are still young.

According to the International Nuts Council statistics, Tanzania exports over 3,000 metric tonnes of macadamia annually.

In Rwanda, the National Agriculture Exports Development Board (NAEB) has been modernising macadamia growing through the 'Macadamia One Million Project'.

Thousands of seedlings have been distributed to farmers across the country.

The country's hilly landscape and equatorial climatic conditions favour macadamia growing. Officials hope that the project will help plant one million trees on 5,000 acres by 2015. <sup>⑤</sup>



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The agricultural sector enjoys primary focus in South Sudan government's plans for reviving the economy. *African Farming* speaks with a high-level ministerial delegation during the 'Invest in South Sudan' road show held in Dubai in April 2019.

## 'Agriculture number one priority in South Sudan'

**T**HE NEWEST COUNTRY on the world map, South Sudan, is looking to attract foreign direct investments across various industries, in order to develop its economy.

At the South Sudan Investment Road Show held in Dubai in April 2019, Deng Deng Nhial, South Sudan Ambassador to the UAE, addressed a gathering of businessmen and media, speaking about the favourable business environment that the country can offer to investors. This includes rich natural resources, pro business leadership and regulations (including duty exemptions and concessions for imports), labour pool with native English skills and the strategic location in East Africa.

**"In the light of recent volatility in oil pricing across the world, we have decided to invest into something more long-term like agriculture."**

Speaking about the tangible opportunities in priority sectors like agriculture, petroleum, mining and infrastructure, the Ambassador stressed that development of agribusiness takes precedence over all other sectors in the country at the moment, since it is the backbone of the economy with 95 per cent of the country being arable and around 80 per cent of the population rural.

In an interview with *African Farming*, Onyoti Adigo Nyikwec, minister of agriculture and food security, said that food will last longer than oil. In the light of recent volatility in oil pricing across the world, we have decided to invest into something more long-term like agriculture. The government believes that there is a great need to develop agriculture because unlike oil, crops will never dry up if looked after properly. It provides food, cash crops and help in empowering youth and the women. Agriculture, I believe, can take the country ahead."

Blessed with fertile land and abundant water resources, earlier farming was only for local consumption. But now South



The South Sudan Investment Roadshow was held in Dubai in April 2019.

Image Credit: AZ Media



Image Credit: AZ Media

The investment roadshow aligns with the government's aim to raise awareness about the country's progress.

Sudan is looking to commercialise and export food products like sorghum, sunflower, gum acacia and honey. "The more we produce, the more self-sufficient we become," the minister added.

Not just agriculture but even aquaculture is important in the daily lives of the South

Sudanese population. With no advance equipment for fish farming, most of the sector remains untapped. The current wild fishery output is 140,000 tonnes per year but the potential can go up to 200,000 tonnes per year.

Minister Nyikwec explained details of the



Comprehensive Agriculture Master Plan (CAMP) and Irrigation Development Master Plan (IDMP) covering five sub sectors – crops, livestock, fishery, forestry and institutional development. Some of the projects in these areas include capacity building, construction of national diagnostic laboratory for livestock, steps towards drought resilience and livelihood, mitigation of land degradation, research collaboration in the field of vaccination and animal production, among others.

With regards to opportunities, the minister said that the government has identified a number of priority programmes in the CAMP and IDMP, which give the investors an option to select the project and partner of their choice.

The minister for finance and planning, Salvatore Garang Mabiordit, commented, "There is increasing interest from all over the world in the economic growth of the country. We are focussing on the development of roads, electricity and other infrastructure facilities to attract investors and working towards economic diversification as well as strengthening existing industries."

He further added, "For supporting the financing of the agricultural sector, South



Image Credit: AZ Media

South Sudan's minister for agriculture, Onyoti Adigo Nyikwec.

Sudan is promoting the growth and extent of co-operative banks and their expansion into

rural areas in order to support farming by enabling people to borrow at lesser rates."

South Sudan is taking various measures in communicating accurate information and portraying the true image of the country so that the world knows about the huge opportunities that exist in several sectors and the enormous investment potential available.

Past conflict curtailed oil production in South Sudan, but since the peace accord was signed, the country has resumed production, generating increased revenues to fund development.

The investment roadshow aligns with the government's drive to raise awareness about progress in the country, and investment to re-ignite its economy. It hopes to build on the potential of its diverse underdeveloped sectors and industries.

The government is aiming to showcase the opportunities and incentives that make South Sudan an attractive investment destination, highlighting the country's importance as a gateway to markets in east and central Africa. South Sudan's mineral deposits, fertile land, and infrastructure and industrial needs all offer potential investors opportunities outside the petroleum sector. <sup>1</sup>

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Biogas systems improve the sustainability of a livestock farm's daily operations by cutting methane emissions.

Companies are exploring the use of cow manure to generate biogas, which can replace fossil fuels used in transportation.

## From waste to energy

**H**UMAN-INFLUENCED CLIMATE change, rise in global warming which occurs due to increase in temperature of atmosphere by burning of fossil fuels and release of harmful gases by industries as well as the effects of overpopulation are all demanding immediate attention.

Several innovative solutions are seeking to redefine change and help preserve the environment. The use of cow manure to produce energy, for instance, is helping in many ways:

### Manure energy can replace fossil fuels

It is now seen as raw material for producing biogas, as a viable energy alternative to nuclear and fossil fuels.

### Dwindling world phosphorus reserves

Manure, in addition to energy, contains valuable nutrients that plants need: nitrogen and phosphorus. Phosphorus is a mineral that plants need to grow. The world's reserves of phosphorus are dwindling quickly, which means we need new solutions for mineral recycling, soon. Recycling the phosphorus and nitrogen in manure makes it possible to use fewer chemical fertilisers.

### Manure needs a lot of storage space and field area

From a farmer's perspective, liquid manure needs large slurry tanks and wide fields to spread the manure on. Milk production also requires larger fields to expand by adding more cows. Cutting down forests for fields just to spread manure is not environmentally sustainable.

Like many other countries of the world, Finland is also trying to find solutions for carbon footprints for food and traffic which is the source of a fifth of the country's greenhouse emissions. Finland produces roughly 15mn tonnes of manure every year, making it an interesting raw material for large-scale biogas production.

Valio, owned by Finnish dairy farms, wants to reduce its milk chain's carbon footprint to zero by 2035. The company hopes to

achieve this by binding more atmospheric carbon dioxide in grass fields and generating biogas from manure to replace fossil fuels.

"Valio is owned by 5,000 Finnish dairy farms with cooperatives in between. Our calculations show that if we used the manure from all our farms to make biogas, the volume would be enough to fuel the farm machinery and Valio's milk collection trucks. Recycling manure into biogas could, therefore, reduce milk's carbon footprint by up to 50 per cent. This would reduce the use of fossil fuels as well as methane emissions, generated during manure storage and use," says Juha Nousiainen, Valio's director for the carbon neutral milk chain.

Valio partners with the energy company, Gasum to find solutions to the climate challenge. "As the largest biogas producer in the Nordics, working together with Valio is a natural solution for us to create solutions for a circular economy. Gasum invests strongly in growing its gas refuelling station network in Finland and the other Nordics. Biogas production must increase to meet traffic emissions reduction targets," says Matti Oksanen, Gasum's director for business development.

Biogas systems improve the sustainability of a dairy, swine or poultry farm's daily operations by helping farmers conserve resources and cutting methane emissions – both of which combat climate change. In 2017, Valio was the first in the world to patent a method to turn liquid manure into both clean water and easily transportable, organic-approved phosphorus and nitrogen fertiliser fractions that are easy to spread. The same process allows for producing biogas from dry manure fractions and other milk chain side flows. There are many benefits: using slurry as a fertiliser gets easier, nutrient cycling becomes more efficient, and the runoff of nutrients decreases. The method differs from current separation processes in that it's possible to remove most of the water from the fertiliser fractions and turning the energy in manure to biogas. Valio has made use of its milk component processing know-how in the manure nutrient separation process. **E**



The rise of AMR is of growing concern and necessary interventions are being made to curtail its spread.

# Combating Antimicrobial Resistance

**A**NTIBIOTIC MISUSE IN food animal production is one of the major causes of Antimicrobial Resistance which is the ability of a microorganism (like bacteria, viruses, and some parasites) to stop an antimicrobial (such as antibiotics, antivirals and antimalarials) from working against it.

After the adoption of the World Health Organisation (WHO) led Global Action plan on AMR at the World Health Assembly in 2015, many countries have developed their National Action Plan (NAPs) on AMR with interventions specific to human and animal health as well as the environment.

The WHO strongly recommends an overall reduction in the use of all classes of medically important antibiotics in food-producing animals, including complete restriction of these antibiotics for growth promotion and disease prevention without diagnosis. Healthy animals should only receive antibiotics to prevent disease if it has been diagnosed in other animals in the same flock, herd, or fish population.

Historically, some developed countries, particularly those of the European Union (EU), have addressed AMR through systematic policy and practice initiatives. For example, the use of antibiotic growth promoter (AGPs) in animals was banned in the EU in 2006.

While the prudent use of antibiotics is important to treat animal diseases, its overuse and misuse can contribute to antimicrobial resistance. Especially in food producing animals, AMR poses a serious threat to the safety and quality of feed and food, food security and livelihoods. In recent decades, the intensification of animal production due to the increasing demand for products of animal origin has led to an increasing overall use of antimicrobial, according to the Food and Agriculture Organisation (FAO).

In response to the growing momentum to reduce animal use of antibiotics, several multinational companies have taken initiatives to reduce the use of antibiotics in their supply chain. Pressure from consumers and investors, along with campaigns by civil society have played a major role.

Herbal medicine, unique in its use of



The worldwide interest in herbal products has grown significantly.

Image Credit: Adobe Stock

combinations of herbs and the interactions between constituents to treat illness, is an alternative solution. Synergy is an essential characteristic of herbal medicine. Essential oils in many medicinal herbs and spices have antifungal effect, for instance, dill, clove and tea tree oil. Antiviral effects of herbs and spices have shown to function by indirectly suppressing virus proliferation through regulating the hosts' immune systems and also by directly inhibiting virus proliferation through targeting vital proteins essential for the viral life cycle.

Ayurved, which manufactures and exports safe herbal products supported by extensive research, aims to reduce the problems of AMR in animal products.

Nbiotic, prepared with the use of selected herbs like allium sativum, zinzibar officinale and eucalyptus helps in improving the gastro intestinal health, growth performance as well as feed efficiency.

There are solutions in herbal medicine to combat the problem of respiratory distress in animals, as well. Respzz, prepared from herbs like adhatoda, ocimum, glycyrrhiza

provides a protective, anti-stress, adaptogenic, restorative and soothing effect on the respiratory system of birds and helps in improving their performance.

Ayurved blends and synergises its herbal knowledge with modern scientific and advanced technologies to provide effective and safe solutions. It stems from a well thought-out, planned scientific approach to the collection of herbs, standardisation of ingredients, processing of all the raw materials and scientific packaging of formulations.

The consumers, globally, are well aware about health risks. They understand that safe and traceable food is more important than ever.

Antimicrobial resistance (AMR) threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi.

AMR is an increasingly serious threat to global public health that requires action across all government sectors and society as well as greater innovation and investment in research and development to obtain effective solutions. **B**

Increasing attention to detail in nutrition and feed makes all the difference in dairy farming.

## Optimum nutrition for dairy cows



Image Credit: Adobe Stock

A knowledge of the basic digestive system of cows and the role of various nutrients is important in dairy farming.

**F**INDING THE RIGHT balance of nutrition for cows is instrumental in achieving dairy farming success. The focus on feed and nutrition should support milk production, fermentative digestion and metabolic health.

Regardless of the size of the dairy farm, food producers need to be able to make informed decisions that give best outcomes for the livestock, the environment and the farmer, says Martin Smith, technical director- Middle East Africa region, Evonik Nutrition and Care. "By understanding amino acid nutrition of dairy cows, farmers can begin to make better choices about feeding strategies; can reduce nitrogen excretion improving cow health and reducing impact on the environment; and make more profit for themselves by increased performance and reduced input costs," Smith adds.

Evonik recently launched a new science-based programme called the 'Evonik School of Animal Nutrition' to help its customers achieve optimum performance

and profitability with minimum environmental impact.

The company invited participants from South and Southern Africa to Hanau, Germany, recently to gain expert knowledge about a range of topics including raw material quality control, poultry nutrition and gut health management and Evonik's understanding of optimum nutrition for poultry, pigs, tilapia and dairy cows.

Stressing the importance of various nutrients in the optimum daily diet, Claudia Parys, senior manager, global technical support – rumen nutrition, explained, "The most important aspect is to feed the rumen

microbes properly with structured fibre, starch and rumen degradable protein sources". The minimum forage portion needed is about 50 per cent, the remaining part is a compound feed consisting of grains, protein sources and a mix of minerals and vitamins. Rumen-protected amino acids mainly methionine, help to optimise the diet for performance, diet cost and herd health.

Evonik recently invested in a laboratory in Nairobi equipped with a state-of-the-art Near Infrared Reflectance (NIR) analyser. This machine rapidly analyses feed material for a wide range of nutrients and can be accessed by customers.

Asked about the role of accommodation in optimum nutritional quality, Smith says, "For any livestock it is true that a stress-free environment is best. When stressed, all animals will divert nutrients away from productive functions like milk production, growth, egg production. They do this to maintain body systems in the face of such stressful challenges (this is called

**The minimum forage portion needed is about 50 per cent, the remaining part is a compound feed consisting of grains, protein sources and a mix of minerals and vitamins.**



homeostatis), so if a farmer can provide comfortable surroundings with easy access to water and feed, and where stress is minimised, then the animal will be able to utilise correctly balanced feed in an optimum way.

The nutrition requirements for cows will also vary depending on the animal's stage of life. Lactating dairy cows, for instance will need higher amounts of energy, water and calcium in their diet.

A knowledge of the basic digestive system of cows and the role of various nutrients is important in dairy farming.

Combined with feed analysis, it helps in providing a well-balanced diet which will enable production in a sustainable way.

Present and future improvements in livestock nutrition and feed resources are now being directed at the use of approved probiotics and the application of nanotechnology in livestock nutrition and feeding. New data from Trouw Nutrition's longitudinal study indicates that the same science that links early life nutritional programming to adult health of humans, can benefit dairy cows, showing how early calf nutrition can help programme a cow's future metabolism. Experts believe that this may



Image Credit: Adobe Stock

Rumen-protected amino acids mainly methionine, help to optimise the diet for performance, diet cost and herd health.

hold the key for improving long-term health and sustainable performance.

With feed costs making up more than 50 per cent of many dairy farms' expenses, monitoring daily feed usage and inventories is critical to dairy profitability.

Several facilities including improved mixing and feeding equipment technology, competent ruminant nutritionists, computer-

ized ration formulation and diet modeling available are increasingly being used to help dairy farms decide on the optimum nutrition strategy for cows.

Dairy nutrition is about understanding the nutrient requirements of dairy cows at various stages of lactation and combining various feed alternatives to meet those needs in a cost-effective manner. <sup>1</sup>

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Oserian Flowers received recognition in the renewable energy category of the Kenya Association of Manufacturers (KAM) Energy Management Awards, 2019. The director for human resources and administration, Mary Kinyua, talks to *African Farming* about the sustainability measures adopted by the company.

## Sustainability in bloom

Kenyan flower growers are actively seeking cleaner technologies as well as recycling methods.



Image Credit: lockyfoto/Adobe Stock

**K**ENYA'S FLOWER POWER has been felt across international markets. According to the Kenya Flower Council, the country is the lead exporter of roses to the European Union with a market share of about 38 per cent. The flower export values of Kenya are estimated to have trebled during the past decade.

However, this growth has also given rise to several environmental challenges through the years. For example, the huge population growth around Lake Naivasha, where many flower farms are located, has been posing threats to the water resources and affecting the marine life. However, many companies are paying closer attention to green initiatives and taking action to make sustainable practices a priority.

Floriculture is one of Kenya's great economic success stories. It is now the fastest growing export sector in the Kenyan economy, providing direct employment for over 100,000 workers and an estimated two million people indirectly, according to the Kenya Flower Council (KFC).

There are concerned efforts by government institutions, flower companies, the KFC and other stakeholders to increase pressure on the industry for matters relating to the optimum use of water, waste

disposals and the effect of chemicals and pesticides. Kenyan growers are actively seeking cleaner technologies by using geothermal and solar techniques for power generation, while water and organic matter are recycled by most farms.

This interview reveals details about the sustainability measures that Oserian has developed.

### **What are the ways in which Oserian farm in Kenya is leading the way in environmentally-friendly measures?**

With the growing demand for flowers to be produced in a more sustainable manner that will give a positive impact to the environment without compromising the natural resources, Oserian Development Company has come up with various measures in order to achieve this by adopting a 'Champion by Nature'

**"Oserian Development Company has come up with various measures in order to achieve this by adopting a 'Champion by Nature' approach towards carbon free goals."**

approach towards carbon free goals. The company's latest addition to its green energy initiatives is the launch of the solar plant on 9 May 2019, with a capacity to generate one megawatt of power which, injected into the existing geothermal adds to 3.5 megawatts, enough to run the industrial park and residential areas within its expansive premises. Oserian is the only farm in the world that is using both solar and geothermal under one grid to power its operations fully with renewable energy, besides being home to the world's largest geothermal powered greenhouse.

Two years ago, Oserian shifted to electrical tugs that run on geothermal charged engines to ferry flowers from greenhouses to the pack house, a development that has knocked off an estimated 300,000 litres of diesel, a massive saving on costs and especially hugely benefiting the environment that is suffocating from fossil fuels. It is the only farm using these electric tugs to transport flowers.

Oserian has set up its own Vision 2020, of being a carbon-free zone and the clean energy and environmental care steps being undertaken to reduce carbon in its business value chain all point to this goal.

Oserian is one of the most forested regions in Kenya. The farm plants trees



every week and provides seedlings to the surrounding communities to enhance Kenya's tree cover.

Our greenhouses are on hydroponics so as to reduce use of fertilisers and water consumption in the flower production. Plants uptake only what is required and the excess returned to the system for recycling and replenishing. This way there is no wastage. Reducing fertiliser usage and minimising water consumption are known to contribute to a cleaner safer environment. The farm is big on recycling and all materials within its operations are reused instead of being discarded as waste. Plant materials are composted, greenhouse covers recycled as well as other building materials.

Oserian also imported sheep from South Africa, Dorper, and crossed it with the local Maasai breed creating the Domaa, as part of its support to the livelihood of the locals who are basically livestock farmers. The Domaa has proven higher meat content which gives the farmers better yields, better earnings and more food. The Domaa project is part of the farm's contribution to food security and increased income to the rural communities, a pursuit of the Government of Kenya, Big Four Agenda economic and social development programme. The sheep mows grass at the farm or rather help keep it short, a deliberate move to avoid using fuel lawn mower reducing the company's carbon emissions while it has an impact on reduction of insects that thrive on vegetation leading to further reduction on use of pesticides in the greenhouses.

#### **Tell us about the diseases that are a threat to flower production and the measures taken to minimise fungicide spray**

Foliar fungus diseases are the most serious disease problem on cut flowers. Powdery mildew and black leaf spot are two of the most common foliar diseases.

Powdery mildew produces a very fine, powdery coating on the surface of buds and leaves. Significant cases have stems and particularly thorns, infected. Attacks on young leaves and buds will cause deformity with retardation of growth.

In the black leaf spot disease, the spots, which may be as much as 12mm across, are generally circular and have an irregular edge often with a yellow halo. Leaves frequently turn yellow and fall early. Sometimes new leaves are produced, and these may also become affected.

Botrytis another disease that is a threat, attacks flowers during cool damp weather. It is primarily a disease of the flowers and buds, leaves are infrequently attacked. Infected buds rot on the stem and infection may progress down the stem.

Downy Mildew is a disease that causes purple-red to dark-brown spots with irregular margins on the leaves, however, often angular. Stems, petioles and flower stalks can split and spotted with purple marks.

### **"The use of the geothermal heating helps to maintain and regulate temperatures in the greenhouses creating an ideal climate that is optimal for production."**

The company is using an Integrated Pest Management (IPM) system for control of pests and diseases by researching and breeding beneficial organisms that consume harmful pests without applying synthetic pesticides. It has partnered with Andermatt of Australia and Madumbi of South Africa to form Madumbi East Africa, an IPM firm that is producing some 10,000 friendly dudus weekly for control of pests in the greenhouses. Madumbi is also formulating environmental friendly pesticides under IPM. IPM has multiple benefits which include healthier plants, reduction of chemical exposure to workers as it provides minimal use of fungicide sprays and greatly contributes to a cleaner atmosphere. The company has also adjusted its production system with developments in legislation of pesticides and bee-friendly products following the changes by the European Union regulations allowing only use of pesticides with low post-harvest intervals.

#### **Please elaborate on the benefits of using greenhouses over natural sunlight and heat for growing flowers.**

Outdoor temperature swings range widely between day and night. Plants subjected to extreme cold and heat across a 24-hour period do not grow as well as greenhouse

plants and stressed plants become stunted over time. The enclosed indoor space greenhouses provide is typically temperature-controlled with heaters and air ventilation for specific plant species. Timers connected to the heaters allow altering the temperature settings depending on the time of day. By following each plant species' temperature preferences, foliage, flowers and fruit flourish throughout the controlled space.

Controlling indoor air movement provides the greenhouse plants with a constant supply of carbon dioxide, which they need for sugar production. Although outdoor plants have sufficient carbon dioxide levels, strategically placed horizontal fans throughout a greenhouse allows air to press closer to the foliage for peak photosynthesis action. The concentrated carbon dioxide results in larger leaves, stronger plant stems and possible early flowering and fruiting. However, air movement must be coupled with proper ventilation. Closing off the greenhouse to outside air circulation lowers indoor carbon dioxide levels because the plants use the gas quickly while transferring oxygen to the air in exchange.

The use of the geothermal heating helps to maintain and regulate temperatures in the greenhouses creating an ideal climate that is optimal for production. Reducing humidity clears the environment conducive to development of diseases. The lighting offers extended daylight for plants requiring longer light hours than the normal sun period. Due to the heating, Oserian is able to grow certain varieties that are exclusive to the farm due to inability to survive outside a heated growing environment. The geothermal wells produce carbon dioxide which is needed by flowers in the green houses to enhance photosynthesis. This way, Oserian geothermal greenhouses produce stronger, healthier and more attractive flowers than those grown in a natural carbon dioxide zone. <sup>E</sup>



Image Credit: Oserian

Oserian's solar panels.

Agritec Africa set to take place from 19-21 June 2019 at Nairobi, Kenya provides a launch pad for new ideas, products and services.

# Powering agricultural growth

SEVERAL COMMITMENTS ARE taking place to secure investments across the African agricultural industry, driving demand in sectors including agricultural equipment, seeds and biotechnology and irrigation, among others.

The 6<sup>th</sup> Agritec Africa, jointly organised with the Ministry of Agriculture, Livestock, Fisheries and Irrigation, Kenya, will have the participation of nearly 150 companies from Kenya and abroad and help exchange information and ideas about different segments of the industry while bringing together the farming community, government officials, distributors and all important stakeholders.

**“For entrepreneurs with vision and seamless ambition, Agritec Africa provides a unique opportunity to see, learn, sell, buy and tie up.”**

Sanyal Desai, CEO, Radeecal Communications, the organisers of the show, says, “This year companies from all sectors including irrigation, plasticulture, seeds, government bodies, banks, agricultural machinery, dairy technologies, poultry, grain and allied technology will be present at the exhibition. Such global exhibitions are very important for overall growth in the agricultural sector.”

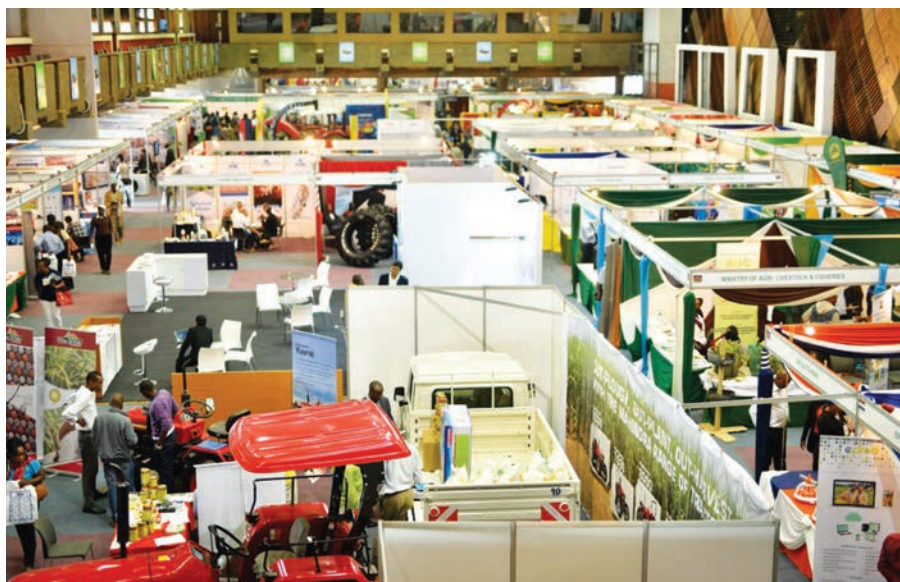


Image Credit: Radeecal

The theme of the exhibition is - 'Improving farmers' income through innovation and technology'

“For entrepreneurs with vision and seamless ambition, Agritec Africa provides a unique opportunity to see, learn, sell, buy and tie up,” says Neeraj Shah, CFO, Radeecal Communications.

The varied profile of participants represents agri ecology, agricultural building contractors, agricultural machinery, aquaculture, biotechnology, fertilisers and chemicals, floriculture, fork lift and handling equipment, greenhouses, irrigation and water technologies, livestock and dairy farming, marketing and export

services, organic agriculture, seeds and plant propagation material, plant protection, plasticulture, post-harvest treatment, poultry, precise agriculture, research and development, renewable energy, rural development, software and hardware, veterinary, turnkey projects and knowledge transfer products.

The show has also planned to organise concurrent events such as the Dairy Livestock and Poultry Expo Africa and Graintech Africa, where many international companies are showcasing their featured products to the industry through their participation in this fair.

Exhibitor participation includes China, France, Greece, Japan, India, South Africa, Egypt, Kenya, USA, Turkey, Austria, Germany, Jordan, Israel, Denmark, Netherlands and Korea.

The theme of the Exhibition is - 'Improving farmers' income through innovation and technology', in line with its aim to aid the growth of the agricultural sector through the development and knowledge enhancement of the farming community.

Agritec Africa provides opportunities to learn about the latest precision agriculture technology which compliments agrochemicals, fertiliser and water requirements. Agritec Africa 2018 had witnessed participation from all across Africa and abroad. **E**



Image Credit: Agritec Africa

Agritec Africa will have a varied profile of participants.



The 8th edition International Floriculture Trade Expo (IFTEX) is set to be held from 5-7 June 2019 in Nairobi, focusing on Kenya's flower industry growth and opportunities.

## Bolstering the floriculture industry

**T**HE IFTEX SHOW echoes the broad range of quality cut flowers from Kenya, targeting different markets. The show includes buyers attending from all over the world and exhibitors representing all the different sectors in the flower industry.

Floriculture is one of Kenya's great economic success stories. It is now the fastest growing export sector in the Kenyan economy, according to the Kenya Flower Council.

Producers from Ethiopia, Rwanda, Uganda, South Africa, Zimbabwe and other African countries have found the way to IFTEX as a crucial place to meet existing and new buyers from an increasing number of visiting countries. Also, a growing number of international flower producers present themselves through exhibiting at this



International promotion efforts for the fair are going very well.

annual trade market.

### More fresh goods

It is for the first time that a significantly lower number of technical supply companies will be presenting themselves at this fair with a stand.

### International buyers promotion

International promotion efforts for the fair are going very well according to organisers, and the number of pre-registered buyers is growing steadily every week.

A group of flower buyers from the USA is preparing themselves for a trip to Kenya to attend this year's IFTEX, according to organisers. Furthermore, pre-registrations of international buyers have come in already from Canada, Germany, Italy, France, Japan, Kuwait, Holland, Russia, Saudi Arabia, South Korea, the UAE, the UK and China.

### Growers quality competition

Special attention will be given to this year's Growers Quality Competition. Judging will focus on comparisons between varieties and not between types. **E**

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The general manager of Victam International 2019, Sebas van den Ende, talks to *African Farming* regarding the event and the trends shaping the industry.

## Providing a boost to agribusiness



Victam 2019 encompasses the close link of theory with practical solutions.

Image Credit: Victam

**T**HE EVENT WILL be organised from 12-14 June 2019 at the KoelnMesse in Cologne, Germany. Co-located with VICTAM International is GRAPAS EMEA 2019, which showcases the latest equipment for grain, rice and flour milling. International companies such as CPM, Yemmak and Rosal will exhibit at the show.

VICTAM will display innovations in technology, ingredients and additives available to manufacture and process feed for animals, pets and aquatics, together with a wide range of necessary ancillary equipment – silos, conveyors, bagging, elevators, etc. New at this year's event are the buyers' missions. The exhibition will also serve as the platform for companies such as Geelen Counterflow, Bühler, Van Aarsen

International and Famsun to introduce their latest innovations.

### How is this year's event going to be different from the earlier ones?

This edition we will organise a scientific conference, the 1st International Feed Technology Conference (IFTC) in coopera-

**New at VICTAM International 2019 are the buyer's missions, which will include decision makers from major companies within the animal feed and grain processing and milling industries.**

tion with Wageningen University. Prof Jürgen Zentek from the Berlin University, Dr Menno Thomas of Zetadec, Dr Hans Stein from the University of Illinois and Dr Ir Thomas van der Poel of Wageningen University are confirmed as keynote speakers.

The event encompasses the close link of theory with practical solutions. This edition will be the same size as that of last year.

### What do you see as the top reasons to attend the event?

This year will have over 300 exhibitors, the highest number ever. The latest innovations within the animal feed and processing industries will be on display and there is a complete programme available for the feed industry.



### What are the innovations in the grain and feed industry on focus?

The innovations are focused on technology and feed formulation. We also see a lot of innovations in the grain processing industry, especially in measuring and controlling processes. For the different segments, there will be an award for the best innovation. In total there are around 40 applications. These will be handed out during VICTAM International 2019 in Cologne.

### Please comment on some of the trends shaping the industry.

We see a larger concentration in exhibitors and visitors due to consolidation of companies. We also see a geographical movement towards Eastern Europe, Middle East and Africa. Especially in the field of ingredients and additives, there is a development towards sustainability and health.

Other industry conferences at Victam International 2019 are: Petfood Forum Europe 2019, Aquafeed Horizons 2019, Feed Strategy Conference Europe 2019, GRAPAS and Global Milling Conference 2019, a seminar by AllAboutFeed, a workshop from Bioenergy Europe and a workshop by GMP+. Exhibitors will also be



Image Credit: Victam

Sebas van den Ende, general manager, Victam.

given the opportunity to present technical seminars.

New at VICTAM International 2019 are the buyer's missions. In association with the local associations, buyer's missions with decision makers from key companies within the animal feed and grain processing and milling industries from Eastern Europe, the Middle East and Africa will be traveling to Cologne to visit the show. The business

match-making programme, which was introduced in 2017, helps to facilitate business meetings between exhibitors and visitors prior and during the event helping visitors and exhibitors at VICTAM International 2019 to meet the right contacts.

Victam International will organise a feed industry tour on 11 June 2019 to the Feed Design Lab and Nijssen/ Granico, both located in the Netherlands. Feed Design Lab is the research and education center for innovation and sustainability in the feed industry. Nijssen/ Granico is a modern feed mill, which processes waste streams from the foodstuff industry into sustainable feed.

The VICTAM Foundation dates back to 1964 and was originally founded to organise a trade show for suppliers to the animal feed and related industries. In due course the foundation widened its scope of activities to promoting the international feed, grain and biomass industry in general. These activities can adopt various forms, such as the organization of exhibitions, conferences, student exchanges, publishing, support of research projects and institutes, and contacts with and support of relevant associations. <sup>1</sup>



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Nawa Mutumweno explores the innovative agro technologies and initiatives showcased during the Agritech Expo that unveil the future for agriculture in Zambia.

# The changing agricultural landscape of Zambia



Image Credit: Adobe Stock

The farmers in Zambia are showing a willingness to adopt smart and innovative solutions that provide a smooth and sustainable route to quality farming and maximum production.

**P**RESIDENT EDGAR LUNGU underscores the importance being accorded to agriculture in Zambia's diversification agenda from the copper mould.

"My government recognises the important role that this sector plays and is resolved to pursuing appropriate policies which are aimed at transforming it into a dynamic, commercial and sustainable sector, capable of meeting the aspirations of our people," he said when opening the sixth edition of the Agritech expo in Chisamba, central Zambia, in April 2019.

"We need to diversify the sector from its current status to a commercialised and export-oriented position in order to fully explore its potential. In terms of agricultural trade, there is a huge demand for agricultural food products, both processed and raw, at domestic and regional levels and beyond," he pointed out.

Some of the bottlenecks inhibiting growth of the agricultural sector in the region, according to the Bankers Association of Zambia (BAZ) include low productivity, low mechanisation as well as inadequate information on modern farming techniques, Lack of agriculture extension officers to help small scale farmers and the fact that farming is taken as a hobby and not a business, which makes it difficult for financial institutions to lend to farmers

The International Development Enterprises (iDE) Zambia is currently implementing a project known as

**"We need to diversify the sector from its current status to a commercialised and export-oriented position in order to fully explore its potential."**

Smallholder Agricultural Reform through Enterprise Development (SHARED), tailored to reduce rural poverty through the creation of sustainable income and livelihood opportunities. The project, funded by the Swedish International Development Agency (SIDA), supports lifting of smallholder farmers out of poverty by shifting to more lucrative agricultural value chains and adopting technical and business practices that support enterprise growth.

Sylvester Kalonge, the country director commented, "iDE Zambia has been working to transform lives of smallholder farmers using market-based approaches. To achieve this goal, it is cardinal to develop strategic partnerships with private sector players along the various value chains."

The Czech Ministry of Agriculture-sponsored Agriserve Agro Limited has a robust extension programme in an alliance with the Dairy Association of Zambia



(DAZ) which seeks to increase access of livestock services to small holder dairy farmers across Zambia. A private sector-led initiative for small scale farmers, it aims at dairy cooperatives and covers herd health plans and artificial insemination (AI) to enhance conception rates and guaranteed milking. The European Union is helping to promote greater integration of smallholder farmers in profitable value chains through programmes such as EU 99M EUR "Sustainable Commercialisation of Zambia's Smallholder Farmers"

The community of farmers in Zambia is showing a willingness to adopt smart and innovative solutions that provide a smooth and sustainable route to quality farming and maximum production. These cover agricultural sectors including crops, finance, irrigation, machinery, equipment and livestock.

#### Aquaculture

The aquaculture status in Zambia is rapidly increasing with a number of donor supported aquaculture development programmes targeting small-scale farmers.

Skretting Zambia is a newly built company specialised in the production of

high quality tilapia feed, helping to cover the gap in the shortage of high quality extruded fish feed across Zambia to ensure that all farmers benefit.

"Skretting Zambia wants to play a major role in pushing Zambia's aquaculture system to greater heights of meeting its per capita consumption of fish. We would like to help people sustain their livelihoods through better understanding of the importance of using quality extruded feed," said Sikabalu Malawo, technical sales officer.

**The farmers in Zambia are showing a willingness to adopt smart and innovative solutions that provide a smooth and sustainable route to quality farming and maximum production.**

#### Finance

AB Bank is involved in financial literacy programmes such as the Farmers and Micro Business Simulation whose main focus is to have farmers and small

businesses view their enterprises as profit centres and manage them as such, in the long run.

"Banks value their relationship with Zambian farmers and are committed to providing financial solutions to help them grow," said Leonard Mwanza, CEO of the Bankers' Association of Zambia (BAZ).

During the Agritech Expo, STI International in Thailand and manufacturers of Flying Star Farm Utility Vehicles showcased and explained the benefits of "F.U.V", a life changing machine which has impacted the lives of small and medium farmers across Asia and parts of East and West Africa.

It is a fact that Zambia's agriculture can foster economic growth, job creation and development in the country if well managed. Private sector investments through effective partnerships between agribusinesses, key public and private actors and farmers' organisations are essential for unlocking this potential which remains relatively untapped but offers huge opportunities for development. These efforts can help getting closer to Zambia's ambition is to be the breadbasket of the region and a regional marketing hub. <sup>Ⓔ</sup>



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# Effective grain storage to tackle African food security

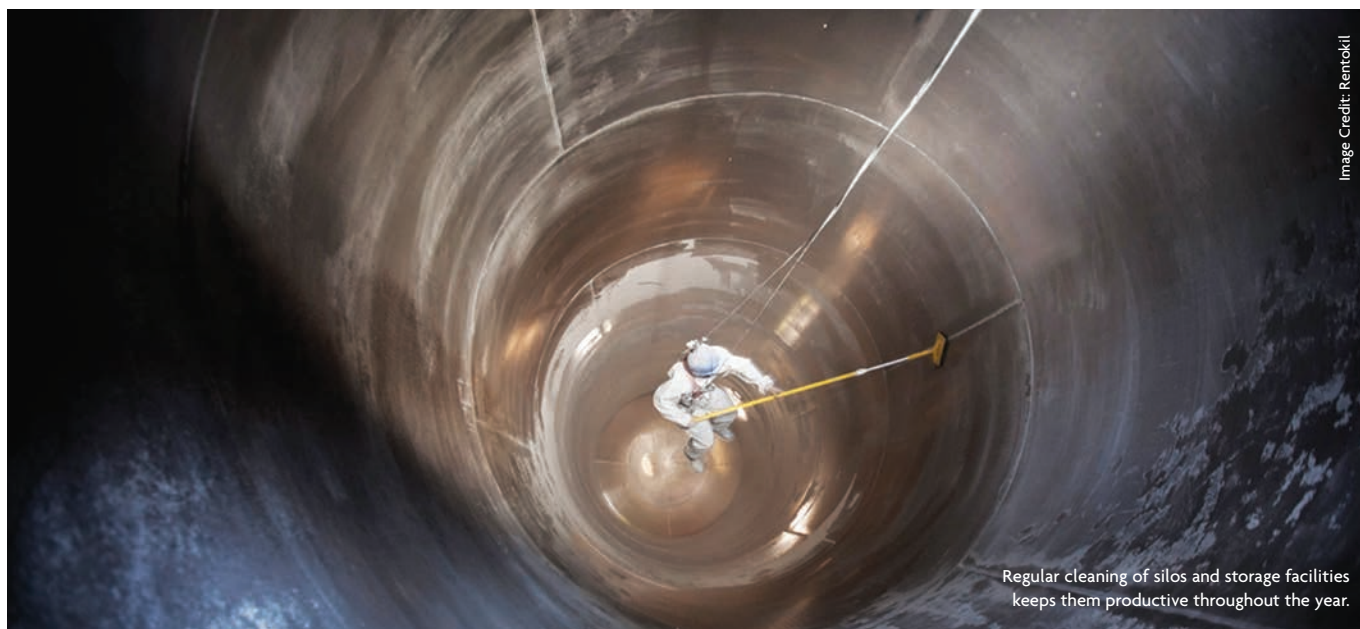


Image Credit: Rentokil

Regular cleaning of silos and storage facilities keeps them productive throughout the year.

**T**HERE IS AN increasingly popular trend across the globe, of making silos and grain storage facilities attractive through paintings and art. However, greater awareness about the proper maintenance and hygiene of these facilities can go a long way in ensuring food security, especially in Asian and African countries.

The African Post-Harvest Losses Information System (APHLIS) estimates that in sub-Saharan Africa, up to 50 per cent of crop production may be lost before produce reaches the consumer. Losses result from poor storage and handling practices and a lack of infrastructure. With an estimated value of US\$4bn, these losses threaten the food security and livelihoods of millions.

According to the Food and Agriculture Organisation, FAO, new evidence continues to point to a rise in world hunger in recent years after a prolonged decline. An estimated 821 million people – approximately one out of every nine people in the world – are undernourished.

Ensuring global food security will be even more challenging in the future due to climate change.

## Implementing a thorough and regular cleaning routine for silos and storage facilities to minimise product spoilage helps to keep them productive throughout the year.

### Maintaining silos and grain storage facilities

Due to the large quantities of flour, grain, sugar, maize and animal feed products that they typically store, silos are attractive to rodents and stored product insects (SPIs) bringing in the possibility of spreading

infections such as those caused by Salmonella and Hantavirus.

David Cross, head of technical training at Rentokil Pest Control and Paul Casson, technical field manager, Rentokil Specialist Hygiene share important tips to keep silos clean and pest-free:

**Seal any gaps:** Any entry points or vents for mice through the exterior of the silo or surrounding buildings should be sealed with wire wool, caulk, metal kick plates or cement and need to be checked regularly.

**Remove any clutter or food sources :**Storage containers or clutter in structures around the silo provide rodents with a place to hide, so it's worth moving these away from walls if possible.

**Quick detection:**Non-toxic monitoring blocks are another way to detect rodent activity as early as possible.

Implementing a thorough and regular cleaning routine for silos and storage facilities to minimise product spoilage helps to keep them productive throughout the year.

Regular testing for mycotoxins is also necessary in grain storage. Aflatoxin is a naturally occurring toxin produced by the fungus *Aspergillus*. Moisture and heat stress is commonly associated with most aflatoxin outbreaks.

### Boosting safe storage in Africa

Forced to sell their produce at low prices soon after harvest to save their crop from insect and rodent damage owing to poor storage facilities, farmers are often food insecure and in debt across the continent.

An alarming amount of grains, pulses and other food products continue to be lost due to improper handling and storage.

Reducing food loss is important since it makes more food available and this is crucial in low-income and food-deficit



countries. New storage technologies can reduce food losses by capturing a greater proportion of crop production and by better preserving crop quality.

Reliance on grain imports by sub-Saharan Africa to meet the region's grain shortfalls poses a food security risk that has seen governments, development agencies, private sector and producers partner bringing in various initiatives to reduce any grain losses during post-harvest stage, with a focus on improving the quantity and quality of grain storage solutions.

### Grain post-harvest loss is especially acute for smallholder farmers who lack effective, safe and affordable storage solutions.

The Alliance for a Green Revolution in Africa (AGRA) project, has been working across the region to help develop market opportunities that will allow hard working families to lift themselves out of poverty. The Alliance believes that reducing post-harvest losses as well as increasing access to processing equipment allows smallholder farmers to participate in competitive, structured commodities markets where they can earn more money for their hard work and establish stronger commercial relationships with a larger circle of buyers.

As part of a new initiative by AGRA, in Ethiopia, the construction of 25 silos to be used by cooperative unions in the teff and wheat value chain in four regional states, was kicked off at the end of last year. The programme is aimed at increasing the capacity of farmers through greater market opportunities.

Logistics and safe storage play an important role in food safety strategies. Symaga is well-known in manufacturing of industrial silos for the large storage projects across the globe. It has been chosen by the Sudanese government to uphold access to food in the African country through a grain storage project with 300,000 tonnes of capacity. The project is divided into two plants with more than 90 silos in Barakat city, on the coast of the Blue Nile, and in Manaqil city, in the state of Al Jazirah.

In Kenya and South Africa grain storage has taken a new approach as governments and private sector players target scaling up of improved storage technologies to retain high quality of stored grain and ward off attacks from insects.

AFGRI Group Holdings (AGH) recently announced plans to create a strategic grain storage platform for South Africa, in collaboration with several institutional investors. The deal is expected to substantially increase food security in the region.

Grain post-harvest loss is especially acute for small holder farmer who lack effective, safe and affordable storage solutions. The majority of farmers still rely on outmoded storage procedures.

The use of hermetic bags helps to ease storage of grains and oilseeds such as legumes, wheat, corn, rice, sorghum, soybeans and oats. Such innovative technologies are helping to prevent losses between the farm and consumers.

The Purdue Improved Storage (PICS) bag is an airtight storage bag that provides a solution for smallholder farmers to extend the storage time for their seeds and crops. They provide airtight storage solutions for smallholder farmers who suffer severe losses due to insects. The bags provide an effective method of controlling insects on maize for smallholder farmers and preserves the quality of the grain being stored. It can be used in hot, humid climates, is chemical-free, controls moisture content, and there is no need for refrigeration. This method kills insects and aids the control of mould.

The use of metal silo technology has also helped provide better storage facilities in some parts of Africa.

There is undoubtedly, an urgent need for an integrated



Grain silo

Image Credit: Adobe Stock

approach towards reducing food loss at all stages of the agricultural value chain. Increasing investments in drying, storage and processing facilities for grains and perishable crops, agricultural cooperatives to help farmer groups reduce the cost of storage and drying facilities and spreading better awareness of the need for proper hygiene in storage are all ways to bring about substantial changes to the problem of food security.

Efforts to protect harvested grain could play a major role in the fight against hunger in Africa as populations rise on the continent and climate change threatens more harvests. <sup>Ⓔ</sup>

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Innovations in farm equipment are helping to redefine the future of the agricultural sector, providing effective results in production and distribution of agricultural produce.

## Enhancing farm productivity

**F**ARM MACHINERY IS undoubtedly the lifeblood of agriculture, driving its profitability and productivity. With the huge investment necessary for the equipment, it is necessary to pay close attention to the maintenance of parts, in order to minimise costs and time involved. Wear parts are a significant economic factor for any farm and the selection should be based on local farming conditions and projected acreages.

**LEMKEN is sub-dividing its tillage wear parts range into the Dural (long-service life) and DuraMaxx (extra-long service life) product lines to meet customers' varying demands.**

LEMKEN, a specialist in professional arable farming, providing agricultural implements for soil cultivation, seeding and plant protection, is sub-dividing its tillage wear parts range into the Dural (long-service life) and DuraMaxx (extra-long



Carbide shares of the Karat cultivator.

Image Credit: LEMKEN

service life) product lines to meet customers' varying demands.

The company specialises in the production of tillage equipment. Considering its comprehensive depth of in-house produc-

tion, which also includes a heat treatment facility, the German company traditionally focuses its core strengths on designing and producing high-quality equipment parts. As early as the mid-1980s, Dural plough bodies were introduced as the first ever generation of wear parts identified by their own brand name. About 10 years ago, the Dural bodies were followed up by the introduction of DuraMaxx bodies made from specially hardened steel, increasing service life by 150 per cent.

LEMKEN has since expanded its portfolio of high wear-resistant parts to cover the area of stubble cultivation. The range of wear parts for the LEMKEN Karat cultivator, for example, now includes a full range of carbide parts to supplement the existing standard steel and hard-faced shares. Also, in addition to the proven standard specification of discs offered for the Rubin compact disc harrow, LEMKEN now offers discs made from highly-tempered steel, providing 20 per cent longer service life. As its range of high-performing wear parts is continuously broadened to cover all other equipment types, LEMKEN now sells these products under its DuraMaxx brand and has adopted the Dural brand for its durable standard-specification part offering. **E**



DuraMaxx bodies on the mounted plough Juwel 8.

Image Credit: LEMKEN



Sensor based sorting technologies are helping drive greater profitability in the sector.

Image Credit: TOMRA Food

TOMRA Food sorting machine at Olam Progida.

# Upgrading the efficiency of nut production

**T**HE SORTING MACHINE industry has been evolving constantly, to accommodate rapidly changing global environment. The advantages range from providing better food safety to consumers, reducing waste to increasing productivity.

The specialised software of Nimbus biometric signature identification (BSI+) from TOMRA Foods is helping food producers with multiple advantages, such as increasing the customer's involvement in the creation of a product's biometric signature. It also makes BSI technology more user-friendly for operators, requiring less training and resource allocation. The advanced user-friendly interface offers different input options, hence more flexibility, helping customers use their sorting machines quickly and with ease to fulfill their particular needs. Aykut Gönen commented on their satisfaction with the ease of use coupled with high performance of the sorting machines: "All hazelnut products manufactured in our factory are processed with care to meet our customers' specific needs and product specifications, which have been defined through extensive joint deliberations.

In this regard, TOMRA Foods Turkey Sales Manager Ahmet Koçyi it commented: "Nimbus BSI+ is a technology that has proven itself globally in the nut sector, and we are consolidating our superiority in software with mechanical developments. Thanks to its mini-pitch air manifold, the sorting of any caliber of product can be done more precisely, hence substantially decreasing the quantity of good units in the waste and increasing efficiency. As a result, our machine helps improve the efficiency of the facilities, the quality of the product and the customer's profitability, while minimising product waste.


**The mini-pitch air manifold feature of Nimbus BSI+ enables the sorting of any caliber of product to be done more precisely.**

The BSI+ module uses both near infrared and visible spectrum wavelengths to detect product defects for a more detailed classification capability. The BSI+ module detects product defects both visible

and invisible to the human eye using near infrared spectrum. This technology helps stay ahead of the competition in detecting defects such as bug bites, rot, colour defects and musty pieces in hazelnuts, peanuts, almonds and all other types of nuts.

TOMRA Food designs and manufactures sensor based sorting machines and integrated post-harvest solutions for the food industry. The company's mission is to enable its customers to improve returns, gain operational efficiencies, and ensure a safe food supply via smart, useable technologies.

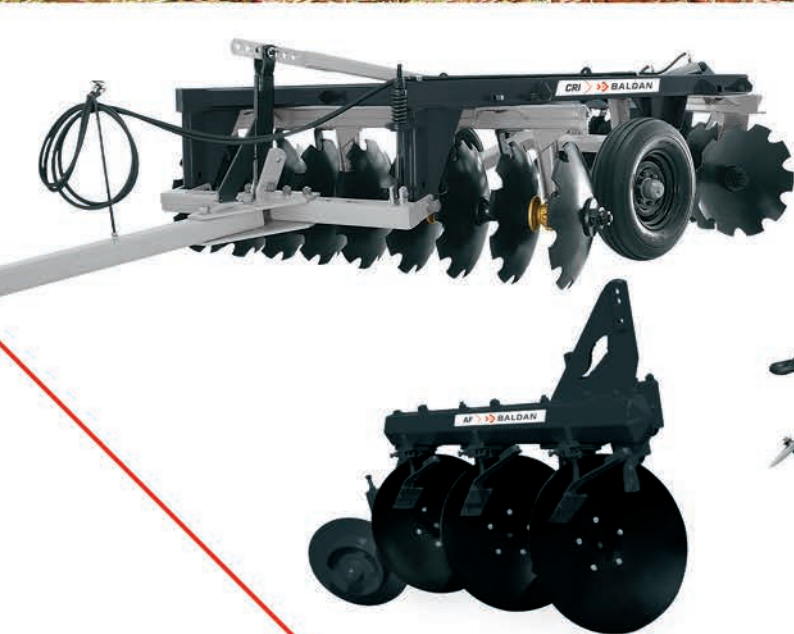
Olam Progida is part of the Olam Group, an agri-business enterprise which works from seed to shelf by supplying food and industrial raw materials to customers worldwide. Olam is a leading supplier of hazelnut kernel products through Olam Progida.

In the nuts sector, latest advancements in sorting equipment have enabled food producers to increase both yield and quality of the final product. They greatly help in improving the efficiency of processing lines and also plays a role in enhancing food security. 



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The gap between producers and consumers of agricultural produce is still huge but technological innovations are making a difference.

## The digital connect



Image Credit: Adobe Stock

Digitally-enabled marketplaces help farmers reach a broader spectrum of buyers.

A GROUP OF AFRICAN farmers are producing avocados, but every season after harvest, they struggle to sell their produce. Often, they have no choice but to sell it at the local market for a low price. Sometimes, the produce goes bad since it becomes difficult to find a buyer on time. The farmers are not organised and do not have the capacity either to negotiate for better prices, or to store their produce until prices increase. These are real problems affecting the incomes of farmers.

This is where digital platforms are serving as virtual meeting places or global marketplaces for agricultural produce and gaining increasing popularity. There are a growing number of marketplace startups trying to help agribusiness buyers and sellers conduct transactions more conveniently online and at a cheaper, more transparent price point.

**"ProduceMart.com aims to simplify the process for both buyers and sellers, by offering a remote, secure way to connect with each other."**

When there is a steep rise in the price of agricultural commodities, it is expected that the increase in food commodity prices offers farmers in developing countries an incentive to increase their yields and incomes. But profitable smallholder farming requires timely access to affordable and quality inputs and the possibility to sell the products at harvest for remunerative prices. Millions of rural smallholder farmers struggle for access to local and national markets that could lift them out of hunger and poverty.

The Mercy Corps' AgriFin Accelerate (AFA) programme has

indicated that access to digital financial and information services is critical in enabling African smallholder farmers to bridge productivity gaps, thereby increasing food security and incomes.

The AFA programme seeks to support and increase the number of emerging 'digital farmers' to blaze a new path and show that engaging in agriculture as a business can be as profitable as any other business venture by using low-cost digital financial and information services.

It has been estimated that much loss occurs across various stages of the agricultural value chain. Digitally-enabled marketplaces for agriculture connecting farmers and markets, help them reach a broad spectrum of buyers and consumers leading to increase in incomes. This also gives rise to virtual cooperatives to broker better prices with suppliers.

In many African countries, it is not always easy to connect buyers and sellers of agricultural produce, especially on an international scale. There is a need for organised platforms to promote food and market security through a fair, transparent and formal marketplace.

ProduceMart, is the new online, global market place where farmers can list and manage agricultural produce as well as ingredients, giving buyers the option to search for their requirements and also to be completely convinced about the quality and quantity of their order prior to the sale.

The chief product officer, Sola Erogbogbo says that he realised during his interactions with various African farmers the immediate concerns they expressed were about reaching new markets and having the transactions managed with transparency, and both of these are addressed by the platform.



"ProduceMart aims to simplify the process for both buyers and sellers, by offering a remote, secure way to connect with each other," he says.

"As consumers, we're used to shopping for all kinds of products online and we want to make it just as simple and intuitive to buy and sell agricultural produce in a similar way."

Sellers have the option of sharing samples either on a free or paid-for basis and buyers not only have a vast variety to choose from, there is also significant saving in costs and time to source produce from around the world.

## Agricultural technology start-ups are providing innovative solutions that help to transform Africa's food security issues.

"There are so many ways that produceMart.com can help to ease the pressures faced by buyers and producers and we're confident the platform will improve the way they do business," says Erogbogba.

ProduceMart aims to become the go-to B2B destination for buying and selling wholesale agricultural produce and ingredients online. The company acts as an intermediary platform for both buyers and vendors, supporting them at every step, regardless of where they are in the world.

These "platforms of platforms" are typically thought of as connecting customers and merchants, but as new Mercy Corps research in Africa shows, they are also connecting farmers to markets – potentially increasing farmers' incomes by 50 per cent or more.

TruTrade Africa is a social enterprise providing smallholder farmers with a reliable route to market and fair prices for their produce with a mission to increase smallholder farmer incomes through integrating them into sustainable value chains. This is done by bringing together the 'supply power' of millions of small-scale producers, to meet the demand of local, regional and international markets. TruTrade provides an alternative to the buy-low-sell-high trading practice common in agricultural value chains in Africa, exploring the development of digitally-enabled marketplaces for agriculture, with the vision to reach millions of farmers, connecting them both with markets and the services that they need to grow and thrive.

Since 2014, Twiga has been bridging gaps in food and market



Image Credit: ProduceMart

ProduceMart.com, a start-up company aims to make it simpler for producers to sell their agricultural produce and ingredients on an international scale.

security through an organised platform for an efficient, fair, transparent and formal marketplace. This is done by sourcing quality produce from thousands of farmers, providing them with a ready guaranteed market, and deliver from our pack houses to thousands of vendors, at prices fair to everyone.

Mercy Corps' research shows that digital platforms link the smallest of agricultural businesses to an expansive and ever-growing market of buyers, often bypassing middlemen and resulting in better prices for goods sold. When they operate at scale, these platforms also greatly reduce transaction costs related to aggregating and moving goods and making payments. Digital data from platform activities can also drive increased financing to farmers, both as buyers of services and sellers of produce.

Virtual marketplaces such as these, enable the purchase and sale of produce to be initiated and closed electronically after due diligence or face-to-face meeting. As well as giving farmers a broader market to sell their produce, the platforms allow farmers to connect with a broad community of peers.

Technology has touched nearly every aspect of the global economy and our everyday lives; and for smallholder farmers it offers immense opportunities to grow their agricultural output, gain access to new markets and improve profit margins.

Digital technologies are increasingly being embraced to make farming more interesting and in the case of Africa, they can, no doubt be transformational. An increasing number of such initiatives in the agriculture sector are becoming available. Technology is making it easier to get involved in the various sub-sectors of the agricultural industry, as an investor, a supplier, a farmer and as the market.

Digital start-ups are providing innovative solutions that help to transform Africa's food security issues.

As Africa's population doubles by 2050 and the demand for food and rural jobs escalates, the transformative power of super platforms cannot be undermined. **15**



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Innovative solutions for agriculture are bringing in revolutionising changes for Africa helping to augment farmer incomes and increasing their market access.

Image Credit: Adobe Stock

Technology is helping to transform Africa's food security in many ways.

# Game-changer for agriculture

**T**HE CHALLENGES FACED by the agricultural sector of Africa are compounded by the need to support a growing population, climate change, a lack of technical expertise and the migration of young people away from rural areas and into cities.

Entrepreneurs in Africa are increasingly seeing opportunities in the agricultural sector and are developing solutions that enable farmers to increase their yields and access markets across the globe.

From big data to biotechnology, sensors, drones, autonomous systems and more, the technologies likely to make the most difference in agri-tech are tools and equipment that can capture and interpret data.

Technological developments in such as aerial imagery from drones or satellites, weather forecasts and soil sensors are making it easier for farmers to manage their crops in real time. Cloud computing, open-source software and digital tools have become increasingly affordable and accessible to farmers.

According to Thomas Fuerst, WING Marketing at Nokia, while research clearly shows that technology can add tremendous value to South African farmers, the uptake has not been what it should be, particularly among subsistence and small-scale farmers. "This is likely due to the perceived costs associated with technology," he says.

The adoption of technology in agriculture also requires that various stakeholders work together. In a report done by the University of Stellenbosch for the Western Cape Department of Agriculture, while agricultural technology will result in higher yields,

reduced costs and improved nutritional value of foods, it needs the farming sector, government and education institutions to work together. "Crop disease, pests, and drought are some of the biggest issues facing agriculture in sub-Saharan Africa," says Fuerst. According to CAB International, crop pests and diseases account for close to half of the total crop losses in developing countries and in a 2017 UN report, it was stated that about 200 000 people, mostly from developing countries, die every year from pesticide poisoning. "By using technology, and more particularly the Internet of Things (IoT), we can arm farmers with more detailed data about their farm as well as the macro environment to assist them in planning their crops more accurately and thereby driving a better yield, while eliminating risk," he says.

Nokia's Smart Agriculture-as-a-service solution runs on the Nokia Worldwide IoT Network Grid (WING), which is a global horizontal platform which allows telcos to not only roll out IoT services more quickly on their network but gives them the flexibility to scale globally when they need to. "They don't have to rely on the cost and complexity of things like roaming agreements that you have with traditional mobile phone services. It allows operators to roll out IoT services much quicker and scale their network much faster without investing huge amounts of CAPEX," says Fuerst.

Nokia works with the operator to roll out sensors that detect moisture, temperature, wind speed, and pests and deploy them across their whole network, not just in one province or town. "This way they are gathering data about the weather, pests and climate



conditions across a far wider area and provide this data to the farmers as a service. There's a smartphone, tablet or a computer application where they can access and leverage that data. It gives them access to data on weather conditions, pest trends, etc. and they can make smarter decisions about irrigation, applying pesticides, when to harvest or not and things like that. The farmer then also has the ability, if there's some specific problem they have, they can send an SMS to an advisory centre and get advice on how to solve a specific problem."

The operator, on the other hand, doesn't have to invest a lot of CAPEX to roll out this IoT network and then put all these sensors on it – they can leverage WING to keep their costs low for the infrastructure and all they have to do is buy these sensors and put them across their network. Then they can access all that data and it can allow them, with minimal CAPEX, to now offering a service to their farmers at a low enough price so that the business model works for both parties.

There are several other initiatives by entrepreneurs that are proving to be beneficial in bringing about the much-needed changes. Some notable ones include Hello Tractor, which allows farmers to connect with tractor owners and rent smart tractors—a potential gamechanger in Africa where there are 13 tractors for every 100,000 square kilometer (globally, there are 200 tractors for every 100,000 square kilometer). There's also 2KUZE, which connects farmers, agents, buyers and banks in Kenya, Uganda and Tanzania. Using the 2KUZE mobile platform, smallholders can connect directly with buyers and agents to secure the best price for their goods, and receive payments securely via their phones, without having to walk for hours to markets.

The blockchain technology has the potential to expand rural finance by making financial transactions more accessible and less expensive, and allow farmers and others throughout the value chain to manage their supply chain more efficiently.

"With the rapid pace of growth of the use of drones, automated tractors, artificial intelligence, robotics and block chains, agriculture as we know it today will change," said the President of the African Development Bank Group, Akinwumi Adesina, speaking about the potential of new technologies to transform agricultural

Emerging solutions are enabling farmers to increase their yields and access markets.



Image Credit: Dusan Kostic/Adobe Stock

production 2018 Agricultural and Applied Economics Association (AAEA) annual meeting. "It is more likely that the future farmers will be sitting in their homes with computer applications using drones to determine the size of their farms, monitor and guide the applications of farm inputs, and with driverless combine harvesters bringing in the harvest."

Many global companies are also making attempts to advance digitalisation of African agriculture by launching payment systems, credit platforms, and digital insurance.

Technology is making farming more attractive for young people and pursue it as a business. There is also need to spread awareness among farmers and smallholder businesses about the benefits through the intervention of technological advancements. Through a combination of forces, emerging technologies can impact industries and solution systems.

The success of finding the right solutions for agriculture would depend on the need for farmers, private companies, government institutions and all other stakeholders working together to address the need for changes.

Clearly, innovative technologies are set to transform African agriculture, bringing jobs and strengthening food security. **E**

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## Northmec completes multiple Case IH tractor order

SOUTH AFRICAN CASE IH distributor Northmec handed over the latest in a series of farm equipment orders from the country's government, with Cyril Ramaphosa, South Africa's president, in attendance at an event to mark the delivery of the new machines.

The 50-strong fleet of Case IH tractors covers some of the most popular ranges in the marque's product line-up for South Africa, from JXT models to Farmall JX machines. It includes eight of the 45hp JX45T tractors, 27 of the 95hp JX95 Straddle machines and 15 of the 110hp JX100 models.

They will be used by the Ebenhaeser community in the Suikerbosrand and Roodplaat areas of the country.

Ramaphosa underlined the need to ensure land was used as productively as possible. The fleet purchase was made under the South African government's land reform initiative to empower individuals to farm in their own right.

Under this programme, Northmec has previously supplied a number of Case IH machines to the area's farmers, including JXT, JX, Maxxum and Puma tractors, and 5140 Axial-Flow combines.



Case IH Northmec tractor handover.

Image Credit: Case IH

Alongside the new tractors, Northmec has also supplied a number of implements suited to the power of the individual models, enabling farmer buyers to be able invest in a package of tractor and matching equipment to perform a complete range of farming tasks.

Case IH is set to launch its Coffee Express 200 multi self-propelled coffee harvester onto the African markets, in a move designed to further extend the brand's harvest product offering and bring to the coffee sector the same levels of product engineering, efficiency, service and support enjoyed by users of its grain, sugar cane and cotton harvesters, as well as tractors and other farm equipment.

Case IH draws on more than 175 years of heritage and experience in the agricul-

tural industry. A powerful range of tractors, combines and balers supported by a global network of dealers dedicated to providing customers with the superior support and performance solutions to be productive and effective in the 21st century.

CNH Industrial is at the forefront of the capital goods sector and, through its various businesses, designs, produces and sells agricultural and construction equipment, trucks, commercial vehicles, buses and specialty vehicles, in addition to a broad portfolio of powertrain applications.

Present in all major markets worldwide, CNH Industrial is focused on expanding its presence in high-growth markets, including through joint ventures.



Image Credit: Case IH

The fleet purchase was made under the South African government's land reform initiative.

## CowTribe combats livestock mortality with mobile technology

THE COMPANY IS an animal health solutions provider in Africa and aims to leverage mobile technology for providing livestock farmers with reliable access to veterinary services.

The cloud-based system aims to speed up the delivery of vaccines and other animal health services. Card manufacturer Databac Group is providing near-field communication (NFC) cards to identify the farmers and share data on their livestock's health history.

Databac managing director Charles Balcomb said, "Cowtribe is having a real impact on reducing livestock mortality and increasing the income of farmers in Ghana. It is showing how business and technology can successfully serve to benefit communities – even in the remotest regions of the world. We are proud that our cards are part of their efforts."

Following an introduction by startup accelerator Fledge in Barcelona, Spain, Databac donated a direct-to-card printer and ribbons to support the ambitious project. Databac also manufactured 13.56MHz NFC cards pre-printed with CowTribe's branding.

Livestock owners are issued with a card which holds the farmer's

information and serves as a wallet for mobile payment. When placed at the back of a smartphone, the card calls up the farmer's file, allowing the field agent to read and update the information, including the number of animals and their vaccination history.

CowTribe's nationwide system is providing a successful solution to the death rate of goat, sheep, chicken and cattle in Ghana. With time, it hopes to reach all of the one million-plus farmers throughout the country.

Aiming to improve the livelihoods of last-mile farmers in particular, CowTribe's system currently serves around 30,000 individuals, treating them as 150 communities and thereby giving them access to services previously unreachable to them. The social enterprise is currently expanding the system to include the use of NFC cards.

"Databac's cards perfectly integrate with our system. They make it incredibly easy and quick to call up information. The farmers also love showing them off. Many do not have passports or drivers' licences, so they also serve as their ID," said CowTribe co-founder Peter Awin.



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## Nardi Sunstorm headers assure greater precision

NARDI DESIGNS AND manufactures agricultural trailers and combines headers for worldwide harvesting. Its Sunstorm pans boast a free rows system equipped with a high-performance mechanic that guarantees greater strength, high speeds and nearly zero losses.

A sunflower is a simple crop to grow, but a delicate crop to harvest, especially when it is dry. Nardi Sunstorm has a specific cutting system that is delicate and to keep all seeds inside. It is designed to work on large hectares, allowing savings in time, fuel and field steps, resulting in cost savings.

Nardi Sunstorm can also harvest down crops. Frame and front pans are so robust that they can work to touch the ground. The frames are reduced to a minimum and therefore the width of the machine corresponds to the effective working width, regardless of the seeding distance. Special and unique hydraulic options are available to boost performance, such as front shield chopper and registerable position.

The head is like a comb, the pans gently guide the stems to the knives. The concave structure welcomes any seed that has fallen as if it were a box. The pans are in white colour to ensure the best visibility.

The shield allows to drive each individual sunflower to get the right position when cutting, preventing the reel from directly striking the flowers. All cut flowers are pushed immediately but gently to the oversized auger (about 55cm). The distance between the reel and the auger is reduced to a minimum to ensure a very homogeneous crop flow to the combine.

Sunstorm Pans are available in sizes 600, 740, 940, 1200mt and from this year also in the 1400mt version. It is also available for smaller combine harvesters with a working width of four and five metres.

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## Kaesler Forum shines spotlight on flavours in animal nutrition

UNDER THE MOTTO, "The Power of Flavours", the Kaesler Forum 2019, which took place from 8-9 May in Cuxhaven in Lower Saxony, dealt with the topic of flavouring substances and their physiological added value in animal nutrition. With its new event format, the North German manufacturer of feed additives is presenting itself as a competent industry pioneer that places independent basic research above commissioned studies and emotional marketing.

Kaesler's management explained the idea behind the event format in its opening speech: "Flavourings are marketed in the industry primarily through emotional arguments. Kaesler wants to show animal nutritionists and feed manufacturers that they get physiological added value in nutrition."

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