

# African Farming

and Food Processing

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## Grain protection

Ensuring grain health during storage

## Plant nutrition

Fighting iron deficiency

## Tractors

Latest innovations



Olam unveils the largest integrated feed mill, hatchery and breeder farm in Nigeria, p 12







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Image Credit:  
Christopher Boswell/AdobeStock



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## Farming Calendar 2017-2018

### DECEMBER

08-11 Addis Agrofood ADDIS ABABA  
[www.addis-agrofood.com](http://www.addis-agrofood.com)

### 2018

### FEBRUARY

01-04 Agroexpo ZMIR  
[www.agroexpo.com.tr](http://www.agroexpo.com.tr)

### MARCH

14-16 HortiFlora Expo ADDIS ABABA  
[www.hppexhibitions.com](http://www.hppexhibitions.com)

27-29 Agrofood Nigeria LAGOS  
[www.agrofood-nigeria.com](http://www.agrofood-nigeria.com)

### APRIL

04-06 NIPOLI Expo IBADAN  
[www.nipoliexpo.com.ng](http://www.nipoliexpo.com.ng)

12 - 14 Agritech Expo Zambia CHISAMBA  
[www.agritech-expo.com](http://www.agritech-expo.com)

17-19 Fresh Produce Africa NAIROBI  
[www.hppexhibitions.com](http://www.hppexhibitions.com)

25-26 Aviana Nigeria IBADAN  
[www.avianaafrica.com](http://www.avianaafrica.com)

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

## Uganda hosts Agribusiness Congress East Africa

AROUND 2,000 AGRI-PROFESSIONALS are expected to descend on the National Crops Resources Research Institute (NaCRRI) in Namulonge from 29-30 November for the Agribusiness Congress East Africa conference and outdoor exhibition. Uganda's Minister of Agriculture, Animal Industry & Fisheries, Ssempiija Vincent Bamulangaki, will deliver the opening keynote address.

Apart from the high-level conference featuring expert speakers, the event this year will also feature more than 45 exhibitors, free training workshops and agronomy consultations, roundtable discussions as well as live demonstrations and crop trials.

The agricultural and economic partners of Agribusiness Congress East Africa include the Ministry of Agriculture, Animal Industry and Fisheries, National Agricultural Advisory Services (NAADS), The Grain Council of Uganda (TGCU), Agricultural Council of Tanzania (ACT), Eastern Africa Farmers Federation, Eastern African Grain Council, International Livestock Research Institute (ILRI), SA Capital Equipment Export Council (SAEEC), National Crops Resources Research Institute (NaCRRI) and VECO East Africa.

The technology and services industry in the sector has come out in huge support of the event and leading farming equipment suppliers John Deere and Mascor as well as Heartland Global are platinum sponsors at Agribusiness Congress East Africa while Case, Engsol, Tafe and Toyota are gold sponsors.

The event will bring together key industry players in the region and is expected to play a major role in boosting Ugandan agriculture.

"Land tenure and affordable finance are the major challenges to expanding and developing the agri sector. Current interest rates put enormous stress on agribusiness and are often prohibitive. We need to look at novel ways to finance the agri sector, and get around using land as collateral," said Jon McLea, director at Agricon and session chairman at the event.

## Fostering agricultural business development in west Africa

FOLLOWING THE HUGE success of the AGRIKEXPO & CONFERENCES 2017, recently held at the International Conference Centre in Abuja, the organisers are now planning a bigger event for its eight edition in 2018. The last edition of AGRIKEXPO saw an impressive turn out of exhibitors and visitors from various areas of the agric value chain. AGRIKEXPO, supported by the Federal Ministry of Agriculture and Rural Development, is one of the leading expos dedicated to agricultural business development in west Africa.

AGRIKEXPO 2018 will be held in 18-20 September 2018 and the organisers commented that trade visitor traffic is set to grow with several sector oriented seminars in poultry and livestock care, machinery and mechanisation and input supply, including delegations from various sector associations.

Many countries have already signed on for national pavilions for the event next year. Speaking to the organisers during the event, the head of Indian High Commission confirmed that given the growing amount of bilateral relationship between Nigeria and India and the enormous opportunities in the sector, India will be looking to have an extensive pavilion at the 2018 event.

The conference will also see a presentation by the head of Ghana chamber of commerce and industry, Dr Apagye Dankyasso, who will be leading a delegation of key agribusiness stakeholders from Ghana. The heads of trade association in Ivory coast, Senegal and Benin

republic are also expected at the event along with their delegations.

Ahaji Sani Dangote who is part of the Nigeria agribusiness group would again lead a delegation of agripreneurs for participation at the event.

Vice-President Prof Yemi Osinbanjo, who is the head of the economic team of the nation has been invited as special guest at the event. The minister of agriculture Chief Audu Ogbah, minister of trade and investment Dr Okey Enelamah, several state governors and a host of other dignitaries will be present at the event.

AGRIKEXPO 2018 will be held a time when the need for local processing and packaging is growing and one of the highlights of

the expo would be the presence of key stakeholders in Agriculture, the organisers, 151 PRODUCTS, said.

As the media partner for the event, *African Farming* will be on ground to cover the event and to engage stakeholders, given its status as Africa's foremost and most authoritative voice for farming and agribusiness.

In the words of the Ugo Nwabuisi, chief executive officer at 151 PRODUCTS, AGRIKEXPO will continue to create a credible opportunity for bilateral Trade and Agricultural development, especially in support of the effort of government at total transformation of the sector.



Image Credit: AGRIKEXPO

AGRIKEXPO 2018 will see participation from key industry players.



## An app that spots crop disease

A TEAM OF scientists has received a US\$100,000 grant to refine a mobile application that uses artificial intelligence to diagnose crop diseases and aims to help millions of African smallholders.

The CGIAR Research Programme on Roots, Tubers and Bananas team won the grant during a big data conference in Colombia as part of the CGIAR Platform for Big Data in Agriculture Inspire Challenges.

The app, to be used against cassava brown streak disease and the cassava mosaic disease, is expected to be rolled out in 2018.

It accurately diagnoses diseases in the field and will send mobile phone short message service (SMS) alerts to farmers in rural Africa.

David Hughes, associate professor of entomology and biology at US-based Penn State University, who leads the project together with James Legg, a plant virologist with the International Institute of Tropical Agriculture, Tanzania, said that the team needs to continue field-testing and improving its user-friendliness.

The app uses a Google programme called TensorFlow that allows machines to train and learn. "We trained it to recognise plant diseases. What the app does in real-time is to assign a score to a video being captured," said Hughes. "That score is the probability that the plant in the video shows symptoms of one of five diseases or pests.

So far the app distinguishes five major types of damage to cassava plants: three diseases and two types of pest damage.

Cassava virus diseases alone cause losses of more than US\$1bn annually in Africa, and threaten food and income security of over 30mn farmers in east and central Africa.

"The main target will be farmers in sub-Saharan Africa. However, we will be working with the global network of CGIAR, and this means that the app could equally be of value in other parts of the developing world, such as Latin America and Asia," said Legg.

"We think the most important value we will create will be through (agricultural) extension workers already helping farmers, and most of whom



So far the app can distinguish five major types of damage to cassava plants.

Image Credit: romio\_crv/AdobeStock

do already own smartphones. It is realistic to anticipate that (most) farmers in sub-Saharan Africa will have smartphones capable of running the app within five to ten years."

According to Hughes, the project's expansion is aimed at collecting more images to train the machine to identify more diseases in more crops – such as banana, sweet potato and yam – as well as work with farmer groups to provide local language apps they want to use.

Peter Okoth, a consultant agronomist at the Kenya-based Newscape Agro Systems Ltd, told SciDev.Net in an interview that smallholders in Africa cannot afford basic agricultural inputs, and thus well planned value chain arrangement with key players are needed to make its potential roll-out in Africa feasible. "For this app to generate the desired impact, the developers must partner with service providers and plant-health specialists and financiers to solve the problems," explains Okoth. "The CGIAR needs to move a step further and constitute action consortia with membership drawn from an array of actors who are needed to address the practical aspects of solving the crop problems jointly with the farmers."

## ECA, AfDB, AUC pledge support for robust land policies in Africa

THE AFRICAN UNION Commission (AUC), the African Development Bank (AfDB) and Economic Commission for Africa (ECA) pledged to do more to support African governments to develop robust policies that will support the continent's economic and social transformation by the optimum use of land and natural resources at the second biennial Conference on Land Policy in Africa in Addis Ababa.

ECA deputy executive secretary Abdalla Hamdok said the ECA remains committed to contributing to the implementation of the AU Agenda on land as demonstrated by its support through the hosting of the Land Policy Initiative (LPI), which is transitioning to the African Land Policy Centre (ALPC), for eleven years.

"We commit to provide support to AU Agenda on land including hosting the ALPC and continuing to support this land policy conference," said Hamdok, adding the



Inclusive land policies play a major role in creating opportunities for investment while protecting the interests of the people.

Image Credit: maresacha/AdobeStock

main purpose of the outfit is to enable the use of land to lend impetus to the process of African development.

"Africa ought to see land as a major resource to enhance food security, peace and security and ensure environmental protection. By developing inclusive land

policies, we create an opportunity for investment while simultaneously protecting the interests of the African people," he said.

AfDB's director general for the eastern Africa region Gabriel Negatu, said the bank is prepared to work with partner institutions to assist governments to ensure land

governance and land policy processes in Africa are transparent, easily understood and accessed.

Janet Edeme, head of rural division in the department of rural economy and agriculture at the AUC, said through hard work with partners, they were building consensus, raising awareness, generating evidence, developing capacities and improving coordination to enhance implementation of the AU Declaration on Land, helping to address some of Africa's daunting land challenges.

She said the ALPC will, among other things, set the agenda on land issues in Africa, acting as a repository of knowledge and represent Africa on global platforms; drive continental land policy and advocacy to ensure land remains a priority in the policy agenda and create continental and regional platforms that enhance coordination in the land sector.



## Tanzania scraps levies to boost coffee production

THE TANZANIAN GOVERNMENT is scrapping taxes and levies imposed on coffee as part of measures to boost production. Minister for Agriculture Charles Tizeba said that the government will scrap 17 levies and taxes. They include coffee buying, processing and selling fee as well as the marketing fees.

The move follows complaints by farmers about multiple taxes imposed on coffee and other cash crops. Tanzania has been charging US\$1,000 for a licence to sell coffee abroad, US\$20 for a permit to purchase parchment dry cherry coffee and US\$250 for a coffee processing licence.

The country has put in place a 10-year development plan to raise the annual production of coffee.

## Malawi to hold national fisheries forum

THE MALAWI MINISTRY of Agriculture, Irrigation and Water Development has announced that it will hold the 2017 National Fisheries and Aquaculture Forum in Mangochi. A press statement signed by Secretary for agriculture, irrigation and water development, Grey Nyandule Phiri, said that the forum will provide an opportunity for exchange of experiences and challenges among the participants.

Participants at the forum include researchers, fish farmers, fishermen, non-state actors and policy makers against the background of the rolling out of the National Fisheries and Aquaculture Policy of 2016.

"The forum will also provide updates on the finalised, ongoing and planned fisheries and aquaculture programmes as well as sharing research findings on fisheries and aquaculture with specific issues on climate change, biodiversity conservation, governance, fish trade and genetic improvement," he said.

## African countries call for sharing framework for exploration of genetic materials

AFRICAN NATIONS ARE pushing for a review of an access and benefit sharing framework for exploration of genetic materials obtained from farmers in developing countries.

African countries raised their concerns at the seventh Session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture held in Kigali last week, which seeks to expand the basket of crops exchanged through the Treaty's Multilateral System.

The Treaty's Multilateral System seeks to remove restrictions to diverse genetic materials stored in gene banks by scientific institutions,

plant breeders and other sector players.

According to the Food and Agriculture Organisation of the United Nations (FAO), the number of food and agriculture plants currently covered under the International Treaty is limited to 64, namely maize, rice, wheat, potato, cassava, sorghum and banana, among others, which provide 80 per cent of world population's food intake from plants.

René Castro-Salazar, assistant director-general at FAO said the need to expand the food basket is critical due to rapid population growth and degradation of natural resources.

The threats of climate change including disease outbreaks, heavy rainfall and changing ecosystems, could result in many plant and animal species going extinct. The need to strengthen the pact for countries to develop crop varieties. is therefore crucial.

Available figures show the multilateral system resulted in an exchange of over four million samples of genetic resources over the past 10 years. However, delegates from developing countries pointed out that the exchange was not mutually beneficial due to lack of monetary contributions to the treaty's common fund.

It was also not clear how the transfer, mostly by private sector research organisations and seed companies, improved food security, livelihoods or contributed to empowering needy communities around the world. Developing countries pushed for stakeholders to commit to making the benefit-sharing provision work for all.

"The implementation of the benefit sharing agreement faces many challenges since contributions are voluntary. The result is that despite a lot of material transfer, you find no sufficient funds going back to communities to support projects for enhancing their livelihoods," said Rwanda's minister of agriculture and animal resources Geraldine Mukeshimana.



Image Credit: Max Barattini/Adobe Stock

Developing crop variety is crucial in facing the challenges posed by a growing population and climate change.

## Heat tolerant durum wheat discovery to aid farmers in West Africa

THE DISCOVERY OF heat resilient durum wheat that could potentially boost the income for one million farming families in the extreme heat of famine-affected Senegal, Mauritania and Mali 2017 and has been awarded the 2017 Olam Prize for Innovation in Food Security. The genome fingerprinting research project, led by Dr Filippo Bassi of ICARDA and Professor Rodomiro Ortiz (SLU, Alnarp), and funded by the Swedish Research Council, used non-GM molecular breeding techniques to develop a set of durum wheat varieties that can

withstand constant 35-40 degree heat along the savannah of the Senegal River basin.

In this region, farmers grow rice for eight months of the year but the land remains unproductive for the other four months. The new durum varieties have therefore been developed to grow super-fast so that farmers can grow the wheat between rice seasons, which could produce 600,000 tonnes of new food, equivalent to 175 servings of pasta per person per year in the region, and could generate US\$210mn in additional income for

the farmers.

Through ICARDA's policy of sharing all germplasm and IP (identity preservation) freely with developing countries, the discovery also has wide adaptation potential for other areas hit by increasing temperatures.

This ground breaking research was voted by a panel of expert judges as the winner of the Olam Prize for Innovation in Food Security – an international prize launched by the global agri-business in partnership with the Agropolis Fondation.



## Nigeria urged to make agric insurance compulsory

THE NEW PRESIDENT of Nigerian Council of Registered Insurance Brokers, (NCRIB) Shola Tinubu, has urged the federal government to make agricultural insurance compulsory in the country.

The NCRIB president highlighted the need for government to embrace insurance in its efforts to take prudent economic strides, considering that its scarce resources and tight budget had made it less likely to replace assets in the event of loss. On payment of bidding fees by insurance brokers, the NCRIB president urged government to retool the procurement rules for insurance brokers, making it to be in tandem with similar professional bodies.

Tinubu also said that during his two year tenure as NCRIB president, he and his team will focus on eight point sustainable agenda that will ensure that insurance broking profession stands at par with its counterparts anywhere in the world.

According to the NCRIB president, the quest by the government to reflate national economy and put the nation on a sustainable path of economic growth has necessitated the government to make agricultural insurances compulsory, as a pre-condition for facilities, subsidies and other government support.

Tinubu, applauded the progressive moves by government to diversify the economy from oil to non-oil.

He stated, "In order to increase insurance penetration in a geometric proportion, there should be concentration on the agric sector in terms of marketing the intrinsic value of the insurance products to farmers and other agricultural and agro allied sectors."

## Chinese investors eye Ethiopian livestock processing

CHINESE INVESTORS HAVE expressed interest to invest in an integrated livestock, meat and dairy farm processing and ceramic production in joint venture with Ethiopian investors.

Xinfei Tangshan Technology Company is eyeing Ethiopia to invest in milk, meat processing and production of ceramics out of the cattle bone.

Zheng Lixin is a Chinese investor who visited Ethiopia to see the potential of the livestock sector. According to him, the integrated agro-industry parks which are aimed at providing the private sector with incentives are instrumental to speeding up the required transformation in the sector.

He said the country's untapped livestock resource coupled with government's favourable tax and investment policies as well as the availability of industrial parks demonstrate that the nation is conducive for livestock processing investment.

He expressed his interest to invest in meat and dairy processing in close partnership with companies in Ethiopia particularly with Excel Agro-processing Company which is currently operating in the country.

Noting that Excel Agro-processing Company has rich experience and gone long way to explore better ways of engaging in the sector, he said that working with the company would ease the challenges that novice investors may encounter.

"We are looking for partnership with the Ethiopian investors in the areas where feasibility studies are conducted and make the investment easier for us," he said.



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## Liberia validates new agriculture process framework

A TWO-DAY validation workshop on the review of the Liberia's Agriculture approval process was held recently in Monrovia. The workshop was organised by the Food and Agriculture Organisation of the United Nations (FAO) in partnership with the Government of Liberia, through the Ministry of Agriculture (MOA).

The two-day seminar was held in the framework of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT) Programme. The objective of the seminar was to support the application of the VGGT by providing technical guidance on how to safeguard the tenure rights in the context of agricultural land related investment. VGGT is a tool employed by the FAO to promote and secure tenure rights and equitable access to land as a means for eradicating hunger and poverty.

## Helping east African farmers adapt to climate change

A MOBILE APP, Africa Tree Finder, has been developed to help farmers and local authorities in east Africa choose the right kind of tree to plant - key to helping countries meet curb their emissions and adapt to a changing climate, say the developers.

In Kenya's Nyanza region, the app identifies 80 different tree species that can potentially flourish for wood production, human consumption, animal use, environmental use and to make medicines.

The app draws on data which is continually updated from a potential natural vegetation map that shows

plants that would survive unaided, according to the World Agroforestry Centre (ICRAF), which developed the app. The map covers Burundi, Ethiopia, Kenya, Malawi, Uganda, Rwanda, Tanzania and Zambia.

"In African dry areas (for example), there is a very tight margin around which trees may be impacted by climate change. However, if temperatures increase by say two degrees Celsius, there is a likelihood that some species may not survive," said Peter Minang, the global coordinator of an international partnership researching tropical forest margins at ICRAF.

## Ghana-Hungary partnership to boost agricultural production

ANDRÁS SZABÓ, THE ambassador of Hungary to Ghana, has underscored the importance of innovation and research for the development of Ghana's agricultural sector in his speech at the recent Ghanaian-Hungarian Agriculture Forum held in Accra

Szabó said that the future of agriculture and extra production in Ghana is expected to be dependent on new innovations and technologies through research.

He further disclosed that a team from the Hungarian National Agriculture Research and Innovation Centre visited Ghana to explore the agriculture sector for a further collaboration with Ghana's research centres and universities.

The team also introduced Hungarian crops and seeds and the application of different modules from Europe to ascertain the best means of improving agricultural production in Ghana, therefore to bring mutual benefit of both the countries.

He said that in order to support Ghana government's 'One-District, One-Factory' (1D1F) programme, Hungary is taking steps to construct food processing units in Ghana. In addition, Hungary had also held extensive discussions with some Ghanaian farmers in the poultry and animal breeding industry to strategise on quality meat production.

Victor Oppong Agyei, chairman of the Ghana poultry farmers association, said that local farmers were ready for the introduction of modern poultry equipment like processing plants and modern poultry houses to improve and enhance broiler production in the country.

## Soil-based filter bricks to recycle water for irrigation

RECENT RESEARCH IN Morocco has revealed that a home-made filter system using layers of soil and gravel cleans domestic waste water well enough to make it suitable for irrigation.

The filter prototype, tested in Al Haouz, a rural district about 40 km from Marrakech, removed a large amount of waste such as solid particles, organic pollution, nitrogen and fertiliser residue. The system was also successful at killing off coliform bacteria and other pathogens in the water including faecal matter, E.coli and streptococci bacteria.

The filter system consists of a two-stage process that can be easily assembled with local material in water barrels. The researchers created filter 'bricks' from sandy soil, charcoal, sawdust and iron scraps, and packed these into the barrels with gravel. While running through the barrel, the water is filtered alternatively by the bricks and the gravel.

The experiment's results were published on 13 October in the *International Journal of Hygiene and Environmental Health*. Laila Mandi, a researcher at Morocco's Cadi Ayyad University and lead author of the paper, said the soil bricks on their own were good enough to filter organic waste and nutrients from the water. But when combined with the gravel, the two-stage system became effective enough to tackle pathogens.

She said the system could provide cheap and low-tech water filtration to rural, arid areas. "The cost of this technology is very low compared with systems like lagoon filters, wetlands and sand filters," Mandi said.

It also has benefits such as simple maintenance, no frequent clogging and no energy requirements, she added. The expected lifetime of each filter system, if correctly maintained, is about 20 years.

The researchers worked with the people of Talat Merghen village to test the prototypes. They collected domestic waste water from 72 people in eight households. The water was stored in a holding tank, from where it was first fed into a settling tank – to separate sediment and silt – and then into the two-stage filter system.

Once optimised for flow load, the system removed around 90 per cent of pollutants, including around 95 per cent of nitrogen, a fertiliser residue. The filtered water was not safe to drink, but was usable for agricultural irrigation and household chores. It could be made potable with additional treatment, such as chlorination or UV light, Mandi said.

The method could help recycle water in arid regions, such as the North African and Asian deserts, where water preservation is crucial for farmers and expensive, industrial water purification is not available.



The method could help recycle water for irrigation in arid regions where water resources are scarce.

Image Credit: GoneWithTheWind/AdobeStock

## Ethiopia sets up modern animal husbandry system

THE ETHIOPIAN MINISTRY of Livestock and Fisheries said it has been aggressively working to establish modern animal rearing system with a view to making citizens more beneficiary and realising the country's goal to be best animal product supplier from Africa by 2025.

Opening the 1st Livestock and Fisheries week recently, minister Professor Fekadu Beyene said, "Currently the nation's livestock and fisheries resources have been contributing a significant portion to the economy, but compared to its potential much remains to be done to benefit sector actors and the country by large."

Cognizant of its huge potential resources, the government has planned to aggressively engage to ease challenges facing the sector by carrying out various capacity building activities supported by researches and trainings, producing animal fodder both in quality and quantity, carrying out proper feeding and development management, providing health services and productive species selections and distributions among other related activities.

Besides, the government has also targeted to modernise the sector by utilising latest technology, improving animal productivity, preventing and controlling animal diseases so as to provide communities balanced diet among others.

The minister also said that the week was organised aimed at evaluating and promoting the nation's livestock and fisheries resources. "It will boost contributions to the nation's economic development. It has a great importance to create awareness and establish common ground to sector's actors and stakeholders."

State Minister Dr Misrak Mekonnen said that the country has huge livestock resources animal, but the country is not utilising its huge potential.

The government has targeted to modernise the sector by utilising latest technology.



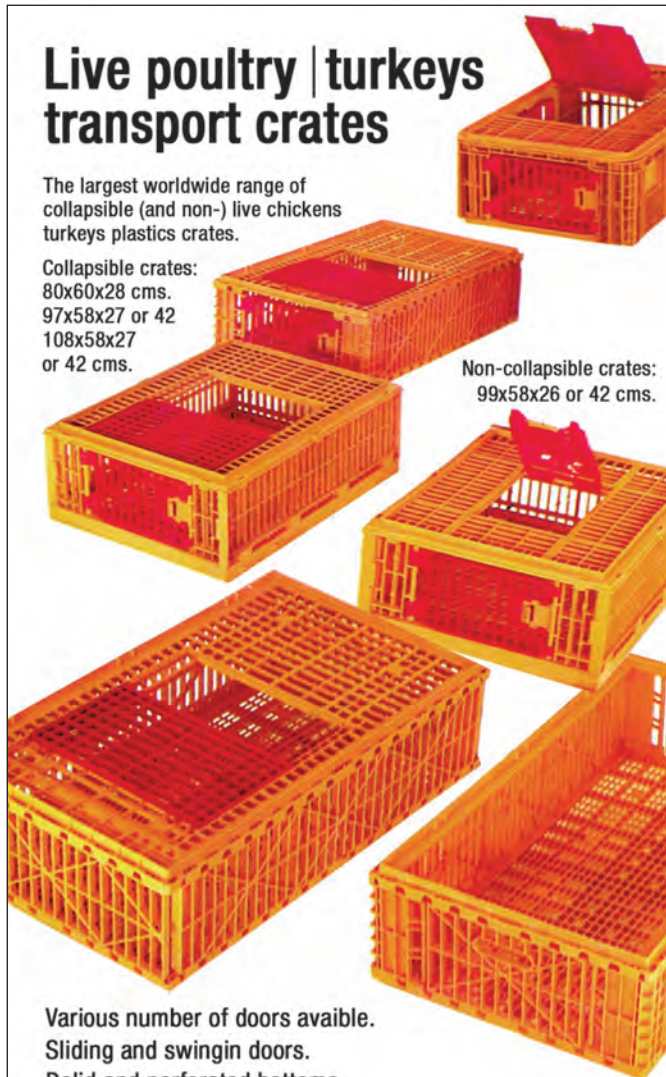
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This year's Agritechnica show held at the Hannover Fairgrounds in Hannover, Germany, welcomed 2,803 exhibitors and 450,00 visitors, including more than 100,00 from outside the country. The main theme of this year's show was 'Green Future-Smart Technology', with a host of exhibitors presenting their new innovations: tractors, farm machinery, equipment, spare parts and accessories.

## Agritechnica 2017: The latest machinery innovations

THE 2017 EDITION of the show presented a jam-packed line-up of events, including conferences and forums such as Young Farmers Day, a day that welcomed young farmers from across the world to take part in an international exchange of experiences and Workshop Live, an event that provided exclusive insights into the practical work of young mechanics.

One of the biggest manufacturers of tractors, harvesting machines, diesel engines and agricultural machinery, Deutz-Fahr showcased its new offerings at Agritechnica. In a press briefing the company held, it presented its new offerings in all power ranges for both the European market and global markets. Deutz-Fahr showcased the 9340 TTV and 7250 TTV models in the Warrior special limited edition at the show. The Same brand also showcased the new SAME Frutteto Natural, Argon, Explorer TB and Virtus at the show.

In Deutz-Fahr's combine harvester offerings, the company has renewed the major components of the 5 and 6 straw-walker models to further increase comfort and productivity. The C9300 Series combine harvesters are presented at this year's show with 340 hp and 395 hp Stage IV Mercedes-Benz engines.

New Holland recently introduced agricultural implements the DiscCutter F 320P front mower conditioner and DiscCutter 320P rear mower conditioner with hydraulic suspension and stone release were exhibited at Agritechnica as part of the company's product offering. The agricultural machinery manufacturer confirmed they will form part of the yellow family of harvesting machinery, where the brand already offers big balers, round balers and forage harvesters, whereas the company's new tillage solutions also presented at the show are painted in New Holland tractor blue. "We provide all-round agricultural solutions to maximise the efficiency and productivity of our customers: agricultural implements must be perfectly integrated with the product they are fitted to – and this is what we are doing - combining our technological excellence with specific



New Holland showcased the DiscCutter F 320P at Agritechnica. (Photo: New Holland)

expertise from Kongskilde," said Carlo Lambro, New Holland Agriculture brand President. "

New Holland won Machine of the Year 2018 Award in the Mid Class Tractor category at this year's show for the New Holland T6.175 Dynamic Command™ tractor in the Mid Class Tractor category after being judged against a criteria that looked at performance, productivity, cost of operation.

*African Farming* spoke to Rainer Sy export manager at Lemken at the show "South Africa was completely a turnaround - 2016 there was a drought almost a disaster. This is the same in Zambia, Namibia and other southern countries but now we have had a pretty good year - we are heading US\$5.9mn local turnover in South Africa which is quite good. Other countries we had some sales in include Senegal and Morocco and we are in process with Algeria. We have discussions with Sudan and Ethiopia - where we already have sales. Nigeria has more inhabitants than Russia, in the year 2013 they expect to have more inhabitants than the US, so that is why they want to invest in agriculture and food security."


Fliegl presented its new product range at the 2017 edition of the show, including Fliegl Buffalo, a new combination of rotor loading system, pickup, cutting rotor, holding hopper and overloading apparatus. Material is taken up, cut, stored in a holding hopper and overloaded onto the transport vehicle. The result is a harvesting process with unprecedented efficiency - a revolution in grassland harvesting. The Fliegl Buffalo was awarded

the Silver Innovation Award at Agritechnica.

Joskin, provider of the world's largest offerings of trailers for transport and spreading of agricultural products, showcased its trailer dedicated to the palm harvest at the show. The company has designed a new trailer for the harvesting of palm fruits. Based on the successful Trans-CAP, this trailer is simple, sturdy and can face all types of tracks. The sprung drawbar ensures a significant flexibility and protects the driver from shocks. The Trans-PALM tipping trailer was designed to be packaged in containers, which increases the transport possibilities while reducing the freight costs. As an example, up to 4 units of Trans-PALM 4500/7C65 can be put in one 40" container.

Based in France and manufacturing agricultural machinery since 1946, Rolland, unveiled the HD Definition for its international clients at the show. This new panel of options will seduce the intensive users by rising the spreader's capacities while facilitating the maintenance. The deck offers dismountable wearing parts and a bell covers the gearbox shafts to prevent liquids intrusions. The TCE concept designed by Rolland 25 years ago, makes the beater frame the closest as possible to the bed chain in order to mix the manure, while also improving spreading quality and width.

A full width side deflector has been designed to easily spread on fields sides. The composting deflectors can now be piloted hydraulically. A rubber protection that was designed for use in the mining industry is available to protect the hood from abrasion and chocs. It is a dismountable wearing part.

This year's show was hailed a success with visitors from 138 countries; most of them from The Netherlands, followed by Denmark, Switzerland, Austria and Italy. Visitor growth was recorded in the numbers from North America, Eastern Europe, Asia and Africa. The visitor survey showed more than two-thirds of the surveyed farmers, contractors and machinery rings intend to invest in the next two years. The focus of this investment was primarily linked to replacement and expansion. 

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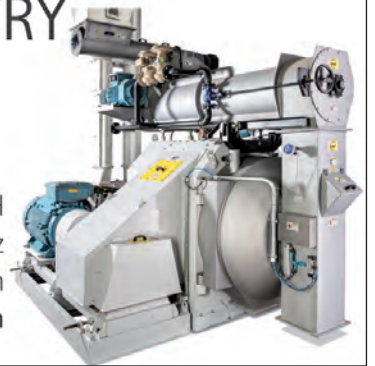
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Olam Nigeria Limited recently unveiled Nigeria's largest Integrated feed mill, hatchery and breeder farm. Iliya Kure writes about the farm, its operations and the role it could play in transforming Nigerian poultry industry.

# Pioneering growth in the Nigerian poultry industry



Image Credit: Olam

Outside the animal feed mill at Olam's integrated feed mill, hatchery and breeder farm.

**“WE STAND NOW** on the site of Nigeria's largest integrated animal feed mill, poultry breeding farm and hatchery. With the government and the community as our partners, it is our ambition that this new investment will help Nigeria meet its ever-growing demand for high quality animal protein.”

These were the words of managing director and chief executive officer of Olam Nigeria's integrated feed mill, KC Suresh, in September, at the inauguration and formal commencement of business at the integrated feed mill, hatchery and breeder farm in Kaduna, northern Nigeria.

The ground-breaking ceremony for the project was performed by governor Nasiru El-Rufai of Kaduna State, on 8 April 2016. This followed meetings with Olam in

**On an annual basis, the facility is expected to process 180,000 tonnes of corn; 75,000 tonnes of soybeans; and 360,000 tonnes of animal feed.**

Singapore in September 2015, where the company made a firm decision to invest further in Nigeria and in Kaduna State.

Located in Chikpiri Gabas village, KM 25, along Kaduna-Abuja expressway, the state-of-the-art poultry farms and animal feed mill covers a total of 844 ha and is operated with the latest techniques in biosecurity and at full capacity will supply 1.6 n day-old-chicks every week.

Olam Nigeria has invested about US\$150mn to establish two integrated

facilities in Kaduna and Kwara states, resulting in two animal feed mills, poultry breeding farms and day-old-chick hatchery.

The company has an advanced feed laboratory which further assures quality at each state of production, and ensures all hatched chicks receive full vaccination and environment-controlled transportation to protect their health.

The Kaduna facility has two warehouses with storing capacity of about 8,000 mt of raw materials. It has 15 poultry farms, each housing 50,000 birds.

On an annual basis, the facility is expected to process 180,000 tonnes of corn; 75,000 tonnes of soybeans and 360,000 tonnes of animal feed.

Combined, the two state-of-the-art animal feed facilities can provide local farmers with 720,000 mt of poultry feed.



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**Innovations in poultry feed**

Olam's two poultry feed brands, Chikun and Ultima, are fortified with amino acids, vitamins, minerals and feed additives which meet national and international standards.

According to the company, it is introducing heat-treated mash and pelleted feeds to Nigeria for the first time to ensure high microbial safety for its feed.

"We project that our investment will enhance domestic poultry production by approximately eight billion eggs and 100 mn kg of poultry meat - the equivalent of 40 eggs and 0.5 kg of chicken per Nigerian per year," said Emma Blinkhorn, public relations officer at Olams International.

**Olam is introducing heat-treated mash and pelleted feeds to Nigeria for the first time to ensure high microbial safety for its feed.**

**Fostering local content**

"We source many of the raw materials for our animal feed locally (soybeans, corn, cassava). In the crop year 2016-17, Olam was the largest buyer of Nigerian soybeans from local farmers and traders.

"With the projected demand for these raw materials, we could impact more than 300,000 smallholder crop farmers." Emma said.

Olam believes that its poultry business will provide direct employment to more than 250 people and create additional 400-500 indirect jobs.

The animal feed and protein operations are creating about 6,000 jobs to high



Day old chicks being fed at the farm.

skilled individuals among them, veterinarians and aquaculture technicians.

Olam is working with the International Institute of Tropical Agriculture (IITA), Ibadan, an Agricultural Research Institute, in the area of high yield seeds production, which the company plans to distribute to local farmers.

"We have started 220 ha of soybean seed farming on our Kaduna site and we hope to gradually expand this to offer high-quality seeds to farmers in Nigeria. We have set a target to increase Nigeria's soybean production from 500mt to 2,000mt over the next five to seven years," said the public relations officer. This act, they believe, will impact the livelihoods of more than 300,000 smallholder crop farmers.

**Support from the Nigerian government**

Expressing delight while speaking at the

inauguration and formal commencement of business at the Integrated Farm, governor Nasiru El-Rufai, described the Olam project as a major investment in the State, saying government had to go an extra mile to create a competitive business environment for investors.

"Kaduna State provided this land free of charge to Olam, carrying the burden of paying nearly US\$1.3mn in compensation to customary title holders in the clear belief that such is a worthwhile expense for the benefit of our people."

According to him, his administration was developing a green economic zone in partnership with an India based company, Skipper Seill, which will accommodate other agribusinesses, including the OCP Centre of Agricultural Excellence (Morocco), Flour Mills fertiliser blending plant (Nigeria) and the Mahindra tractor manufacturing plant



Chikun animal feed bags at the farm.

Image Credit: Olam

Image Credit: Olam

(India), all powered by clean solar energy, with gas turbines as back-up to be provided by Greenwich Energy of France and Greenville Oil and Gas (Nigeria).

El-Rufai described the project as a significant milestone for Kaduna State especially in Nigeria's drive towards food security and economic diversification through agriculture.

While inviting other investor to Kaduna, the governor described the state as one with comparative advantage, saying, "Our farmers are the leading producers of ginger, maize and soybeans in this country. We are close second in the production of sorghum, beans, tomatoes, chilly peppers and potatoes. Kaduna state is blessed with vast arable land, immense water resources and farmers who know how to farm, limited only by their small holdings."

**Olam is working with the International Institute of Tropical Agriculture (IITA), Ibadan, an agricultural research institute, in the area of high yield seeds production.**



Sharad Gupta, vice-president of Olam Grains and head of animal feed and protein.

He described Olam as the largest single foreign direct investor in Kaduna State in decades, stressing that in addition to creating thousands of direct jobs, it will also create many more indirect jobs, as it will outsource its grain supplies to farmers as well as create a ready source of day-old chicks to smaller poultry farmers.

Also speaking at the occasion, president

Muhammadu Buhari described the investment as a symbol of national growth and stability of the nation, adding that apart from boosting food production, it will help to reduce crime and rural-urban migration through job creation.

Buhari described Olam as thoroughly Nigerian, stressing that since its incorporation in the country in 1989, it had extended its operation across the country.

"I would like to acknowledge their investments in the country," Buhari said.

#### **A long history**

Established in 1989, Olam traded cashews from Nigeria to India. Today Olam is a leading agri business operating from seed to shelf, supplying food and industrial raw materials to over 22,900 customers worldwide.

Olam has over 70,000 employees across 70 countries and has built leadership positions in several platforms, including cocoa, coffee, cashew, rice and cotton. The company which is listed on the Singapore Exchange (SGX) and counted among the top 30 companies by market capitalisation, sources its raw materials from over four million farmers and their communities. 

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Genetic tools can play a major role in boosting egg production with genomic selection, egg quality testing and innovative monitoring techniques.

## Genetics to boost egg production



Image Credit: Hendrix Genetics

Genetic tools can also play a role in managing disease and nutrition.

**E**GG CONSUMPTION IN Africa per capita is steadily increasing, with the benefits of the low cost protein still being discovered. As the population grows and income levels rise, the pressure to supply eggs will intensify, and African producers have a great deal of opportunity to succeed in the marketplace. In fact, eggs are one of the most efficient and cost effective ways of converting feed into protein for human consumption, with far lower environmental impacts than, for example, cattle farming. Therefore, the prospects for everyone involved in the egg production value chain over the next five years are very promising.

### Boom in the poultry industry

As some recent events demonstrate, Africa continues to be an important area of growth. From October 1-6, representatives attended the Poultry Trade Mission in Uganda and Rwanda, hosted by the Netherlands-African Business Council (NABC) as well as the first ever Poultry Africa Expo & Conference. The trade mission was attended by 12 Dutch poultry companies with a programme of activities intended for networking and discussion. After the mission, the first Poultry Africa Expo and Conference took place in Kigali. This event gave opportunities for all participants to exchange information and

### Within commercial production, producers require robust, easy to manage and forgiving birds, capable of bouncing back to full production following the inevitable challenges.

knowledge. The mood of the event was positive as many in the field have recognised that regions such as Uganda and Rwanda have an intensive agricultural sector whereby poultry farming has become an important industry. The demand for eggs is steadily increasing, and the poultry sector in Rwanda is still relatively small, but fast-growing.

### Improving production with genetics

Within commercial production, producers require robust, easy to manage and forgiving birds, capable of bouncing back to full production following the inevitable challenges. Using genomic selection, exhaustive testing of egg quality and innovative monitoring techniques, Hendrix Genetics' research and development programme results in breeds with unique and highly desirable combinations of resilience, efficiency and performance. Additionally, technical support, offered by

the global team, is crucial in order to set producers up for success in managing disease, nutrition and egg production.

Within the R&D department, testing of pedigree birds is conducted in commercial environments in approximately 25 locations around the world with hundreds of thousands of birds annually. The commercial cross birds tested are the daughters of pre-selected cockerels, and by testing a large number of birds the company is able to gather a large amount of data. The more measurements collected, the more accurate breeding values become for selection purposes.

Furthermore, the offspring of the cockerels in the commercial line are tested in at least two different locations so that the effects of management, feed and climate differences can be incorporated into the analysis. For these reasons breeds such as the feed efficient ISA Brown and the versatile, robust Bovans are popular across Africa. New performance standards have recently been released, giving producers even more accuracy in predicting flock performance.

Egg production in Africa accounts for less than five per cent of the world total. At the same time, as egg consumption continues to grow, African egg producers are poised to tap into the tremendous potential within the region with the right products and services within their grasp. **E**

## A natural alternative to antibiotics

THE OVERUSE OF antibiotics in human medicine is a major cause behind the development of bacterial resistance. Another important contributing factor is the overuse and misuse of antibiotics in intensive animal production. It is estimated that over half of all the antibiotics produced is used up in farm animals, that too for non-therapeutic purpose. When animals are administered an antibiotic that is closely related to an antibiotic used in human medicine, cross resistance occurs and disease-causing bacteria become resistant to the drugs used in human medicine.

Non-therapeutic use of antibiotics are being slowly limited from intensive animal production. Worldwide, consumers are actively pressurising governments to bring resolutions to limit the use of antibiotics as growth promoters. However, the burning question now is, what do you replace antibiotic growth promoters with? According to feed additives company, Ayurved, nature has provided us with



NBIOTIC uses herbs that promote intestinal microbiocenosis.

Image Credit: Ayurved

immense treasure which when harnessed with right kind of knowledge can provide solutions to practically every problem.

NBIOTIC is a phyto additive growth promoter fortified with essential oils created by the research and development team of Ayurved. According to the company, it is a natural alternative to antibiotic growth promoter,

helps in improving FCR and attaining better final body weight in pigs and poultry. The herbs present in NBIOTIC include allium sativum, zinzibar officinale and cichorium intybus among others. The herbs promote gut function and maintains the micro biocenosis of the gut. They are natural growth promoters, have antioxidant and antimicrobial properties and promote gut morphogenesis.

The main mechanism through which NBIOTIC promotes growth is by increasing the height of villus and crypt depth, thus improving the absorptive capacity of the gut. It also helps in improving the intestinal environment for the growth of beneficial bacteria while inhibiting pathogenic bacteria. The goblet cell number also increases, thus providing protection to the gut from local antigens. Ayurved points out that the overall effect is that it provides all the benefits that are found in antibiotic growth promoters while providing food safety.

## Rwanda to increase chicken population by four million in next five years

THE RWANDAN GOVERNMENT has announced ambitious plans to increase the country's chicken population by four million over the next five years. In turn, this will take the total chicken population to 11mn by 2023 and increase egg production by 143 per cent in the east African country.

This move was announced by the minister for agriculture and animal resources (MINAGRI), Dr Gerardine Mukeshimana, in a bid to increase protein availability and help improve nutrition for the Rwandan people. During talks with government institutions, development partners, and members of Rwandan Parliament, the minister laid out her plans on how to further develop the economy while at the same time achieving farming targets.

She said the move was intended to scale up the livestock sector, especially poultry, which is rich in protein and can contribute to rapidly improving nutrition among Rwandans.

MINAGRI figures from 2010 show that the country had 3.5mn chickens. Egg production that same year was 80mn which increased to 157.7mn in 2016. According to these figures, a Rwandan ate about seven eggs per year in 2010, or half an egg per month, which increased to 13 eggs in 2016, about one egg per month, which are very low consumption statistics.

However, farmers in Rwanda state that they are hindered in developing their poultry flocks as the cost of feed is much higher than the returns from eggs and poultry meat. Addressing the issue of costs of production, minister Mukeshimana said, "We are working with people who produce day-old chicks so that we set up a system that will allow a smallholder farmer to get the chicks after six months so that they are able to spend less money rearing the chicks, as after three months, they can get yields."



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Inter-disciplinary research by the International Livestock Research Institute (ILRI) and the Ministry of Agriculture, Livestock and Fisheries (MALF) has revealed the potential benefits of a comprehensive livestock master plan in Tanzania.

# Tanzania livestock master plan to create two million jobs



The livestock master plan could help to improve productivity and total production in the key livestock value chains.

Image Credit: Carsten Krueger/AdobeStock

**W**ITH RAPID ECONOMIC growth forecast in much of the continent, government development priorities largely focus on increasing productivity and investment. And in Tanzania, where approximately 37 per cent of the rural households possess cattle, chicken, goats, pigs and sheep, this puts livestock at the centre of the development debate.

Despite accounting for 11 per cent of the African cattle population, livestock-related activities contribute only 7.4 per cent to Tanzania's GDP and growth of the livestock sector at 2.6 per cent is low. In recent years, the government of Tanzania has prioritised the transformation of the agricultural sector, yet the absence of a livestock roadmap has hindered progress. The absence of clear roadmaps to develop the livestock sector has persistently hindered successful implementation of these previous investment plans.

However, detailed inter-disciplinary research by the International Livestock Research Institute (ILRI) and the Ministry of Agriculture, Livestock and Fisheries (MALF) reveals the potential benefits of a comprehensive livestock master plan in Tanzania.

## Development of the plan

Funded by the Bill & Melinda Gates Foundation, development of the Tanzania livestock master plan was overseen by a high-level technical advisory committee convened by the MALF livestock permanent secretary, Maria Mashingo, and chaired by Catherine Dangat, ministry's director for policy and planning. The committee comprised directors of key MALF livestock-related departments and other government agencies, and representatives from the private sector, civil society organizations and development partner agencies.

## Investment in the development of crossbred dairy cows could lead to a 35 per cent surplus of milk production.

Data collection and quantitative diagnostics were supported by ongoing involvement of national livestock experts and in consultation with a wide range of key stakeholders. The quantitative sector analysis was undertaken using a Livestock Sector Investment and Policy Toolkit developed by

the World Bank, the Agricultural Research Centre for International Development (CIRAD) and the Food and Agriculture Organization of the United Nations working under the auspices of the African Union Interafrican Bureau for Animal Resources.

## Targeted outcomes of the MALF/ILRI plan

The plan sets out the investment interventions—better genetics, feed and health services, which, together with complementary policy support—could help to improve productivity and total production in the key livestock value chains for poultry, pork, red meat, milk, and dairy cows. With relatively small levels of investment in the livestock sector, US\$621 mn over five years, the joint MALF/ILRI plan aims to create 1.8 mn full-time jobs—80 per cent going to farm family members and another 20 per cent to hired employees.

Beyond the direct benefits to the livelihoods of rural people, transformation of the country's livestock sector has the potential to lower food prices, benefitting urban consumers, and to generate foreign exchange earnings through increased exports. Implementation of the livestock master plan is also seen as critical to

achieving food and nutritional security at household and national levels.

### Reevaluating the livestock industry

The Tanzania plan assesses contributions by three traditional pillars of livestock development—breeds, feeds, health—as well as by institutional policies on key livestock value chains (crossbred dairying, and red meat, pig and poultry production) for the long-run development of the sector.

The plan provides evidence that investment in the development of crossbred dairy cows could lead to a 35 per cent surplus of milk production over domestic demand, enhancing nutritional security, industrial output (eg in the baking industry) and export earnings.

The story is less positive in the red meat subsector where limited access to land for grazing and feed production will constrain growth in the beef sector. Without a substitution away from beef consumption, Tanzania is still likely to face a 17 per cent red meat deficit by 2022. Since small ruminant meat accounts for less than 20 per cent of red meat production, it is unlikely to significantly help close this projected deficit. With a rising population, this is likely to put upward pressure on red meat prices.



The plan aims to introduce more sustainable and climate-smart operations in the pig sector. (Timestudia/AdobeStock)


### Increasing meat production

Successful interventions—largely in the areas of breed selection, disease control and feed production—could significantly expand the share of poultry in the economy by 182 per cent, to US\$323mn within five years. Interventions in the pig sector—leading to more sustainable and climate-smart operations and ensuring high-quality and safe pig meat/pork—could significantly reduce poverty by increasing household incomes, food and nutritional security. The contribution of pork to Tanzania's GDP

would be expected to rise by 83 per cent, to US\$36mn by 2022.

Perhaps most importantly, the growth of the poultry and pig subsectors would enable Tanzania to close the projected 'all meat' deficit, increasing the share of white meat to total meat consumption from the current nine per cent to 41 per cent by 2032. There are, however, some caveats. The benefits that can accrue from implementing the livestock master plan will require investment in changing tastes away from red meat. **E**


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Cassava's potential in Africa is slowly expanding beyond food security. The 3rd Cassava World Africa held in Lusaka from 10-11 October 2017 focused on the role cassava could play in bolstering industry and economies in the continent. Nawa Mutumweno reports.

## Cassava's emerging potential

**A**LTHOUGH CASSAVA'S ROLE in food security in the continent is now being recognised, it still lags behind maize, rice and wheat in terms of attention and research.

Cassava is abundant in sub-Saharan Africa, and is a worthwhile alternative to improve food security for millions of people. Turning a traditional crop like cassava into the commercial realm for food and non-food applications is the ambition of many African countries. For many years, commercial cassava cultivation in Africa has been limited but it is heartening that this is changing.

Governments across Africa are pushing for the expansions of cassava investments and value addition that can potentially create more employment and economic development for the countries.

**There has been interest from mining firms to use cassava starch in processing plants and in the beverage industry for beer production.**

Even though Africa produces the largest volumes of cassava, it is yet to capitalise on its harvests through modern mechanisation, availability of high yield cassava varieties and improving its processing capabilities. Limitation of investments in agriculture tools and infrastructure are hurdles on the road to success.

It is against this background that the Centre for Management Technology (CMT) organised 3rd Cassava World Africa in Lusaka from 10-11 October 2017 under the theme: 'Raising Cassava Productivity in Africa to Meet Rising Demand in Food & Industry'.

### **A platform where stakeholders converged**

The event has established itself as the preferred conference for cassava industry players across Africa. The summit addressed that included cassava varieties, supplemental irrigation, seedlings and had the attendance of key players from west and



The summit was attended by key industry players from across the continent.

east Africa sharing their experiences, challenges, and opportunities with the common goal of maximising cassava value added products.

New features at the forum included: commercial farm operator's perspective on cassava plantation investment; regional governments' smart incentives and policies for cassava investment; mechanisation solutions in advancing cassava farming; market prospects of value added products – starch, biofuels, animal feed, glucose syrup, flour; outlook for maize vs cassava in Africa; and latest processing technologies to produce quality starch.

### **Exploring new opportunities for cassava**

The Cassava World Africa also covered, inter alia, areas like land availability for cassava farming and new land models; access to agri financing and options; improving productivity and quality – learning from Asia; commercialisation of smallholder cassava production; high quality cassava seed multiplication; processing and brewing cassava beer; latest updates on new cassava varieties; and cassava projects and downstream investments.

It presented cassava market business prospects across Zambia, Mozambique, Uganda, Nigeria and Tanzania. Among key speakers was Dick Siame, country

programme officer at International Fund for Agriculture Development (IFAD) who shared on 'Commercialisation of Smallholder Cassava Production in Mozambique and Zambia: Opportunities and Challenges'.

Also commenting on the commercial cassava processing initiatives was Union Dicon Salt on its investment in commercial cassava plantation and downstream projects in Nigeria and Flour Mills of Nigeria's account of its cassava bread initiatives pinpointing how it overcame constraints of inadequate equipment for flour production to impact on cassava flour inclusion in bread formulations. Presenting its successful case study was Zambian Breweries describing its journey in processing and brewing cassava beer and how it worked with smallholder farms and managed the supply chain.

Zambian Breweries has invested US\$2.2mn in Luapula Province that will enable 4,000 small-scale farmers to grow cassava. The brewery plans to turn Mansa, the provincial headquarters, into the 'cassava capital city of Zambia'.

"The brewery has collaborated with Zambia Agriculture Research Institute (ZARI) to develop new varieties for cassava and invest in mechanisation of cassava production with support from Musika," the firm's agriculture manager Chris Nicole said.

### Support from governmental and non-governmental sectors

The summit also had Uganda's Ministry of Agriculture, Animal Industry and Fisheries sharing details of the country's smart incentives and policies to promote cassava investment via land availability and new land models and developing basic infrastructure from farm to processing facilities.

Funding cassava projects, both upstream and downstream, as well as marketing cassava value added products in Africa were two key highlights at the event which featured panel discussions on 'Financing cassava projects and downstreaming investments' and 'Towards better market access' featuring speakers from the Rockefeller Foundation, Zambia National Commercial Bank, Zambia National Cassava Association, and Tanzania Private Sector Foundation (TPSF), among others.

### Nigeria has started to benefit from its import substitution policy in cassava starch – led by the federal government – which has earned it US\$4mn in the financial year that ended 2016.

#### Beer and starch production from cassava

The forum was a meeting point for decision makers from cassava plantation investors/owners; processors and end users from the sectors of food and beverage, brewery, paper, textile, livestock feed, plywood; starch producers and traders; bioethanol, biofuel producers; asset management companies, investment banks, agricultural funds companies; seeds/enzymes suppliers; machinery and technology providers; fertilizer, agro-chemical and biotech companies; crop consultants; irrigation and wastewater



Image Credit: Adobe Stock/ tinglee1631

Even though Africa produces the largest volumes of cassava, it is yet to capitalise on its harvests through modern mechanisation.

management companies; government agencies and research institutes.

Opening the event on behalf of the Zambian Minister of Agriculture Ms Dora Siliya, ministry permanent secretary, Julius Shawa, said the country has found alternative use for excess cassava.

There has been interest from mining firms to use cassava starch in processing plants and in the beverage industry for beer production. The country has also issued the first licence for companies to produce ethanol from cassava.

"The demand for cassava is likely to outstrip the current excess cassava production in the country," he revealed.

Presenting a paper on value addition and investments in the cassava industry, Premiercon Starch Company Limited (PSCL) CEO, Lubasi Yuyi, said the firm intends to establish a starch manufacturing company in Zambia.

With support from the Citizens Economic Empowerment Commission (CEEC), it will set up a US\$3.5mn plant anchored on an out-grower scheme with a target of about 80,000 mt of processed cassava annually.

Nigeria has started to benefit from its

import substitution policy in cassava starch – led by the federal government – which has earned it US\$4mn in the financial year that ended 2016.

#### A hardy, versatile crop

Cassava is worthy promoting as a food and cash crop because of its adaptability (drought-resistant), low labour requirements, multiple by-products (flour, pellets, feed, and starch) and high energy output per unit area and labour compared to cereals, according to the Food and Agriculture Organisation (FAO).

"This renders it a suitable and cheaper substitute for cereals in starch and feed manufacture," the UN agency added.

"There is need to establish linkages among farmers and processors to create a readily available market, which is currently a challenge. We need to improve the supply chain efficiency by strengthening farmer organisations' storage and infrastructure facilities," the Indaba Agricultural Policy and Research Institute (IAPRI) rightfully observed.

The potential of cassava as a cash crop will increase but the extent to which this transformation can be achieved is yet to be seen. **E**

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Deficiency of iron presents one of the biggest constraints on the harvest of good quality fruit and vegetables from alkaline soils. Dr Terry Mabbett writes on how plant nutrition can be managed to incorporate adequate levels of iron for crops.

## Ironing out deficiency in fruit and vegetables on alkaline soils

**I**RON IS A commonly occurring element in soil but frequently insoluble and unavailable for uptake by roots and therefore useful in plant growth and development.

Plant-unavailable iron presents one of the biggest constraints on the harvest of good quality fruit and vegetables from alkaline soils. Soils may be alkaline due to the over-liming of naturally acidic soils and the application of alkaline irrigation water. These constraints are easily lifted but the most common underlying and hard-to-cure cause of alkaline soil is calcium carbonate-rich parent rock material weathering and developing within an arid or dry environment to form so-called calcareous soils.

Citrus, olives, top fruit (apples and pears), stone fruit (peaches, plums, cherries, apricots and nectarines) and avocado are some of the classic fruit tree crops that are potentially cursed by iron deficiency when growing on calcareous, alkaline soils.

**Citrus, olives, top fruit (apples and pears), stone fruit (peaches, plums, cherries, apricots and nectarines) and avocado are some of the classic fruit tree crops which are potentially cursed by iron deficiency when growing on calcareous, alkaline soils.**

### Iron in abundance but unavailable to plants

Pear (*Pyrus domestica*) is one of the fruit tree crops most prone to plant unavailable iron, plagued by iron deficiency symptoms and the physiological consequences of iron deficiency. Marked leaf chlorosis (yellowing) as a hallmark symptom of iron deficiency is accompanied in pears by a significant reduction in yield and quality of harvested fruit and a shortened productive life for pear trees and orchards of around five to six years. The situation is no better for crops that bear



Pomegranate fruits are supremely rich in iron and in India are recommended as part of a diet to boost blood iron and alleviate anaemia

their fruit and foliage closer to the ground. Grapevines and soft fruit including strawberries are all at risk of iron deficiency, as are salad crop vegetables including tomato, capsicum pepper and cucumber, leaf crops including lettuce and various brassicas and legume crops such as peas and beans.

Another classic case is cucumber (*Cucumis sativus*) prone to iron deficiency whether grown in the field or greenhouse. Iron deficiency causes a uniform yellow/green chlorosis of the newest leaves on cucumber plants while all the other leaves remain dark green.

Initially, veins on the by now chlorotic newest leaves will stay green to give the leaf a net-like pattern. However, under acute iron deficiency conditions, smaller veins also lose their natural green colour with leaves developing 'burn' (a dry necrosis), especially when exposed to strong sunlight.

### Iron is fundamental for crop plants

Foliar chlorosis (leaf yellowing) as the hallmark symptom of iron deficiency in crop

plants should come as no surprise because the micronutrient is an essential and fundamental mineral element for plant metabolism including as an activator of enzymes in photosynthesis and cellular respiration.

Magnesium is the central component of the chlorophyll molecule but synthesis of this light-intercepting plant pigment requires iron. Iron is also vital for maintaining the structure and function of chloroplasts which are the chlorophyll-containing cell organelles.

Of equal importance to plant growth and development is the position and role of iron as the 'heme' component in the cytochromes of the electron transport chain and closely involved in the generation of ATP, the universal chemical energy currency of life.

### Plant response to iron stress

In addition to the visible morphological symptoms shown by plants in response to the availability of iron (or rather a lack of it),

a deficiency also produces physiological and biochemical responses at plant-root level in dicotyledonous plants.

Physiological responses include increased extrusion of hydrogen ions or protons [H<sup>+</sup>] to lower pH of the rhizosphere and the release of natural reducing and/or chelating chemical compounds including phenolics and flavins. Plants will additionally set in motion a two-step mechanism to facilitate greater uptake of Fe (iron). Trivalent ferric iron Fe (III) is first reduced by a plasma membrane bound enzyme called ferric-chelate reductase (FC-R) to the divalent ferrous iron Fe (II) which is subsequently absorbed by the roots.

Soil bacteria and fungi in the rhizosphere may also play a part by the secretion of 'siderophores,' which are small high-affinity iron chelating compounds. They are amongst the strongest soluble Fe<sup>3+</sup> binding agents known.

Overall result of these mechanisms is increased plant availability of iron and a more efficient movement of the iron micronutrient across living cell membranes and into plant roots. Among the more marked plant biochemical responses is an accumulation of organic acids, primarily citric acid as citrate and malic acid as malate, in the roots and the leaves. And clearly a mitigation response to iron stress because these organic acids are natural chelates.

### Solutions to these problems lay in the application of foliar sprays of soluble iron nutrient products.



2 First symptoms of iron deficiency in citrus occur in the foliage which takes on a pale yellow appearance.



Cucumber is susceptible to iron deficiency but the greenhouse crop seen here, though growing in an inherently alkaline soil, looks good thanks to foliar spray treatment with a soluble iron nutrient product.

#### Cast iron chemical secrets of success

Solutions to these problems lay in the application of foliar sprays of soluble iron nutrient products. The most basic choice is iron (ferrous) sulphate (FeSO<sub>4</sub>), but this simple and soluble, divalent iron salt is relatively unstable and therefore rapidly oxidised and precipitated out as insoluble plant-unavailable trivalent iron compounds such as ferric hydroxide (Fe (OH)<sub>3</sub>).

The oxidation/precipitation process begins in acid conditions, rises further as the soil medium moves up the pH scale towards pH 7, the point at which soil condition is considered to be neutral (neither acid nor alkaline). It accelerates thereafter as pH moves further upwards into alkaline soil 'territory' (pH 7+). Acidity/alkalinity is measured and recorded over a pH range of 1 to 14. pH 1 denotes extreme acidity and pH 14 the extremity of alkalinity. A soil-water solution of pH 7 is neutral.

Secret to crop cultivation and production success on alkaline soils is the stability and ability of the iron nutrient delivery system in holding onto and protecting the soluble iron fraction from oxidation and precipitation, so it can be presented to the plant as available and usable iron. Requirements are for nutrient compounds and delivery systems with physical-chemical properties that maintain stability and integrity of the Fe-chelate in the face of rising pH levels and increasingly alkaline reaction soils.

pH is a measure of the concentration of hydrogen ions [H<sup>+</sup>] (otherwise called protons) in the soil medium. Rising pH is a result of a decreasing proportion of positively charged hydrogen ions (H<sup>+</sup>) in

relation to negatively charged hydroxyl ions (OH<sup>-</sup>). The latter cause oxidation and precipitation by reacting with ferric ions (Fe<sup>3+</sup>) produce insoluble ferric hydroxide.

#### Chelated solutions to iron unavailability in plants

The natural reaction and response of crop plants and associated soil micro-organisms in the rhizosphere, to iron stress is clearly important but invariably insufficient to overcome the inherent problem of iron unavailability in alkaline- reaction soils. This requires the application of soluble nutrient products containing powerful and proven synthetic chelating agents.

A chelating agent (chelate) has molecules of which can form several bonds with a single metal ion in this case Fe<sup>3+</sup>. In other words, a chelating agent is a multi-dentate ligand. The chelate effect is the enhanced affinity of such chelating ligands for a metal ion compared to the affinity of a collection of similar non-chelating (mono-dentate) ligands for the same metal. Net result of this high affinity for Fe<sup>3+</sup> is enhanced stability of soluble iron and successful transfer of iron into the roots for utilisation by the plant's metabolism.

#### Omex Fe N Feed and Omex Feomax

However, the use of iron chelates in agriculture and horticulture is not a 'one fits all' situation because different chelates have differing abilities to hold on to ferric ions as the pH level moves up and into alkaline soil territory.

Omex Agrifluids a United Kingdom based company with an international market base has harnessed these differ-



ences to provide farmers and growers with a two product choice in a 'horses for courses' approach for rectifying and overcoming problems for plant growth and development and arising from the non-availability of iron to crops growing in alkaline soils.

"The problem of iron unavailability to crop plants actually 'kicks in' within acidic soils, subsequently accelerating and accumulating beyond pH 7 (neutral) and into alkaline soil territory," said Peter Prentis, marketing manager at Omex. "Our iron availability programme is based on two different iron chelates which are Fe-EDTA (Ethylenediaminetetraacetic acid) and Fe-EDDHA (ethylenediamine-N,N'-bis(2-hydroxyphenylacetic acid)," said Omex export manager Alan Lowes.

"To overcome iron unavailability and to correct deleterious consequences for plant growth and development (including iron deficiency symptoms), that begin in mildly acid soils, we recommend our Omex Fe N Feed product based on the Fe-EDTA chelate," said Prentis. "Fe-EDTA remains stable and therefore holds on to its soluble ferric ion component up to point approximately mid-way between pH 6 and 7," added Lowes. "But much beyond this point (pH 6.4) Fe-EDTA is rapidly destabilised by an increasing concentration of [OH-] (hydroxyl ions) with soluble iron oxidised and precipitated out as insoluble and plant unavailable ferric compounds," said Prentis.

"As such we recommend the use of Omex Fe N Feed for crops growing in soil up to pH 6.4," added Lowes. "Beyond this point farmers and growers should alternatively



Image Credit: Dr Terry Mabbett


Capsicum pepper is commonly grown in greenhouses and needs to be monitored carefully for iron deficiency.

use our Omex Feomax containing Fe-EDDHA that stays stable and continues to hold on to its soluble ferric iron component up to a pH level of 8," said Prentis.

Some other manufacturers will claim that Fe-EDDHA is effective up to pH 11. However, attempts to grow crops on alkaline soils with a pH much above eight are likely to run into all sorts of other serious problems, in addition to plant unavailable iron. This is the time to use soil amendment products to bring pH levels down into a range within which plants can cope, albeit with assistance from Fe-chelates such as Omex Fe N Feed and Omex Feomax.

So far we had talked about crops grown in natural soil so I asked Alan and Peter if they had any specific recommendations for the increasing number of growers opting for

soiless media and hydroponic systems in the greenhouse industry.

"Monitoring the pH of water and soiless media is much easier than pH testing of soils as well as being more likely to give growers a definitive reading and clear cut answer to act upon. Thus when regular testing is carried out on soiless media and hydroponic systems and provided pH control is adequate growers should obtain the desired result from using the Fe-EDTA chelate as Omex Fe N Feed. However, where greenhouse cultivation still relies on natural and intrinsically alkaline soils, for which it is much more difficult to obtain definitive results from pH testing and to effectively reduce pH level, then the more stable Fe-EDDHA chelate as Omex Feomax would be advised," they said. 

## Johannesburg to host the southern Africa fall armyworm stakeholders' meeting

THE FALL ARMYWORM, a transboundary pest that is difficult to manage and first reported in southern Africa in late 2016, continues to cause damage to maize and other crops in the region. Key concerns about the fall armyworm infestation are the impact on food security and livelihoods of especially smallholder farming households.

From 30 November - 01 December 2017, the Food and Agriculture Organisation of the United Nations (FAO) and Southern African Development Community (SADC) will hold the southern Africa fall armyworm stakeholders' meeting in Johannesburg, South Africa.

The meeting will bring together key stakeholders in the region, including representatives of member states, donors, academia, research organizations and development partners. The stakeholders will present and discuss their fall armyworm



Fall armyworm damage to a maize crop.

response actions and plans for the 2017/18 agricultural season. They will also identify policy issues that will inform the response in the short, medium and long-term.

Donors and development partners will give their perspectives on the concluded and planned fall armyworm response actions.

The key outputs of the meeting will be a situation update of the fall armyworm infestation in the region, including response actions, a regional preparedness plan for the 2017/18 production season, key messages on fall armyworm management for farmers and policy issues that will inform the response in the short, medium and long-term.

The event will be co-hosted by the FAO subregional coordinator for southern Africa David Phiri and Esaiah Tjelele, crops programme officer at SADC and supported by the Department of Agriculture, Forestry and Fisheries, government of South Africa.



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Whether harvested from African fields or imported on foreign ships, cereal grain must be protected in store. Dr Terry Mabbett writes about grain management practises to ensure the protection of cereal grain in store.

## Protection of cereal grain in store

**I**NSECT PESTS OF stored grains were traditionally temperate (eg *Sitophilus granarius* – grain weevil) or tropical (eg *Sitophilus oryzae* – rice weevil) in origin and distribution. But the international marketing of grain and use of temperature controlled stores has virtually eliminated this distinction. African countries now have to cope with those insect pests imported together with consignments of grain from North America and Europe as well as their own indigenous insect pests.

Most in store pests are larva and adults of beetles and weevils (Coleoptera) or larva of various moths (Lepidoptera). The most important pests include *Sitophilus* sp (grain weevils), *Tribolium* sp (flour beetles), *Rhizopertha dominica* (lesser grain borer) and warehouse moths (*Ephestia* sp). Safe storage of grain requires an integrated package of pesticide application to control residual infestation in empty stores and insects which are typically carried into store on newly harvested grain, eg Angoumois grain moth (*Sitotroga cerealella*).

Chemical control must be sufficiently residual to protect bulk grain consignments throughout the entire storage period from the feeding activities of hatching larvae or adults and without compromising eventual use of the grain. Those charged with protection of grain in store, and especially on small units and farm enterprises, require a package of portable and versatile machinery which is both effective and user friendly.

**Chemical control must be sufficiently residual to protect bulk grain consignments throughout the entire storage period without compromising eventual use of the grain.**

### Store cleaning and disinfestation

The physical and biological integrity of incoming grain and cleanness of the store must be assured prior to the start of any chemical control. Improperly cleaned and dried grain is a bonus to insect pests, fungal moulds and bacteria and is more likely to harbour insect and mite pests, while furnishing favourable conditions for arthropod activity. Mud, dust, dirt and organic matter will inhibit the activity of pesticides and disinfectants and degrade their performance.



Thermal fogging of bagged cereal grain in store.

Image Credit: EA Allman

Many of the most important insect pests of stored cereal grain, including *Tribolium* sp (flour beetles), saw-toothed grain beetle (*Oryzaephilus surinamensis*) and the larvae of *Ephestia* sp (warehouse moths) and *Plodia interpunctella* (Indian meal moth) are secondary pests. This means that in most instances these insects can only feed on physically damaged and broken grains. Other pests such as *Carpophilus* sp (dried fruit beetle) and *Cryptophagus* sp (silky and fungus beetles) of maize and small grain cereals are attracted to mouldy grains on which they will feed.

Thorough physical cleaning of empty stores using industrial vacuum cleaners or sweepers, with all sweepings burnt, and carried out in good time prior to harvesting is the first step required to secure the safe storage of grain. Next step involves spraying an appropriate and approved insecticide to disinfest the empty store or silo. This can be carried out using lever-operated knapsack sprayers or compression sprayers with hydraulic nozzles, or a shoulder-mounted (knapsack) mistblower. Mistblowers operate on a twin-fluid principle in which one fluid (air) is used to break up another (water) into droplets. Choice of sprayer will be determined by dimensions, capacity and internal structure of the building to be protected.

Small, flat storage units can be adequately sprayed using lever operated knapsack sprayers or compression sprayers fitted with an extension lance if necessary. Horizontal booms fitted to the lance and holding several nozzles will speed up treatment of large floor areas. The advantage of compression sprayers is that they can be

**For larger premises, especially where there are many cracks and crevices and a requirement for rapid drying the low volume shoulder-mounted (knapsack) mistblower is preferred.**



Custom-built grain silos are the key to the successful and safe storage of cereal grain.

Image Credit: Bentall Rowlands

used free standing or shoulder-slung as well as in the knapsack mode. Care must be taken to spray all surfaces including the roof, walls and achieve good coverage of 'dead' spaces around plant and equipment including conveyors, elevators and other grain handling equipment.

For larger premises, especially where there are many cracks and crevices and a requirement for rapid drying the low volume shoulder-mounted (knapsack) mistblower is preferred. Key benefit of mistblowers is the propulsion of a mist comprising of small droplets into every corner and alcove of the store. This provides dual 'space' and residual protection against currently active insects and insects that will hatch from eggs or emerge from pupae once the grain is in store. Knapsack mistblowers deliver low volume (LV) sprays of smaller droplets for improved coverage with minimum liquid run off and surface wetness. Coverage and economy can be enhanced and improved even more by fitting the sprayer with custom-designed ULV jets. These reduce flow rate and allow the operator to achieve ultra-low volume (ULV) spray application.

Final act in the 'empty store' protection programme is terminal disinfection using an appropriate insecticide that is typically delivered by fumigation, smoke canister or thermal fogging (thermal or 'hot' fogger). Thermal foggers can deliver a pre-mixed commercial fogging formulation or a 'standard' insecticide formulation (eg emulsifiable concentrate) mixed and diluted with a recommended and approved carrier liquid (oil or solvent). They are designed for use in the hand-held mode. The operator starts to fog at one end of the building and carefully walks backwards toward the exit, which is shut tightly on completion.

Alternatively, thermal foggers can be set up in automatic mode and run for the stipulated time as a stand-alone unit with all personnel safely outside of the store. The tiny droplets produced by the 'hot' fogger, which are just 10µ (micron) or less in diameter, will form a fog that stays suspended in the air for a long period of time. The active insecticide thus enters and penetrates every 'nook and cranny' in the store to kill off any remaining insect infestation. The tiny droplets will eventually sediment out onto a surface to provide residual protection against hatching larvae and adults.

Careful farmers and store managers will follow up with a terminal fog disinfection using a powerful and broad spectrum disinfectants including those based on the 'peroxygen principle' –

mixture of hydrogen peroxide and peroxyacetic (peracetic) acid. Disinfection by fogging 'takes care' of any potential fungal and bacterial infections including air-borne fungal spores like those produced by Aspergillus sp and other mycotoxin-producing moulds. Modern disinfectants will also destroy a wide spectrum of animal viruses. This extended activity is particularly important during outbreaks of foot and mouth disease, swine vesicular disease, avian influenza and other highly pathogenic and contagious viral diseases of livestock.

**Use of pesticides in enclosed storage situations and especially the application of grain store insecticides with a typically high fumigant action are potentially hazardous.**

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**Treating the grain**

Having secured pest-free status for the empty store or silo the next step is to treat and protect the grain as it is loaded onto the conveyor and carried into the store. In the past, many grain store managers relied on dust formulations of insecticide to treat grain. However, these are difficult to apply uniformly, hazardous to handle and leave unnecessary solid residues on the grain. Insecticides formulated as liquid are easier to handle, will offer superior coverage and leave deposits and residues that will all but disappear. Attempts to treat grain after it has been loaded into the store will result in superficial protection only thus allowing infestations inside the bulk or grain heap to escape. Treatment of the grain while it is spread out on the conveyor during loading is the only way to ensure effective coverage and protection.



Image Credit: Omex


Specific insect pests such as the Angoumois grain moth are brought into the store from the field on harvested grain. This is one of the key reasons why grain cleaning and drying prior to storage is so important. Ripe wheat ready for harvest in Kenya.



Image Credit: Alvan Blanch

Provided the store has been properly disinfested and the grain treated with insecticide during loading via the conveyor there is no reason why the grain heap should not stay pest free throughout the duration of normal storage. If isolated problems do occur, perhaps via rodent or bird infestation, then lightweight hand-held ultra-low volume sprayers are among the most useful and versatile applicators available for the targeted spot applications usually required.

Use of pesticides in enclosed storage situations and especially the application of grain store insecticides with a typically high fumigant action are potentially hazardous. And this together with the application of insecticide through low volume and ultra-low volume sprayers, which generate small and highly mobile droplets, will create and present one of the most high-risk situations for any spray operator. Recommended and stipulated protective clothing and safety equipment, including face masks, face shields, goggles and respirators, must be worn and used when handling, mixing and applying all chemical pesticides. **E**



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As the EU considers extending its approval for the herbicide, glyphosate, African researchers highlight safety concerns.

# Call for caution on glyphosate



Image Credit: banmafarsai/AdobeStock

Glyphosate is the main ingredient of the herbicide Roundup, which is used extensively in Africa.

**A**FRICAN RESEARCHERS HAVE intervened in a controversial debate involving scientists and decision-makers around concerns that the agricultural chemical glyphosate might be carcinogenic, and have called for the precautionary principle to be applied.

Glyphosate is the main ingredient of Roundup, the most widely used herbicide in the world. According to a study conducted by the statistics company Statista, global consumption of glyphosate rose from 56.3 mn kg in 1994 to 825.8 mn kg in 2014.

A study that assessed the value of glyphosate in the South African agricultural sector with a focus on the 2012/2013 season, concluded it was the country's most used herbicide and found that in 2012, over 23 mn litres of glyphosate were sold at an estimated value of US\$47mn.

However, there has been a strong call to ban the product in South Africa and Europe. While it is popular with farmers who appreciate its effectiveness, it faces strong opposition a section of society concerned about evidence that it could be

a carcinogen. The International Agency for Research on Cancer (IARC) has classified glyphosate as probably carcinogenic.

On 25 October, the European Commission will hold a vote on a proposal to extend, by ten years, the commercial licence of this product. A public campaign is underway to stop its approval. Around 40 European NGOs launched a European Citizens' Initiative to call for a ban on glyphosate in line with EU pesticide law that prohibits the use of substances that may cause cancer in humans at the beginning of the year.

## Contested evidence

Glyphosate is part of a group of 80 chemical agents considered potentially dangerous, according to the IARC Monographs on the Evaluation of Carcinogenic Risks to Humans.

Speaking to SciDev.Net, IARC researcher Kathryn Guyton said that this is based on limited evidence that glyphosate causes non-hodgkin lymphoma (NHL) in humans and convincing evidence that it causes

cancer in laboratory animals. The IARC also concluded that there was strong evidence of genotoxicity, both when it comes to 'pure' glyphosate and its formulations.

However, the IARC assessment has been challenged by the European Food Safety Authority (EFSA) and the European Chemicals Agency (ECHA).

"The Monographs Programme provides scientific evaluations based on a comprehensive review of the scientific literature, but it remains the responsibility of individual governments and other international organisations to recommend regulations, legislation, or public health intervention," the IARC said in an interview.

The fact that these agencies have come to different conclusions appear to be largely attributed to variations in the methodologies they describe.

Some have, for instance, focused exclusively on glyphosate, while others have gone further to also look at the range of adjuvants chemicals added to enhance effectiveness and to obtain specific formulations.

Multinational agrochemical company Monsanto was asked whether it might consider suspending production of Roundup, on public health grounds, until the scientific community reaches a consensus.

"The reality is that glyphosate safety is supported by one of the most extensive worldwide human health, crop residue and environmental databases ever compiled on a pesticide product," said the company in an email statement. "In evaluations spanning four decades, the overwhelming conclusion of experts worldwide has been that glyphosate can be used safely."

"Like all pesticides, regulatory authorities around the world routinely review the latest safety data on glyphosate. To be clear: No regulatory agency in the world has concluded glyphosate is a carcinogen," the company added.

### Concerns in Africa

A lively public debate around these issues is taking place in Africa too — particularly in South Africa, Senegal and Benin, where an NGO has called for the compound to be banned.

"Glyphosate is used by rice farmers in the Senegal River Valley but no research

has been done on this molecule in Senegal," said Amadou Diop, a lecturer specialised in analytic chemistry and bromatology, based at the Analytic Chemistry and Bromatology Laboratory in the Faculty of Medicine, Pharmacy and Odontology of Dakar's Cheikh Anta Diop University.

**"Glyphosate is used by rice farmers in the Senegal River Valley but no research has been done on this molecule in Senegal."  
-Amadou Diop**

But, he adds, from the point of view of its chemical composition, glyphosate is in line with the rules that need to be followed. "What is more concerning is its potential genotoxicity," he says.

According to Diop, "When there are strong grounds to suspect a given molecule may be toxic and scientific evidence does not show it to be harmless, common sense

suggests that we should stop using it until we have conclusive evidence. That's the line that us Africans should take".

### Risks and alternatives

The pressing concern among those that oppose the ban on glyphosate remains that the ban could have an effect on food security given the pesticide's popularity with farmers.

Diop pointed out there are alternatives that "work just as well".

"There is a whole range of molecules that can be employed instead of glyphosate," he said. "Generally, organophosphorus compounds are used as insecticides, and we should not forget biopesticides".

But, moving beyond these debates, Diop believes that the best way forward lies in an integrated approach to crop management.

"Not all of the soil's micro-organisms are bad for crops," he pointed out, before noting that excessive reliance on pesticides leads to soil depletion. Often, when inappropriate amounts of pesticides are used, yields don't increase, they go down," he said. **B**

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## Mozambique Grain Institute revived

THE MOZAMBIQUE GOVERNMENT has revived and restructured the Mozambique Grain Institute (ICM), giving it the power to coordinate agricultural marketing, the minister of industry and trade, Max Tonela, told the country's parliament.

Answering questions from deputies on agricultural marketing, he said that the other key attributes of the ICM were to maintain reserves for food security purposes, and to operate as a buyer of last resort.

Tonela said the ICM has signed 51 memorandums of understanding with other stakeholders in the agricultural marketing chain in order to ensure a market for agricultural surpluses, and to prioritise national production in supplying food processing industries. The agreements signed this year envisage the marketing of almost 593,000 tonnes of crops, particularly maize, beans and soya.

The detailed figures given by Tonela indicate that a great deal of this year's harvests must still be in the hands of farmers. The target for marketing all food crops (grains, vegetables, root crops, pulses and oilseeds) in 2017 is 16.75 mt, but marketing in the first nine months of the year fell just short of nine million tonnes. 2.37 mt of grain (mostly maize) was marketed. Although this was a 10 per cent increase on the figure for 2016, it was only 69 per cent of the



The ICM will maintain grain reserves for food security purposes.

target of 3.42 mt. Tonela believed this is because many producers are holding back much of their maize, waiting for prices to rise.

The marketing of vegetables was an unqualified success. In the first nine months of 2017, producers sold slightly more than two million tonnes of vegetables, which was 43 per cent more than the target.

Tonela said a major contribution had been made by large supermarkets, hotels and restaur-

rants in buying up surplus vegetables, and this guaranteed market had encouraged small producers in the green belts around Mozambican cities to step up their production.

The minister announced that before the end of the year the government will issue regulations on the sale, import and export of agricultural products that will remove barriers which still exist in marketing, and induce increases in agricultural production and productivity.



The African tractor market is diverse, with the wide range of farming systems and sizes in place creating a demand for tractors of every type and in all the major power sectors. Mike Williams gives a round up of the latest developments and innovations.



The 5711 with a 110 hp engine is the top model in Massey Ferguson's new 5700 Global Series.

Image Credit: Massey Ferguson

## A diverse market

ONE OF THE features of the tractor market in Africa is its diversity, with a varied range of farming systems and sizes producing a demand for tractors of every type and in all the major power sectors.

This year's additions to the Massey Ferguson range include new models for both the upper and lower ends of the power range plus some in the middle. For contractors and the biggest farms Massey Ferguson has the new 8740 model at the top of their high horsepower 8700 series. It has a 400 hp engine and the performance figures include 12 tonnes of lift capacity on the rear linkage and five tonnes at the front. Like the other six 8700 series models, the 8740 features a Massey Ferguson CVT transmission and an ISOBUS compatible terminal for the driver.

**Fendt tractors are available with power outputs from 70 hp upwards, but much of the interest following the African launch has centred on the four 1000 series models at the top of the range.**

There are also new additions to Massey Ferguson's Global Series, the mechanically simple, no-frills tractor range that is popular in African markets. The new models are the 5700 series available in 100 and 110 hp versions with a specification that includes a gearbox transmission with 12 forwards and reverse speeds with up to 40 kph available. The rear linkage lifts 4.3 tonnes and cab and platform versions are available. For their new mid-range tractors Massey Ferguson has announced the 6700 S series with six models powered by four-cylinder engines providing rated outputs from 120 to 175 hp.

Massey Ferguson's Electronic Power Management feature can add up to a further 25hp, bringing the output for the top model to 200hp. The lift capacity at the rear is up to 9.6 tonnes and transmission options include a powershift and Massey Ferguson's constantly variable transmission or CVT.

The Massey Ferguson brand name is owned by the AGCO group which also makes tractors and machinery under the Challenger, Fendt and Valtra names. Fendt is a leading German based company with a reputation for build quality and engineering innovation, and medium and high horsepower Fendt models have recently been introduced in southern Africa, attracting a positive response.

### Fendt 1000 series models make their mark

Fendt tractors are available with power outputs from 70 hp upwards, but much of the interest following the African launch has centred on the four 1000 series models at the top of the range. They offer power outputs from 396 to 517 hp and feature an updated version of the Fendt Vario CVT, originally introduced more than 20 years ago.

Fendt was the first company to offer a tractor with a CVT, and it remains the only major manufacturer specifying this type of transmission throughout the range from 70 hp upwards. The special feature on the latest Variodrive version available on the 1000 series Fendt tractors is that it powers the front and rear wheels independently, allowing the torque to be allocated automatically to maintain the maximum work efficiency depending on the conditions and the type of equipment being used.

### Intelligent power management

Recent additions to the John Deere range include two flagship models at the top of the 6R series. Rated outputs for the new 6230






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and 6250 models are 230 and 250hp, but the Intelligent Power Management feature can provide an additional 50hp for each model, making 300hp available on the 6250. Lift capacity figures are five tonnes at the front and up to 10.4 tonnes on the rear linkage and a cab suspension system plus front axle suspension are both available.

While the new 6R tractors give a boost to the John Deere range in the higher horsepower sector, the company is also reporting increased demand in some southern African markets for their 5E series utility tractors providing 55, 65 and 75 hp outputs. Some of the extra sales are from farmers choosing to diversify into small scale alternative cropping enterprises, explained Jurgen Schlebusch of John Deere in South Africa. Vegetable production, fruit growing and vineyards can all provide marketing opportunities and are attracting increased interest, he said, and the 5E tractors plus a wide range of John Deere implements and attachments are a popular, value-for-money choice. The three 5E models have 2.9-litre engines and are available in two and four-wheel drive versions with a mechanical transmission providing either nine forward and three reverse gears or 12 gears forward and in reverse.

**While the new 6R tractors give a boost to the John Deere range in the higher horsepower sector, the company is also reporting increased demand in some southern African markets for their 5E series utility tractors providing 55, 65 and 75hp outputs.**

**Catering to multiple sectors**

This year is the 175th anniversary of the Case IH company which began making farm machinery in the United States when field equipment was powered by horses and oxen. Power farming started with steam, and the first Case steam engine was built in 1869, with Case later becoming the world's largest manufacturer of agricultural steam engines before making a successful move into tractor power.

Present day Case IH products feature one of the largest selections of tractors available, including the flagship Quadtrac models with four rubber tracks, articulated steering and power outputs up to 620 hp. Recent arrivals below the 100 hp threshold include the Case IH Farmall JXM series with two models producing 80 and 88 hp rated output. The JXM models are designed as general purpose workhorse tractors, available in two and four-wheel drive versions and with 2.5 tonnes rear lift capacity. Transmission choices start with a shuttle gearbox providing eight ratios forwards and in reverse and there is also a 20-speed shuttle that includes slow speed creeper gears.

**Claas offers greater engine power**

Increased engine power and transmission improvements were recently announced by Claas for their Axion 900 series tractors, with availability scheduled for early next year. As well as updated versions of the original four models, there is also an extra model at the top of the range producing 445hp. All Axion 900 series tractors are powered by six-cylinder FPT engines with an uprated turbocharger providing additional power output, the drive system is an updated version of the Claas CMATIC CVT and the lift capacity on the rear linkage for all models is 11 tonnes with up to 6 tonnes at the front.

Claas is also introducing updates for the smaller Arion 500 and 600 series tractors covering outputs from 115 to 185 hp. The 500



Image Credit: Fendt

The high horsepower 1000 series Fendt tractors are now available in southern Africa.



Image Credit: John Deere

The John Deere 5E series utility tractors have power outputs between 55 and 75 hp.



Image Credit: Kubota

Kubota M7001 series tractors are built in France with up to 175 hp maximum power output.

series models are equipped with four-cylinder DPS engines which have two turbochargers, including a smaller one providing fast response times. The transmission options are a four-range, six-speed powershift or a CVT system, the rear linkage lift capacity is up to eight tonnes on the largest 600 models, and the new Claas Proactive front axle suspension system is available at extra cost to provide a smoother ride with increased stability.





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## LEMKEN Opal 090 Reversible Mouldboard Plough

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3

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### A comprehensive tractor range

New Holland offers one of the most comprehensive tractor ranges with up to 557hp available from the top T9 series model, and in some African countries there is a strong demand for the selection of special tractors including narrow models for fruit production and vineyard work. New Holland TT4 utility tractors are a popular choice in Africa, with four models powered by FPT engines producing rated outputs between 55 and 88 hp. The engine capacity is 2.9 litres for the two smaller models, increasing to 3.9 litres for the 4.80 and 4.90 models with 80 and 88 hp outputs. All TT4 tractors have turbocharged engines, with intercooling included on all but the 55 hp version.

The TT4 lift capacity on the rear linkage is said to be the best available for tractors up to 90 hp, with up to 1845 kg for the standard specification and 2,050 kg maximum with the optional specification. TT4 series mechanical transmission choices include a powershuttle option providing 20 speeds forwards and in reverse and maximum travel speeds are up to 36 kph depending on the model.

## New Holland TT4 utility tractors are a popular choice in Africa, with four models powered by FPT engines producing rated outputs between 55 and 88hp.

### Innovations from Deutz-Fahr

A special feature on the high specification 9340 TTV Agrotron model in the Deutz-Fahr range from Germany is the electric parking brake or EPB. The brake has a control system that automatically releases when the operator selects a gear to start driving the tractor either forwards or backwards, and the brake is automatically applied when the operator dismounts from the tractor. The 9340 TTV is powered by a 336 hp engine, the CVT drive system has a 60 kmph top speed and the rear lift capacity is 12 tonnes.

The lower horsepower Deutz models include the narrow V, S and F models in the Agropius series. Designed to work in vineyards, fruit production and other situations with restricted space, Agropius special tractors are available with overall widths from 1.16 m upwards, they are available with three and four-cylinder engines developing between 82 and 106 hp and the transmission options include the OverSpeed shuttle gearbox with 45 speeds forwards and in reverse.

### Kubota expands to medium power sector

Kubota's success in the tractor market was originally confined to the low horsepower sector where they were a leading manufacturer of small agricultural and compact tractors. While the small tractor success continues, Kubota has been expanded its product range to cover implements and machines, and the Japanese based company has also introduced tractors in the medium power sector. Much of the machinery expansion has been achieved by taking over existing manufacturers, but the tractors are based on Kubota research and development and two years ago they opened a new purpose-built factory in France to build the new M7001 series tractors.

The three M7001 Kubota tractors provide rated outputs of 130, 150 and 170 hp plus a 20 hp power boost for the 130 and 150 hp models and a 5 hp boost for the 170 hp tractor. Kubota is one of the world's biggest manufacturers of diesel engines for agricultural and construction equipment, and they make the 6.1-litre engines for the M7001 tractors. Transmission choices are a



Image Credit: Deutz

With 1.16 m overall width, the narrowest version of the Agropius tractors from Deutz-Fahr is designed for vineyard work.



Image Credit: Lovol

Arbos 5100 series tractors are built in Italy by the Chinese based Lovol company.

powershift with 24 speeds forwards and reverse plus optional creeper speeds, and customers who prefer a stepless CVT type drive system can choose the Kubota designed KVT option.

### Lovol takes over Goldoni

China's ambitions to extend their influence in the world tractor market have taken another step forwards with the news that the Chinese based Lovol company has taken over the Goldoni tractor business in Italy. Goldoni is a specialist manufacturer of tractors in the 38 to 75hp range, including agricultural and special vineyard and fruit models, and the new owners plan to extend Goldoni's production and marketing and introduce updated models.

Lovol already owns Matermacc, a specialist seed drill company in Italy, and they are also developing new 5100 series tractors covering the 110 to 136 hp sector. The tractors will be built in Italy using the Arbos brand name, with some of the parts supplied from China, and these tractors plus the Goldoni range will be sold in Europe and China initially, with further markets planned. The tractor range will also be extended with additional models up to 260 hp currently under development, and additional machinery products will also be introduced including a range of tillage implements, sprayers and fertiliser spreaders following the Matermacc purchase, and a combine harvester is also at the development stage. **B**

**Escorts unveils its first electric tractor**

FARMTRAC TRACTORS EUROPE, part of the Escorts Agri Machinery company unveiled its first electric tractor produced by its Indian parent company Escorts at Agritechnica 2017, Hanover.

Farmtrac also showcased its latest global tractor series created in cooperation with Studio FA Porsche ranging from 20-120 HP at the show.

Named NETS, New Escorts Tractor Series, the latest Farmtrac tractors are fully compliant with tier-4 emission norms of Europe and America, and custom-designed with simplicity for unique farm applications at each horse power level. This includes the flagship NETS with higher horse power (70 to 90 hp), compact tractors in 22 to 30 hp range, crossover tractors for both paddy and haulage applications, and tractors with cabin options for driving comfort.

Farmtrac also introduced tier-4 emission norms' compliant CRDi engines, which hitherto was limited to cars and naturally-aspirated machines that work good for tractors operating in slush. The company showcased futuristic and eco-friendly electric tractor along with variants with Hydraulic and Mechanical power transmission platform

Farmtrac produces more than 20 types and varieties of tractors.



Image Credit: Farmtrac

within the NETSseries.

The Global NETS series has been introduced to meet customer demand from the United States, Europe, Latin America, Africa and ASEAN countries.

Speaking on the launch at Agritechnica, Nikhil Nanda, managing director at Escorts said, "At Farmtrac, we are extremely proud to associate with the state of the art Studio FA Porsche committed to technological innovations and building smarter and most efficient technology. NETS, Global Tractor Series is yet

another breakthrough to meet growing customer needs across United States, Europe, Africa, Latin America, Middle East and ASEAN countries. We are excited to introduce the electric tractor built for sustainable and green agriculture. Farmtrac Tractors Europe today offers farm solutions for farmer demands across all price points and technology applications, globally."

Ravi A Menon, chief executive officer, international and emerging businesses at Farmtrac said, "NETS designed by Studio FA Porsche is a unique industrial offering which adds a new dimension to comfort and style along with power and utility."

"At Farmtrac, we will continue to innovate and offer the latest in the industry. We are committed to offer indigenous and state of the art technologies for better productivity and customer value. Our global technology collaborations will help us bring the best to our global customers," Rajiv Wahi, head of international business added.

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**BIA Baldan**



New research aims to help farmers gain more benefit from intercropping by making information about fertiliser use available.

# Making intercropping more effective with data

**I**NTERCROPPING, THE PRACTISE of growing two crops simultaneously on the same piece of land provides multiple benefits to farmers. However, it also requires careful planning and resource management.

One of the challenges in the adoption of intercropping is a major information gap. Farmers often find it hard to decide on the optimal levels of fertiliser that has to be used. For instance, in some parts of Africa, farmers intercrop sorghum - a grain - and peanuts. However, there has been very little study gone into the fertiliser use for intercropping sorghum and peanuts in these areas.

A new study by researchers from Niger, Mali, and the United States aim to fill this information gap. They have developed a method to help farmers determine how much fertiliser to apply when intercropping.

"Using fertilisers efficiently can help farmers improve profits from their crops," said Charles Wortmann, an agronomist at the University of Nebraska-Lincoln. "That can help many break out of cycles of poverty and increase food production and food security."

**One of the challenges in the adoption of intercropping is a major information gap. Farmers often find it hard to decide on the optimal levels of fertiliser that has to be used.**

## Insight into sorghum-peanut intercropping

The researchers have developed mathematical equations to calculate crop yields as the level of application for a nutrient, such as nitrogen, changes. These equations - called crop nutrient response functions - also consider local soil properties and climate.

"They can help determine how much fertiliser to apply based on fertiliser cost, grain value, and money available for fertiliser use," explained Wortmann. This knowledge, according to him, can help farmers optimise fertiliser use and maximise profits.

Similar research in the past has focused on grain crops, like rice and corn. "There has been much less research on legume crops, such as peanut," said Wortmann. "Also, very little work has been done on sorghum-peanut intercropping."

In this study, researchers developed crop nutrient response equations for sorghum grown in Sahel areas in Mali and Niger. The Sahel lies south of the Sahara and has little rainfall. The soil is sandy with little organic matter and the conditions are often harsh and stressful for crops.

The researchers determined sorghum responses to several nutrients, including nitrogen, potassium, and phosphorus. Then they used the data to create similar equations for intercropping sorghum and peanut.

"Our findings will allow farmers to optimise their fertiliser use during intercropping with little or no additional research," Wortmann said.

That's important, because both sorghum and peanut are



Image Credit: fotokate/Adobe Stock

Intercropping can help farmers reduce risks associated with crop failure.

important vital crops in many parts of Africa. They are used primarily for human consumption. Sorghum is ground into flour and cooked as porridge. It is an important source of energy as well as protein. Additionally, both sorghum grain and the non-grain parts of the plant may be used for livestock feed.

Peanuts are commonly crushed and cooked with a vegetable. That provides a good balance of energy from the peanut oil to complement the protein, vitamins, and nutrients provided.

## Benefits of intercropping

With intercropping, the yield of each crop may be lower than if these crops were grown individually. However, the combined yield of the two crops generally exceeds the yield of sorghum or groundnut grown by itself.

Intercropping can also benefit farmers in several other ways. If one crop does poorly - due to insects or pests, for instance - the other crop may not be affected.

"It can reduce risks associated with farming compared with producing a single crop," says Wortmann. "Often the unaffected crop may over-perform and compensate for the reduced performance of the other crop." This is especially important in parts of the world with less food security.

According to Wortmann, the findings of this study can be applied to areas beyond the Sahel. "I think our results can help farmers in other areas of West Africa and also in parts of southern Africa where sorghum-peanut intercropping is important," he said.

"The research findings have already been integrated into decision tools for optimisation of fertiliser use," Wortmann added. Farm advisors and farmers are now being taught how to use tools.

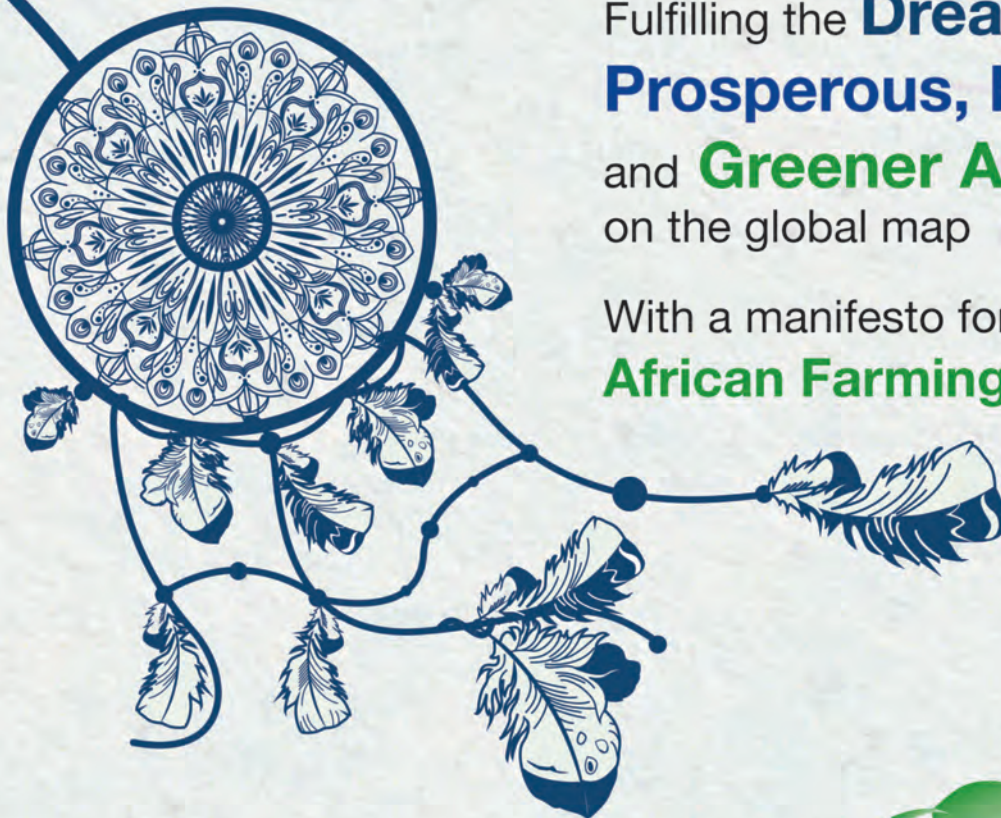
But achieving broad impact is a challenging task. "There are tens of millions of farmers in Africa," said Wortmann. "Reaching them all can be difficult given the scarcity of resources." **B**

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Eseye, global provider of M2M cellular connectivity for the Internet of Things (IoT), has partnered with Burkard, to use IoT in forecasting crop disease, with an aim to enhance yields.

# IoT to forecast crop disease

AWS IoT to enable farmers to receive tailored information from their fields.

Image Credit: Nirutt/Adobe Stock

**T**HE GROWING WORLD population is posing the increasingly critical question of global food security. With sustained global population growth, it is estimated that by 2050, a 70 per cent increase in food production is required to ensure the world is fed. In this scenario, crop diseases can have a devastating humanitarian and economic impacts.

Traditionally, the method of identifying signs of crop disease has been time-consuming, cumbersome and costly, involving research scientists assessing the contents of in-field samplers under a microscope. Preventative pesticide spraying is also used to protect crops from possible disease, with weather or planting dates informing decisions on the chemicals to be applied. This is less effective and more costly than targeted spraying, it may be detrimental to consumer health and the environment, and over time, sees pests and diseases becoming resistant to the treatment.

Jeremy Potgieter, regional head at SADC, Eseye said that 20-40 per cent of crop losses are attributed to disease, "The accurate prediction and prevention of diseases is a vital area to address in the battle to enhance yields, and is now an area in which cellular IoT and the AWS Cloud is providing support to an innovative solution."

## Real-time pathogen monitoring equipment

Burkard, the designers and builders of air samplers for agricultural research, has developed a piece of real-time pathogen monitoring equipment to predict and provide an early warning system of crop disease risk. The company has collaborated with Eseye, global provider of M2M cellular connectivity for IoT, which delivers highly secure and reliable global cellular network data through its AnyNet Secure SIM, and provides automatic routing onto up to 440

cellular operators in 190 countries and links seamlessly to the AWS Cloud.

Burkard's innovative product uses Eseye's AnyNet Secure global cellular connectivity and AWS IoT to enable farmers to receive tailored information from their own fields, whenever they want it, and to have full control over that data.

## The reach of IoT

Potgieter explained that the Burkard Auto Sampler sits permanently within a farmer's field remotely collecting DNA release and uses a LAMP assay to quantify airborne spores. "Crop data is transmitted, over-the-air via the AnyNet Secure SIM, back to the AWS Cloud where it is analysed and reported in a matter of minutes using AWS IoT Gateway tools, which do the mathematics behind the forecasting. Information is stored and presented back so farmers can see exactly which fields are at risk and act accordingly to treat the crops."

Earlier, for similar agricultural projects, Burkard used a general modem and SIM card to send texts to alert on potential crop risks. However, Burkard found this unresponsive because the lack of reliable connectivity across different locations resulted in the frequent need to change providers.

Stuart Wili, managing director at Burkard, said, "While working on a similar project a few years ago, we had to send operators out with mobile phones from as many different providers as possible to find out which had the best signal in certain fields. It was not only extremely inefficient but often connectivity was lost anyway. This time we knew we needed a reliable connectivity solution to make the project a success."

## Support from AWS' software tools and cloud

The AnyNet Secure SIM enhanced features also enable IoT devices to remotely and securely activate, provision, authenticate

and certify devices or 'things', in field, over-the-air. Integration with AWS Cloud Services, further simplifies project set up and deployment by reducing the need for investment in specialist in-house infrastructure and development resources.

"With the AnyNet Secure SIM, farmers don't need to rely on single local network coverage, which often can't be guaranteed. Instead they can be assured accurate data from the field is being securely and accurately transmitted back to the server, without any concern over connectivity, the AnyNet Secure SIM will utilise any and all connectivity available." said Wili.

## Delivering timely data

The module deployed, an Eseye Hera 604 with add-on logger functionality, can store all data and publish to AWS as required, ensuring there is no loss of information. A key challenge to the solution is to deliver secure and resilient connectivity, otherwise the farmers' data will be void.

Wili explained, "We are finally giving farmers an answer to their concerns over the ramifications of crop disease. This not only provides peace of mind, but the solution also supports the environment and saves precious time, resources and ultimately money. Looking to the future, we plan to roll out the technology across the globe, particularly in developing countries, where the importance of farming is far higher, and therefore the need to prevent disease to ensure a healthy crop is even greater."

"Eseye's work with Burkard and AWS is a prime example of the range of economic, social and environmental benefits which can be reaped through IoT. By using AnyNet and AWS solutions, the agricultural industry can harness the knowledge and foresight from accurate data in making informed decisions," said Paul Marshall, chief customer officer at Eseye. **E**

## Case IH's new Maxxum Multicontroller tractor wins Machine of the Year

CASE IH'S NEW ActiveDrive 8 version of its latest Maxxum Multicontroller tractor range has been awarded the Machine of the Year title for 2018 at AGRITECHNICA.

Judged by a panel of European agricultural magazine editors, the accolade has been given in recognition of the performance and cost-saving benefits the new transmission and other range developments bring to this tractor market segment.

The Machine of the Year award, one of the key events on the Agritechnica agenda, is judged by journalists from the German agricultural publications *agrartechnik*, *traction*, *Agartechnik*, *Land & Forst*, *Bayerisches Landwirtschaftliches Wochenblatt* and from other international agricultural publications. The journalists make their overall selection from 14 categories ranging tractors and other self-propelled equipment to implements. The winners of each category are then revealed in mid-November, before the overall MOTY winner selected is revealed at Agritechnica.

An entry into the MOTY 'mid-class' tractor bracket, the latest Maxxum Multicontroller models feature a new semi-powershift transmission offering eight powershift steps in each of three ranges. Named ActiveDrive 8, it joins the existing four-speed semi-powershift and continuously-variable transmission options available on Maxxum tractors, which respectively have been renamed as ActiveDrive 4 and CVXDrive.



ActiveDrive 8 provides a total of 24 speeds in both forward and reverse.

Image source: Case IH

ActiveDrive 8 provides a total of 24 speeds in both forward and reverse. The transmission incorporates a number of features designed to make the tractor more efficient and the driver more relaxed. A creeper version is optional available for special applications.

Covering speeds up to 10.2 km/h, range one is specifically designed for heavier draft work. For special applications requiring very low speeds, such as vegetable crop work, ActiveDrive 8 is also available with additional creep speeds. Range two, the main working range, covers nearly 90 per cent of all field,

grassland and loader application requirements, allowing the tractor to work under full load, without any torque disruption, from 1.6-18.1 km/h. For road travel, the transmission is designed to start in range three, and a skip-shift function allowing quick progress through the powershift speeds. An auto shift feature means the tractor can be set to progress automatically through any set of eight speeds in the field, and through all 16 gears in the top two ranges on the road. A pedal kick-down function can be used to over-ride the transmission automation and cause it to downshift.

## AGCO launches industry's first Class 8 large square baler

AGCO CORPORATION HAS introduced the industry's first Class 8 large square baler at AgriTechnica in Hanover, Germany.

The Model 2370 UHD baler has been created to meet the needs of large commercial hay growers, operations that export hay and biomass material and businesses harvesting biomass for the biofuels and livestock feed industries.

This new baler is designed specifically for producing heavy, dense bales from light-weight, dry, slick grass and crop residue that can be hard to bale. It offers the throughput and reliability large operations require

when harvest windows are small, and tons-harvested-per-day is driving an operation's profitability.

"As their market demands increase, our customers have asked for even more capacity, density and reliability from large square balers," said Shaun Allred, tactical marketing manager for hay and forage products at AGCO. "Our engineers in Hesston, Kan., went to work, and the result is the industry's first Class 8 baler. The Model 2370 UHD makes 3' X 4' bales with 20 percent greater density than our industry-leading Model 2270XD baler, and it is built with the durability to run under high loads, covering thousands of acres, bale after bale."

Small and large square balers are ranked in Class 1 through Class 8 using rated plunger load, the most measurable factor impacting a bale's density. Class 8 is for balers with 750-plus kilonewtons (kN) plunger force, the highest classification.

Key features of the new large square baler, include a faster, 15 per cent heavier, more powerful plunger that operates at 50 strokes per minute. It packs a maximum load capacity of 760 kilonewtons (kN) – 63 per cent greater than the 2270XD baler. It also offers a heavy-duty main chassis frame, designed to handle heavier loads commonly seen when producing ultra-high-density bales. An all new OptiFlow pickup assembly system with five tine bars and 80 double tines on the pickup assembly to deliver 25 per cent greater pickup capacity compared to previous Hesston balers is another new feature. The machine is has a simple design with fewer cylinders, hoses, couplers and hardware compared to competitive balers, to help reduce maintenance and service and offers greater twine capacity and new shielding that makes service faster and easier which also helps keep the baler running more hours for greater productivity.



Small and large square balers are ranked in Class 1 through Class 8 using rated plunger load.

Image Credit: AGCO



## New Holland launches new CX5 and CX6 Series combines

NEW HOLLAND AGRICULTURE is launching the new CX5 and CX6 five- and six-strawwalker combine harvester series, which stands out for its extraordinary flexibility. With four models and seven versions, this combine series delivers unique quality and performance in every field and every crop. This performance comes with best-in-class comfort of the new Harvest Suite Deluxe cab. The high capacity, together with the highly fuel-efficient engines featuring ECOBlue HI-eSCR technology for Tier 4B compliance, and the easy, quick maintenance, results in best-in-class operating costs for the customer. The new CX5 and CX6 series offers a solution for all: from livestock farmers who want quality straw to contractors and cash crop farmers who can easily switch crops without compromising on performance and quality.

Image Credit: New Holland



New Holland's patented Smart Sieve system controls the lateral movement of the sieve according to the degree of the slope and the size of the grains.

Lars Skjoldager Sørensen, head of harvesting product line at New Holland, explained, "The CX5 and CX6 Series offers a wide range of features and adaptation possibilities that can address every harvesting situation: fixed or Smart Sieve self-levelling cleaning shoe, Autofloat II system, a wide choice of headers including High-Capacity, Varifeed, Flex and Draper options, and the possibility to select straw chopping or rowing. Combined with the Series' best-in-class crop-to-crop flexibility and advanced automation features in the PLM system, it makes the CX5 and CX6 ideal for customers who need the highest levels of versatility for crops and fields - cooperatives, mixed farmers, medium cash crop farmers and contractors."

The new Harvest Suite Deluxe cab integrates feedback received through extensive customer consultation to set new standards in operator comfort. With 3.7cu m of volume, it is the biggest cab in its class and comfortably accommodates two occupants.

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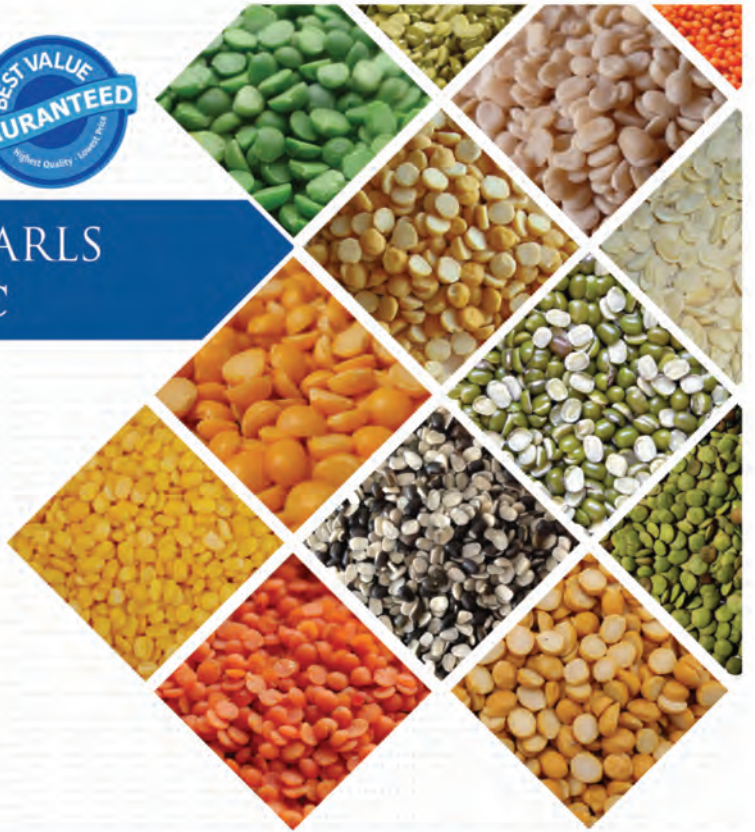
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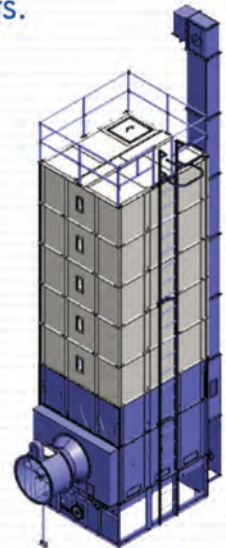
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