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Case IH introduces Patriot 250 sprayer to Africa and Middle East. p32





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A woman chicken farmer in one of the ACGG Tanzania sites. p12



A close-up of the orange, rust-coloured powdery pustules on the underside of the coffee leaf. p20

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**Printed by:** Buxton Press

**US Mailing Agent:** African Farming & Food Processing USPS. No. 015-224 is published six times a year for US\$90 per year by Alain Charles Publishing Ltd, University House, 11-13 Lower Grosvenor Place, London, SW1W 0EX, UK  
Periodicals Postage Paid at Rahway, NJ. Postmaster: send address corrections to: Alain Charles Publishing Ltd, c/o Mercury Airfreight International Ltd, 365 Blair Road, Avenel, NJ 07001.  
ISSN: 0266 8017

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## Farming Calendar 2018

### APRIL

12-14 Agritech Expo Zambia CHISAMBA  
www.agritech-expo.com

25-26 Aviana Nigeria IBADAN  
www.avianaafrica.com/nigeria/about.html

### MAY

15-16 Africa Climate Smart Agriculture Summit NAIROBI  
www.csa-africa.aidforum.org

### JUNE

04-06 African Farming's Agroinvestment Summit LONDON  
www.agroinvestmentsummit.com

20-22 Agritec Africa NAIROBI  
www.agritecafrica.com

24-26 Africa's Big 7 JOHANNESBURG  
www.africabig7.com

### JULY

12-13 Aviana Kenya NAIROBI  
www.avianaafrica.com/kenya/

### AUGUST

02-04 Value Added Agriculture Expo ACCRA  
www.reedexpoafrica.co.za/ValueAddedAgricultureExpoWestAfrica/

08-09 Farm-Tech Expo Kenya NAIVASHA  
www.farmtech-expo-kenya.com

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

## Kimberly new general counsel at Africa50

AFRICA50, THE PAN-AFRICAN infrastructure investment platform capitalised by the African Development Bank, 25 African countries, and two African Central Banks, is pleased to announce the appointment of Kimberly Heimert as General Counsel.

As General Counsel and member of Africa50's senior leadership team, Heimert will provide expert advice on Africa50's strategies and their implementation, manage the legal function, be directly involved in investment transactions, and work closely with Africa50's Board of Directors as its counsel.

"Appointing a General Counsel of Ms. Heimert's caliber will greatly facilitate Africa50's mission," said Akinwumi Adesina, President of the African Development Bank and Chairman of Africa50's Board of Directors. "Under her leadership, I expect that Africa50 will set high standard for legal and ethical behavior, while balancing financial performance and corporate integrity for infrastructure development in Africa."

Prior to joining Africa50, Heimert was vice-president and general counsel of the Overseas Private Investment Corporation (OPIC), the US Government's development finance institution. As an appointee of President Barack Obama and the second most senior official at OPIC, she led a team of 35 legal professionals, served on OPIC's Investment and Enterprise Risk Management Committees, and was Counsel to the Board of Directors, Audit Committee, and Risk Committee. During her tenure, OPIC committed more than US\$2.6 billion to projects in Africa. Prior to OPIC, Heimert was the deputy chief counsel for Loan Programme at the US Department of Energy, where she helped oversee legal aspects of creating and monitoring a portfolio of energy projects worth over US\$30 billion. Before working for the U.S. Government, she was a Managing Director and Counsel at General Electric Energy Financial Services, leading teams in energy-related transactions and helping to create the company's energy venture capital group. In private practice she has worked for many top law firms.

## Chinese companies' permits removed over illegal fishing in West Africa

THE CHINESE MINISTRY of Agriculture is pulling the plug on three Chinese companies conducting illegal, unreported and unregulated (IUU) fishing in West Africa

This demonstrates an increased intolerance by authorities towards Chinese vessels involved in IUU. The MoA has cancelled the distant water fishing certificate of the Lian Run Pelagic Fishery Company Ltd. The company has had a poor record of IUU fishing for years and is facing a total shutdown of its entire distant water fishing operations involving 30 vessels in total. Also, the ministry has cancelled fuel subsidies for vessels belonging to two other major Chinese distant water fishing companies.

Last spring, vessels from all three companies were arrested in the West African region during a joint patrol between Greenpeace and local fisheries inspectors. Evidence of various infringements including illegal nets, shark finning and fishing without licence were handed over by Greenpeace to West African and Chinese authorities and have now helped the Chinese Ministry in combating IUU carried out by Chinese distant water fishing vessels.

Pavel Klinckhamers, international project leader for West African Oceans at Greenpeace Netherlands, said, "Fish is an essential part of the diet for millions of people in West Africa. Only when local governments and fishing nations take strong action towards fisheries management and illegal fishing in the region can these resources and important ecosystems be safeguarded for future generations." China is currently taking measures to restrict 2900 distant water fishing vessels' activities in their main fishing grounds. Three companies lost



Apart from arresting vessels in Guinean waters, Greenpeace also carried out joint patrols in Senegal, Guinea Bissau and Sierra Leone.

their certificates for distant water fishing, while 15 company owners and captains were blacklisted. In 2016, China revised its Management Regulation on Distant Water Fishery and introduced stronger punishment measures against IUU.

Dr Ibrahim Cisse, oceans campaign manager at Greenpeace Africa, said, "African governments initiatives against IUU fishing would be more efficient if they were to establish a system for sharing information on illegal vessels operating in their waters. Also, African governments must share this information with the flag states of the vessels that are breaching regulations as well as the countries where the companies behind the vessels are situated."



**EAGC to develop standards for hermetic bags**

KENYA IS PLACING a big bet on hermetic storage bags, one of the oldest forms of food preservation in the world, to reduce post-harvest losses which claim up to 30 per cent of annual maize production.

Hermetic bags are designed to insulate cereals from heat, air and moisture. The airtight bags deplete oxygen, thereby getting rid of insects without use of pesticides.

Data produced by the United States International Agency (USAID) shows about 1.5 million hermetic bags had been sold in Kenya by end of 2017 following a nationwide campaign by agriculture ministry to popularise the bags among small scale farmers. Small scale farmers account for 80 per cent of the annual maize production in Kenya.

Regional lobby the Eastern African Grain Council (EAGC), says it has joined hands with the Kenya Bureau of Standards (Kebs) to develop standards.

“The reusable bags are fast spreading among smallholder farmers, and, if unregulated, through developing the necessary standards, unscrupulous business people could dump sub-standard materials and pass them on as hermetic storage solutions,” said EAGC executive director Gerald Masila.

Mass adoption of the bags is expected to cut post-harvest losses estimated to up to 11 million bags valued at Sh33.5 billion every year. Mr Masila, however, reckons that the standards development process, which has been divided into five phases, will stretch over 18 months to end by June next year.

A technical committee has already been set up with Kebs taking the secretary position, Mr Masila said, adding that technically competent individuals would be co-opted into the team as required by law.

**Disasters causing billions in agricultural losses**

ACCORDING TO A new report from the Food and Agriculture Organization of the United Nations (FAO), between 2005 and 2015 natural disasters cost the agricultural sectors of developing country economies a staggering \$96 billion in damaged or lost crop and livestock production. Half of that damage – US\$48 billion worth – occurred in Asia, says the report, which was launched today at a conference in Hanoi convened by Viet Nam's government in collaboration with FAO.



Image Credit: Adobe Stock

Drought is the costliest type of disaster for Africa, which was launched today at a conference in Hanoi convened by Viet Nam's government in collaboration with FAO.

Drought – which has battered farmers in all corners of the globe, North, South, East and West – was one of the leading culprits. Eighty-three per cent of all drought-caused economic losses documented by FAOs study were absorbed by agriculture, with a price tag of US\$29 billion.

But the report also details how multiple other threats are taking a heavy toll on food production, food security, and people's livelihoods. For Africa, as well as Latin America and the Caribbean, drought is the costliest type of disaster.



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## Conflicts, climate hurt food security in Africa

HIGH LEVELS OF food insecurity persist in the world, due largely to conflicts and to adverse climatic shocks, particularly in East African and Near East countries, where large numbers of people continue to be in need of humanitarian assistance, a new FAO report said. About 37 countries are in need of external assistance for food, unchanged from three months ago, according to the Crop Prospects and Food Situation report

Civil war and insecurity are direct reasons for high hunger rates in 16 of those countries, ranging from Burundi to Yemen. Inflation in the Democratic Republic of Congo more than doubled in 2017 to a 42 per cent annual rate. Violence has disrupted traditional trade routes around the Sahel, driving up prices, while food shortages are reported around southern and eastern Libya.

Inadequate and erratic rainfall poses a growing threat to food security in Southern Africa as well as in Eastern Africa, where many rural households have suffered from four consecutive drought-affected agricultural seasons. Cereal production in East Africa saw a 7.2 per cent drop, leading to increased stress in various countries.

Aggregate cereal production from Somalia's "deyr" rainy season is estimated to be 20 per cent below average. A similar pattern in rainfall and yields was observed in north-eastern Tanzania.

In Kenya, seasonal rainfall was up to 80 per cent below average levels, warranting close monitoring of rangeland conditions in eastern areas of the country.

Prices of staple cereals are also high in Ethiopia and the Sudan, where retail prices of sorghum, millet and wheat have doubled since last October.

## Mauritania's oil, fisheries sectors set for growth

SIGNIFICANT OIL AND gas discoveries off the coast of Mauritania have enhanced the West African country's appeal as a foreign investment destination and this could mean positive knock-on effects for the agriculture and fisheries sectors.

Ayana McIntosh-Lee, vice president – communications and external affairs, BP Mauritania and Senegal, described the commercial atmosphere in Nouakchott, the Mauritanian capital, as "buzzing".

Fisheries make up Mauritania's second-biggest industry after iron ore, but this is being held back by a lack of processing facilities. Again, this could be an opportunity for foreign investors to make inroads into Mauritania. China has invested in fish meal plants but the government has ambitions for exporting fish to Asia and Europe.

It is hoped that oil and gas development will boost the fisheries industry, as was the case with parallel development in the North Sea, which is an area where Britain should be able to lend expertise as well as investment. The port of Nouadhibou, 450km north off the capital, is also important to the Mauritanian economy as it is a centre of deep sea fishing. This port is naturally sheltered and has been extended and upgraded to include an iron ore terminal, fishing port and commercial port. Crucially, it has been developed as free zone port to attract foreign investment and to become a hub for fish processing.

While Mauritania is 90 per cent desert, the agricultural industry focuses on meat and milk. However, as is the case with the fishing industry, more processing facilities and improved access to energy via the country's gas reserves are required for Mauritanian agriculture to move to the next level. Currently, Nouakchott imports all its meat as Mauritanian farmers export their produce to nearby countries like Senegal and Nigeria.

## AfDB hails Japan's multi-billion-dollar support for Africa's economic transformation

AFRICAN DEVELOPMENT BANK president Akinwumi Adesina has praised the government of Japan for its strong support of the bank and its multi-billion economic transformation partnership with Africa. Adesina identified the private sector, energy and infrastructure development as main sectors that have benefited from Japan's support.

Adesina highlighted huge business opportunities for Japanese investment in the agribusiness sector. He emphasised the strategic importance of two new initiatives: the Transformation of the African Savannah Initiative (TASI) and the bank's Technologies for African Agricultural Transformation (TAAT) programme for scaling up agricultural technologies for millions of farmers. Both initiatives are aimed at reducing Africa's widening and increasingly expensive net food trade deficit.

Adesina emphasised the importance of good nutrition, especially for young mothers and babies, and said Africa's most important infrastructure is "the grey matter infrastructure" of babies and young children. "Stunted children today mean stunted economies tomorrow," said Adesina, who is championing a continent-wide initiative to end the burden of malnutrition in Africa – the African Leaders for Nutrition (ALN).

During his official visit to Japan, Adesina



met top officials, including deputy prime minister Taro Aso, vice minister of finance for international affairs, Masatsugu Asakawa, leading government ministers, and stakeholders, to consider issues of mutual concern. Speaking at the meetings, Adesina recalled the Bank's long, close and friendly relationship with the government of Japan. He commended Japan for committing US\$6 billion to fund energy projects in Africa through the Japan Africa Energy Initiative Facility, which allows Africa to access Japanese technologies and expertise.

He described the Japan-Africa Energy Financing Facility as "a product of the personal engagement and close relationship

the bank has with African Ambassadors resident in Japan, as well as a special relationship between the bank and the government of Japan."

Adesina assured Japanese officials that the Bank's planned General Capital Increase would predominantly benefit Africa's lower income countries. During meetings with executives of the Toyota Tsusho Corporation, the Africa-Japan Relations Committee, the Japanese Association of Corporate Executives, and the Japan International Cooperation Agency (JICA), the African Development Bank made a case for enhanced private-sector participation in Africa's development and new methods of financing.





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Agritech Expo Zambia is expected to attract more than 22,000 visitors, over 270 local and international exhibitors along with 3,500 VIP and large scale farmers

# International pavilions enthusiastic about Zambia's agri potential

**W**HAT MAKES THE agricultural sector in Zambia exciting? "Simply said, almost endless possibilities," says Mr Timo Olkkonen, the Ambassador of Finland to Zambia, Zimbabwe and Malawi. The Finland country pavilion is one of several international pavilions at the upcoming, multi-award winning Agritech Expo Zambia, returning to Chisamba from 12-14 April for the fifth time.

"In recent years, Zambia has witnessed a strong economic growth," Olkkonen says, "and the outlook for medium and long term remains positive. Zambia's growing and diversifying agriculture sector offers a variety of possibilities for Finnish companies and solutions that can benefit the Zambian people. In Finland the growing season is around only 90 days a year but in Zambia's fertile soil, water resources and climate conditions favour agriculture throughout the year. Crop rotation and irrigation makes it possible to have several harvests a year. This is something that really excites me."

He says this year's Finland country pavilion will feature "some well-known Finnish brands that are already in Zambia, for example Valtra tractors. Finland's high-quality and innovativeness also extends to the agriculture sector. In terms of the Finnish offering to Zambia, the most relevant would deal with mechanisation, energy solutions and efficiency, research and development and processing and packaging. We Finns also always look at agriculture and forestry together and take into account the synergies between the two and the integrated land-use practices."

## Zambia's agri sector exciting for German companies

"Zambia's agricultural sector is exciting for German companies that sell agri and livestock equipment because the country has a stable policy environment" says Martin Botzian, head of communication, DLG International GmbH, organisers of the German pavilion at Agritech Expo Zambia. He says, "this means the government supports the agricultural sector and commercial farming. Farmers are willing to invest.



Last year's German country pavilion at Agritech Expo Zambia.

## International interest in the three-day expo is growing every year with more and more foreign companies looking to invest and find business partners in Zambia

"Zambia is a good place to grow crops and there is enough fresh water for irrigation. Processing the raw crops has huge potential. The commercial farming in Zambia will generate enough surplus food to export to Zambia's neighbours. By starting to commercialise the agricultural land you increase food security, prevent mass migration out of the country into the cities and create businesses that add value at a local level to reduce poverty."

The German pavilion will host companies from many fields in agriculture. Mr Botzian says, "some are into agri machinery, others are involved in animal

husbandry with the consulting and constructing of barns for example, fertilisers and crop protection, storage solutions like silos or dryers, solar technology, meat processing, livestock floors, animal identification and setting up trade fairs and providing project management and consultancy services."

## Growing expo

This year's event at GART is expected to bring more than 22 000 visitors, over 270 local and international exhibitors with 3,500 VIP and large scale farmers and 150 members of the media. Agritech Expo Zambia is free to attend for all visitors that pre-register.

The international interest in the three-day expo is growing every year with more and more foreign companies looking to invest and find business partners in Zambia. So far the country and international pavilions from France, Germany, Zimbabwe, Czech Republic, Finland and the EU have already been confirmed. 





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Central and Eastern Africa are set to benefit from the establishment of new poultry breeding facilities in Tanzania – a nation also partnering to explore new high-productivity chicken genotypes. Tim Guest reports

## Breeding estates, improved genotypes and the role of women

**L**ARGE-SCALE IMPORTATION OF chicken to Africa from countries such as the US and Brazil has long been a source of contention, as not only has this made it harder for small-holder poultry farmers to survive, it has also increased the risks of disease among such non-native flocks.

However, this situation may gradually change, as Eastern and Central African nations are soon to reap the benefits of new breeding estates and hatching facilities being established in Tanzania. These will make the country one of the most important poultry-producing markets in the region and fourth in Africa in relation to breeding a particular rare drought and disease-resistant chicken. One of the main benefits other nations will see, directly impacting their former dependence on imports, is the opportunity for their poultry sectors to move away from having to import chickens to actually being able to export their own home-grown birds. (Tanzania recently banned the importation of chicks and chicken meat, which together with the new breeding estates and hatcheries support the government's aims to control diseases such as bird flu and boost local markets).

The new breeding estates and hatcheries are a collaborative venture between Irvines Tanzania and Tyson Foods of the US. They include the Kiliwest farms located in the Kilimanjaro Region's Siha District, which began initial operations last month, and the Kerege Hatchery, which is due to be up and running in the Coastal Region's Bagamoyo District by July.

Initial weekly breeding plans include 250,000 Cobb 500 parent broilers, though Irvines said that this will increase to 500,000 per week, a figure that is expected to meet the whole nation's demands for chicken and allow any excess production to be exported regionally and further afield.

### The ACGG is using existing research in its work as well as introducing its own innovative approaches to the development and supply of genetics in country value chains

#### African Chicken Genetic Gains

Tanzania is one of the nations currently partnering with the African Chicken Genetic Gains (ACGG) organisation, an Africa-wide collaboration led by the International Livestock Research Institute (ILRI). Other countries involved include Ethiopia, the Netherlands and Nigeria. The aim of the group is to test and eventually make available high-producing, farmer-preferred genotypes that increase smallholder chicken productivity across Africa. The ACGG is using existing research in its work as well as introducing its own innovative approaches to the development and supply of genetics in country value chains. These innovations include high-producing genetics that are well-adapted to low-input production systems. In this regard, where the chicken value chain has received heavy investment, little of this has been used to improve genetics for



A chicken farmer in one of the ACGG Tanzania sites.

image credit: ACGG Nigeria / O Bamidele

smallholders; the ACGG, therefore, intends to target genetics and breeding to help improve existing animal health and management infrastructure because it believes genetics is the key to increased productivity. A further ACGG approach is to foster closer cooperation with farmers, including through on-farm and field testing, about farmer-preferred breeds of chickens, so that smallholder and local consumer preferences can be catered to.

Increased productivity is at the heart of the ACGG's initiatives and its innovation platforms offer all major stakeholders in country chicken value chains the chance to receive and share the knowledge needed to deliver increased productivity. That said, critical to the success of the programme is the establishment of public-private partnerships and will underpin testing and development of germplasm - the living genetic material maintained for the purpose of, in this case, poultry breeding, preservation, and other research uses – which will be conducted so that business cases in support of farmer-preferred breeds can be made. Uptake of the new lines by the private sector is critical for the wider adoption, maintenance, multiplication, and delivery of the right genetic technologies, and developing strong relationships with the private sector will be an important function of the innovation platforms.



### The role of women in poultry breeding

Another vital approach by the ACGG is to place women at the centre of their activities as, by and large, they are the people owning and managing the flocks, as well as trading at market; some 70 per cent of smallholder poultry farmers in Africa are women. The ACGG ensures that women are involved in constraint identification, definition of breeding objectives, testing of improved genetic lines through to full participation in the innovation platforms, and they will also be engaged fully in data collection and analysis, with a further objective being to test and respond to the specific concerns and preferences of women as farmers and consumers. When the ACGG launched its efforts in Tanzania a few years ago, with a plan to identify and cross-breed high-producing exotic chickens with local breeds, it involved universities, smallholder chicken producers, research centres, NGOs, government agencies such as the Tanzania Livestock Research Institute (TALIRI) and Sokoine University of Agriculture, and set about working closely with smallholder farmers, particularly women. Indeed, members of the Tanzania Gender Network Programme were involved, and cautioned that the men of every household where a woman was in charge of poultry had to be made aware of how the project to improve breeding and genetics would benefit them, so as to avoid household conflicts.

## Kuroiler – a hybrid chicken from India – has a reputation for low maintenance and ability to thrive on household and agricultural waste

### Breeds under evaluation in Tanzania

In Tanzania, the ACGG programme has been implemented in five sub-national Zones namely the Central semi-arid, Eastern sub-humid, Southern highlands, Lake, and the Southern humid zones. The ACGG national team is led by scientists from the Tanzania Livestock Research Institute (TALIRI) and from Sokoine University of Agriculture. A total of 20 districts, 80 villages and 3,200 households are targeted by the programme, with several strains of chicken being tested, including Black Australorp, Koekoek, Kuroiler, Sasso (these three are introduced breeds), as well as some local strains. The chickens are being evaluated under semi-scavenging and on-station management conditions for egg and meat productivity, adaptation, and preference by farmers and other stakeholders in the poultry value chain.

One of these, the Potchefstroom Koekoek, was bred at the Potchefstroom Agricultural College during the 1950s and is a composite of the White Leghorn, Black Australorp and Bared Plymouth Rock. It is a breed that can, according to the ILRI, be considered as a locally developed. The breed's cocks and culled hens are used for meat production. The Koekoek's colour pattern is a sex-linked gene that is very useful for colour sexing in cross-breeding for egg producing types of hens used in medium input production systems. The ILRI says that the breed is very popular among rural farmers in South Africa, and neighbouring countries for egg and meat production, as well as for their ability to hatch their own offspring.

Another on test in Tanzania is the Kuroiler, a commercial, dual-purpose, hybrid chicken from India derived through crossing either coloured broiler males with Rhode Island Red females, or, White Leghorn males with female Rhode Island Reds. According to the ILRI, the breed has a reputation for low maintenance and ability to thrive on household and agricultural waste. The breed can produce 150-200 eggs annually, according to data collected under extensive management conditions in Uganda.



Image Credit: Hannah Rollings

Each newly hatched Potchefstroom Koekoek is weighed before being sold. The birds are tagged to keep track of their performance, including weight and number of eggs they lay.

### Final word

It is a busy time for poultry breeding and genetic development in Tanzania, a country spearheading Africa's efforts to derive less of its sustaining livestock needs from overseas and instead rely on its own expertise, research, science, approaches and home-grown birds to meet its needs – and eventually those of other nations, as well. **B**

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Egged on by the global outrage against the practice of culling day-old chicks in millions, the stakeholders have come together to develop technology to determine the sex of chicks at the embryological level.

## In ovo method: The next big thing in chicken sexing

**T**HE COCKERELS (MALE chicks) have become the appendix of hatcheries around the middle of twentieth century. The advancements in genetics enabled the bifurcation of chicken species into 'specialisations'- layer and broiler. While the layer hen, as the name suggests, was engineered for churning out eggs, the broiler variety was developed to sate the meat cravings of Homo sapiens.

### Sex kills

The scientists, till date, have not been able to cultivate genetically modified chickens that produce only pullets (female chicks). The gender of the fertilised egg is more or less roll of the dice, means, the chances of a new-born chick being a cockerel is 50-50.

In the egg farmer's eyes, a cockerel is something to be dispensed with in quick time as it doesn't lay eggs and rearing male chicks make no commercial sense since their meat is sub-par. Hence, the farmer has to kill off the freeloaders before they go on a feeding spree. And therein lies the problem. To get rid of the male chicks, the farmer must first determine the chick's gender. This is where the chicken sexers come in.

**According to In Ovo founders, Wouter Bruins and Wil Stutterheim, the company has found new substances that indicate the sex of an egg as early as day nine of incubation**

### A brief history

The history of professional chicken sexers goes back to the early twentieth century when the Japanese set up a school (Zen Nippon Chicken Sexing School) to train the youth in the art of chicken sexing in true samurai spirit. Even now, the chicken sexers from Zen Nippon school are in high demand with many news report claiming the alumni command a salary north of US\$55,000 per year in and around Europe. The high levels of pay take into consideration the accuracy (some claims go



Culling methods include putting chicks into a grinder, breaking its neck, electrocution, suffocation and gassing.

up to 99 per cent) and speed (up to 1,200 per day) at which they can sort the chicks on a gender basis. The dedication that has gone in to perfect the 'muscle memory' to do the kind of work they do makes a strong case on the pay front.

Here's how journalist Joshua Foer describes the process in the book *Moonwalking with Einstein*: "The bird is cradled in the left hand and given a gentle squeeze that causes it to evacuate its intestines (too tight and the intestines will turn inside out, killing the bird and rendering its gender irrelevant). With his thumb and forefinger, the sexer flips the bird over and parts a small flap on its hindquarters to expose the cloaca, a tiny vent where both the genitals and anus are situated, and peers deep inside. To do this properly, his fingernails have to be precisely trimmed. In the simple cases—the ones that the sexer can actually explain—he's looking for a barely perceptible protuberance called the "bead," about the size of a pinhead. If the bead is convex, the bird is a boy, and gets thrown to the left; concave or flat and it's a girl, sent down a chute to the right."

Some hatcheries take to feather-sexing to determine the sex of chicks.

The sexing is followed by the indiscriminate culling of male chicks.

Culling methods include putting chicks into a grinder, breaking its neck, electrocution, suffocation and gassing. The culled

chicks are later fed to animals.

Around 3.2 billion male chickens are being killed every year across the globe. The cruel practise has sparked an outrage with many animal rights groups vehemently opposing the culling. The protest had reached a flashpoint when Farm Forward released a video clip showing the brutal treatment dealt to male chicks at hatcheries. The video immediately went viral and has forced Unilever to commit resources to find a workaround to put an end to the mass culling. The consumer giant is in the process of finding a scalable solution to sex chicken at the embryological level.

### Irons in the fire

A Dutch start up, In Ovo, is on the verge of developing a prototype to determine the gender of chicks in the incubation stage. According to founders Wouter Bruins and Wil Stutterheim, the company has found new substances that indicate the sex of an egg as early as day nine of incubation. These substances are fast and relatively easy to detect, says Bruins. The technique has been tested at a Dutch hatchery, where the company was able to hatch roosters and hens separately on several occasions. The method is fast enough to separate large amounts of eggs automatically.

The scientists at the Dresden University of Technology and the University of Leipzig are plugging away to make a scalable device to

Image Credit: Adobe Stock



sex the chicken at the embryological level. The team, led by Roberta Galli and Gerald Steiner, has developed a method to sex chickens three days into incubation. "At this stage, an embryo's blood vessels will have formed," Steiner explains, "but not the nerve cells, so they can't feel pain".

The researchers use a laser beam to cut a small, circular hole at the top of the egg. Next, near-infrared spectroscopy is used to determine the sex of the embryo based on its DNA content – which is around 2 per cent higher in male chicks. "To the naked eye, we can't see the difference between male and female embryos, but the computer can – if it's programmed to do so," says Steiner.


Dr Michael Ngadi, a food and bioprocess engineer in the department of bioresource engineering at McGill University, has patented a scanning technology, called Hypereye. "Through a fairly complex mathematical analysis where we are using some deep learning



Image Credit: Adobe Stock

Near-infrared spectroscopy is used to determine the sex of the embryo based on its DNA content.

techniques to identify or relate those spectral and image data to the specific attributes that we are looking at – in this case, whether [the egg] is fertile or not and whether [the embryo contained] is male or female," he said. The commercialisation of the technology is imminent.

US based eggXYt uses gene editing for chick sexing. The company was founded in 2016 by CEO Yehuda Elram and Dr Dani Offen, head of the department of neuroscience at Tel-Aviv University in Israel. "We edit the genes of the chicken so male eggs are laid with a biomarker," Elram explains, "and the female eggs identical to eggs as we know them today. The identifier is bio-luminescent and is detected at the speed of light by seXYt, the optical scanner eggXYt has developed." 

**US based eggXYt uses gene editing for chick sexing. The company was founded by Yehuda Elram and Dr Dani Offen, head of the department of neuroscience at Tel-Aviv University**

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## ACGG project releases gender strategy document

**T**HE AFRICAN CHICKEN Genetic Gains (ACGG) programme is an Africa-wide collaboration led by the International Livestock Research Institute (ILRI) with diverse stakeholders including universities, national research institutes and private sector partners in Ethiopia, Nigeria and Tanzania.

While gender equality concerns and women's empowerment were considered in the overall design of ACGG, it did not automatically translate into a systematic and meaningful integration of gender concerns into programme implementation. Halfway through the programme's life, the top question for ACGG was not whether to integrate gender in the program but 'how'. In October 2016, ACGG and ILRI therefore commissioned KIT Gender1 to lead a one year programme-wide process of co-creation and learning to develop an ACGG Gender Strategy.

The result is a gender strategy that:

- guides ACGG on how to integrate gender into its research in a meaningful, effective and feasible manner
- provides the basis for a common understanding in ACGG of what women's empowerment and gender integration means in the context of the program
- clarifies what change is expected, the mechanisms through which this is expected to happen and what is required from different ACGG team members
- has a strong focus on ongoing learning, knowledge creation and documentation

The programme's overall purpose is to 'catalyse a farmer-centric public-private partnership model for chicken genetic improvement and testing, multiplication and delivery as a sustainable pathway to productivity growth, poverty reduction, increased household animal protein intake and empowerment of women farmers in rural communities'.

### Gender integration vision

ACGG has from its outset recognised women as essential actors in the smallholder chicken value chain and acknowledged the particular constraints women chicken farmers face due to unequal gender relations. A closer reading



ACGG works in partnership with rural communities to test the productivity of improved breeds.

of ACGG's proposal to the BMGF reveals that women's empowerment is articulated at outcome, objective and activity level of the programme.

A two-pronged approach for women's empowerment through ACGG is specified in the proposal: firstly, ensuring that gender equality and women's empowerment is inherent in all that the programme does and secondly, directly targeting gender inequalities. Furthermore, placing 'women at the centre to ensure success' is considered one of the programme's five main pillars. Concretely, this is meant to happen by focussing on women 'right from the identification of the constraints, definition of breeding objectives, testing of the improved lines for suitability as well as participation in the Innovation Platform (IP) meetings'.

The proposal also stipulates that all data collection and analysis should be gender disaggregated, that gender segregated benefits and impact of introduction and adoption of improved chicken lines need to be understood, and some targets for women's representation in project activities.

'On-farm testing' of improved breeds is the main mechanism of ACGG for researching what chicken and service delivery models different farmers prefer.

From a gender perspective, that would imply collecting data to understand: the different trait preferences of women and men, how gender relations affect women's access services, inputs and markets, how the new technology brings them benefits and local interpretations of women's empowerment. 'IPs' are facilitated by ACGG at the national level for public-private sector partnerships to emerge that can make farmer preferred lines available and accessible, and at the community level to create awareness about available chicken breeds and to help find solutions to local challenges, especially those faced by women farmers. IPs are expected to act as important vehicles to engage women as stakeholders in the chicken value chain. At the community level, in particular, an expected outcome of the IPs is 'a functioning mechanism developed for ensuring the empowerment of women smallholders to participate in the chicken value chains and to lead efforts to generate and share knowledge ... on improved and profitable chicken production'. For this outcome to be realised, it would imply explicitly identifying in community innovation platforms (CIPs) gendered needs and constraints experienced by women in the

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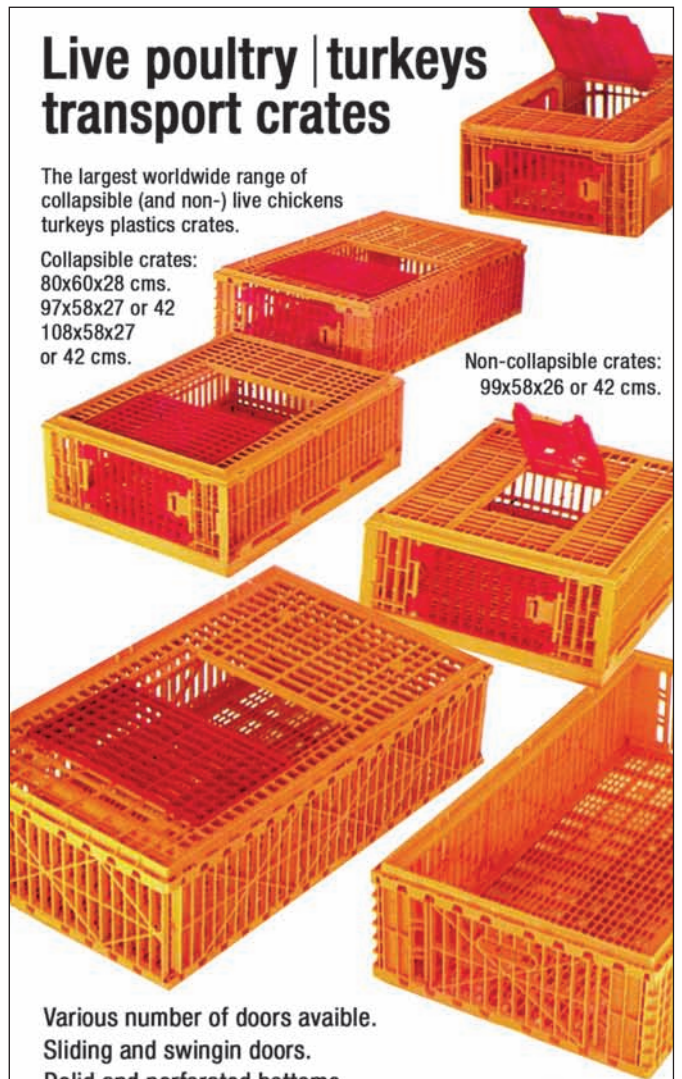


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value chain and addressing them by the program. National innovation platforms (NIPs) are ACGG's main mechanism for forming public private sector partnerships in order to make 'farmer preferred lines' available and accessible, and ensuring an enabling environment for the preferred lines to thrive. The work of the national level IPs is expected to be informed by gender issues captured at CIP level and brought to the NIPs through feedback loops envisioned between community and national levels.

### Gender integration experiences

At the beginning of the gender strategy development process, gender-disaggregated data had not been systematically collected from ACGG supported households as part of on-farm testing. Data collection had so far not been initiated around intra-household decision-making (for example, who decides when to sell and slaughter, use of income from chicken sales, when to consume etc) and how these in turn influence how benefits are distributed to different individuals in the household, let alone how they empower women. Similarly, gendered needs and constraints experienced by women had not been systematically identified in CIPs and addressed by the programme and feedback loops between community, and national level IPs had not been established to ensure that gender issues captured at CIP level were brought to and addressed at NIP level. While the number of women participants at

CIP level had been fairly high, the representation of women at NIP level had been low.

### Conceptual framework

An important aim of the gender strategy development process was to create a common understanding of what women's empowerment and gender integration means in ACGG. To this end, the KIT gender team facilitated participatory gender analysis exercises with key ACGG staff and partners in all three program countries to unpack the programme's ToC from a gender perspective and to introduce and make relevant key gender concepts. Findings from these country-based analyses fed into the final gender strategy workshop (Addis Ababa, September 2017) during which key conceptual and operational building blocks of the strategy were further clarified and enriched.

The gender strategy also provides room to work with other women value-chain actors, especially from the perspective of upgrading chicken producers in the value chain and in terms of ensuring the voice of women entrepreneurs is heard and acted upon in ACGG-facilitated IP work.

## In ACGG, empowerment of women chicken farmers is a process of developing a combination of expanded choice and strengthened voice

### Women's empowerment and ACGG

For the purpose of the gender strategy, a distinction is made to define women's empowerment 'subjectively' and 'objectively'. 'Subjectively' defined women's empowerment signifies how the 'abstract notion' or 'state of being' of empowerment is articulated and understood in local contexts by chicken farmers themselves, especially women. Women's empowerment means many different things to different people across countries, and agro-ecological and cultural systems. It also depends on other social identities of individuals, such as class, ethnicity and age. Exploring women's empowerment 'subjectively' defined requires investment into qualitative research on local understandings of empowerment. 'Objectively' defined women's empowerment is used to denote an understanding of women's empowerment based on existing state-of-the-art research and literature on the subject, which forms the starting point for ACGG's gender integration work under the guidance of the gender strategy.

The main dimensions of this 'objective' understanding of women's empowerment are translated into workable concepts in the context of ACGG (expanded choice and strengthened voice) and reflected in the gender-responsive ToC, goals, indicators and milestones of the gender strategy. The basis for ACGG's 'objective' definition of empowerment is a recent conceptual model of women's empowerment developed by KIT Gender for the BMGF.

### Women's empowerment

In ACGG, empowerment of women chicken farmers is a process of developing a combination of expanded choice and strengthened voice. 'Expanded choice' concerns the ability of a woman chicken farmer to influence choices that affect her life and future as a successful chicken producer and to contribute to her family's wellbeing. This is influenced, among others, by whether ACGG's research and program activities engage directly with her to solicit information about her experiences and preferences, and her access to and control over vital resources (in particular services, inputs and markets), as well as benefits (in particular income, nutritious animal protein and food). 'Strengthened voice' concerns the capacity of a woman chicken farmer to speak up and be heard, and to shape and share in discussions and decisions (in public and private domains) that affect her life and future as a successful chicken farmer. This is influenced, among others, by ACGG's efforts to create safe spaces for women to express their concerns (such as an IP) and the responsiveness of the programme to concerns expressed. It is also affected by the extent to which women get recognised as knowledgeable chicken farmers by ACGG and in their communities.

Women's empowerment is a 'dynamic process underpinned by the transformation of gender relations'. This transformation happens as women chicken farmers increasingly exercise agency through making decisions and grow in their self-esteem as knowledgeably successful chicken producers. It also happens as resources are redistributed so that women's access to technology, inputs, services and knowledge increases, and through shifting institutional structures (such as the gender norm about who should eat first) that shape women's choice and voice at the household level, in the community but also in the ACGG programme itself. <sup>1</sup>

For the full document visit:  
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ACGG has from its outset recognised women as important actors in the smallholder chicken value chain.



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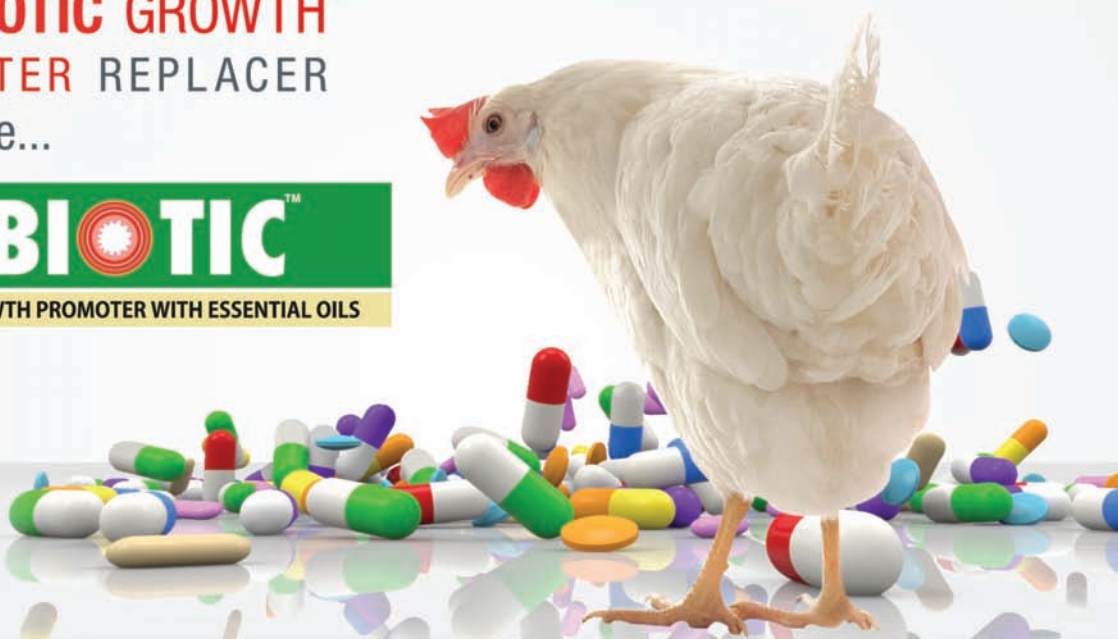
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Coffee leaf rust affects two main commercial coffee species – Arabica coffee and robusta coffee. Dr Terry Mabbett reports.

## Leaf rust corrodes coffee yield

**C**OFFEE IS TRULY African in origin having ‘started life’ thousands of years ago as an understory shrub of rainforest in the Ethiopian Highlands. It is therefore reasonable to assume that coffee leaf rust, caused by the fungus *Hemileia vastatrix* and still the most devastating disease of coffee, has co-evolved with the genus *Coffea* in Africa.

What was initially called “the coffee leaf disease” was first reported on wild *Coffea* species by an English explorer in the Lake Victoria region of East Africa in 1861. Then in 1869, the Reverend H J Berkeley and his assistant Mr Broome, reporting in the *Gardeners' Chronicle*, described a fungus they had found associated with the disease on some dried coffee leaves sent from Ceylon (now Sri Lanka). They subsequently assigned the scientific name *Hemileia vastatrix* to the fungus.

### Coffee leaf rust hit Sri Lanka's coffee estates with a vengeance destroying the industry by 1890 and forcing estate owners to grow tea instead

The classic symptom of the disease is the orange and rust-like powdery pustules. These lesions develop rapidly in the leaf erupting through the stomatal pores on the abaxial (lower) leaf surface. They comprise thousands of asexually produced propagules called urediniospores which spread the fungal infection to other leaves and plants, mostly by wind and rain splashes but also through biological agents such as insects. Resultant effect is a rapid reduction in the photosynthetic potential of foliar canopy, premature fall of evergreen coffee leaves and significant yield loss.

Coffee leaf rust affects two main commercial coffee species – *Coffea arabica* (Arabica coffee), which thrives in cooler upland environments such as the Kenyan Highlands, and *Coffea canephora* (robusta coffee), which is better able to cope with hotter and more humid conditions in the lowland tropics such as Côte d'Ivoire in West Africa.

#### Spread of coffee and leaf rust disease

Coffee cultivation started to spread throughout the world many centuries ago



A close-up of the orange, rust-coloured powdery pustules on the underside of the coffee leaf

Image Credit: Trond Kristiansen Nordbox

with coffee leaf rust logically following on, but considerably later. You might expect the very first coffee leaf rust epiphytotic (epidemic) to occur within the coffee plant's native African range. However, coffee cultivation on an intensive scale in East African countries like Kenya and Uganda or Cameroon in West Africa did not start in earnest until well into the twentieth century, and ironically long after coffee was being grown on a commercial scale in south and south-east Asia.

In fact, coffee leaf rust first erupted in epidemic proportions on the south Asian island of Ceylon (now Sri Lanka) where coffee was already being grown largescale in the second half of the nineteenth century. Coffee leaf rust hit Sri Lanka's coffee estates with a vengeance destroying the industry by 1890 and forcing estate owners to grow tea instead. But not before valuable definitive work on fungicide control was achieved.

Fungicidal activity of copper-containing compounds had already been established in the south of France for the control of downy mildew in grapes but it was the coffee leaf rust epidemic in Sri Lanka which really secured a place for spray application of copper fungicides and which is still used worldwide today. Coffee leaf rust never went away although, until recently, was kept in check and below economic threshold levels by the use of resistant coffee varieties and fungicide spraying.

#### Leaf rust hits Latin American coffee

Central and South America remained free

of leaf rust disease until the 1970s, with fungicide spraying and the use of coffee varieties with disease resistance. That was until 10 years ago when rust disease started to surge in a number of major coffee-growing countries including Colombia in South America and Costa Rica and Guatemala in Central America. The underlying reasons for this latest upsurge are climate change and poor economic conditions.

According to Latin American scientists, a common factor in the relatively recent Colombian (2008-2011) and Central American (2012-2013) epidemics was a reduction in the diurnal thermal amplitude, with higher minimum/lower maximum temperatures of +0.1 °C/-0.5 °C (average) during 2008-2011 compared to a low coffee rust incidence period in 1991-1994 in Chinchiná, Colombia. And +0.9 °C/-1.2 °C (average) in the high coffee leaf rust year of 2012 compared with the prevailing climate in Guatemala. The experts claim the phenomena probably decreased the latency (inactive) period of the disease.

But the story does not end there. Modern varieties of coffee cultivated in South and Central America were bred and developed with resilience to coffee leaf rust fungal pathogen. However, the sheer size of the spore load created during these epidemics would have been more than enough to break down any varietal resistance to leaf rust disease. Furthermore, the epidemics occurred when coffee prices were inherently low with corresponding low profitability



levels for farmers leading to sub-optimal coffee management (including relaxation in routine spraying with fungicides) which resulted in increased plant vulnerability.

The takeaways from this fiasco include the need for continual breeding and development of rust resistant coffee varieties and the maintenance of routine fungicide applications. It is amazing that protectant, copper-based fungicides are still used today to provide basic protection for coffee against leaf rust disease. And all the more so when you count the number of other types of fungicide developed much later, but which have already disappeared from the market due to loss of efficacy against leaf rust disease and/or concerns about safety of spray operators, coffee consumers and the environment.

### Copper fungicides

The active principle in all copper-based fungicides is the divalent copper ion ( $\text{Cu}^{2+}$ ) which protects the leaves against infection by germinating fungal spores. Copper fungicides are purely protectant (protective) in action, remaining as a deposit and residue on the leaf surface to intercept and kill alighting spores as they germinate. As

## It is amazing that protectant, copper-based fungicides are still used today to provide basic protection for coffee against leaf rust disease.

such they need to be routinely applied and also have high tenacity with resistance to weathering and wash off by intense rainfall.

### The main points for using copper fungicides:

- Broad spectrum of activity that controls other diseases of African coffee including coffee berry disease and coffee leaf rust
- Broad spectrum activity which essentially prevents pathogen populations from becoming resistant to the action of copper ions
- Copper fungicide deposits are inherently tenacious and resistant to weathering in the face of fierce rainfall
- Copper fungicide sprays have a 'tonic' effect on coffee due to the additional role of copper as an essential plant micronutrient
- Copper fungicides are universally approved for use in countries where coffee is grown and those which import

green coffee or processed coffee like roasted coffee beans and soluble (instant) coffee products.

### Which one to use?

There are a number of so called particulate, fixed copper fungicides on the market. 'Fixed' describes the sparingly soluble nature of the fungicide, with the active copper being 'secured' in the molecule, and 'particulate' implies the nature of the formulation as a water dispersible granule or a wettable powder.

The three mainstream copper fungicides are cuprous oxide, cupric hydroxide and copper oxychloride. The molecular weight of cuprous oxide [ $\text{Cu}_2\text{O}$ ] is 143.00 with 127.00 (88 per cent) of this accounted for by the mass of two copper atoms. The equivalent figure for cupric hydroxide [ $\text{Cu}(\text{OH})_2$ ] is 63.5/97.5 (65 per cent) and for copper oxychloride [ $3\text{Cu}(\text{OH})_2 \cdot \text{CuCl}_2$ ] is 381.00/696.00 (55 per cent), respectively.

On a gram for gram basis cuprous oxide contains around 20-25 per cent more fungicidal capacity than cupric hydroxide and copper oxychloride, and with all else equal, coffee growers will get more 'bang for the buck' when using cuprous oxide. **E**

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In the wake of the fall armyworm outbreak, UN's Food and Agricultural Organisation launched a guide to help maize farmers tackle the menace.

# Reining in the maize runners

## What is fall armyworm (FAW)?

Fall armyworm (*Spodoptera frugiperda*), is an insect pest of more than 80 plant species, causing damage to economically important cultivated cereals such as maize, rice, sorghum, and also to vegetable crops and cotton. It is native to tropical and subtropical regions of the Americas. It is the larval stage of the insect that causes the damage. FAW reproduces at a rate of several generations per year, and the moth can fly up to 100km per night.

## What alternative crops can farmers be advised to grow?

Maize is the crop most infested now in Africa. As a staple crop, it is unlikely that farmers and their families will want to abandon maize. There are ways of managing FAW in maize, as demonstrated in the Americas.

**Over 98 per cent of maize farmers in Africa are smallholders, growing maize on less than 2 ha and typically saving seed to plant the next crop**

## What products can be used to control FAW, and when and how should they be applied?

FAO is working with member countries from around the world to determine the recommendations for farmers' actions, including pesticides that are effective, yet with low risks to humans and the environment. These recommendations are made nationally.

## What pesticides should be used to control FAW?

Pesticides may be needed to control FAW locally. The most effective, lowest-risk, economical, accessible and easily used by smallholders (without sophisticated machinery) need to be determined within each country and across the continent. It's not just a question of the most effective pesticide in a research station, the specific recommendations (active ingredient, formulation, type and timing of application), and their costs and benefits to smallholder farmers must be determined.



Image Credit: francopolpatto/Adobe Stock

Low levels of fall armyworm infestation at certain stages of maize growth may not cause much yield loss.

## When should pesticide applications begin in maize to protect it from FAW?

Only when justifiable. Low levels of infestation at certain stages of maize growth may not cause much yield loss. The economic or action threshold must be determined and recommended for each stage of maize growth and for each type of pesticide and application techniques. Costs can vary tremendously. To economically justify their use, the costs of pesticide use must be equal to or less than the value of the additional yield that farmers receive for taking action. The prices that farmers receive for their harvest must also be correctly valued.

## Are aerial applications of pesticides recommended for the FAW?

No. The destructive life stage (the larva) digs deep into the whorl of maize, occasionally, making aerial applications of very low efficacy, while spreading pesticides over large areas of non-target habitat.

## Is the use of biological control a possibility for the FAW in Africa?

There are many biological organisms that can help control FAW. Some may be naturally occurring in Africa (general predators, parasitoids and some entomopathogens), and some might need to be introduced from the Americas (specialised parasitoids, predators and certain strains of

entomopathogens). The use of botanicals is also an appealing option.

## Is GMO maize the solution to FAW in Africa?

While GMO maize is already being used in South Africa, it is generally only accessible by larger commercial farmers who have access to capital, resources and stable markets for their maize. Over 98 per cent of maize farmers in Africa are smallholders, growing maize on less than 2 ha of land and typically saving seed to plant the next crop. The use of purchased inputs, including seed, is low. Given the high cost of transgenic maize seed, the lack of adequate supply channels, and lack of economic incentives for smallholders to grow maize (due to the low and volatile prices received) there is a low probability that the technology would be used in a sustainable manner by smallholder maize farmers in Africa. Even for commercial maize farmers in Africa, the long-term benefits of transgenic maize were put into doubt when, within two years of deployment, the maize stem borer began to show resistance to Bt maize in South Africa, and was later confirmed. <sup>1</sup>

Go to the URL to download the guide:  
<http://bit.ly/2p0InUA>  
(Published with permission from FAO)



## Omex Agrifluids at Agritech Expo Zambia 2018

OMEX AGRIFLUIDS WILL participate in Agritech Expo Zambia, from 12-14 April 2018 at Gart Research Centre in Chisamba, Zambia.

"We are expanding the company's distribution network in Central and Southern Africa and introducing a range of specialist soluble-liquid foliar fertilisers and soluble powder formulations," said Alan Lowes, regional director of Omex Agrifluids.

Omex Agrifluids is keen to consolidate its business position in Sub-Saharan African countries especially Zambia and South Africa, while re-establishing the company's presence in Zimbabwe. Key crops of immediate interest for the Omex Agrifluids' range of products include wheat, sugar cane, potatoes, tobacco, cotton, coffee and high-value horticultural crops.

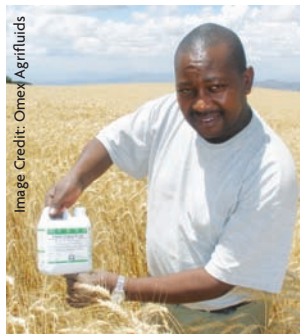


Image Credit: Omex Agrifluids  
Omex Agrifluids' products are widely used on wheat in East Africa

"Among the products earmarked for introduction, development and expansion throughout the region is Omex Bioboost," said Alan Lowes.

Omex Bioboost contains the full range of NPK macronutrients, plus magnesium, together with a full range of trace elements (micronutrients) complemented and synergised by a completely natural, plant-sourced biostimulant which targets root growth and development. Omex Agrifluids will roll out the carpet for farmers and growers and members of the wholesale and distribution trade in liquid fertilisers and soluble powder nutrient formulations at the company's stand in the British Pavilion at Agritech Expo Zambia 2018.

Omex Agrifluids will roll out the carpet for farmers and growers and members of the wholesale and distribution trade in liquid fertilisers and soluble powder nutrient formulations at the company's stand in the British Pavilion at Agritech Expo Zambia 2018.

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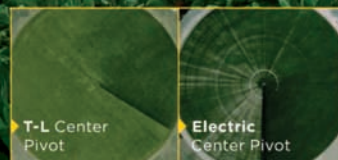


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Artificial Intelligence is developing at a staggering rate with the market expected to contribute an astounding US\$15.7 trillion to the global economy by 2030.

# Artificial Intelligence: What does the future hold for agri industry?

**T**HE ARTIFICIAL INTELLIGENCE (AI) industry is booming, and with 47 per cent of digitally mature organisations stating that they now have a defined AI strategy, this rapidly evolving technology shows no sign of slowing down any time soon.

AI is developing at a staggering rate and infiltrating into all industries across our society, with the market expected to contribute an astounding US\$15.7 trillion to the global economy by 2030. From robotic farmers to implantable chips in the brain to cure dementia, the next few years are not only big in the technological world, but everybody's world in general.

So, as we continue to learn about AI and the impacts it will have across multiple industries, what really is in store for the future of AI, and more specifically, the future of AI within the agricultural sector?

## The future of artificial intelligence within the agricultural sector

Whilst farmers have tractors and big machinery to aid them in their work, the industry remains one of the toughest and most strenuous when it comes to manual labour. Traditionally, the planting, maintaining and harvesting of crops takes up time, energy, money, labour and resources. It doesn't come cheap, and it doesn't come easy. But, modern agriculture has started to see big changes.

Farming operations are becoming increasingly sophisticated as they evolve with the developments of technology. Precision agriculture, using advanced technology and big data to improve crop production and practices, is seeing more efficient and educated farming procedures brought to life. For example, AI is set to reduce this high level of repetitive and physical work by developing different components to help make farms smarter and more efficient. In a new initiative called FarmView, research has been carried out to create a fleet of mobile field robots that will be able to help with plant breeding and crop management by combining sensors, robotics and AI. These bots will have the ability to take a visual survey of a vineyard at the start of the season, then as the



Futuristic gadgets are becoming more accessible to farmers.

Image Credit: Adobe Stock


season progresses, be able to use machine learning to predict the expected fruit yield. These machines will not only reduce manual labour in this industry but should also see farms able to utilise, manage and organise their crop intake.

Popularly used as aerial observational technology, drones are set to be immensely beneficial to the farming industry in years to come. Many farmers have acres upon acres of land – all of which can be hard to manage and watch over. Drones will become extremely helpful in aiding farmers with land monitoring, as they will be able to survey crops and also carry out long-distance crop spraying. These futuristic gadgets are becoming more accessible and will likely become invaluable to any farmers harvesting solutions.

Farms will not only be monitored from the sky but from machines working directly on the ground, too. Cutting-edge machine vision tools that help farmers to scan their fields, assess crops and get rid of weeds, will become widespread. These hi-tech cameras will be fixed onto crop sprayers and will use inbuilt deep learning

technology to identify plants in the field. If these cameras see a weed, it'll hit it with pesticide, but if it sees a crop, it'll drop some fertiliser.

With all of this expected over the next few years, the growth potential of AI within other aspects of the agricultural industry will be huge. So, will the introduction of technology start the solution to one of the world's biggest problems - solving world hunger? With many areas of the world struggling to grow and eat their own crops, hopefully, advancements in this arena will see changes to many world issues.

Artificial intelligence is rapidly ingraining itself into the way we live our lives. With no intention of slowing down, how different will your world be in just a handful of years? For more information on the future of AI within the agriculture sector, visit [www.uk.rs-online.com](http://www.uk.rs-online.com). 

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## Adesina urges America to support African agriculture as a business

THE PRESIDENT OF the African Development Bank, Dr Akinwumi Adesina has made a strong case for increased American and global investments to help unlock Africa's agriculture potential.

He made the remarks as the distinguished guest speaker, at the USDA's 94th Agriculture Outlook Forum in Virginia on Thursday, on the theme The Roots of Prosperity.

According to Adesina, "For too long, Agriculture has been associated with what I call the three Ps - pain, penury, and poverty. The fact though is that agriculture is a huge wealth-creating sector that is primed to unleash new economic opportunities that will lift hundreds of millions of people out of poverty."

Participants at the forum included the secretary of agriculture, Sonny Perdue; deputy secretary of agriculture, Stephen Censky; president of the World Food Prize Foundation, Kenneth Quinn; chief economist of the US Department of Agriculture (USDA), Robert Johansson; deputy chief economist, Warren Preston; and several top level government officials and private sector operators.

Adesina appealed to the US private sector to fundamentally change the way it views African agriculture.

"Think about it, the size of the food and agriculture market in Africa will rise to US\$1 trillion by 2030. This is the time for US agri-businesses to invest in Africa," he said. "And for good reason: Think of a continent where McKinsey projects household consumption is expected to reach nearly US\$2.1 trillion and business-to-business expenditure will reach US\$3.5 trillion by 2025. Think of a continent brimming with 840 million youth, the youngest population in the world, by 2050." The US government was urged to be at the forefront of efforts to encourage fertiliser and seed companies, manufacturers of tractors and equipment, irrigation and ICT farm analytics to ramp up their investments on the continent.

"As the nation that first inspired me and then welcomed me with open arms, permit me to say that I am here to seek a partnership with America: a genuine partnership to help transform agriculture in Africa, and by so doing unlock the full potential of agriculture in Africa, unleash the creation of wealth that will lift millions out of poverty in Africa, while creating wealth and jobs back home right here in America," the 2017 World Food Prize Laureate told the Forum."

Adesina told more than 2,000 delegates that the African Development Bank is spearheading a number of transformative business and agricultural initiatives. "We are launching the Africa Investment Forum, as a 100 per cent transactional platform, to leverage global pension funds and other institutional investors to invest in Africa in Johannesburg, South Africa from November 7-9."

The World Bank, International Finance Corporation, the Inter-American Development Bank, the European Bank for Reconstruction and Development, the Asian Infrastructure Investment Bank and the Islamic Development Bank, are partnering with the African Investment Forum to de-risk private sector investments. The African Development Bank is also pioneering the establishment of Staple Crop Processing Zones in 10 African countries, that are expected to transform rural economies into zones of economic prosperity and save African economies billions of dollars in much need foreign reserves. "We must now turn the rural areas from zones of economic misery to zones of economic prosperity. This requires a total transformation of the agriculture sector. At the core of this must be rapid agricultural industrialisation. We must not just focus on primary production but on the development of agricultural value chains," Adesina added. "That way, Africa will turn from being at the bottom to the top of global value chains."

In his keynote address US secretary of agriculture, Sonny Perdue, said the US Administration has removed more restrictive regulations to agriculture than any other administration. "Our goal is to dismantle restrictions that have eroded agricultural business opportunities."

"Agriculture feeds prosperity and accounts for 20 cents of every dollar. As global prosperity grows, it in turn fuels the demand for more nutritious food and business opportunities," he added.



Image Credit: Adobe Stock

Technologies for African Agricultural Transformation (TAAT) is a new US\$1 bn initiative to unlock Africa's huge potential in the savannahs.

In his concluding remarks, Adesina informed participants about a new US\$1 bn initiative, Technologies for African Agricultural Transformation (TAAT) to unlock Africa's huge potential in the savannahs.

Expressing strong optimism that the future millionaires and billionaires of Africa will come from agriculture, Adesina said: "Together, let our roots of prosperity grow downwards and bear fruit upwards. As we do, rural Africa and rural America will brim with new life, much like I witnessed in Indiana, during my time as a graduate student in America. Then, we will have changed the 3 'Ps' to prosperity, prosperity and prosperity."



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Image Credit: FG Wilson

FG Wilson has a long-established network of dealers across Africa offering installation, parts and aftersales through the lifetime of a generator set.

Ann Brown, managing director of FG Wilson, explains how farmers can save big money by using her company's high-performance generator sets.

## Meeting power needs since 1966

**A**S A WAY of providing uninterrupted supply of electric power, generator sets have been around for a long time. FG Wilson has been manufacturing generator sets for more than 50 years, with over 600,000 units installed since 1990 (as far back as the computer records can go). Ann Brown, managing director of FG Wilson, can see why generator sets are a popular choice.

"There are many ways to store or produce energy but when it comes to guaranteeing standby or emergency electrical power, in terms of cost, flexibility and responsiveness, for many people, the best option is a generator set," she says.

In its simplest form, a diesel generator has an engine driving an AC generator / alternator which produces an AC electrical output. The engine and alternator are fixed to a rigid steel chassis which usually contains a fuel tank. That has been the basic principle for a long time and for several decades FG Wilson has been at the forefront in driving efficiency of generator sets to new levels.

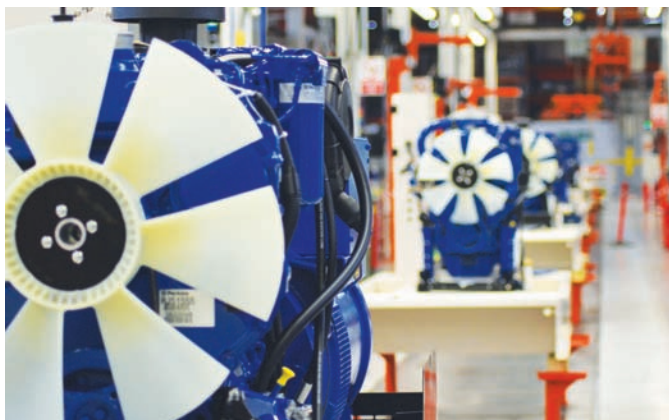


Image Credit: FG Wilson

FG Wilson has been at the forefront in driving efficiency of generator sets to new levels.

Ann says, "Our 6.8 – 25 kVA range is probably among one of the most popular choices for farmers, and FG Wilson have really focused on making it among the most efficient generator sets available."

The range was originally designed for telecom operators for whom efficiency is very important: most units are installed in remote locations, and are required to be reliable with long working life at viable operating costs.

**Most generator sets come with a fuel tank allowing 8-10 hours of usage. The FG Wilson 6.8–25 kVA range offers tanks of 600, 1000 and 2000 litres, single or double-walled**

It all starts with the engine, a Perkins 400 Series, which offers a 1,000 hour service interval. Not only does this reduce maintenance frequency, it also cuts costs, with fewer parts replacements over the lifetime of a generator set.

According to FG Wilson estimates, over a 10-year period, with moderate usage, this can save up to US\$15,000 versus a unit with 250 hour service intervals and save US\$10,000 versus a unit with 500 hour service intervals. The engines are also designed for a long working life: among FG Wilson products, it's very common to see engines working hard well past 20,000 hours.

And that's just the beginning. Ann says, "Most generator sets come with a fuel tank allowing 8-10 hours of usage. The FG Wilson 6.8–25 kVA range offers tanks of 600, 1000 and 2000 litres, single or double-walled. That means long endurance before refuelling: running four hours a day, the FG Wilson 11 kVA generator set has a maximum fuel endurance of 55 days for the 600 litre tank, 92 days for the 1,000 litre tank and 185 days for the 2,000 litre tank." Fuel is valuable and the range has security features to prevent theft or vandalism. The fuel pipework is



concealed between the base and fuel tank, enclosures are lockable and the range comes with optional GPS tracking.

A range of enclosures protects generator sets from wear and tear and also reduces noise to comfortable working levels. Enclosures are made of high grade steel protected by powder coat paint which lends a finish on par with the automotive industry. And there is a choice of three enclosures, offering different noise levels, which means customers only buy the one which is right for their needs, and avoid an over-specified enclosure design.

Enclosure design is based on modular principles. As a result, there are interchangeable components for easy on-site repair or replacement. The lift-off doors and access panels ensure easy access for service and maintenance.

As with any equipment, service plays a huge part in sustaining efficient operation over a long time.

### A range of enclosures protects generator sets from wear and tear and also reduces noise to comfortable working levels

FG Wilson has a long-established network of dealers across Africa offering installation, parts and aftersales through the lifetime of a generator set.


Ann says, "Local, effective support is very important. Our experience shows that over a 10-year product lifetime, being able to resolve a product issue with one fewer visit to site can save customers an average of US\$6,000 for every generator set. That requires local dealers who stocks parts and are trained to diagnose



Image Credit: FG Wilson

Lift-off doors and access panels ensure easy access for service and maintenance.

issues right away. FG Wilson puts a very big priority on this." That means a global parts operation carrying 12,000 parts lines, taking 500 orders a day and shipping up to two million parts a year to dealers who know the products better than anyone."

For Ann, that adds up to a strong package: "If you're thinking of buying a generator set, it really is worth buying the most modern design within your purchasing budget. It will pay for itself over time with savings on fuel and efficiency. For me, FG Wilson generator sets are right up there. They are easy to install and operate, reliable and designed for a long and productive working life and give excellent value for money." 





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Case IH's design head, David Melvin Wilkie – the prime mover behind the award-winning autonomous concept tractor – gets candid about his working style in an exclusive interview with *African Farming*.

# Breaking new ground in design

**When do you expect to go into production? Could you briefly introduce the team that made this concept tractor possible?**

The Case IH autonomous concept is a fully functioning prototype developed in close liaison with the CNH Industrial's Innovation team, the Design Centre and the ASI. The concept aims to showcase and test our autonomous technology and is not directly related to a future production tractor. However, it will certainly influence the next generation of Case IH tractors. The design has been developed by our North American studio in Burr Ridge (Chicago) under my direction. We worked hand in glove with our innovation team as it's a truly functional concept.

**Tell us some of the challenges you have faced while coming up with the concept**

Every new design project is a challenge. This concept brought us an enormous amount of freedom which is unusual in industrial field. The fact that we no longer needed a cab and the driver is remote, changes everything.

This is no conventional tractor. In order to protect the engine and complex electronics on board, we had to design a clean yet functional body. We started off by developing the face and hood - taking after the Case IH Optum series. From this, we have created a very fluid sculptural body which not only protects the tractor but gives it a strong, stylish and futuristic character.

**How do you strike the balance between functionality and design? Where do you draw the line?**

Functionality is always our number one goal. Nevertheless, good design and functionality can live together. I truly believe good design can enhance the functionality



Case IH unveiled world's first autonomous concept tractor in 2016.

Image Credit: Case IH

of a product. The architecture of a well designed machine inspires confidence in the user. Good design can help build the brand image and maintain the machine's appeal throughout its lifetime which in turn keeps its resale value on the higher side.

**Good design and functionality can live together. I believe good design can enhance the functionality of a product**

**How do you go about your product design? From the drawing board to the real-world product, can you walk us through the metamorphosis?**

Our first job is to fully understand the client's needs. Be it the brand or product development, we have to study the market and competitors and see what could work. Our design team is a mix of experienced specialists and young talented designers. We also have ex-automotive designers with a passion for good design. Initially, I would involve designers from different studios with varied cultural backgrounds. This allows us to open up the boundaries.

Our designers often exceed expectations. We love to push the limit to see how far they can go. The next step, however, is to do a review with our brand, marketing and product engineering teams. This is where we find the correct balance – whether to pick a conventional solution or go for an advanced

idea. As the project develops, it becomes clear which direction we should take.

Design starts as two dimensional sketches through to CAS Computer designed surface models up to full-size prototypes. A final design choice is only made after indepth studies by engineering and ergonomics, supported by market research.

**Tell us how your career helped shape your design outlook**

I have been involved with many automotive brands over the years. My time in automotive design has helped me understand the importance of good design and how design could be stylish. In automotive, a good or a bad design can be the difference between success and failure. Attention to detail is probably the biggest single influence – going beneath the skin and making sure that even the bits you don't see can look good and work well.

**What's next big thing on your product line? What are you currently working on?**

Of course I cannot discuss any of our future projects in detail. Our design team gets involved in major projects to small detail improvements and graphics.


The next big thing will possibly revolve around the continuing influence of technology and connectivity in our machines. It is even more important in our business than in the world of automotive. Technology will make the operators life more productive and comfortable. 



Image Credit: Case IH

David Melvin Wilkie, design director, CNH Industrial Design Centre.



## World Bank optimistic about the growth potential of Ghana's agricultural sector

GHANA'S ECONOMY EXPANDED for the fifth successive quarter in September 2017, at a rate almost double that of 2016, according to a World Bank report.

The 3rd edition of the Ghana Economic Update, which focusses on agriculture as the engine of growth and jobs creation, notes that the service sector bounced back, and the fiscal consolidation is paying off. The inflation rate is also down to almost 10 per cent.

"The macroeconomic outlook was largely positive based on the 2017 performance. GDP growth for 2017 is estimated to have almost doubled from the 3.7 percent in 2016, and is expected to stay at that elevated level through 2018," said Henry Kerali, World Bank country director for Ghana.

The external position has improved as the trade balance has shifted to a surplus. Ghana has made good progress in macro-stabilisation in 2017, but it needs to sustain the fiscal consolidation efforts. According to the report, inflation is likely to fall within or be close to the Bank of Ghana's medium-term target range of 6-10 per cent in 2018. To sustain the fiscal consolidation efforts, two areas are particularly important over the medium-term—domestic resource mobilisation and expenditure controls. Despite the positive outlook, challenges remain, including further containing inflation and strengthening and



Image Credit: Adobe Stock

Ghana has made good progress in macro-stabilisation in 2017.

deepening the financial sector to lower interest rates. "The country's heavy reliance on primary commodities, including cocoa, gold, and oil—all prone to volatility in international commodity prices—create uncertainty about its actual future paths for growth, inflation, export receipts, and domestic revenue," said Michael Geiger, senior economist and co-author of the report.

## Angola and AfDB sign US\$101mn contract to support agricultural value chains development

THE AFRICAN DEVELOPMENT Bank is fully engaged in ensuring efficient and sustainable agricultural production projects in its regional member countries. This can drive economic growth and poverty reduction as well as fulfil both domestic and global demand for agricultural products.

It is within this perspective, that Angola's finance minister, governor for the bank, Augusto Archer de Sousa Manguiera, and the African Development Bank's country manager for Angola Joseph Ribeiro, signed a US\$101.07 mn loan agreement for the Cabinda Province Agriculture Value Chains Development Project.

The loan was approved by the African Development Bank's Board on 15 December 2017 and will directly benefit 51,000 economically active rural agricultural smallholders in all four municipalities of the Cabinda Province (Belize, Buco Zau, Cacongo, and Cabinda

City) as well as small and medium sized entrepreneurs responsible for providing agricultural support services and food processing. A number of enabling infrastructures will be built including 191 km of access roads, 54km of power supply networks, 750 hectares of irrigation systems, 16 boreholes for water supply, a primary school and a medical facility in each of the four municipalities.

Speaking at the ceremony, the governor of Cabinda Province, Eugénio César Laborinho praised the Bank for approving an integrated development project that will help address the challenges faced by smallholders and cooperatives in the province, notably the lack of access to agricultural inputs and credit to boost production. "The implementation of this project inaugurates a new era in Cabinda's history, and is timely, as it responds to the recommendations of the President of Angola, João Lourenço,

related to the creation of economic opportunities for the population in Cabinda", the governor added. The finance minister highlighted the alignment of the project with the government's policies aimed at diversifying the economy. According to him, "this project will help address persistent economic and social problems in Cabinda, in particular, the high unemployment and poverty rates". For his part, the agriculture and forests minister Marcos Nhunga emphasised the relevance of the project in terms of generating sustainable incomes through agriculture value chains, and therefore enhancing economic stability for rural households in Cabinda.

Joseph Ribeiro highlighted the Bank Group's commitment to deliver such transformative projects, which he said, "is aligned to the Bank's High 5s related to Feed Africa and Improve the quality of life of the people of Africa."

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# Patriot 250 Extreme sprayer now available in Africa and Middle East

**C**ASE IH, THE global agricultural equipment leader, has introduced its new Patriot 250 Extreme sprayer to the African and Middle East markets. The 250 becomes the entry-level option in the four-model Patriot range, offering an easier step-up to self-propelled spraying for farmers who previously had to rely on tractor-pulled sprayers.

Daniel Bordabossana, marketing manager for Case IH Middle East and Africa, said, "For farmers who want to maximise crop yield with self-propelled spraying that's fast, accurate, and easy to apply, the Patriot 250 Extreme offers a new option. Larger Patriot sprayers have gained an excellent reputation in Africa, and the Patriot 250 Extreme share their proven technologies and capabilities. We expect the Patriot 250 Extreme to be popular because of its low running costs, ease of use, and ease of maintenance."

All models in the Patriot range have the most advanced spray technology on the market to help farmers maximise yield potential by keeping fields clean and plants healthy. Patriots are also distinguished by their cab-forward, rear-engine layout, which contributes to best-in-class performance.

## Greater spray area and best-in-class crop adaptability for high yields

The Patriot's cab-forward, rear-engine layout places the static weight of the cab and engine over the front and rear axles, with the dynamic weight of the chemical tank located in the centre of the machine. This means there's more equal weight distribution between the axles when the tank is

full and the booms are out. As a result, the Patriot has exceptionally good stability, which improves safety and comfort, and a light footprint, which reduces rutting and soil compaction. The rear-engine also allows for a small hood, which improves out-of-cab visibility.

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Another feature which aids the Patriot's stability, as well as giving a smooth ride across fields, is the aircraft-style trailing link suspension. This absorbs both vertical and lateral shock loads in ways no other suspension package can. Additional protection from field loads is provided by the machine's heavy-duty, low-deflection frame, made of rigid one-piece rectangular steel tubing, which also provides a stable attachment point for the sprayer's booms.

The Patriot's booms are constructed of rectangular tube in a truss-style design, with few but large support-members for strength and durability. Right and left booms are independent, with a total span of 27 metres. This long reach allows for fewer passes and a greater sprayed area, resulting in higher crop yield, reduced component wear, and lower fuel consumption. In the Patriot 250 Extreme, boom height can be varied from 60 to 220 cm. The AutoBoom

automatic boom height control maintains optimum spray height for better coverage and the AccuGuide automated guidance system helps reduce skips and overlaps. The booms are fed by a 2,500-litre solution tank and a 280-litre rinse tank, with a 36.5-litre chemical eductor.

The Patriot 250's 1.7 metre-high chassis affords best-in-class ground clearance of 1.6 metres, making it possible to work in taller crops. For the flexibility needed when spraying different crops, the Patriot 250's wheel track can be varied from 250 to 305 cm, with hydraulic adjustment made easily via a control in the cab. Optionally-available crop shields can easily be installed to split crops in fields that don't have true rows to make passes in, or in fields of row crops that have canopied-over.

The Patriot 250 Extreme is powered by a strong and proven FPT 4.5-litre in-line four-cylinder engine. With common rail injection and a turbo intercooler, this makes 165 horsepower. To put all of this power to good use, traction assist for the 4x4 hydraulic transmission is standard. The other, larger Patriot models have engines displacing 6.7- and 8.7-litres and produce 220 to 325 hp. Additionally, the Sprayers comes as standard with full AFS AccuGuide for controlled traffic.

To minimise downtime with the Patriot 250 Extreme, and to encourage normal maintenance precautions even when working to tight deadlines, essential routine maintenance items are located on one side of the machine. There is easy access to components under the sprayer frame and there are ladders, walkways and platforms to make it easy to reach service points higher up. 



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## LEMKEN mechanical seed drill Saphir 7

The Saphir 7 mechanical drill enables the timely and exact placement of fine seeds to give plants the ideal head start. A reliable mechanical metering system is combined with double disc openers to ensure that seeds are drilled at constant depth, even in tough, dry or reduced tillage conditions. The Saphir 7 mechanical seed drill can be combined with the Zirkon 8 rotary harrow to create the ideal seedbed, or with roller frame only.

### 3 reasons for combining tillage and seed drilling into one pass

- 1 Saves time...**  
Not only can it save time, but it can also greatly reduce fuel consumption. On top of time and fuel savings it makes it easier to get the seed into the soil whilst conditions are just right.
- 2 Conserves moisture...**  
By reducing the amount of tillage passes needed to form a good seedbed, evaporation can greatly be reduced whilst increasing the water holding capacity of soil.
- 3 Minimal tillage...**  
The combination of the Saphir 7 mechanical seed drill and Zirkon 8 power harrow makes one pass tillage possible. The double disc openers on the Saphir 7 are designed to cope with reasonable amounts of trash.



## MILLTEC offers complete rice mill solutions

MILLTEC MACHINERY PVT Ltd is a leading technology provider offering end to end solutions for rice milling, pulses processing, maize (corn) milling and roller flour milling plants.

It is the only end-to-end solutions provider for the rice mill industry globally and offers customised project solutions from concept stage to the production stage, keeping the costs at optimal levels and assured delivery on time. The state-of-the-art

manufacturing facility, innovative Research and Development team, quick deliveries and excellent after sales service have helped propel MILLTEC to become the market leader in quick time.

MILLTEC offers engineering, erection and commissioning support to the clients including the training of the personnel to run the mills. The company also boasts of an excellent after sales record.

MILLTEC also provides grain storage and handling technology to the customers apart from colour sorting and packaging solutions.



MILLTEC offers engineering, erection and commissioning support to the clients

Image Credit: MILLTEC

coordination with suppliers and contractors; installation of plant and machinery; total engineering support and monitoring of the project progress; trial run and commissioning of the plant with committed results; training and development of operating staff.

MILLTEC offers new technology for elite series milling plants, parboiling and drier, sorting and grading plants, solution for yield control, co-generation plants, silica extraction from rice husk ash etc.

The company has established sales and service offices in India, Nepal, Bangladesh, Thailand, Sri Lanka, Vietnam, Cambodia, Pakistan, Philippines, Germany, Iran, Nigeria and Myanmar. MILLTEC also offers AMC (Annual maintenance contracts) which enables the customers to reduce the downtime.

Turnkey solutions offered by MILLTEC include: Recommendation of suitable machinery and accessories; process flow and plan layout; supply of machinery, accessories and other required material;

MILLTEC aims to deliver customer-driven innovative solutions to save process loss and to maintain hygienic standards in food processing and allied industries by adopting qualitative practices. The company is managed by technocrats who have decades of experience in the related field. The company is presently on an intensive drive to explore new markets to expand its reach worldwide

MILLTEC has more than 800 employees with market presence in Europe, Africa and Middle East Markets apart from Asia.

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