

African Farming

and Food Processing

Europe €14.50 - Ghana C1.3 - Kenya KSH150 - Nigeria N200 - South Africa R18 - UK £9 - USA \$15

Minimum tillage

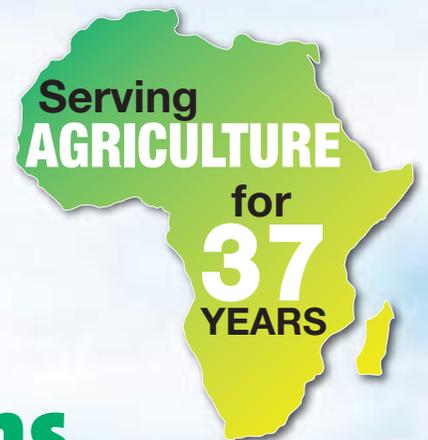
Latest in seed-drills and planters

Livestock breeding

for enhanced food security

Biosecurity protections

against avian flu



African farms under threat from armyworm infestation. p34

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Crop production using no-till and minimum cultivation systems offers a range of benefits.
(Photo: Oticki/Shutterstock)



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African Farming and Food Processing

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Farming Calendar 2017

February

22-25	Sudan Poultry Expo www.expoteam.com	KHARTOUM
26-02	SIMA 2017 www.simaonline.com	PARIS

March

03-05	12th Agro & Poultry East Africa www.mxmexhibitions.com	NAIROBI
14-15	5th Commercial Farm Africa www.cmtevents.com	DAR ES SALAAM
20-21	GFIA www.innovationsinagriculture.com	ABU DHABI
23-25	Nigeria Poultry and Livestock Expo www.nipoliexpo.com.ng	LAGOS
28-31	1st All Africa Postharvest Congress and Exhibition www.africa-postharvestconference.uonbi.ac.ke	NAIROBI

April

26-28	Fresh Produce Africa www.hppexhibitions.com	NAIROBI
27-29	Agritech Expo Zambia www.agritech-expo.com	CHISAMBA

June

07-09	IFTEX 2017 www.hppexhibitions.com	NAIROBI
08-10	Cape Agri Week Expo www.agricapeweek.co.za	WORCESTER
14-16	Agritec Africa www.agritecafrica.com	NAIROBI

Readers should verify dates and location with sponsoring organisations

Spotlight on Africa at World Aquaculture 2017

THE WORLD AQUACULTURE Society (WAS) will hold its annual conference in Africa for the first time in 2017 – turning the spotlight on the potential of aquaculture production to support economic development and investment opportunities in the continent. The conference will be hosted by the Aquaculture Association of Southern Africa and the South African Department of Agriculture, Forestry and Fisheries.

Aquaculture is growing in relevance as an environmentally sustainable way to meet global demand for fisheries products, while sub-Saharan Africa's vast inland waters and coastlines – home to a small but rapidly growing aquaculture sector – present a largely untapped opportunity to contribute to the socio-economic development needs of the region.

Themed "Sustainable Aquaculture – New Frontiers for Economic Growth – Spotlight on Africa", World Aquaculture 2017 will bring together around 3,000 industry, academic and government delegates from the 100 member countries of the WAS in Cape Town, South Africa, from 26–30 June 2017.

Representing the coming of age of African aquaculture and a significant milestone for the global aquaculture community, WAS will launch its Africa chapter at the conference, where the continent will join the United States, Korea, Asia-Pacific and Latin-American-Caribbean as fully affiliated chapters of the WAS.

The conference will balance global and African perspectives, the theme captured in keynote addresses – "Feeding the Nine Billion: The Role of Aquaculture" by sustainable aquaculture advocate Dr Rohana Subasinghe, and "African Perspectives on Aquaculture" by Dr Sloans Chimatiro, Programme Manager: Fish Trade at the World Fish Centre, Zambia – highlighting the value of aquaculture in global food security.

Commenting on the potential of African aquaculture, WAS President Juan Pablo Lazo said, "The time is right for the world aquaculture community to focus on Africa. Rapid urbanisation, economic growth and a rising consumer class will only increase demand for fish and aquaculture presents a solution for production of affordable, fresh fish for the region."

SIMA to champion innovation in farming

SIMA, THE PARIS International Agri-Business Show, to be held from 26 February to 2 March 2017 at the Paris-Nord Villepinte Exhibition Centre, will focus on what farming professions will be like in the future. Innovation will be central to this edition of the SIMA exhibition. The 2017 topic, "Being a farmer in 10 years" will provide a comprehensive overview of the farming world and also sets out to be pragmatic, with contributions from all areas, including beyond the farming environment.

According to the organisers, the SIMA 2017 exhibition will be innovative in more ways than one, in particular with the Start-up Village, bringing together young companies from the digital world; API-AGRO Hackathon – 48 hours to create innovative agricultural applications; the Agreen'Startup, the startup competition for reinventing farming; and numerous innovations presented by its exhibitors.

This year, SIMA will also host Africa Summit, which alludes to the agreement that was entered into between the European Agricultural Machinery Committee (CEMA) and the United Nations Food and Agriculture Organisation (FAO) in 2015 to promote wider usage of sustainable agricultural mechanisation in developing countries. The summit will bring together professionals from the agricultural sector, as well as exhibitors and African institutional partners.

One of the two major events that constitute the summit is the inauguration of the show on 26 February 2017 which will see participation from African ministers and African institutional partners, who will present their agricultural development strategy. SIMA will



SIMA 2017 will host exhibitors and visitors from around 140 countries. (Photo: Fotokostic/Shutterstock)

also host a conference on the theme, "Agricultural mechanisation in Africa: the best strategy for establishing a foothold on this market", on 28 February with an address from the FAO and contributions from the network of farm machinery cooperatives and exhibitors from Africa. Organised by AXEMA and SIMA, the conference will discuss topics such as high potential areas, testimonials, key factors for success and tools for growth in Africa.

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-  15 industry feature zones
-  6+ country pavilions
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-  450 commercial farmers
-  40+ countries represented
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-  ICT park **NEW**
-  Mowing and baling demonstrations **NEW**

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AU urges member states to prioritise agriculture

THE AFRICAN UNION (AU) has called on the member states to prioritise agriculture in order to grow their economies. The AU commissioner for rural economy and agriculture, Peace Tumusiime, said experience from elsewhere indicated a positive correlation between development and modernisation of agriculture.

Speaking in Ethiopia ahead of the Heads of States Summit at Addis Ababa, Tumusiime said, "Most of the countries that have developed first focused and modernised their agriculture. If you develop agriculture first, it will become a springboard for growth of other sectors and the economy in general." She urged African countries to continue implementing the Malabo and the Maputo declarations in which they pledged to invest more for the transformation of agriculture on the continent.

Kenya bans poultry import from Uganda over bird flu

KENYAN AUTHORITIES HAVE announced a ban on the importation of poultry and poultry products from Uganda, following an outbreak of avian flu in the country. The Agriculture ministry in Nairobi also cancelled all permits that had been issued for the import of poultry in a bid to safeguard the 32 million chicken in Kenya.

Agriculture cabinet secretary Willy Bett said that surveillance and rapid response teams had been deployed to points of entry and common border counties of Busia, Bungoma, Trans-Nzoia, Turkana, West Pokot, Siaya, Kisumu, Homa Bay and Migori.

Bett said that the country was prepared to tackle the disease, adding that a multi-disciplinary national taskforce had been activated and was on high alert.

Rice breeding programs in Africa receives Korean support

THE RURAL DEVELOPMENT Administration (RDA) of the Republic of Korea has entered a strategic partnership with the Africa Rice Center (AfricaRice) under the Korea-Africa Food and Agriculture Cooperation Initiative (KAFACI) to accelerate the development of a new generation of productive and stress-tolerant rice varieties to meet the needs of rice farmers and consumers in Africa.

KAFACI aims to contribute to food security and enhanced economic growth in Africa through modernised agriculture by drawing on the experience, knowledge and resources of the Republic of Korea. The partnership will support seed multiplication and dissemination efforts for newly released improved rice varieties, which will contribute to strengthening national seed systems. It will also help establish a strong research network of African and RDA scientists working on rice breeding for Africa.



Demand for rice is growing at more than six per cent per year in Africa – faster than any other food staple. (Photo: Pierre Jean Durieu/Shutterstock)

The Republic of Korea has rich resources of germplasm known as Tongil-type rice that has a yield potential of six to eight tonnes per hectare of milled rice. The high-yielding Tongil variety, derived from indica-japonica cross, sparked the green revolution in the Republic of Korea, transforming the country from a rice importer to a self-

sufficient producer in the 1970s. "The Tongil-type rice could be used to develop a new generation of rice varieties for Africa," said AfricaRice director general Dr Roy-Macauley.

The partnership is expected to broaden the African rice gene pool with high yield and quality traits from Korean rice germplasm. It also aims to

enhance African rice breeding capacity by training national rice breeders through the regional training centre of AfricaRice located at its regional station in Saint Louis, Senegal.

The project will be co-ordinated by a Korean rice breeding expert put at the disposal of AfricaRice by RDA and an AfricaRice breeder. It will cover the following 20 African countries: Angola, Burkina Faso, Cameroon, Côte d'Ivoire, Democratic Republic of Congo, Ethiopia, Gabon, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Rwanda, Senegal, Sudan, Tanzania, Uganda, Zambia and Zimbabwe.

"We strongly believe that this landmark initiative will contribute to boosting the rice sector in Africa and will emerge as an exemplary model of technical development cooperation for improving the lives and livelihoods of smallholder farmers and consumers," said Roy-Macauley.

Chinese firm invests US\$1bn in Tanzanian cassava

TANZANIA HAS SIGNED a US\$1bn partnership agreement with a Chinese firm to commercialise cassava farming and processing. The move is expected to help growers who have been struggling with the challenge of accessing reliable markets. Tanzania Agricultural Export Processing Zone Limited and Epoch Agriculture (TAEPZ) from China said they created an out-grower scheme that will ensure sufficient production of cassava for processing.

Under the agreement the firm will also establish an industrial park comprising of

factories to produce cassava flour, cassava starch, animal feeds, organic fertiliser and paper pulp, starting with three regions of Mtwara, Lindi and Coast, according to the firm's chairperson Dior Feng.

Tanzania Private Sector Foundation (TPSF) executive director Godfrey Simbeye said that Tanzania has lot of untapped opportunities and the private sector was ready to fully exploit them.

"We have to intervene in the project for the purpose of ensuring that it is fast-tracked and given its potential in spurring inclusive

economic growth. We facilitated the assessment whereby our country can conform to Chinese standards," he said.

The Tanzanian government has described the partnership agreement as a big boost towards industrialisation. Permanent secretary in the Ministry of Industry, Trade and Investment, Dr Adelhelm Meru, said that once the agreement was fully implemented, it will transform the living standards of farmers and contribute to the government's commitment to make Tanzania an industrialised country.

Irrigation app to cut water waste, crop losses

RESEARCHERS FROM KENYA'S Meru University of Science and Technology have created a mobile app that monitors the water requirement in fields and controls irrigation equipment to deliver the optimum amount. The irrigation system, initially tested at the university's own farm, is now being rolled out to the public.

Daniel Maitethia, an electronics lecturer at Meru University, pointed out that farmers in the region traditionally water crops with cans or buckets, which is an inefficient way of getting water to plants. "The lack of measuring means that they water crops unevenly – so some may get too much water, and others not enough," he said.

The new sensor-based automatic irrigation system app uses sensors placed throughout a field to determine if soil is moist enough. If it is

too dry, a control unit uses solar panels to open the valve of a water tank and then closes it again when the soil is damp enough.

If there is a glitch in the system, the farmer receives a text message notifying him of the problem and a technician employed by the university will then help him remotely with instructions, or physically come to the farm if needed.

The combined app and irrigation system cost US\$480 per quarter of an acre, including solar panels and two drip irrigation lines. The system can be expanded to an additional quarter acre for US\$48.

While the upfront cost of the system is high, Maitethia said that he believes it will not only curb water waste but save labour costs as it does not require farmers to physically monitor it.

Zimbabwe's milk production up by 14 per cent

ZIMBABWE'S RAW MILK production increased by 14 per cent in 2016 compared to the previously year owing largely to an improved dairy herd.

Statistics provided by the Dairy Services Unit in the Ministry of Agriculture, Mechanisation and Irrigation Development show that the milk production rose to 65.3 million litres in the full year, up from 57.5 million litres the previous year.

According to the Zimbabwe Dairy Industry Trust (ZDIT), the increase in milk production was in line with the target annual growth of 12 per cent. "This (increase in milk production) has mainly been attributed to various intervention and initiatives by both the private and public sector stakeholders in the industry aimed at revitalising the local industry to ensure self-sufficiency in the commodity," ZDIT said.



The rise in production has been attributed to an improved dairy herd. (Photo: Han maomin/Shutterstock)

According to the latest figures from the Ministry of Agriculture's dairy services department, monthly production averaged five million litres last year up from four million litres in 2015. During the same period, the intake of raw milk for processing was up by 17 per cent to 58.7 million litres from 50.4 million litres over the same period in 2015.

Pöttinger launches new roller conditioner

PÖTTINGER HAS LAUNCHED NOVACAT RCB, its latest new roller conditioner, offering the advantages of being more economical, reliable and easier to service.

The new roller conditioner, which is available for all NOVACAT Alpha Motion models as well as the NOVACAT 262, 302 and 352, is fitted with two toothed belts instead of the usual drive chain. The toothed belts provide double the freedom of movement on the top roller, which translates into an extra 25 mm and guarantees optimum conditioning of the forage.

The toothed belts also ensure that the drive system is maintenance-free. The tension of the toothed belts can be conveniently adjusted from the outside. The back tension idler has an automatic lock and can be aligned with the belt using an offset sleeve. Grease is applied to the bearings using an external central greasing point. Oil lubrication is no longer necessary, which considerably reduces the contamination in the drive area. A clean machine makes a significant contribution to clean forage and as a result improves forage quality, according to Pöttinger.

The machine also delivers an optimum drying sequence, thanks to the wide swath placement on rear mower units, which helps greatly in delivering the best possible forage quality.

The new NOVACAT A10 with roller conditioner. (Photo: Pöttinger)



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Business opportunities in Rwandan agriculture abound

EMPLOYING 70 PER CENT of the labour force in Rwanda and accounting for a third of the country's GDP, agriculture not only has a great impact on the livelihoods of Rwandans but also provides a solid foundation for investment. Unsurprisingly, agriculture was the second biggest contributor to GDP growth in the third quarter of 2016, according to the latest National Institute of Statistics of Rwanda (NISR) report.

For providing a great example of how land governance issues can be addressed, Rwanda was also chosen as one of the six pilot countries to implement the African Union's CAADP, the AU's Comprehensive Africa Agricultural Development Programme. The programme aims to build the capacity of African countries to better address land governance concerns and a variety of supportive agricultural and structural investment plans.

"By conceptualising an agriculture programme that has the securing of land rights and the consolidation of land use at its core, Rwanda has not only enhanced agricultural productivity but also harnessed economies of scale and improved market access and incomes," said Andrew Mold, acting director of UN Economic Commission for Africa (ECA) in Eastern Africa.

Rolls Royce to supply engines for Claas agricultural vehicles

LUXURY CAR AND aviation engine manufacturer Rolls-Royce has signed a project agreement with agricultural vehicle specialists Claas to supply MTU series 1000 to 1500 engines for use in its combine harvesters, forage harvesters and 4x4 high horsepower tractors from 2019. These engines will comply with the

European Union's Stage V emissions standards, which will come into force in 2019.

The engines to be fitted are the improved versions of the MTU Series 1000 to 1500, which will be fitted into Claas Lexion and Tucano combine-harvesters, its Jaguar forage harvester and its 4x4 high-horsepower tractor Xerion.

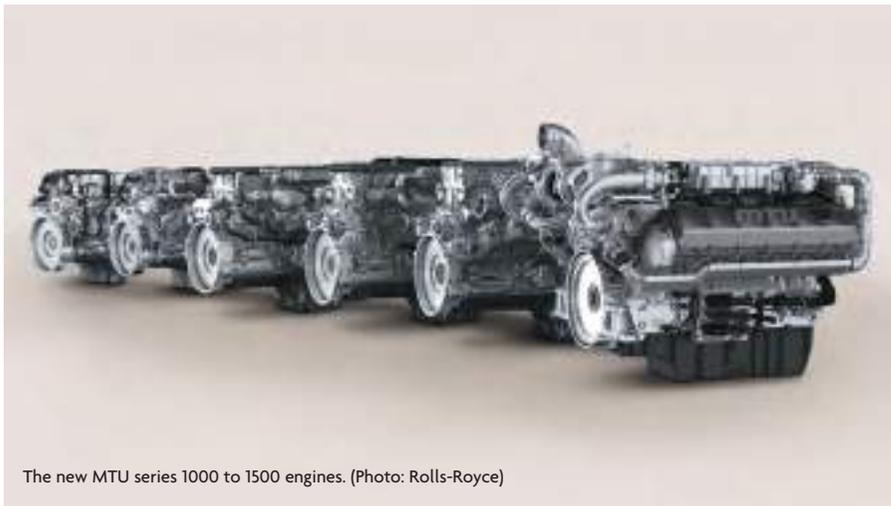
The MTU Series 1000 to 1500 is based on Daimler OM 93x and OM 47x commercial vehicle engines and cover a broad power range from 100 to 480 KW.

From 2019, 4,000 to 5,000 engines are to be supplied per year across all series and emissions levels. The MTU brand is part of Rolls-Royce Power Systems.

Bernd Kleffmann, head of systems engineering development at Claas Selbstfahrende Erntemaschinen GmbH, said, "With an eye on the EU Stage V Emissions Directive, we have decided in favour of these tried-and-trusted engines from MTU to power a large proportion of our vehicles. We already have over 10 field-trial vehicles fitted with EU Stage V MTU engines and are very satisfied with them."

"We are delighted at winning one of the most renowned agricultural machinery manufacturers for the EU Stage V engines we have introduced," Bernd Krüper, vice president industrial business including construction and agriculture at MTU, said.

"This is a continuation of our long-standing success story with Claas," he added.



The new MTU series 1000 to 1500 engines. (Photo: Rolls-Royce)

Mauritania to gain US\$21mn IFAD grant to boost food security, nutrition and reduce rural poverty

THE INTERNATIONAL FUND for Agricultural Development (IFAD) agreement for the Inclusive Value Chain Development Project (PRODEFI) was signed on 12 January in Rome by Michel Mordasini, Vice-President of IFAD and Mariem Aouffa, Ambassador of Mauritania to Italy and Permanent Representative to Rome-based United Nations agencies.

The total cost of the project is US\$45.2mn of which IFAD is providing a US\$21mn grant including US\$6mn grant from the Adaptation for Smallholder Agriculture Programme (ASAP) Trust Fund. It is co-financed by the national private sector (US\$2mn), the Government of Mauritania (US\$5mn) and by the beneficiaries themselves (US\$2.2mn). The remaining US\$15mn will be covered by other financing sources or by the next IFAD financing cycle for Mauritania (2019-2021).

"PRODEFI will build upon and replicate IFAD's experience in Mauritania and elsewhere in the sub-region by adopting a poverty reduction approach based on supporting inclusive production, transformation and marketing systems," said Philippe Rémy, IFAD Country Programme Manager for Mauritania. "In addition, it will reduce the country's dependence on food imports, create jobs and

increase the incomes of rural households, especially women and youth," he added.

The first phase of PRODEFI will focus on horticulture, poultry farming, goat milk and non-timber forest products. Inland fishing will be tested around Lake Fom Gleita at the beginning of the project. Following market studies, new income-generating crops or activities will be defined for the second phase of the project. In addition, the project will support the competitive production systems to respond to market demand. It is expected that 285,600 Mauritanian farmers will receive training and advisory services associated with the production models under the project.

To address the issue of climate change, the project will facilitate, through the ASAP grant, the use of solar energy – from production to storage and processing – and promote sustainable management techniques for natural resources including water, pasturelands and plant resources.

PRODEFI also aims to promote a better match between supply and demand. It will develop the public-private-producers partnerships in the interest of smallholder farmers and facilitate their access to markets.

Biocontrol product to fight aflatoxins in African farms

THE INTERNATIONAL INSTITUTE of Tropical Agriculture (IITA) in collaboration with the United States Department of Agriculture – Agriculture Research Service (USDA-ARS) and national partners has developed a biocontrol product called aflasafe that can reduce contamination from aflatoxin.

Aflasafe has been reported to achieve up to 98 per cent efficacy in reducing grain contamination in the fields and store houses. Following the proven success of the product, the IITA is now set to enable commercialisation of the technology, to ensure that farmers in need of the product would have access to it. The product will soon be made available in at least 11 countries in sub-Saharan Africa.

It is estimated that more than 4.5 billion people in the developing world are exposed to aflatoxins, which are carcinogenic poisons produced by a fungus that contaminates crops and are detrimental to human health. They also reduce crop value, leading to a loss of at least US\$450mn in commerce annually to African economies.

The new aflasafe Technology Transfer and Commercialisation Project (aTTC), funded by a US\$20mn grant from the Bill & Melinda



Elimination of aflatoxin contamination using aflasafe is expected to improve profitability of maize and groundnut value chains. (Photo: EcoPrint/Shutterstock)

Gates Foundation and USAID, was launched in December 2016.

aTTC will be led by IITA with support from USDA-ARS, Chemiconics, Dalberg Global Development Advisors, the Partnership for Aflatoxin Control in Africa of the African Union (PACA), national institutions, and Regional Economic Communities such as the Economic Community of West African States (ECOWAS). aTTC places partnership with the private sector at the core and is collaborating

with business partners to achieve its goal of a scenario where farmers will use the product and produce aflatoxin-safe grains for their families and the community.

“To get aflasafe to the masses, we need many companies, millions of small-scale farmers, distributors, who know what aflasafe can do to apply it. IITA is excited because the Institute is on the edge of reaching this goal,” IITA deputy director general, partnerships for delivery, Kenton Dashiell said.

New races of wheat rust identified

ACCORDING TO TWO new studies produced by researchers in collaboration with FAO, wheat rust, a family of fungal diseases that can cause crop losses of up to 100 per cent in untreated susceptible wheats, is making further advances in Europe, Africa and Asia.

The reports, highlighted in the journal *Nature* following their publication by Aarhus University and the International Maize and Wheat Improvement Centre (CIMMYT), show the emergence of new races of both yellow rust and stem rust in various regions of the world in 2016.

The study also confirms that well-known existing rust races have spread to new countries and stresses the need for early detection and action to limit major damage to wheat production.

“These new, aggressive rust races have emerged at the same time that we are working with international partners to help countries combat the existing ones, so we have to be swift and thorough in the way we approach this,” said FAO Plant Pathologist Fazil Dusunceli. “It is more important than ever that specialists from international institutions and wheat producing countries work together to stop these diseases in their tracks – that involves continuous surveillance, sharing data and building emergency response plans to protect their farmers and those in neighbouring countries.”

If not detected and treated on time, wheat rust can turn a healthy looking crop, only weeks away from harvest, into a tangle of yellow leaves, black stems, and shrivelled grains.

Hubbard introduces new M22 male line

POULTRY GENETICS COMPANY Hubbard has developed a new male line through intensified selection work focused on yield and conformation, the Hubbard M22.

The highly competitive Hubbard M22 builds upon the performance and feed conversion rate (FCR) advantages offered by Hubbard's existing male lines such as the Hubbard M99 optimised for total yield and market-leading FCR, while producing more than 1 to 1.5 per cent additional breast meat yield.

Hubbard's integration of scanner technology into selection programs has accelerated genetic advances that better enable Hubbard's geneticists to focus on specific criteria such as breast meat yield and conformation.

New Holland Agriculture completes acquisition of Kongskilde Agriculture

FOLLOWING THE ANNOUNCEMENT made in October, New Holland Agriculture has completed the acquisition of the agricultural Grass and Soil business of Kongskilde Industries, part of the Danish Group Dansk Landbrugs Grovareselskab. This acquisition will see New Holland expanding its wide offering with new implement product lines. New Holland will now extend its product range to include tillage, seeding and hay and forage solutions under various brands, including Kongskilde, Överum, Howard and JF. The Kongskilde brand and sales organisations, dealers and importers will continue to operate, ensuring continuous customer support. New Holland will gradually integrate the new agricultural implements into its own product offering.

Case IH to unveil new autonomous tractor at SIMA

THE FIRST MAJOR international show of its 175th anniversary year will see Case IH unveil to farmers the very latest from the brand's innovation team, the autonomous Magnum tractor. While the machine is currently concept, it will be complemented by recent product introductions including the updated Quantum plus updated round and square balers and new precision farming technology at the Case IH stand at the SIMA show in Paris.

While auto-steering and other automated machine functions are already helping to improve circumstances for operators on currently-available machines, long hours in the field are often still essential, while sourcing staff sufficiently qualified and prepared to work them is becoming difficult. Designed to relieve drivers from long hours in the tractor seat and allow farm businesses to make better use of labour, while making unmanned work around the clock possible, the autonomous concept vehicle (ACV) even offers the potential



The ACV has been awarded a silver medal at the SIMA Innovation Awards. (Photo: Case IH)

to automatically adapt to weather events, and can work alongside existing machines.

Retaining its conventional engine, transmission, chassis and implement couplings, and using RTK GPS to provide sub-2.5 cm steering repeatability, the ACV development offers the potential to address these issues and enable farmers and farm staff to enjoy more sociable working

hours, thereby helping support the industry and its existing labour force. It does this through a design which allows programming, control and monitoring of the tractor to be carried out remotely via a tablet or PC. Safety is assured through the use of in-built sensor, radar and laser-based lidar technology, integrated into the restyled cabless design.

Where fields are interlinked by private tracks, the ACV can even be programmed to move between them, and has the potential to use weather data to stop work if weather dictates, and even use that data to move to a field with drier conditions. Although the ACV is still in the concept stage, its technologies are suited to integration into new conventional tractors in the future, and are as applicable to smaller tractors – those for orchard work, for example – as they are to machines of the size of Magnum.

This is reflected in the more imminently-available new precision farming technology being revealed by Case IH at SIMA, including AccuTurn, a new tractor option which automates the process of turning on the headland and entering the next chosen swath. Also on show will be the benefits of the Case IH RTK+ network, designed to provide seamless correction signal coverage with RTK accuracy and maximum uptime.

Aller Aqua opens operations in Ghana

ALLER AQUA GROUP, Europe's largest producers of environmentally friendly fish feed, has opened the Aller Aqua Ghana Limited office and warehouse at Senchi Amanfrom in the Asuogyaman District of the Eastern Region. The office is strategically situated by the Volta River where many fish farmers have their farms.

The company produces fish feed for aquaculture, which is exported to more than 60 countries worldwide, from factories in Denmark, Poland, Germany and Egypt. The company

commented that the Ghana office would be a hub, from where the imported fish feeds would sold to fish farmers in the country.

The inauguration was attended by many customers, business partners and industry officials. Amongst participants were officials from the District Assembly, the Ministry of Fisheries, the Royal Danish Ambassador and members of the press.

Madam Tove Degnbol, the Royal Danish Ambassador to Ghana, speaking at the



Aller Aqua Group is Europe's largest producers of environmentally friendly fish feed. (Photo: Jannarong/Shutterstock)

inauguration expressed the hope that the investment would support the development of aquaculture in Ghana.

Mastercard launches agtech platform in East Africa

MASTERCARD HAS LAUNCHED a new agricultural technology app to help small-plot farmers in East Africa to manage sales, payments and distribution of crops. The platform aims to bring the benefits and security of mobile commerce and payments to farmers in Kenya, Uganda and Tanzania.

The app is named 2KUZE, which means "let's grow together" in Swahili, and was developed at Mastercard's Nairobi Labs for Financial Inclusion with the support of the Gates Foundation. In the initial pilot, 2KUZE is being launched in partnership with Cafédirect Producers

Foundation, a non-profit organisation working with 300,000 smallholder farmers globally. Currently, 2,000 small-scale farmers in Nandi Hills, Kenya are using the solution to sell their produce and working with farmer-friendly agents to ensure they reach the right buyers for the best price.

The primary value proposition of the app, which works on feature phones, smartphones and PCs, is to connect farmers, agents and buyers on a digital platform toward greater pricing transparency and more effective distribution. According to Mastercard, 2KUZE makes



The app helps farmers to directly access the market through their phones. (Photo: Bogdan Wankowicz/Shutterstock)

transaction much safer and simpler for all stakeholders in the agricultural supply chain – the farmer, the buyer and the agent. Farmers using 2KUZE can conduct the entire transaction of selling produce and receiving payments via their feature phones, without having to walk for hours to the markets. The platform enables farmers to capture a greater percentage of the wholesale value of their goods by providing price transparency, more direct access to buyers and empowerment of farmer-friendly agents.

This solution, in particular, supports women farmers, who often have household

duties that prevent them from leaving the farm gate and are more often subject to having to take whatever deal is given to them on the day. Digitising these transactions in a trusted, auditable environment provides a legitimate financial footprint, opening up access to loans and other financial services, and also introducing a more efficient process that benefits the entire value chain, as well as the overall economy.

Mastercard Lab is exploring the potential of 2KUZE to help farming communities receive the right level of investment and to encourage more efficient ways of doing business with smallholder farmers.

New satellite pest risk service to help African farmers

THE CENTRE FOR Agriculture and Biosciences International (CABI)-led Pest Risk Information Service (PRISE) project has been awarded US\$8mn in funding over five years by the UK Space Agency to reduce crop losses caused by pests in six sub-Saharan African countries and improve farmer livelihoods.

PRISE will create a pest risk forecasting system based on Earth Observation and Plantwise data with the aim of providing risk forecasts and early warnings in time for smallholder farmers to take preventive action, increasing their resilience to pest outbreaks.

Discussing the scope of the initiative, CABI CEO Dr Trevor Nicholls said, "An estimated 40 per cent of the world's crops are lost to pests. This impacts the ability of smallholders living in poor rural communities to feed their families. More broadly, it affects food supply chains, international trade and achievement of the sustainable development goals. We must take action. I am delighted that the Plantwise network and data can be

leveraged into this innovative new initiative using Earth observational data to predict pest outbreaks and reduce their impact by giving farmers early warning and more timely management advice."

PRISE is funded by the UK Space Agency's International Partnership Programme (IPP), a five-year, US\$192mn programme that partners UK space expertise with governments and organisations in emerging and developing economies.

The PRISE consortium includes Assimila Ltd, King's College London and STFC Centre for Environmental Data Analysis, who will link their Earth Observation expertise with the Plantwise work undertaken by CABI. Partners also include the ministries of agriculture in the initial three countries of Kenya, Ghana and Zambia, delivering on-the-ground local knowledge to the project.

PRISE is one of 21 projects chosen to provide solutions to local issues in countries across Africa, Asia and Central and South America in areas including food security, drought, flooding and deforestation.

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Crop protection with thermal fog generators

THE TRADITIONAL WAY of treatment against pests and diseases in crops is the use of motorised knapsack sprayers (so-called mist blowers), which spray upwards of 600 litres of spraying liquid per hectare. With a typical spraying tank capacity of 10 litres, these backpack sprayers need to be refilled 60 times for treating just one hectare.

However, the use of thermal fog generators or ULV aerosol generators instead of traditional spraying methods creates a huge impact on resource use. Owing to the huge quantity of small droplets that are produced in fogging or ULV machines, an optimal coverage of the plantation can be achieved with a much smaller amount of spraying liquid. The typical application rate is only three to six litres of total spraying liquid per hectare.

This implies that the same quantity of the chemical preparation as in traditional spraying methods is used, but the amount of carrier substance (usually water) is much lesser. The quantity of the chemical preparation itself must always be in accordance with the prescription of the manufacturer of the preparation. Using a much smaller total quantity of spraying liquid eliminates the need to refill the machine during the treatment of one hectare and also reduces the time required for the process.

German company Swingtec offers a complete programme of professional thermal fogging machines with its Swingfog range. The average time required to treat one hectare with Swingfog thermal fogging machines range from approximately 3-18 minutes, depending on the model.

ULV aerosol generators for spraying

Apart from thermal fogging, the use of ULV aerosol generators is another sustainable and economic approach to spraying. In spraying terms, ULV is defined as the smallest volume of liquid required to achieve the treatment objective. Generally, using the ULV spraying mode, the quantity of spraying liquid required lies between 0.5 and 50 litres per hectare, depending on the



Fog penetration in a chilli plantation, when treatment was started before sunrise. (Photo: Swingtec)

environment and treatment objective.

Using Swingtec's backpack ULV aerosol generator Fontan Portastar S, one hectare can be treated within 45 minutes and the truck-mountable Fontan Mobilstar will do the same within just over seven minutes.

The key point of the success of the application with these methods is always the penetration of the plantation with millions of small pesticide droplets. These droplets will be carried by the wind through the rows of the plantation and will penetrate the crop as far as 25 metres and more.

The cost of the carrier substance – especially the transportation cost – is lower by a factor of more than 100 with fog or ULV generators.

Sustainable use of resources

Fogging and ULV application methods lead not only to a much shorter application time, but also more sustainable use of resources when compared with conventional

spraying. For instance, treating one hectare with five litres of spraying liquid with the portable Swingfog SN50 in 15 minutes needs about half a litre of petrol compared to approximately nine litres required to apply 600 litres of spraying liquid using conventional sprayers. The cost of the carrier substance – especially the transportation cost – is lower by a factor of more than 100 with fog or ULV generators, which need only very small quantities of carrier liquid. The water saved with the pesticide application can be used for other purposes, such as irrigation.

It should be kept in mind that the distribution of fog and ULV spray mainly follows the wind and thermal conditions. For instance, a light breeze is favourable for extending the reach of the effective fog cloud. In plantations of bushes or low growing plants, the fog should stay low and penetrate the plants. The application in this case should be done before sunrise. In cases where the plantation consists of trees with canopies, the fogging should be performed during morning and/or late afternoon when the thermal drift will drive the fog upwards for a good penetration. **E**

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Biosecurity measures for poultry farming to be bolstered in Africa after bird flu outbreaks. Martin Clark reports.

Biosecurity high on the agenda



Biosecurity can play a major role in controlling the outbreaks of avian flu in poultry farms. (Photo: branislavpudar/Shutterstock)

WITH NEW CASES and different strands of avian flu popping up across the world, scientists and agriculturalists are teaming up to strengthen biosecurity measures at poultry farms in an attempt to mitigate threats.

The industry is on increased alert with multiple outbreaks reported in poultry farms and wild flocks across Europe, Africa and Asia in the past few months.

While most involve strains that are currently low risk for human health, officials are worried that another strain could make the jump into humans, like H5N1 did in the late 1990s.

So far in Africa, H5N1 outbreaks have been reported in birds predominantly in West Africa, including Burkina Faso, Cameroon, Ghana, Niger, Nigeria and Togo.

Another strand, H5N8, has been detected in Tunisia and Egypt, while yet another, H7N1, has been identified in Algeria.

But the problem is becoming Africa-wide, with Uganda recently confirming its first ever cases of avian flu.

Public health officials are understandably nervous, with the World Health Organisation's director-general warning at the end of January that the world "cannot afford to miss the early signals" of a possible human flu pandemic.

Biosecurity is, in essence, made up of three core components: segregation, cleaning and disinfection.

Indeed, Africa presents an additional problem due to limited local government capacities and weak animal and human health services, which, experts say, make it especially vulnerable to missing flu outbreak warning signs.

But that could be about to change. Around the world, health authorities and infectious disease experts are now calling for greater awareness and for surveillance and vigilance to be stepped up.

Stepping up security

According to the South African Poultry Association, biosecurity measures play a vital role in reducing the risk of transmission of all infectious diseases, including the further spread of avian flu.

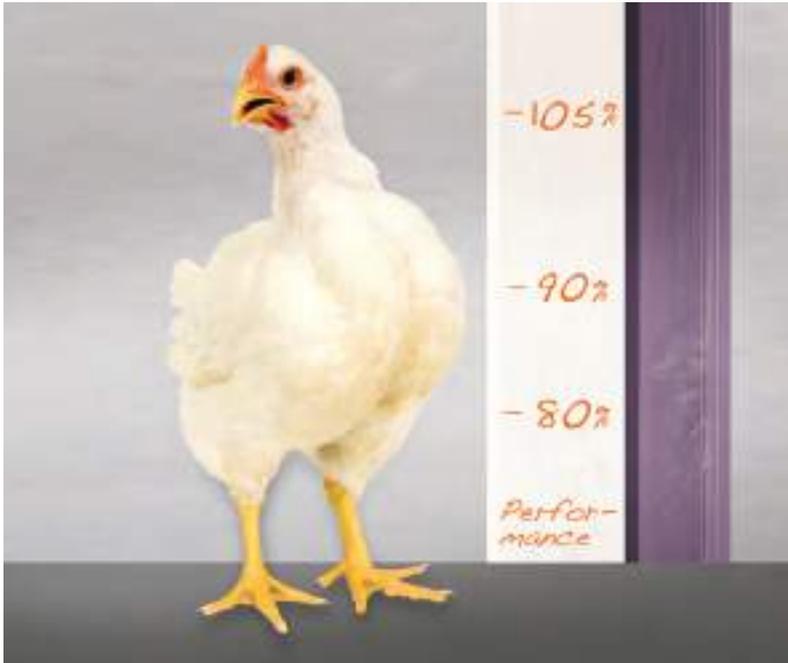
Scientists believe that while wild birds play a role in the spread of disease, they are responsible for only a small proportion of overall transmission worldwide.

The majority of cases are due to local secondary spread between domestic poultry after initial introduction to the disease, or even human-mediated means, such as moving live birds or other farming-related activities.

In some countries, live-bird markets have been a way of maintaining and spreading the virus, and have been the source of infection in humans.

Biosecurity is, in essence, made up of three core components: segregation, cleaning and disinfection.

At its heart, however, this means making sure that all poultry workers are adequately trained in the main areas underpinning any biosecurity strategy.



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As well as good hygiene, including cleaning and disinfecting, the main tenets of commercial poultry farm biosecurity are centred around isolation, visitor traffic control, pest control and the disposal of dead birds (see separate box, Biosecurity Fundamentals).

Segregation is perhaps the most important phase of biosecurity, even for large commercial farms, because it removes the possibility of infection entering a unit.



Cleaning and disinfection of poultry housing units can help to prevent spread of diseases. (Photo: Te Berrie/Shutterstock)

Cleaning likewise will remove most contamination, with disinfection as the final stage to deactivate any remaining virus.

The effectiveness of these measures hinges on the implementation of all the other steps.

Industry challenges

However, the effects of the recent outbreaks are beginning to have an effect on the ground, with bans on imports from countries where bird flu has been identified.

Kenya and Rwanda recently banned poultry products from Uganda, for instance, in the wake of a confirmed outbreak, which was detected when masses of birds were found dead by fishermen on the shores of Lake Victoria.

Containing any spread is an immense challenge, however, and Uganda immediately responded by mobilising an Avian Influenza National Task Force, grouping multiple local and international entities to combat the threat.

That includes the private sector and poultry producers' organisations, which have joined the Ministry of Agriculture, Animal Industry Fisheries (MAAIF) in reaching out to all farmers on how to prevent and control the disease.

The effects of the recent outbreaks are beginning to have an effect on the ground, with bans on imports from countries where bird flu has been identified.

So far, Uganda has confirmed the disease in seven wild migratory birds, five domestic ducks and one chicken, with other suspected cases also now being tested.

Similarly, across the border, Kenyan public health officials are using local radio services to talk to people about the risks, and drawing on the support of the Kenya Wildlife Service along the border areas.

In Uganda, MAAIF Minister Vincent Ssempijja confirmed that it was the country's first avian flu outbreak, but did not underestimate the potential threat, stating that the nation is faced by "looming catastrophe", as he outlined various security measures such as housing all birds and keeping them away from wild birds.

Moreover, the outbreak of avian flu comes at a time of other broader market challenges too, with competition from Europe and other producers undermining poultry producers with cheap imports in key markets like South Africa.

Here, the country's largest poultry company, Astral Foods, also recently averted a total power blackout (after state electric firm Eskom threatened to disconnect the local municipality), which it said may have resulted in the cull of 11.5 million chickens.

So far, there have been no mass culling, and no "catastrophe", as the avian flu spreads.

But now is the time for African farmers to embrace biosecurity measures if the worst is to be averted. **1**

Biosecurity fundamentals

Cleaning and disinfecting: washing hands; using clean work clothes; farm workers to wear clean clothes or change into work clothes on the farm; proper clothing for all visitors (disposable coveralls, hairnet, gloves, and plastic boots); boots dipped in footbath between each house; no equipment sharing between farms.

Isolation: keep birds away from germs; parking away from poultry houses; fencing the perimeter of the poultry operation; not using open water as a source for poultry drinking water as ponds and lakes can be contaminated from migrating birds.

Traffic control: no entry to poultry houses, unless biosecurity rules in place; visitors to sign log book and indicate recent bird exposure; vehicle tyres to be disinfected upon entering and leaving the farm; doors to each house kept locked to decrease unauthorised entry; visit sick flocks last.

Pest control: maintain rodent and fly control programmes; keep doors shut and locked; block holes and trap rodents or wild birds; no wild birds to nest on or around poultry houses; remove all non-essential items from within and around poultry houses; the area within 100ft of the houses to be kept mowed.

Dead Bird Disposal: keep contamination away from flock; if dead birds are to be left outside the house at any time, they should be in a covered container; collect mortality last and dispose of properly to prevent spread of disease to other houses and to prevent pest activity; wash hands after handling dead birds.

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New grant to support African poultry industry

THE WORLD POULTRY Foundation (WPF), a non-profit organisation committed promoting economic development in emerging markets by providing education and technical training on poultry production, has received a four year US\$21.4mn dollar grant from the Bill & Melinda Gates Foundation to enhance poultry production in Tanzania and Nigeria.

The WPF will use the grant to lead a project that will catalyse a transformation of rural poultry production in these two countries, while working closely with government and in-country private sector partners. This initiative is expected to increase poultry production and productivity through the access of low-input dual purpose birds, increase rural household income, improve household nutrition and empower women.

"This grant provides us with an opportunity to implement a strategy that creates access of improved genetics to the rural famers, provides technical assistance and training and offers access to markets that may not have been possible before," said Randall Ennis, CEO of the World Poultry Foundation. "Our goal is to impact 2.5 million households across Tanzania and Nigeria by the end of this four-year initiative.

"Unlike past approaches of delivering free chicks and feed to the rural farmers, this project will focus on training and extension support to build a sustainable value chain," Ennis said. He pointed out that one of the key components of the project is the establishment of over 1,500 entrepreneurial enterprises – primarily owned and managed by women – that will supply healthy brooded and vaccinated chicks to the rural smallholder farmers.



The grant will provide farmers in Nigeria and Tanzania education and technical training on poultry production. (Photo: Bogdanhoda/Shutterstock)

The choice of the two nations for the grant has been attributed to the cooperation of their government ministries and the support of private US companies for the World Poultry Foundation's efforts to train and educate rural farmers.

World Poultry Foundation had been committed to developing appropriate feeding programs for poultry raised in rural Africa for several years. The organisation recently funded a new app, to help farmers mix the right ratio of feed ingredients needed to maintain a healthy flock. The app, called FeedMix, was created by the University of Georgia's Poultry Science Department.

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Improved approaches to livestock breeding can play a pivotal role in ensuring a food secure future. Tim Guest reports on the initiatives of the International Livestock Research Institute (ILRI) in breeding and genetics to promote sustainable use of livestock.

Building food security through livestock breeding

FOOD SECURITY IS at the heart of many initiatives and organisations working to reduce poverty in developing countries. The ILRI, part of the global agricultural research partnership, the CGIAR, is one major force working to address this through its research into improved and more sustainable uses of livestock that will help to ensure the food-secure future the world needs, particularly if it is to avoid the potential conflicts that will result if food security is not achieved.

In its 2013-2022 strategy, the ILRI envisioned 'a world where all people have access to enough food and livelihood options to fulfil their potential', with its mission firmly set as improving 'food and nutritional security and to reduce poverty in developing countries through research for efficient, safe and sustainable use of livestock—ensuring better lives through livestock.'

To achieve these stated aims the organisation partners with other bodies that mutually promote science-based practices, including breeding and genetics, that can be adopted, adapted and further developed to improve livestock husbandry, productivity and the lives of the communities that tend the animals in the process.

According to the ILRI, livestock are becoming agriculture's most economically important sub-sector the world over and the demand for animal foods from developing nations is projected to double by the mid-2030s. If the response and opportunities this presents is fully embraced by the global agro community, this so-called 'livestock revolution' presents a potential way out of poverty for many of Africa's poor. However, with inappropriate policies, scarce livestock feeds, devastating diseases and other factors holding back livestock productivity in poorer countries it falls to the innovations and projects underway by the likes of the



One of the ILRI projects uses on-farm productivity and genetic information on dairy cattle for improved management of artificial insemination and natural mating. (Photo: ILRI/ Camille Hanotte)

ILRI to solve many of these issues.

ILRI projects

The ILRI has an abundance of projects and programmes running concurrently and all contributing to its ultimate goal of delivering food security. With too many to mention here, the following are just a taster of the initiatives being undertaken.

Aiming to deliver more productive chickens to smallholders, the African Chicken Genetic Gains (ACGG) initiative is invested in by the Bill & Melinda Gates Foundation and partnered by PICO Eastern Africa and the Tanzania Livestock Research Institute. It has efforts ongoing in Ethiopia, Nigeria and Tanzania and is seeking to increase access of poor smallholder farmers in sub-Saharan Africa to 'high-producing, locally adapted and appropriate chicken strains' – basically improving the genetic make-up of Africa's

chickens. Multiple improved breeds and strains of chicken are being tested under the project to demonstrate their high-production potential, or not, under low-input systems. Bill Gates has called this project the 'big bet' on chickens, which also includes donating 100,000 birds to communities in the developing world.

On the dairy side and, once again supported by the Bill & Melinda Gates Foundation, is the African Dairy Genetic Gains (ADGG) project running in Ethiopia and Tanzania. Slated to run until October 2020, the ADGG programme fosters the sharing of on-farm productivity and genetic information on dairy cattle between farms and farmers in Tanzania and Ethiopia. It is intended that farmers will be able to manage their herds and improve cow management through the sharing of this information, resulting in sustained animal and herd productivity gains, together with improved smallholder livelihoods that may potentially impact millions across Africa. One of the aims of the programme is to use the information to develop systems to select crossbred bulls and cows of superior

Livestock are becoming agriculture's most economically important sub-sector the world over and the demand for animal foods from developing nations is projected to double by the mid-2030s.

genetic merit for artificial insemination and natural mating. [Staying with cattle, the institute is also involved in long-term research using cloned bulls to develop African cattle resistant to the disease, trypanosomiasis, known also as sleeping sickness.]

Goats as part of the answer

Together with the Jomo Kenyatta University of Agriculture and Technology (JKUAT), the ILRI is targeting smallholder farmers and pastoral herders in East Africa under a small ruminants project to improve the productivity of goats and sheep in relation to climate change. Small ruminants are a key to improving the lives of millions as they are not only easier to look after for rural communities but both women and children are often afforded control of such small livestock. The project is aimed at helping farmers increase small ruminant meat and milk productivity, both sizably and in a sustainable way with the ILRI's animal genetics and breeding group helping use native goats and sheep that have been improved through crossbreeding. This approach avoids introducing exotic breeds from overseas, which is fraught with many disadvantages – as well as some advantages.

The ILRI is targeting smallholder farmers and pastoral herders in East Africa under a small ruminants project to improve the productivity of goats and sheep in relation to climate change.

Piloted in the Nyando climate-smart villages of western Kenya over the past two years, some seven villages are helping smallholders integrate scientific approaches to lessen climate change

effects on the productivity of their herds.

Local knowledge of climate, disease and pests plays a big part in understanding the resilience offered by certain strains and breeds of livestock, which, together with the science delivered by the institute and its partners, helps them decide on and adopt the husbandry approaches best suited to the sustainable needs. Developing and up-scaling improved livestock breeding programmes and strategies for use by farmers are a key part of this project.

Until now, goat and sheep herds in east African communities have been in-breeding without much control, which has led to many small animals that still require looking

after, but which, in turn, do not deliver on improved milk and meat productivity, or, indeed, good market prices. What the project scientists are now doing is to introduce Galla goats and red Maasai

sheep crossed with Dorper sheep.

The resulting animals appear better able to cope with heat stress, survive drought conditions by feeding on poor forage, as well as having greater resistance to diseases than pure local or exotic breeds. One trait that helps disease resistance in the red Maasai sheep and is favoured by the farmers is a longer tail that helps the animals swiipe flies and other insect vectors of disease away and prevent egg laying in the process. With increased growth also being seen in the newly

introduced crosses the project is already delivering better market prices, too, for the farmers.

Innovation through genetics

One of the ILRI's partners is the Centre for Tropical Livestock Genetics and Health, which currently has five key programmes running addressing: dairy genomics, poultry genomics, reproductive technologies across a wide range of livestock, health genetics to select traits to improve such things as resilience to disease in cattle and the fifth programme dealing with informatics and bioresources.

On the dairy side, efforts are being aimed at the application of genomics to dairy production for increased livestock productivity.

The poultry work is aimed at increasing productivity and flock dynamics through the use of cutting edge breeding tools.

Following on from this, the new breeding technologies being investigated and trialed are aimed at seeing how new husbandry techniques can accelerate the impact of livestock genetics on herds and communities. 



Breeding programmes for small ruminants can play a key role in improving food security in rural communities. (Photo: ILRI/ Camille Hanotte)



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Sequencing of the Arabica coffee genome opens a world of possibilities in developing high-quality, climate-resilient coffee varieties.

Creating a better bean with genetics

RESearchers at the University of California, Davis, have successfully sequenced the genome of the *Coffea arabica* coffee plant, the species responsible for more than 70 per cent of global coffee production. The genome sequencing of the estimated 70,830 predicted genes have been released and can be used by scientists and plant breeders around the world.

“This new genome sequence for *C. arabica* contains information crucial for developing high-quality, disease-resistant coffee varieties that can adapt to the climate changes that are expected to threaten global coffee production in the next 30 years,” said Juan Medrano, a geneticist in the UC Davis College of Agricultural and Environmental Sciences and co-researcher on the project.

“We hope that the *C. arabica* sequence will eventually benefit everyone involved with coffee—from coffee farmers, whose livelihoods are threatened by devastating diseases like coffee leaf rust, to coffee processors and consumers around the world,” he added.

This new genome sequence for *C. arabica* contains information crucial for developing high-quality, disease-resistant coffee varieties that can adapt to the climate changes.

Geisha variety of coffee plant

The research team conducted their study on the Geisha variety of coffee plant from Good Land Organics coffee farm in Southern California. They have sequenced samples from 22 other Geisha coffee trees to obtain a glimpse of the genetic variation within that variety and among 13 other *C. arabica* varieties.

C. arabica is a hybrid cross derived from two other plant species: *C. canephora* (robusta coffee), and the closely related *C. eugenioides*. As a result of that hybrid



The study was carried on the Geisha variety of Arabica coffee grown in Southern California. (Photo: SOMMAI/Shutterstock)

crossing, *C. arabica*'s complex genome has four sets of chromosomes—unlike many other plants and humans, which have only two chromosome sets.

Going forward, the researchers plan to focus on identifying genes and molecular pathways associated with coffee quality, in hopes that these will provide a better understanding of the flavour profiles of Geisha coffee.

The threat of climate change

The coffee crop has been under serious threat from the impacts of climate change including unusual heat spikes or unseasonal rain or drought. A research conducted by the Kunming Institute of Botany in China suggested that owing to climate change, the suitable growing area for coffee could decline by 72 per cent between now and 2050.

With coffee production declines due to climate, it is predicted that millions of coffee farmers across the world could go out of business. African coffee growers have also been under severe threat by climate change.

A report published by Australia's Climate Institute showed that in the last 50 years, yields in Tanzania, where 2.4 million people's livelihoods rely on coffee, have fallen by about 137 kilograms per hectare for every 1°C rise in Arabica's minimum

temperature, or around 50 per cent since the 1960s. It predicted that coffee production in the country would fall to critically low levels by 2060s.

In Ethiopia, where coffee accounts for 33 per cent of total national exports, temperature is predicted to see a rise of 3.1°C by 2060 and 5.0°C by 2090, leading to major shifts in coffee growing.

Genome sequencing crucial for global industry

Industry experts are hopeful that the new genome sequencing will help in isolating coffee breeds will be able to mitigate the impacts of climate change.

Jose Kawashima, president and CEO of Mi Cafeto Co, a leading speciality coffee company in Japan, stressed the importance of the discovery for all levels of global coffee production.

“Having worked in the coffee industry for over 40 years and visited coffee farms around the world, I have never witnessed as many quality *C. arabica* coffee farms under duress due to deteriorating social issues and the impacts of climate change as it is now,” said Kawashima.

“Therefore, it is urgent that this scientific discovery be used to implement practical improvements at the farm level to sustain the future of the coffee industry,” he reiterated. **E**

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 **Baldan**

Cultivation of pulses can play a major role in the sustainable management of soil nutrients and in promoting symbiosis through crop rotation and intercropping, according to the FAO.

Sustainable soil nutrition with pulses

A RECENT PUBLICATION by the FAO encourages small-scale farmers to grow pulses and point to the role of pulses in promoting symbiosis through crop rotation.

The FAO report points out that the inclusion of pulses in multiple cropping systems, such as intercropping or simple crop rotation, can be crucial for the sustainable management of soil nutrients and improving soil structure. It is an important step towards implementing more sustainable agricultural practices.

Pulses are annual leguminous crops that have the natural ability to fix atmospheric nitrogen and solubilise phosphorous, thereby contributing to enriching soils with nutrients and increasing crop yields. This reduces the need for synthetic fertilisers, which, in turn, reduces greenhouse gas emissions and lowers the risk of soil and water pollution. The inclusion of pulses as part of crop rotation in a farming system reduces the risk of soil erosion by improving soil structure, which includes soil aggregate stability, soil aeration and soil water holding capacity, and supporting soil biodiversity, the roots of the crops stimulate microbial activity, for instance. Additionally, pulses help to curb pests and diseases when used as green manure or as component crops in intercropping, the practice of growing two or more crops in the same field at the same time.

Pulses have the natural ability to fix atmospheric nitrogen and solubilise phosphorous, thereby contributing to enriching soils with nutrients and increasing crop yields.

Reviving the practice of intercropping

While the inclusion of pulses in crop rotation contributes to improving soil health, the practice of intercropping can yield greater benefits. Intercropping is a traditional agricultural practice that is gaining new momentum owing to an increasing interest in sustainable



2016 was declared as the International Year of Pulses by the UN to promote the cultivation of the crops. (Photo:pxl.store/Shutterstock)

agricultural practices. The main advantage of intercropping is the more efficient utilisation of available natural resources and an overall increase in crop productivity, compared to single crop harvests.

In general, the combination of two or more crops with different rooting patterns, such as combining a shallow-rooted species with a deep-rooted species, allows for more efficient water and nutrient uptake from the soil, the FAO report notes.

Pulses and intercropping

As pulse crops have deeper and more abundant roots, they utilise greater amounts of water stored deep within the soil and can withstand drought better than shallow-rooted crops. The deep-tap root system of pulse crops, such as pigeon peas, make them more suitable for intercropping with shallow-rooted crops, like coarse cereals and oilseeds, which are rain-fed.

In India, for example, maize is cultivated both during the rainy season (from April to October) and in spring (from mid-November to April/May). Intercropping beans with the maize led to significantly higher yields than growing maize alone.

The FAO summarises that pulses can be strategic allies in maintaining and increasing soil health and restoring degraded soils. They can play an important role in achieving the Sustainable

Development Goals, thus contributing to food security, better nutrition, climate change adaptation and mitigation and resilience to shocks.

International Year of Pulses

In an attempt to encourage smallholder farmers to grow pulses and to raise public awareness of the nutritional benefits of pulses as part of sustainable food production towards food security and nutrition, 2016 was declared as the International Year of Pulses (IYP) by the 68th General Assembly of the United Nations. The FAO was nominated to facilitate the implementation of the year in collaboration with various governments, non-governmental organizations and other relevant stakeholders.

Throughout the year, the FAO conducted various initiatives to encourage connections throughout the food chain that will better utilise pulse-based protein, widen global production of pulses, better utilise crop rotations and address the changes in the trade of pulses.

Since the official launch of IYP at the FAO Headquarters on 10 November 2015, pulses have become very popular and the IYP has succeeded in arousing worldwide interest across a wide range of sectors from agriculture and trade to health and nutrition. 

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FG Wilson managing director Ann Brown speaks to *African Farming* about the role of diesel generator sets in ensuring uninterrupted power supply to farms.

Powering the farming industry

DIESEL GENERATOR SETS have been a feature of many farms and food processing facilities for a long time and it is not difficult to see why they are still probably the most flexible and cost-effective way to insure against interruptions in the mains electricity supply.

Generator set brand, FG Wilson, has just marked 50 years in business, and this month, we talked with its managing director, Ann Brown.

FG Wilson hails from Northern Ireland, a part of the world where farming and agriculture are built into the core fabric of the community, a place where it is almost impossible to travel for 20 minutes without passing green fields and farming.

“In Africa, we have installed over 130,000 units with a total capacity of over 12GW, double the total installed mains electricity capacity of Nigeria.”

Ann Brown, managing director at FG Wilson.

Ann says that this farming backdrop has often played a big part in the development of FG Wilson products. “There is a long engineering tradition in Northern Ireland. Many of our engineers grew up around machinery and it has been a big part of their lives. It has always been quite common for many of our people to work with us and at the same time own and operate farms. That life experience has played a big part in the way a lot of our people look at product design. The weather environment here can be really harsh, and when we are designing products, that is always in the back of our minds.”

Delivering optimum performance

In its simplest form, a diesel generator set has a diesel 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 an 8 – 10 hour fuel tank.



FG Wilson diesel generators are designed to work effectively in high ambient temperatures. (Photo: FG Wilson)

That has been the basic principle for a long time and for several decades FG Wilson has been at the forefront in driving that concept to new levels. Designers of generator sets face a constant battle to control noise and heat. For FG Wilson, that means generator sets are designed to operate effectively in up to 50°C temperatures. Ann says, “This needs a really detailed understanding of airflow through enclosures, and it is expertise which we have grown over decades to the point where we can count on a vast library of documented test data to support all of our design work. This is really important in high ambient temperature environments.”

A range of enclosures protects generator sets from weather and also reduces noise to comfortable working levels. Enclosures are made of high grade or galvanised steel protected by powder coat paint which gives them automotive industry levels of finish. Their design is based on modular principles which mean that they have interchangeable components for easy on-site repair. They are equipped with lift-off doors and access panels, which allows good access for service and maintenance.

Control panels are where most interaction with generator sets occurs and

these are designed to be compact and intuitive. Panels include traditional key-start analogue control panels for straightforward functionality and reliability; digital control panels suitable for use in mains failure applications, providing advanced metering, protection and diagnostics; and the next generation of advanced synchronising panels with integrated load management capability, able to synchronise up to 32 generator sets.

“What really marks out FG Wilson,” says Ann, “is the way products are validated and tested. Since 1990 we have installed over 600,000 generator sets with a total capacity of almost 90GW - more than the total installed mains electricity capacity of a country like the UK. In Africa, we have installed over 130,000 units with a total capacity of over 12GW, double the total installed mains electricity capacity of Nigeria. With that number of machines operating across the world, we take no risks with quality or performance. We do not accept engine performance data without validating it ourselves in the environmental conditions which our products will see. When someone buys one of our products, we can safely say that wherever it will be operating, it will have been tested for that environment.” **E**

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IRRIGATION MANAGERS AND COMMERCIAL FARM INVESTORS SOUGHT FOR THREE AGRIBUSINESS OPPORTUNITIES IN ZAMBIA

The Irrigation Development Support Project (IDSP), an initiative of the Government of Zambia financed by the World Bank, will finance and establish irrigated farming developments at multiple sites in Zambia. A procurement process has now begun to select an irrigation manager and commercial farm investor for the following priority sites:

	Lusitu	Musakashi	Mwomboshi
District	Siavonga	Mufulira	Chibombo
Farm size	92 ha	728 ha	884 ha

Please contact the IDSP Transaction Advisor to receive an invitation to bid, tender documents and to register for an investor event to be held in Lusaka during w/c 13th March.

IDSP Transaction Advisor Tom Cochrane, Managing Consultant Cambridge Economic Policy Associates E-mail: IDSP@cepa.co.uk	IDSP National Project Co-ordinator Dr. Barnabas M. Mulenga IDSP, Ministry of Agriculture Email: mulengabarnabas@hotmail.com
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Subsurface drip irrigation systems provide a range of benefits for farmers and promotes sustainable use of resources. *African Farming* looks at the innovations offered by irrigation systems by Eurodrip SA.

Pioneering innovation in drip irrigation

SUBSURFACE DRIP IRRIGATION (SDI), which applies water beneath the soil surface directly to the root zone of the crop, is a system of irrigation that farmers across the world are increasingly adopting owing to its benefits. According to Eurodrip SA, a pioneer in drip irrigation systems, one of the most significant grower incentives to invest in SDI is related to increased crop yield and quality. SDI provides the most efficient way to deliver water and nutrients directly to the root zone allowing for precision crop management. It also allows fertilizer to be directly applied uniformly to the root zone at any stage of growth and with any dosage, without wetting plant foliage.

Another feature of the system is that SDI provides a drier soil surface and contributes to minimising weed growth. It also decreases groundwater contamination and leaching of nutrients caused by over irrigation and poor irrigation uniformity. Another advantage of the system is that SDI allows the use of recycled water for irrigation.

SDI provides the most efficient way to deliver water and nutrients directly to the root zone allowing for precision crop management.

SDI systems have three distinct sections to a system: water source, control head and irrigation block. The irrigation block uses a buried dripline with strategically spaced emitters and laterals as determined by soil type, crop variety, climate and growing practices a grower intends to use. To ensure efficiency, the ground system components are located in an easily accessible area and strategically located away from traffic.

Pioneering systems

Eurodrip SA, a pioneer in drip irrigation systems, through its global network of own subsidiaries and independent dealers, offers cost effective, modular, integrated



SDI helps to reduce groundwater contamination and leaching of nutrients caused by traditional irrigation systems. (Photo: tetiana_u/Shutterstock)

drip irrigation solutions customised to meet specific agricultural and landscaping needs.

Eurodrip was established in 1979 and is the first European company to become involved with drip irrigation. Its innovative method of incorporating drippers into the pipe results in water conservation and greater crop yield.

The company applied a revolutionary manufacturing method by which drippers made out of polyethylene (PE) were internally embodied directly in the pipeline during the extrusion process (with no internal attachments) forming a single piece of irrigation line. This ensures controlled water supply by pushing small amounts of water through the exit holes. According to Eurodrip, this procedure is the most advanced and cost-effective in the industry.

The company has a professional team of agronomists, irrigation technicians and engineers who deliver accurate solutions to diverse crop needs under the most challenging topographical, climatic, soil and water conditions.

The company provides a broad range of applications in open-field crops by applying both surface and subsurface applications with drip irrigation systems offering several advantages. A few of the advantages include increased crop yield, better and uniform quality, substantial savings of water, energy and fertilizers, savings on crop protection, material and energy usage, reduced weed pressure and improved control. Moreover, SDI multi-year use eliminates weed growth, improves disease control, reduces mechanical damage and provides healthier and better quality crops.

Eurodrip also specialises in greenhouse projects by providing constant support to greenhouse growers, through a comprehensive selection of quality irrigation, climate control and other systems for greenhouses, nurseries and net houses.

For landscape projects, the company offers a complete range of surface and subsurface drippers, micro-sprinklers, pop-up sprinklers, valves, filters, controllers and accessories for a broad range of residential and municipal landscape applications. 

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Industry experts discuss the role of the private sector in vitalising Tanzanian agriculture at Agritech Expo Tanzania, which was held in Arusha in 26 - 27 January 2017.

Inadequate supporting infrastructure and investment are the major challenges faced by the Tanzanian agricultural industry. (Photo: Oticki/Shutterstock)

Uplifting Tanzanian agriculture

“TANZANIA’S DEVELOPMENT VISION 2025 and Agricultural Sector Development Strategy (ASDS) established clear priorities for the transformation process towards a modern commercial Tanzania to be private sector-led”, says Geoffrey Kirenga, CEO of the Southern Agricultural Corridor of Tanzania (SAGCOT) Centre Ltd, a public-private partnership that seeks to develop the agricultural sector of Tanzania by fostering responsible agribusiness investments in the country’s southern corridor.

The SAGCOT, a supporting association at Agritech Expo Tanzania, works as a broker and catalyst of partnerships among registered partner organisations to incubate initiatives around inclusive, sustainable and viable agricultural value chains.

Challenges facing Tanzanian agri industry

Kirenga pointed out that top among the challenges facing the agricultural sector in Tanzania is the practice of modern farming remaining an ‘infant industry.’ There are high barriers to entry, inadequate supporting infrastructure, few economies of scale, and low levels of clustering. Furthermore, areas of uncertainty in the policy environment, such as periodic export restrictions, act as disincentives to farmers to make long-term investments, for example in improving land fertility through proper application of lime or investing in improved breeds of livestock. Those farmers who are interested to take a longer-term perspective

are generally unable to access long-term finance on affordable terms.

Through its public-private model, SAGCOT is working towards achieving food security and nutrition, green and inclusive growth and economic impact as part of its broad objective 2030.

According to David Nyange, policy advisor to the Ministry of Agriculture, Livestock and Fisheries in Tanzania, the main challenge faced by Tanzanian agriculture is low agricultural productivity which is partly the result of underinvestment in the sector, particularly in research and extension.

“The role of private sector is highly recognised in the agricultural policy, strategies and programmes.”
– David Nyange, policy advisor to the Ministry of Agriculture, Livestock and Fisheries

Increased private sector investment can play a major role in meeting this challenge and addressing the issues of food insecurity, malnutrition and poverty.

“The role of private sector is highly recognised in the agricultural policy, strategies and programmes,” Nyange said.

Kirenga added, “As industrialisation is at the top of the current development agenda,

the technologies that will be displayed at the Expo have potential to play a great role toward the commercialisation of agriculture which is necessary for ensuring sustainable supply of raw materials to the industry.”

Agri industry converges at Agritech Expo Tanzania

The industry responded with great enthusiasm to the first Agritech Expo in Tanzania. The inaugural farming B2B platform gathered thousands of visitors in Arusha, from commercial to emerging and small scale farms. The event also saw participation from key officials from regional governments, agro associations, NGOs, aid, development and research agencies; agro dealers, traders and retailers; suppliers, consultants and technical experts as well as venture capitalists, investors and bankers.

The host partners for Agritech Expo Tanzania were the Ministry of Agriculture, Livestock and Fisheries in Tanzania, the Agriculture Council of Tanzania (ACT), the Tanzanian Horticulture Association (TAHA) and the Selian Agricultural Research Institute (SARI) in Arusha.

Global farming equipment leader John Deere and its distributor in the country, LonAgro Tanzania Ltd, were gold sponsors for the event. Other leading agri suppliers who participated in the event included Rijk Zwaan, Afrivet, Ford, CMC Automobiles, Hughes Motors, Maji, HortiPro, Irrico, Rivulis, AMDT, FNB, Lindsay Africa, Balton, Kibo Seed, Neptun Boot and TFSC. 

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Crop production using no-till and minimum cultivation systems can offer important benefits, and the development of suitable seed drills and planters is encouraging more farmers to move away from traditional seedbeds. Mike Williams reports.

Re-imagining tillage



John Deere's 1590 no-till drill can be used for both minimum-till and traditional seedbeds. (Photo: John Deere)

BENEFITS OF USING reduced or zero cultivation methods can include faster and more even seed germination due to improved soil moisture conservation, reducing the amount of tractor work needed for seedbed preparation can mean lower fuel and labour costs, and there are likely to be yield benefits because of short- and long-term improvements to the soil structure.

Operating versatility is a feature in a few of the special seed drills designed for reduced or zero cultivation, allowing them to be used for sowing into traditionally prepared seedbeds so that growers can choose the method that suits the crop and soil conditions. An example is the 1590 series box drill, a popular John Deere model designed as a no-till drill but which can also be used with minimum cultivation systems as well as plough-based seedbeds. Special features of the 1590 drill include the design of the single disc no-till openers, exerting up to 200kg of pressure and angled at 7 degrees to cut through surface trash and hard soil. The openers also allow 20 cm of upward movement and 15 cm downwards to maintain accuracy while working in uneven surface conditions.

Operating versatility is a feature in a few of the special seed drills designed for reduced or zero cultivation, allowing growers to choose the method that suits the crop and soil conditions.

The seeding mechanism for the 1590 drill is ground wheel driven, and the hinged attachment to the main frame allows the wheel to move vertically to maintain positive ground contact on an uneven surface. The 1590 drill can be supplied in grain only or grain/fertiliser versions and three sizes are available up to 6.1 metre wide. Row spacing is 19 or 25.4 cm, but moving alternate openers into the raised position increases the space between rows to 38 or 50 cm.

Growers needing high output drilling in conventional seedbeds are offered by the John Deere 455 series drill. Available in two or three sections, it provides up to 10.5 metre working width with outputs as high as

eight hectares per hour, and a flexible link between the sections allows 15 degrees of vertical movement to maintain accuracy while working on uneven ground. The options list includes a special attachment for sowing grass seed and the Coulter Cart is available for dealing with large amounts of residue from previous crops.

The latest in no-till drills

The Baldan company has been making farm machinery in Brazil for more than 80 years and it currently offers one of the largest ranges of seed drills, planters and cultivation equipment. Much of its output is exported, including to most African countries, where its biggest selling drills are the basic SHB and SAB mounted and trailed models with from 11 to 17 rows for sowing small grains. The most popular no-till drills in the Baldan range are the trailed SPD series available in three sizes with 272, 340 and 408 cm working widths and with 16, 20 and 24 rows. The row spacing is 17 cm and the recommended tractor size is 75 to 95 hp for the smallest model, increasing to between 115 and 130 hp for the biggest drill.

Special design features on the Baldan

SPD box drills include a quick-change gearbox with 62 settings to control the seed rate, a central lubrication system and all models use a hydraulic system to adjust the sowing depth and to raise the drill. The options list includes a special grass seed attachment and there is a wide choice of coulter blades and packer wheels.

The special feature of single pass strip tillage crop establishment is that cultivation is limited to narrow strips where the seed is sown, while the soil in the areas between the strips remains undisturbed. Each of the nine cultivated strips prepared by the British built McConnel Seedaerator strip tillage drill can be between 6.0 and 15 cm wide, and the cultivation depth can be adjusted between 10 and 30 cm. The Seedaerator is tractor mounted and needs a minimum of 160 hp. There is a choice of 600 or 1250 kg seed hopper sizes, the main slit forming tines have breakback protection with an automatic reset action, and the seed metering is radar controlled.

Specialist manufacturers of strip tillage equipment include Mzuri, the British-based company that makes the Pro-Til one-pass seed drill plus associated cultivation implements. One of the special features of the Pro-Til drill is the design of the hydraulic control system that provides an even pressure on each of the coulters to maintain an accurate sowing depth. It also ensures a close seed-to-soil contact to encourage faster, more even germination. A band of fertiliser can be placed behind an independently operated leading breaker leg below seed depth to ensure maximum crop response, and the seed harrow at the rear of the drill has an adjustable pressure system that operates hydraulically.

The seed placement patterns aim to provide each plant with the same amount of growing space, access to sunlight and soil moisture and nutrients.

The Pro-Til seed metering unit has an electric motor with a variable speed control, and there is a choice of seed rollers to suit a wide range of different crops. The calibration system operates with a push-button, and the selected settings are entered on a control panel. Although the Pro-Til drill was designed for strip-seeding, it can also be used in traditionally prepared seedbeds, and drills are available in trailed versions with 3.0, 4.0 and 6.0 m working widths and there is a linkage mounted 3.0 m model. Trailed models are available with



Strip tillage crop establishment with a three-metre trailed version of the Mzuri Pro-Til Select drill. (Photo: Mzuri)

the optional Select facility that lifts alternate legs out of operation to provide wider seeding bands.

Innovation in seed placement

A development that is attracting increased interest from machinery manufacturers and from some of their customers is using specially designed drills that place the seeds in patterns that can achieve higher crop yields than traditional in-line sowing. The placement patterns aim to provide each plant with the same amount of growing space, access to sunlight and soil moisture and nutrients, and this has achieved yield benefits in trials using some of the new drills and planters.

An example is the DeltaRow seed placement system that has completed its second year of development by engineers at the Lemken company in Germany for use with its Azurit precision seed drill. Lemken equipment, including its range of seed drills, is already well established in a number of African countries where the DeltaRow system could offer benefits for establishing various crops including maize. Each of the DeltaRow planting units sows seeds in double rows, with each seed evenly spaced from its neighbours both within the row and between the double rows. Lemken has completed two years of trials, and results are said to be positive with yields benefitting from the more uniform crop growth.

Seed placement in double rows is also featured on the TR or Twin-Row precision drill in the Monosem range. The French-built Monosem range is said to be Europe's biggest-selling precision drill brand, and the company was purchased by John Deere in 2015. The Twin-Row planting system was

first developed in the United States and, as the name suggests, it sows the seeds in pairs of rows spaced 20 cm apart. The seeds in the double rows are precisely spaced to form a zig-zag pattern, an arrangement that aims to give each crop plant maximum growing space. South African maize growers using the TR planter typically sow 10 per cent more seed per hectare than with a standard planter says Carrotech, the Monosem distributor, and yield increases in the 8–16 per cent range are usual.

The 'companion crop' system

A different approach to precision drilling is the 'companion crop' system offered by the Pottinger company in Austria, using their recently developed Aerosem pneumatic drill. The Aerosem is tractor mounted with 3.0, 3.5 and 4.0 metre working widths and is designed for precision sowing crops such as maize using 37.5 or 75 cm row spacing and equipped with special sensors to check the accuracy of the seed delivery. The Aerosem can also be equipped with additional conventional sowing outlets located between the precision seed heads, and these are supplied from a separate compartment in the divided seed hopper. The conventional outlets are used to sow a companion crop such as grass seed between the precision sown crop rows, but they can also be used to place fertiliser in strips beside the main crop rows.

Benefits available from companion crops such as grass can include increased competition to suppress weed growth, the grass provides a firm base for tractors and other equipment when the main crop is harvested, and the grass crop can provide valuable livestock feed after the main crop has been removed. **E**

Volvo Penta collaborates with MTS-Sandei to create a higher capacity tomato harvester that delivers greater performance.

Towards more efficient tomato harvesting

VOLVO PENTA IS supplying an eight-litre engine for agricultural specialist manufacturer MTS-Sandei, for its latest tomato harvester. With a capacity of 80 tonnes per hour, the OEM's new THV 800 model is the largest yet for the Italian company.

Created to meet the industry demand for a higher capacity machine, the THV 800 will be powered by Volvo Penta's eight-litre TAD871VE engine. The machine has been successfully field-tested by some of MTS-Sandei's customers and will be previewed at EIMA International Agricultural and Gardening Machinery Exhibition in Bologna, before its official launch in 2017.

"This is an exciting time for us to produce a new high capacity tomato harvester and to satisfy our customers' demands. Our THV 800 is one of the biggest on the global market and we believe it will be a market leader," says Andrea Zanoli, research and development and operations manager at MTS-Sandei.

The THV 800 has some components that are wider than on previous models, allowing for a higher intake and passage of tomatoes, and therefore a greater capacity per hour. The self-propelling machine feeds its crops into a trailer towed by a tractor, and has been designed to work for 24 hours per day, every day throughout the harvesting season, which typically lasts for around 90 days.



The machine uses optical sorters to harvest fruits and vegetables. (Photo: Volvo Penta)

The machine implements mechanical procedures through optical sorters to harvest fruits, soil and stones until the fruit alone are finally placed cleanly in sections into the trailer. The THV 800 can be customised with a range of attachments to suit the customer's needs and can also be altered to harvest strawberries, peppers and cucumbers.

"The machine is strong and robust in order to work continuously, but also needs to be sensitive enough to handle such delicate vegetables," adds Zanoli.

Volvo Penta's TAD871VE is an eight-litre Stage IV/Tier 4 Final diesel engine, which

uses SCR instead of a diesel particulate filter for emissions control, resulting in a compact engine that is easy to maintain. A common-rail injection system and the ability of the engine to produce high torque at low rpm reduce noise and fuel consumption, thereby decreasing emission levels.

"For perishable crops such as tomatoes, having low exhaust emissions is very important," says Giacomo Mondini, Volvo Penta's sales manager, Italy. "MTS-Sandei, like us, has an ethos of caring for the environment, and we have spent a lot of time in research and development to make our products as eco-friendly as possible. 

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A crop-destroying armyworm caterpillar native to the Americas is spreading rapidly throughout Africa posing a major threat to farming worldwide.

Under threat of an armyworm invasion

RESearchers AT CENTRE for Agriculture and Bioscience International (CABI) have confirmed that a recently introduced crop-destroying armyworm caterpillar is now spreading rapidly across Mainland Africa, proving to be a major threat to farms across the region.

According to the organisation, the fall armyworm, native to North and South America, can devastate maize production, the staple food crop that is essential for food security in large areas of Africa. It destroys young plants, attacking their growing points and burrowing into the cobs. The armyworm has been recorded attacking more than 100 different plant species, causing major damage to economically important cultivated grass crops such as maize, rice, sorghum and sugarcane as well as other crops including cabbage, beet, peanut, soybean, alfalfa, onion, cotton, pasture grasses, millet, tomato, potato and cotton.

The pest is known to cause extensive crop losses of up to 73 per cent depending on existing conditions and is difficult to control with a single type of pesticide, especially when it has reached an advanced larval development stage.

“The fall armyworm can be expected to spread to the limits of suitable African habitat within a few years.”

– CABI chief scientist Dr Matthew Cock

Spreading rapidly across Africa

In Africa, the fall armyworm was isolated in Sao Tome and Principe around January 2016 for the first time. A CABI-led investigation has now identified two species of the fall armyworm in Ghana.

CABI chief scientist Dr Matthew Cock said, “We are now able to confirm that the fall armyworm is spreading very rapidly outside the Americas, and it can be expected to spread to the limits of suitable African habitat within just a few years. It likely travelled to Africa as adults or egg masses on direct commercial flights and has since been spread within Africa by its own strong flight ability and carried as a contaminant on crop produce.”

Dr Cock elaborated, “The analysis of our collections from three different regions in Ghana has shown that both species or strains of the fall armyworm are widespread attacking maize. The fall armyworm can be expected to spread to the limits of suitable African habitat within a few years.”

Earlier this month, Reuters reported that a plague of suspected armyworms destroyed 2,000 ha of crop fields in Malawi and was spreading at alarming rates. According to a report by the FAO, fall armyworm outbreaks are causing considerable crop damage in southern Africa as well.

The FAO subregional co-ordinator for southern Africa, David Phiri, said that the situation was constantly evolving. “Preliminary reports indicate possible presence (of the pest) in Malawi,



The fall armyworm is causing severe damage to maize cultivation in Africa. (Photo: CABI)

Mozambique, Namibia, South Africa, Zambia and Zimbabwe. Zimbabwe has positively identified the presence of the pest while the rest are expected to release test results soon,” he said.

In Zambia, the government has already spent US\$3mn in an attempt to control the pest that has affected approximately 130,000 ha of crops. However, the full extent of the damage in the country and other affected countries, is yet to be established.

Call for urgent action

Urgent action is now needed to help farmers and researchers working in affected areas to accurately identify and work out the best strategies to control this pest. While chemical control is the commonly adopted method to fight the pest, CABI advocates on integrated pest management strategies – a mix of biological and cultural controls – to produce greater success and reduce environmental impact.

Dr Cock explained, “Biological control for fall armyworm will need to be studied as the potential for Africa is not well understood yet. It may take several years to identify and test a suitable biological control for this pest in Africa so urgent work is needed right now. In the meantime, we will need to support national programmes to encourage the best types of pest control, and not resort to indiscriminate use of insecticides, which are harmful to the environment and have limited success.”

FAO, in partnership with the Southern African Development Committee (SADC) and the International Red Locust Control Organisation for Central and Southern Africa (IRLCO-CSA), is organising an Emergency Regional Meeting of key stakeholders from 14 to 16 February 2017 in Harare, Zimbabwe. The meeting will discuss the strengthening of surveillance, preparedness and coordinated emergency responses to transboundary crop pests and livestock diseases, including the fall armyworm infestation. **E**

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FERTILIZER MANAGEMENT
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AN ANNUAL GUIDE to suppliers of equipment and services for agriculture and for the primary processing of produce. The first section of the Directory lists suppliers under classification of their products and services. The second section lists alphabetically company addresses.

The third section lists agents and distributors in Africa geographically. The Directory has been compiled from information submitted by the companies concerned.

While every care has been taken to avoid errors and omissions, they may occur; the Editor would like to be notified of these so that the 2018 edition of the Directory can be kept up to date.

Supplier Listings
start on page 39

Agent Listings
start on page 44

Classified Listings

Agricultural Consultancies

ICS

Agricultural Equipment - General

A a Z Performance
Alvan Blanch Development Ltd.
ArmaTrac
Baldan/Pan Trade Services Ltd.
Bentall Rowlands Storage Systems Ltd.
Case IH
Challenger
Ellis Machinery
Eurodrip SA
ICS
Massey Ferguson
Nationwide Equipment
New Holland Agriculture
Nogueira/Pan Trade Services Ltd.
Pöttinger
SaMASZ Sp. Z o.o.
Valtra

Agricultural Projects

A a Z Performance
Bentall Rowlands Storage Systems Ltd.
COMPO-EXPERT
Eurodrip SA
ICS

Agrochemicals - General

COMPO-EXPERT

Animal Health Products

Ayurvet Ltd.
Eurofeed Technologies S.p.A.

Antioxidants

Eurofeed Technologies S.p.A.

Automatic Chain Feeders

Big Dutchman International GmbH

Bagging plant

Awila Anlagenbau GmbH
Bagtech International (Pty) Ltd.
Bentall Rowlands Storage Systems Ltd.

Bale Handling Equipment

Nogueira/Pan Trade Services Ltd.

Biofuel/Biodiesel

Bentall Rowlands Storage Systems Ltd.

Breeding

Hendrix Genetics

Briquetting Plants

Alvan Blanch Development Ltd.

Bulk Storage Equipment

Bentall Rowlands Storage Systems Ltd.
Chief Industries UK Ltd.
The GSI Group South Africa (Pty) Ltd.

Cages & Batteries

Big Dutchman International GmbH

Cassava Processing Equipment

Alvan Blanch Development Ltd.

Centre Pivot Equipment

T-L Irrigation Co.

Cocoa Production

Alvan Blanch Development Ltd.

Coffee Processing, Handling & Storage

Bentall Rowlands Storage Systems Ltd.
RIELA Karl - Heinz Knoop e.K.
Swingtec GmbH

Colour Sorting Equipment

Alvan Blanch Development Ltd.

Concentrate Electrostatic Sprayers

Martignani S.r.l.

Consulting Services

A a Z Performance

Conveyors and Elevators

Awila Anlagenbau GmbH
Big Dutchman International GmbH
RIELA Karl - Heinz Knoop e.K.

Coolers - Environmental

Big Dutchman International GmbH

Coolers - Evaporative

LUBING Maschinenfabrik GmbH & Co. KG

Cotton Handling & Storage

Swingtec GmbH

Crop Drying and Ventilation

Alvan Blanch Development Ltd.
The GSI Group South Africa (Pty) Ltd.

Crop Handling & Storage

Alvan Blanch Development Ltd.
Bentall Rowlands Storage Systems Ltd.
Chief Industries UK Ltd.
Griffith Elder & Co. Ltd.
RIELA Karl - Heinz Knoop e.K.
Swingtec GmbH

Crop Protection Equipment

Bentall Rowlands Storage Systems Ltd.
Challenger
Maquinas Agricolas Jacto SA
Martignani S.r.l.
Massey Ferguson
Swingtec GmbH
Valtra

Cultivators

Baldan/Pan Trade Services Ltd.
Challenger
Ellis Machinery
LEMKEN GmbH & Co. KG
Massey Ferguson
Pöttinger
Valtra

Cultivators - Rotary

Challenger
Ellis Machinery
Massey Ferguson
Valtra

Cultivators - Tined

Challenger
Ellis Machinery
Massey Ferguson
Valtra

Dairy Equipment

SaMASZ Sp. Z o.o.

Diagnostics

A a Z Performance

Disinfectants

Eurofeed Technologies S.p.A.
Intraco Ltd.

Drills

Ellis Machinery
Pöttinger

Drinking Systems

Big Dutchman International GmbH
LUBING Maschinenfabrik GmbH & Co. KG

Dryers

Alvan Blanch Development Ltd.
RIELA Karl - Heinz Knoop e.K.

Egg Collection

Big Dutchman International GmbH
LUBING Maschinenfabrik GmbH & Co. KG

Egg Layer Parent Breeders - Brown

Hendrix Genetics

Egg Layer Parent Breeders - White

Hendrix Genetics

Egg Layers

Hendrix Genetics

Electronic Monitoring & Control

Promtek Limited

Extruders for Food, Feed

Alvan Blanch Development Ltd.

Feed Additives

Ayurvet Ltd.
Eurofeed Technologies S.p.A.
Evonik Industries AG
Intraco Ltd.

Feed Compound

Eurofeed Technologies S.p.A.

Feed Concentrates

Eurofeed Technologies S.p.A.
Intraco Ltd.

Feed Flavours

Eurofeed Technologies S.p.A.

Feed Ingredients

Eurofeed Technologies S.p.A.
Intraco Ltd.

Feed Premixes

Ayurvet Ltd.
Eurofeed Technologies S.p.A.
Intraco Ltd.
Tithebam Ltd.

Feed Processing Plants

Alvan Blanch Development Ltd.
Bentall Rowlands Storage Systems Ltd.
Ottevanger Milling Engineers
Promtek Limited

Feed Supplements

Eurofeed Technologies S.p.A.
Tithebam Ltd.

Feeders

SaMASZ Sp. Z o.o.
TATOMA

Feeding Systems

Big Dutchman International GmbH
SaMASZ Sp. Z o.o.
TATOMA

Fertiliser Mixers

Bagtech International (Pty) Ltd.

Fertiliser Processing Machinery

Bagtech International (Pty) Ltd.

Fertiliser Spreaders

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Fertilisers

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Eurofeed Technologies S.p.A.

Fogging Machines

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Swingtec GmbH

Foliar Fertilisers

COMPO-EXPERT
Omex Agrifluids Ltd.

Food Processing Equipment

Marel Poultry

Forage Feeding Equipment

SaMASZ Sp. Z o.o.
TATOMA

Forage Harvesters

Case IH
Challenger
Massey Ferguson
New Holland Agriculture
Nogueira/Pan Trade Services Ltd.
Valtra

Forestry Equipment

Challenger
Massey Ferguson
Nationwide Equipment
Valtra

Fruit Processing

Alvan Blanch Development Ltd.

Generating Sets

Valtra

Genetic Research

Hendrix Genetics

Grain - Drying & Ventilation

Alvan Blanch Development Ltd.
Awila Anlagenbau GmbH
Bentall Rowlands Storage Systems Ltd.
Chief Industries UK Ltd.

Grain - Handling, Cleaning & Processing

Alvan Blanch Development Ltd.
Awila Anlagenbau GmbH
Bentall Rowlands Storage Systems Ltd.
Chief Industries UK Ltd.
Ottevanger Milling Engineers
RIELA Karl - Heinz Knoop e.K.

Grains, Grain Projects & Edible Oils

Bentall Rowlands Storage Systems Ltd.
MILLTEC Machinery Pvt. Ltd.

Grass

SaMASZ Sp. Z o.o.

Grasscutting Machines - Forage

Challenger
Massey Ferguson
Nogueira/Pan Trade Services Ltd.
Pöttinger
SaMASZ Sp. Z o.o.
Valtra

Grasscutting Machines - Lawn

SaMASZ Sp. Z o.o.

Groundnut Handling Equipment

Alvan Blanch Development Ltd.

Harrows

Baldan/Pan Trade Services Ltd.

Harvesting Equipment

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Challenger
Massey Ferguson
New Holland Agriculture
Nogueira/Pan Trade Services Ltd.
SaMASZ Sp. Z o.o.
Valtra

Horticultural Equipment & Machinery

Challenger
Massey Ferguson
Swingtec GmbH
Valtra

Horticultural Fertilisers

COMPO-EXPERT

ICT Equipment & Services

Big Dutchman International GmbH
Yahsat

Integrated Pest Management

Omex Agrifluids Ltd.
Swingtec GmbH

Irrigation & Drainage Systems

RKD Irrigacion S.L.
T-L Irrigation Co.

Irrigation Equipment

Eurodrip SA
ICS
RKD Irrigacion S.L.
T-L Irrigation Co.

Land Clearing Equipment

Challenger
Massey Ferguson
Valtra

Livestock Handling

ArmaTrac

Maize Shellers

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Nogueira/Pan Trade Services Ltd.
RIELA Karl - Heinz Knoop e.K.

Material Handling

Bagtech International (Pty) Ltd.
Bentall Rowlands Storage Systems Ltd.

Material Handling - Bulk

Bagtech International (Pty) Ltd.
Bentall Rowlands Storage Systems Ltd.

Meat Processing and Packaging

Marel Poultry

Mechanical Services & Equipment

Challenger
Massey Ferguson
Valtra

Medicators

Big Dutchman International GmbH

Micronutrients

Omex Agrifluids Ltd.

Milling & Mixing

Alvan Blanch Development Ltd.
Awila Anlagenbau GmbH
Ottevanger Milling Engineers
RIELA Karl - Heinz Knoop e.K.

Mills

Awila Anlagenbau GmbH

Mills - Grain

Awila Anlagenbau GmbH
Bentall Rowlands Storage Systems Ltd.
Nogueira/Pan Trade Services Ltd.
RIELA Karl - Heinz Knoop e.K.

Mills - Grinding

Awila Anlagenbau GmbH

Mills - Hammer

Awila Anlagenbau GmbH
Nogueira/Pan Trade Services Ltd.

Mould Inhibitors

Ayurvet Ltd.

Oil Extraction Equipment

Alvan Blanch Development Ltd.

Palletizers

Big Dutchman International GmbH

Pelleting

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Awila Anlagenbau GmbH
Ottevanger Milling Engineers
Promtek Limited

Pig Equipment

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Pig Feed

Eurofeed Technologies S.p.A.

Pig Feeding/Drinking Equipment

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The GSI Group South Africa (Pty) Ltd.

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CARFED SA
Eurofeed Technologies S.p.A.
MIK International GmbH & Co. KG

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Pig Housing

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Plant Protection Chemicals

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Planters

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Plastic Flooring, Poultry

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MIK International GmbH & Co. KG

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Massey Ferguson
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Ploughs - Mouldboard

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Massey Ferguson
Pöttinger
Valtra

Poultry Consultancy Services

Meyn Food Processing Technology b.v

Poultry Equipment - Drinking

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LUBING Maschinenfabrik GmbH & Co. KG
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Poultry Equipment/Handling

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CARFED SA

Poultry Feeding

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Big Dutchman International GmbH

Poultry Feeding - Primary

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Poultry Health Products

Eurofeed Technologies S.p.A.

Poultry Housing

Big Dutchman International GmbH

Poultry Processing Equipment & Supplies

CARFED SA
Marel Poultry
Meyn Food Processing Technology b.v

Poultry Projects, Integrated

Marel Poultry
Meyn Food Processing Technology b.v

Public Health

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Swingtec GmbH

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Rice Parboilers

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Privé SA
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Slaughtering Equipment

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Slurry Disposal

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Soluble Fertilisers

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HOZELOCK EXEL
Maquinas Agricolas Jacto SA
Mesto Spritzenfabrik GmbH

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TATOMA

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Tillage

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LEMKEN GmbH & Co. KG
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Valtra

Trace Elements

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Omex Agrifluids Ltd.

Tractors

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ArmaTrac
Case IH
Challenger
Ellis Machinery
Massey Ferguson
Nationwide Equipment
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Valtra

Tractors - Spare Parts/Attachments

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ULV Spraying Equipment

GOIZPER GROUP
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Martignani S.r.l.
Swingtec GmbH

Ventilating Equipment

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Waste Disposal Equipment

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Watering Equipment

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Weed Control

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Weighers - Grain

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HOZELOCK EXEL
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Supplier Listings**A a Z Performance**

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Agents:

Nigeria - Alvan Blanch Nigeria
Uganda - Alvan Blanch Nigeria

**Amandus Kahl GmbH & Co. KG**

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**ArmaTrac**

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Web: www.ayurvet.com
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Agents:
Nigeria - Animal Care Services Konsult Nig. Ltd.



Bagtech International (Pty) Ltd.

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Agents:
Mozambique - Bagtech International



Baldan/Pan Trade Services Ltd.

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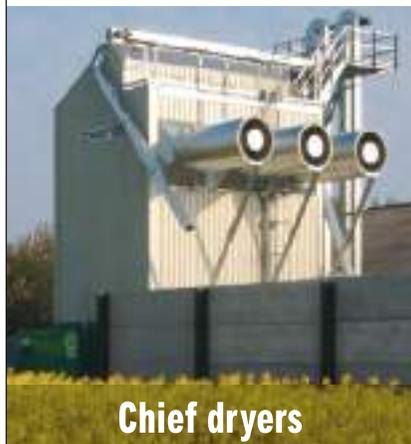
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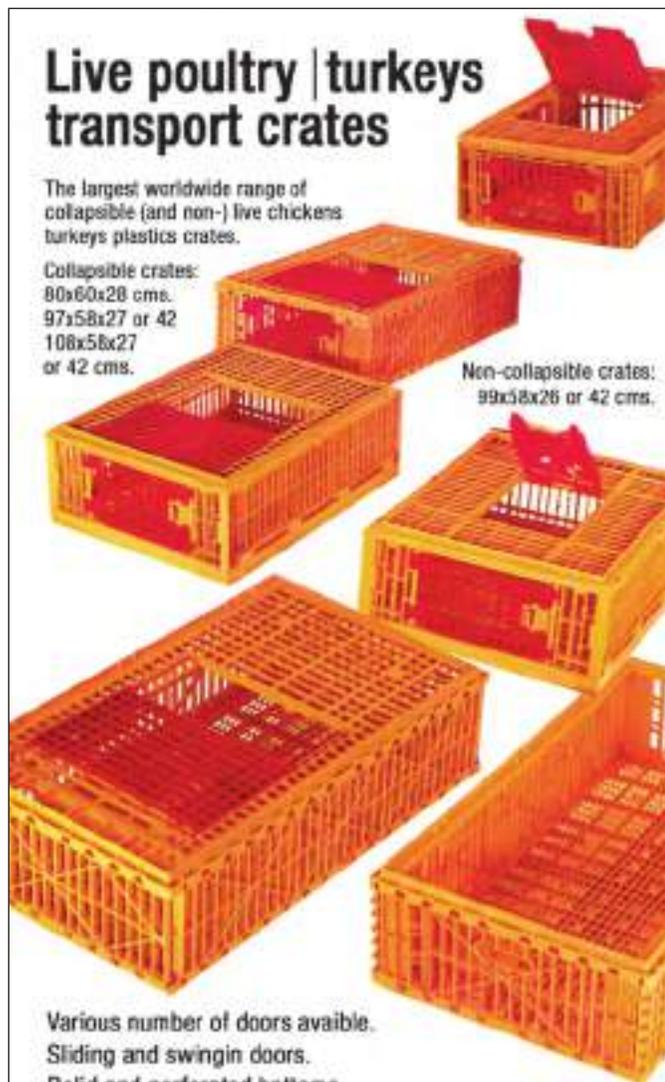
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