

African Farming

and Food Processing

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Digital transformation of African agriculture

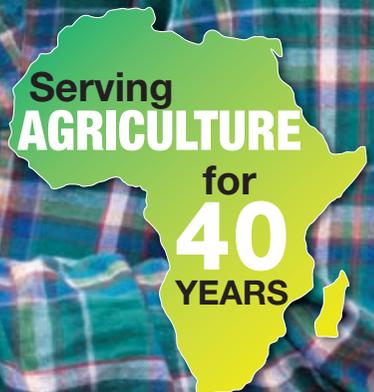
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Strengthening animal production



Liberia's cocoa sector. p17



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Image Credit: Adobe Stock



Milk coolers in Kenya.



Digital mapping for horticulture.

African Farming

and Food Processing

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Farming Calendar 2020

FEBRUARY

18-20 West Africa Agribusiness Show LAGOS
www.waashow.org

19-21 Argus Africa Fertiliser Conference Cape Town
www.argusmedia.com/en/conferences-events-listing/africa-fertilizer

MARCH

9-11 VIV MEA Abu Dhabi
www.vivmea.nl

10-12 HortiFlor Expo HARARE
www.hppexhibitions.com

24-26 agrofood & plastprintpack Nigeria LAGOS
www.agrofood-nigeria.com/agrofood-nigeria.html

APRIL

02-04 Agritech Expo CHISAMBA
www.agritech-expo.com

JUNE

03-05 agrofood & plastprintpack Ethiopia ADDIS ABABA
www.agrofood-ethiopia.com/agrofood-ethiopia.html

15-18 iran agrofood TEHRAN
www.iran-agro.com/iranagro.html

17-19 Agritec Africa NAIROBI
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International community support for Zimbabwe

MILLIONS OF ZIMBABWEANS pushed into hunger by prolonged drought and economic crisis face an increasingly desperate situation unless adequate funding for a major relief operation materialises quickly, according to the United Nations World Food Programme (WFP).

Years of drought have slashed food production in Zimbabwe, once an African breadbasket.

Worryingly, runaway inflation – a symptom of the wide-ranging economic crisis Zimbabwe is experiencing – has propelled the prices of basic commodities beyond the reach of all but the most privileged.

Report: Plant-based meat market to expand

THE SOY SOURCE segment of plant-based meat market will likely register more than 10 per cent gains by the end of the predicted timeframe owing to growing consumer awareness of its numerous health benefits and rising usage in cookies, crackers, snacks and baked products, according to Global Market Insights.

The report stated that the market valuation of plant-based meat will cross US\$320mn by 2025.

These products offer high protein, vitamin B and iron content, along with bioactive components such as isoflavones which maintain bone strength and help treat cancer.

The global plant-based meat market share is highly competitive and includes various participants such as DuPont, Quorn Foods, Pinnacle, Sweet Earth Foods, Maple Leaf Foods and Gardein Protein. Various manufacturers are engaged in developing new products to attract more customers and achieve market expansion.

A growing body of research has associated the consumption of red meat with problems such as cancer, diabetes and heart diseases.

Central Bank of Zimbabwe issues US\$50mn bond for agricultural season

THE CENTRAL BANK of Zimbabwe (CBZ) has issued a US\$50m bond for purposes of financing the 2019/2020 agricultural season. The bond instrument is expected to finance the importation of farming inputs, specifically for maize and soya bean with an aim to improve the production of two important food crops.

As reported in The Herald, agriculture financing is one of the major challenges facing the sector, which is the backbone of Zimbabwe's economy.

The year 2019 was tough for the country's agricultural sector due to poor crop production, disease outbreaks, chemical shortage and high cost of inputs among others, stated the source. The experts are predicting another bad 2019/20 rain season, characterised by low rainfall patterns.

The CBZ Bond will be under the commercial contract farming programme that is being spearheaded through the CBZ Agro Yield (Pvt) Limited.

CBZ Bank stated that it intends to issue a series of 270-day bond instruments to finance the procurement of farming inputs for maize



Agriculture is the backbone of Zimbabwe's economy.

and soya bean that are not available on the local market for the 2019/20 farming season under the commercial contract farming.

Over the past two decades, funding for agriculture has been a challenge especially for the resettled farmers following the land redistribution programme as banks required loan applicants from the sector to provide

collateral in the form of immovable assets to access funding.

This season's rains are again late and inadequate, with planted seeds, having failed to germinate in many areas. Forecasts of continuing hot and dry weather in the weeks ahead signal another poor harvest in April, putting lives and livelihoods at risk.

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EU's F2F strategy to produce a more sustainable food system

THE DRIVE FOR Europe to become a carbon-neutral continent by 2050 is now well underway.

In connection with this, Andre Laperrière, executive director of Global Open Data for Agriculture and Nutrition (GODAN), has commented that the EU's Farm-to-Fork (F2F) strategy is crucial for a sustainable future.

One of the important features of the European Union's Green Deal is the 'Farm to Fork Strategy' (F2F) and this will be crucial in helping Europe achieve a greener and healthier agricultural system. If this key strategy is not actioned, or organisations are not held accountable for failing to comply, then Europe will not be able to achieve its goal in combatting climate change.

"With food systems currently responsible for almost a third of man-made greenhouse gas emissions, putting food under the spotlight is a step in the right direction. By tearing up the outdated format, the F2F Strategy will help reduce emissions and produce a more sustainable food system," he said.

"However, this can be achieved through a fair and direct approach heavily focused on engagement with all those involved in the food supply chain. Only then can we begin the rapid shift away from high polluting industries and technologies.

To begin, food and drink manufacturers need to ensure that their business models and



Image Credit: Adobe Stock

strategies are heavily focused on sustainability. This needs to be promoted from top to bottom from the types of machinery they use to the vehicles they use to deliver products whilst also meeting consumer demands.

However, they can't do this alone and it is important that organisations and policy-makers are ensuring that they are fostering innovation by removing potential barriers. One way this can be done is through encouraging the use of open data as this will help develop a greater understanding and in turn produce more ways to help meet the standards of the Green Deal. By harbouring data sharing, companies and farmers will be

able to look at new and effective ways to maximise the potential of data. In doing this, the results will be vast and will help Europe have a more ethical and sustainable food supply chain. However, it will require collaboration from all parties to ensure this.

The F2F strategy should be not to be viewed as just a policy focused on delivering a better environment. Instead, it should be viewed as a catalyst for change to help improve the thinking and ideas of all those involved in the food supply chain. It should be embraced and used as a way of producing a more prosperous future and identifying new opportunities to take all in Europe to greater heights."

World Food Programme and Sudan hold programme to curb post-harvest losses

THE UNITED NATIONS World Food Programme (WFP) in Sudan hosted an event on post-harvest losses, exploring approaches such as the use of hermetic storage bags that were showcased at the event. In Sudan, smallholder farmers lose up to a third of the food they produce because of inadequate storage systems. Post-harvest losses reduce incomes for farmers, exacerbate food insecurity, and have negative impacts on the environment. Land, water, farm inputs and energy are all used to produce food that is not consumed.

"The impact of harvest losses to Sudan's annual production adds to food insecurity across many states that are reliant on agriculture as the primary source of income," says WFP Representative and Country Director Hameed Nuru. "Hermetic storage bags are a simple solution and WFP is promoting them among smallholder farmers while working at the same time on increasing their awareness on post-harvest losses."

WFP Sudan has reached over 500,000 farmers with a multi-channel Hermetic Storage Communication Campaign in the

states of Kassala, Gedarif and White Nile in 2019. The campaigns focused on encouraging farmers to purchase hermetic bags at a cost of US\$2.50 each - around US\$1 more than the traditional jute bag. The return on investment is US\$26 over three years for each bag of 90kg. By the end of 2020, WFP plans to reach more than two million farmers through a national campaign, featuring Sudan's actor Gamal Hassan Saeed.

"The next step is for the Sudanese private sector to see the business opportunities, invest in simple technologies that will help in reducing post-harvest loss, and be willing to distribute these products along their existing supply chain to reach farmers," Nuru added.

WFP Sudan works with the private sector, banks and microfinance institutions to create an extensive retail network, with the goal of making profitable and affordable hermetic storage bags available to every smallholder farmer in Sudan. The first private-sector points of sale opened in Gedarif and White Nile states in late 2019. In addition, WFP Sudan is working with the Agriculture

Research Corporation to classify hermetic storage bags as agricultural products which will make them eligible for tax exemption. Tax exemption for hermetic bags is expected to further stimulate the private sector to invest in this new technology.

Addressing the conference, the Minister of Agriculture Eisa Osman Sharif stressed the importance of the agricultural sector to the national economy: "The agriculture sector is a driving and leading force for development and we are working with WFP on a five-year plan to reduce post-harvest losses and support smallholder farmers."

The event, held from 27-29 January, linked various actors in the food value chain, including international manufacturers, national distributors and marketing companies along with government representatives from the Ministry of Agriculture - a key supporter and co-host of the event.

Across Africa, postharvest losses along the food chain from farm to fork pose a big challenge to food security. Reducing postharvest losses can help increase food availability and improve farmers' incomes.

Scaling up solar-powered irrigation in Sudan

THE AFRICAN DEVELOPMENT Bank's (AfDB) has approved a US\$21.783mn grant to the government of Sudan to accelerate the adoption of solar-powered irrigation pumps in the country's West Kordofan and North Kordofan states.

The project is expected to enable farmers' adoption of renewable energy technology through the installation of 1,170 photovoltaic (PV) irrigation pumps, the establishment of maintenance and repair workshops for the pumps and the supply of equipment for a pump testing laboratory to provide certification and training.

Agriculture is an important economic sector in Sudan. In 2016, around 40 per cent of the country's GDP came from farming. As a result of the expected phasing out of diesel-fueled pumps, participating farmers will realise cost savings from no longer needing to purchase diesel, which is scarce in rural areas.

The solar-powered irrigation pumps aim to increase productivity and lower pollution and greenhouse gas emissions from agriculture.

Across the region, foreign and local firms are assisting local farmers with technology to boost food production.

Paul Baldeh, AfDB's director for power systems development, noted, "By extending



Image Credit: Adobe Stock

Solar power offers can be ideal for irrigation

farmers a grant covering 75 per cent of installation costs, the government, with Bank support, will overcome the most significant hurdle of adopting clean PV technology: high upfront costs."

The remaining 25 per cent will be payable in instalments over three years. He added that the project will conduct a groundwater survey and sustainability assessment that will inform the development of subsequent projects in Sudan.

The project meets the Sudanese government's renewable energy and poverty reduction objectives as well as the Bank's High Five and Energy Sector Policy. Moreover, the project has a strong potential

to be replicated and scaled up in other parts of the country.

Agriculture is the principal source of income and livelihoods for 60 to 80 per cent of the population of Sudan.

Solar power offers several solutions for farming and it can be ideal for irrigation in developing countries. In many rural areas, especially in developing and emerging countries, the access to the electricity grid is not always guaranteed. In this case, farmers cannot rely on the traditional irrigation system. Thus, using an independent and alternative energy system can be a solution for the farmer to secure a safe power source and for the public grid to avoid saturation.

'Agriculture is the most important business in the world,' AfDB President tells students

PRESIDENT AKINWUMI ADESINA reminded students of the important role they have to play in the continent's economic development, as he was conferred with an honorary doctorate in January.

The Doctorate of Science was awarded by the Federal University of Agriculture in Abeokuta, Nigeria in honor of Adesina's work in agriculture and food security across the continent.

The Chancellor, Edidem Ekpo Okon Abasi-Otu, described him as a global household name whose exploits in promoting value chain addition in agricultural produce have remained unparalleled.

In his acceptance speech, Adesina commended the Nigerian government's efforts to promote agriculture and agribusiness in Nigeria.

"Agriculture is the most important profession and business in the world," Adesina said.

The Bank head pledged to continue the work of transforming Nigeria's agriculture sector.

"The size of food and agriculture in Africa will rise to \$1 trillion by 2030. The population of Africa, now at 1.2 billion, will double

to 2.5 billion by 2050. They all must eat. And only through food and agribusiness can this be achieved," he added.

Adesina said the African Development Bank was spearheading efforts to feed Africa and was investing US\$25 billion over a ten-year period to transform the continent's agriculture sector. What Africa does with food will determine the future of food, given that 65 per cent of the arable land left to feed the world is here, Adesina said.

"I am delighted to see so many of our young people engaged in agriculture arising from the Youth Employment in Agriculture initiative launched when I was minister to get the youth into agriculture as a business. From their innovations in the use of drones, food processing, packaging, transport and logistics and marketing, they are already unlocking the opportunities in agriculture," he said.

He urged agricultural universities to optimise their role in linking research, innovations and technologies to farmers and the food and agriculture industry.

"Africa's youth must become leaders to help feed our world," he advised.

The overall vision of the African

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

This Vision thus focuses on the central goal of poverty reduction and, therefore, on agriculture and rural development as a prime building block, as the key employer of the people and the main contributor to GDP, rural transformation, and economic growth.

The enhancement of sustainable agricultural and rural development is therefore fundamental to the attainment of the Millennium Development Goals (MDGs) in Africa, particularly the eradication of hunger and poverty.

This diversity in agro-ecological zones is a tremendous asset, but it also poses a substantial challenge for African agricultural development, according to the African Development Bank.

Across Africa, there are various initiatives to engage youth in agriculture and empower them with technical skills needed for future jobs.

Germany donates to strengthen Namibia's sustainable bush biomass use

GERMAN AMBASSADOR TO Namibia Herbert Beck officiated a handover ceremony of more than US\$140773.15 in vehicles and IT office equipment to the Ministry of Agriculture, Water and Forestry's - Directorate of Forestry (MAWF), as well as the University of Namibia.

The donation was made by the German Government, through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and forms part of wider cooperation between the two governments on the promotion of bush control and sustainable biomass use in Namibia. In close collaboration, MAWF and GIZ have implemented the Bush Control and Biomass Utilisation (BCBU) Project since 2014.

The donation includes three vehicles intended to strengthen monitoring and law enforcement capacities of the forestry authority in selected priority regions. In these regions, which are among the most severely affected by bush encroachment, the offices of the Directorate of Forestry are further equipped with computers and stationaries.

To strengthen support services for the vibrant bush biomass sector in Namibia, further donations are made to selected partner institutions. As part of the handover, the University of Namibia (UNAM), Department of Animal Science, received a laboratory incubator for analyses of bush-



Mitigating bush encroachment helps agricultural productivity.

based animal fodder samples. Due to the continuing drought, hundreds of farmers have resorted to producing bush-based emergency fodder in 2019.

Herbert Beck remarked, "The Federal Republic of Germany has supported the Ministry of Agriculture, Water and Forestry through various programmes; among others in the areas of conservation agriculture, agricultural advisory, and rangeland management. As of recent, the German Government has especially strengthened its efforts to foster the drought resilience of the Namibian population. In this context, the utilisation

of bush biomass, for example for bush-based animal fodder, plays a vital role."

Dr Thomas Kirsch, country director of GIZ in Namibia, highlighted the close cooperation with the Ministry of Agriculture, Water and Forestry, which serves as custodian of the Bush Control and Biomass Utilisation Project.

He said, "More than 30 million ha of rangeland is affected by bush encroachment in Namibia, which is more than two-thirds of the country". He elaborated that a key achievement of the project has been that "bush is no longer seen as a problem, but as an opportunity."

Smart irrigation controllers to see rapid growth in coming years

SMART IRRIGATION HAS been benefitted with the advent of Internet of Things (IoT), thus pushing the growth of smart irrigation controllers market at a global level, according to Persistence Market Research.

In addition, apart from sprinkling management and management of watering schedules, several players are integrating various functionalities to make smart irrigation a single point of control for the respective application area.

Lighting control is another feature that is being incorporated in smart irrigation controllers. The integration of various functionalities in smart irrigation controllers is expected to create huge opportunities in the coming years.

Smart cities growth fuelling the adoption of smart irrigation controllers

The adoption of smart irrigation controllers is expected to increase in smart cities. Consequently, increasing growth of smart cities is expected to generate potential opportunities for players involved in smart irrigation controllers market. Few countries across the globe are characterised by extreme weather and cold temperatures.

Smart irrigation systems with advanced soil and weather sensors can deliver high efficiency as compared to conventional irrigation systems. The need for advanced irrigation systems is another factor pushing the growth of smart irrigation systems market.

"The global market for smart irrigation controllers is expected to reach a market value of more than US\$1,800mn by the end of the year of assessment from a value of around US\$673mn in 2017. The global market is projected to expand at a stellar value CAGR of 13.3 per cent throughout the period of assessment," according to a new study.

For decades, sprinkler controllers have been simple devices. They typically consist of a rotary dial, a handful of switches, and perhaps a crude monochrome LCD. This is rapidly changing, as smart sprinkler controllers enter the market. These have come from two angles: Startups looking to disrupt the market with brand-new devices, and existing irrigation companies that have upgraded their gear with smart features.

Some smart irrigation controllers also include flow meters and other smart

technology that will alert you of any leaks in your irrigation system.

There are varying levels of 'smartness' in smart irrigation controllers that we should be aware of when switching to or setting up a smart irrigation system.

A smart irrigation controller reads online weather data and responds via pre-set weather triggers. These triggers are set by the user or a local irrigation expert via a web portal or app.

Unlike traditional irrigation controllers that operate on a preset programmed schedule and timers, smart irrigation controllers monitor weather, soil conditions, evaporation and plant water use to automatically adjust the watering schedule to actual conditions of the site.

For example, as outdoor temperatures increase or rainfall decreases, smart irrigation controllers consider on site-specific variables, such as soil type, sprinklers' application rate, etc. to adjust the watering run times or schedules.

With significant water consumption for irrigation, it is important to reduce wastage through smart irrigation methods.

Pelbo and Innovo collaborate for large egg processing projects

PELBO, THE NETHERLANDS-headquartered Moba Group's subsidiary in Brugherio, Italy, has partnered with Innovo to increase its expertise in handling large egg processing projects, expand its workforce to run more projects simultaneously and provide better customer service during the development of these projects.

By teaming up with Innovo, Pelbo is set to provide state-of-the-art technologies and add value to the sector.

"Our aim is to bring innovation and new technologies to the egg processing industry with major technical innovation thanks to the combination of both companies' expertise," Pelbo sales director Fabio Gualtieri explained.

The product portfolio of the Pelbo brand will expand to include:

- Turnkey projects with plate and/or tubular egg pasteuriser for plain, high-viscosity, or ESL products
- Pasteurisation by radio frequency
- Liquid egg concentration line for both albumen and whole egg
- Egg powder processing line
- Centrifugal separator for egg white clarification
- SCADA, the innovative handling and supervision system that integrates the egg-breaking line up to the filling system

Moba Group sales director Paul de Schouwer commented, "Pelbo and Innovo will take egg processing to the next level and move the industry into a new era by using innovative technologies. We are creating a unique center in Italy where all the major components of an egg processing plant, from the egg-breaking line to the pasteurizing systems, are developed and manufactured at a single location."



Image Credit: Adobe Stock

Teaming up with Innovo, Pelbo is set to add value to the sector.

Egg processing is an operation involving the extensive use of technological expertise, skills and knowledge. Achieving products that conform to high standards is a matter of understanding the various critical steps involved in the process.

Some factors that need to be considered include the need for high quality of eggs, adherence to strict regulatory standards for equipment used, continuous monitoring of egg products for pathogenic organisms as well as the times and temperatures involved in the production of various egg products.



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Mark Cornelissen, global hatchery specialist, Hendrix Genetics, speaks to *African Farming* about some factors that reflect on poultry breeding.

Considerations for better hatchability



Image Credit: Hendrix Genetics

The ratio between male and female birds is important to optimise fertility.

THE SUCCESS OF the continuous supply of day-old chicks is highly dependent on both fertility and hatchability. Fertility refers to the percentage of hatching eggs that are fertile, while hatchability is the percentage of fertile eggs that hatch (hatch out of eggs fertile). It is important to understand the role of fertility and hatchability in improving the results of breeder flocks.

Nutrition

The diet of the breeder flocks is of great significance, not only for the quality of the hatching eggs, but for the quality of the semen of the roosters, as well. Make sure that the birds always have enough to eat. When the breeder flock is in a negative energy balance, it will have a negative impact on fertility and hatchability. All major breeding companies can provide recommended diets. Minimum levels of linoleic acid, selenium and vitamin E, need to be maintained as they are all positively related with hatchability and fertility. Be sure a breeder premix is used and not a layer premix.

Age

There is a general tendency to think that fertility will decline when the breeder flock will become older. This is a natural phenomenon that is extremely hard to influence via management or genetic selection. The ratio between male and female birds is very important to optimise the fertility results. Too many males can put too much physical stress on the female breeders and can negatively influence fertility and longevity. Too few males can result in very poor fertility as the females can become too dominant towards the males, reducing the amount of successful mating.

The ratio between male and female birds is very important to optimise the fertility results.

Start in production with a maximum of Nine per cent males (floor systems) and reduce slowly to 8-8.5 per cent. Pay attention to male management (selection of poor males) constantly.

Egg quality

Not all eggs produced by breeder hens are suitable to be placed in the incubators. Proper sorting of hatching eggs is essential in order to improve fertility and hatchability results. Too small eggs (less than 45 grams) have a lower chance to hatch compared to medium and large eggs. Use only eggs of 50 grams and above. It is important to take out all dirty and cracked eggs. An incubator offers the ideal environment for bacteria to multiply quickly. Rotten eggs or bangers/exploders will have a negative impact on the quality of day-old chicks.

Egg storage

Always allow eggs to cool gradually, for example, do not place them in storage too quickly after lay. Try to minimise the duration of storage as long-term storage (greater than seven days) has a negative impact on egg quality and embryo survival, both of which lead to the decrease of hatchability. It is also known that the decrease of hatchability is higher in older breeders (greater than 50 weeks of age). Short storage of hatching eggs (less than



Egg storage temperature and humidity significantly contribute to the success of your hatchability.

seven days) is advised for young breeder flocks (less than 35 weeks of age) as this will lead to higher hatchability in general. Give hatching eggs also some "rest" after laying and don't set them too quickly, only 1-2 days after production.

Egg storage temperature and humidity are two factors that can be easily managed and can contribute to the success of your hatchability. Always remember that storage starts at the day of egg production at the breeder farm. A best practice is to label each batch of hatching eggs with the production date. Try to minimise direct cold or hot air flow from the egg room coolers, humidifiers or the heating system as this will all lead to higher embryonic mortality. Also never place your hatching eggs directly against the wall or on the floor.

Tip: Allow extra incubation time for stored eggs. On an average, one hour extra for each additional day of storage after the first three days is recommended. 

Recommended climate condition during egg storage

Storage duration	Temperature (°C/°F)
0 – 3 days	18 – 21 / 64 – 70
4 – 7 days	15 – 17 / 59 – 63
8 – 10 days	12 – 14 / 54 – 57
More than 10 days	12 – 14 / 54-57
Relative humidity* (%)	Egg orientation
75 – 85	Blunt end up
75 – 85	Blunt end up
80 – 85	Blunt end up
80 – 85	Preferably small end up or turning the eggs an uneven time per day

*The recommended relative humidity range for eggs stored on paper trays is 50 - 75 per cent. The risk for dehydration is much smaller on paper trays, and the risk of floppy trays due to too high relative humidity should be avoided.

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Enhancing methionine in dairy cow nutrition



Image Credit: Adobe Stock

In the majority of high-producing dairy cow rations, methionine is the first limiting amino acid, meaning it determines performance.

THE TRANSITION PHASE is the most critical period in the production cycle of dairy cows and is characterized by a challenged immune system. Factors which have an influence on this are for example, stress due to re-grouping, changes in the ration, parturition and the start of lactation. Therefore, most diseases will occur during this phase and nutrition plays a key role in supporting the immune system and ensuring overall health. Applying the right feeding strategy can help support optimum immune functioning and the health status of the animal, which will ensure a good start into lactation. During the last few years, the supplementation of rumen-protected amino acids, especially methionine, has become more and more important in transition cow nutrition.

In the majority of high-producing dairy cow rations, methionine is the first limiting amino acid, meaning it determines performance. In addition, methionine plays an important role in overall metabolism and is responsible for maintaining several immune functions.

Methionine is proven to reduce inflammation and oxidative stress as well as to enhance milk production

The research group of the University of Illinois (Batistel et al., 2017) investigated the effect of feeding a rumen protected methionine (Mepron®, Evonik Nutrition & Care GmbH, 60 per cent metabolisable methionine) during the transition phase and up to 60 days in milk (DIM). In total 60 cows were assigned equally to two treatments, either the control and or the trial group. The

composition of the ration was the same for both groups, except for the supplementation of protected methionine in the trial group (at 0.09 per cent of DM prepartum and 0.1 per cent of DM postpartum). The supplementation used ensured a Lysine : Methionine ratio of 2.8 : 1.

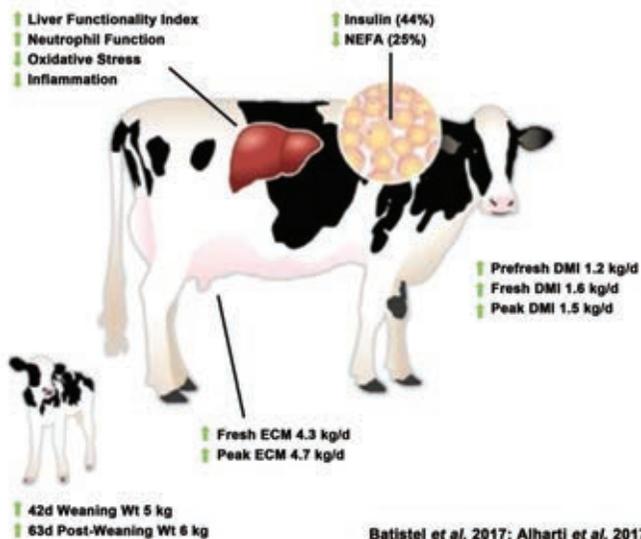
In addition to the performance parameters, blood samples were taken before and after calving to measure different biomarkers of liver function, inflammation and oxidative stress.

During the transition phase, the metabolic activity of the liver increases remarkably, to ensure an optimal nutrient supply for milk synthesis. Therefore, cows with a healthy liver function are able to overcome the transition phase without encountering any bigger problems. The liver synthesizes proteins and enzymes which can be measured as biomarkers of liver function in the blood. Cholesterol (responsible for the stabilisation of cell membranes and maintaining nervous function) and paraoxanase (an enzyme with anti-oxidative and anti-inflammatory properties) are examples of two such biomarkers. Compared to the control group, the cows in the trial group had significantly higher levels of paraoxanase and cholesterol in blood after calving. Elevated levels of cholesterol can be partly explained by the higher dry matter intake of the trial group; but combined with the higher levels of paraoxanase, these values demonstrate that the addition of Mepron® enhanced liver function. Furthermore, the additional metabolizable methionine as a result of the Mepron® supplementation had a positive impact

on different biomarkers of inflammation and oxidative stress. In addition, blood NEFA levels of the cows in the Mepron® group declined by 25 per cent.

These results indicate that the addition of rumen-protected methionine has a positive impact on the health status of high-performing dairy cows and in addition, the weaning weights of calves were also improved.

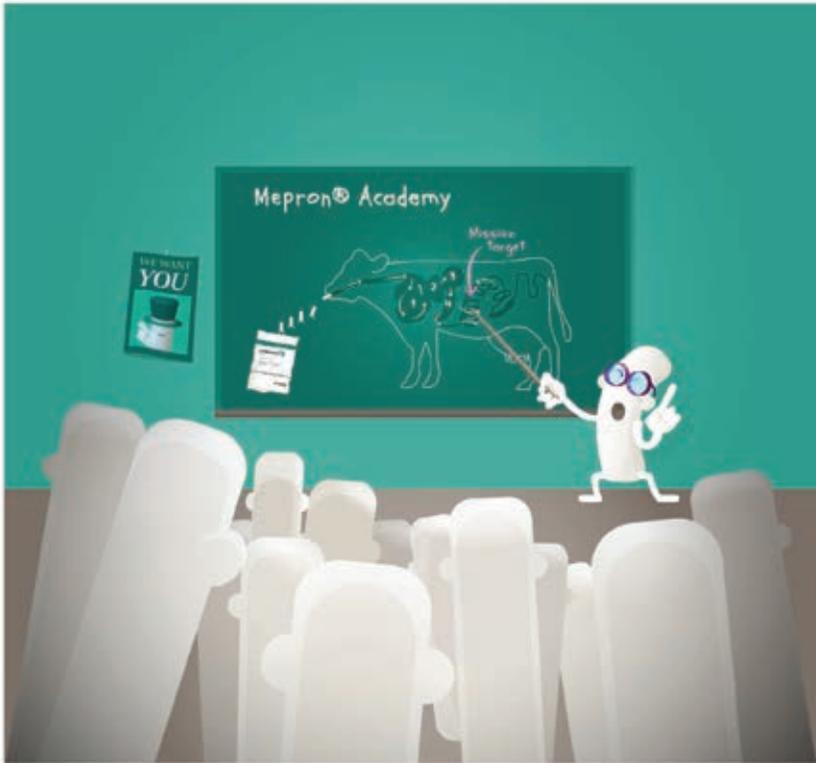
The increase in dry matter intake as well as in performance can be explained by the better health status of the animals. Methionine supplementation increased dry matter intake in the trial group by 1.4 kg on average, resulting in an increase of daily milk yield of about 4 kg during the first 60 DIM. A higher milk yield at peak production consequently leads to a better performance during the entire lactation. Economic calculations have shown that due to the addition of Mepron®, income over feed costs (IOFC) increased by approximately 40 per cow during the transition phase and the first 60 DIM. 



Day relative to parturition	-28 – 0		1 – 30		31 – 60	
	Control	Mepron®	Control	Mepron®	Control	Mepron®
ECM (US) in kg	-	-	37.4	41.7	46.0	50.7
ECM (EU) in kg	-	-	35.1	39.1	43.1	47.5
Revenue/ cow/ day, €1	-	-	11.93	1.29	14.65	16.15
IOFC change, €/cow/day ²	-	-0.37	-	+0.78	-	+0.91
IOFC change, €/ cow	-	-10.23	-	+23.32	-	+27.30

Based on a milk price of 0.34 / kg ECM; 2Costs for Mepron® and for the higher DMI are considered in the calculation;

DIOFC = Income over feed cost



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Mwangi Mumero takes a look at the trends being developed to ease milking and various aspects of the post-milking phase.

Milk handling moving ahead in Kenya

Over 800,000 smallholder farmers produce 80 per cent of milk consumed in Kenya.



Image Credit: sinhyu/Adobe Stock

KENYA HAS BEEN witnessing increased investment in dairy production. However, across the country, lack of cooling facilities has forced smallholder farmers to sell off their milk through informal channels, compromising hygiene and quality.

Milk spoilage during handling and transportation is also prevalent.

Companies dealing with milk handling equipment have been investing heavily in the milk sub-sector across the country.

Solar milk cooling

Recently, Davis & Shirliff, a Kenyan company dealing with water and energy, in collaboration with the University of Hohenheim, with support from the

German International Cooperation Agency (GIZ) has launched a new solar-powered milk cooling system to benefit rural based dairy farmers.

The solar powered plant is an assembly of Steca DC refrigerator, equipped with an intelligent adaptive controller.

“A small-scale solar powered milk cooling system is an important inclusion which can support the milk value chain at the farm,” said David Gatende.

The controller converts the refrigerator to a smart ice-maker that operates on the availability of solar energy, according to Davis & Shirliff Group CEO David Gatende.

“The smart ice-maker has a capacity of 160 litres and can produce up to 13kg of ice per day. The systems are supplied with 25, Two-kg capacity reusable plastic containers, and two, 30-litre insulated milk cans with removable ice compartments. The system is powered by 600Wp (Watt peak) solar PV modules and two batteries with a total capacity of around 1.5kWh,” observed Gatende during a media briefing in Nairobi.

The new solar milk cooler is operational in Siaya, Kakamega and Bungoma counties.

“A small scale solar-powered milk

cooling system therefore is an important inclusion which can support the milk value chain at the farm. The off-grid milk cooling solution would support small scale dairy farmers who often work under conditions where power supply is either absent or unreliable," he added.

Milk Master

Beyond the milk coolers, companies have also been launching other equipment especially suited for smallholders.

In the recent past, a Kenyan firm has launched a hand-operated milking machine suitable for farmers not connected to electricity supply.

Less than 40 per cent of rural households in the country are connected to the national grid.

"A milk machine that does not use electricity will help reduce the technology gaps in rural areas. This hand-driven milking machine has the capacity to milk a cow in 5-10 minutes," observed Jane Wambui Chege, of the Nyahururu Veterinary and Agri-Supplies.

Known as the 'milk master', the milking machine allows the farmer to attach the tit cups to the udder and then freely operate the machine as the milking progresses.

Currently, the machine retails at Ksh 50,000 (US\$556) and is suitable for rural farmers. The company allows farmers to pay in instalments and to collect the milking machine on completion of payment.

"Farmers however need to ensure high levels of hygiene during and after milking. Cleaning of the machine must be done using detergents that have no smell lest they stain milk produced," said Chege.

Further innovations

On its part, food and dairy equipment suppliers Desley Holdings sell parlours, direct line milk machines, crop fillers, sealing machines, milk cooling tanks (closed tanks), batch pasteurisers and continuous flow pasteurisers.

A German company, Risto, sells used milk coolers across the world mainly in bulk batches of 250 tanks.

These include models such as Alfa Laval, Mueller and Serap—with a 2,100-litre tank retailing from US\$2,000.

For instance, a used Mueller milk cooler tank is approximately 2,550l capacity, has an agitator, automatic detergent removal, integrated tank guardian, digital temperature display and automatic cleaning control.

It is 3.35 metres by 1.66 metres and a height of 1.25 metres. According to Risto, the milk coolers are cleaned and checked for functionality before delivery.



Milk coolers boost value addition and improve hygiene.

Netherlands-based equipment retailer SmallDairyEquipment.com also sells milk coolers and other dairy accessories to farmers across Africa. The company buys used equipment directly from farmers in Europe.

According to the KLBCS manager, the installation of the milk cooler has boosted value addition through chilling of the milk.

Another player, Finken Engineering engages in milk dispensers, milk cooling tanks, milk processors, milk pasteurisers, yoghurt production lines, UHT Milk processing lines and CIP systems.

Chinese e-commerce giant Alibaba.com sells milk coolers across Africa with prices ranging from US\$2,000 to US\$30,000, depending on the size.

In the Rift Valley region, through support from the East African Dairy Development Project (EADDP), funded by the Bill & Melinda Gates Foundation, farmers in Kipkaren Division in Nandi County have installed a milk cooler at the Tanykina Dairy Plant.

Officials say that the cooler has increased volumes of bulked milk.

Tanykina Dairy Plant is also engaged in provision of artificial insemination (AI) and veterinary extension services, financial services, a health care scheme for shareholders, collection, bulking, and marketing of milk.

The East African Dairy Development project is implemented by Heifer International works in partnership with the International Livestock Research Institute (ILRI), TechnoServe, the World Agroforestry Centre, African Breeders Service and Total Cattle Management.

It has been working with farmers in Kenya, Uganda, Rwanda and Tanzania for the last six years.

In Kenya, the EADDP project has been working with over 105,000 dairy farmers registered in 21 cooling plants.

Milk cooling initiatives

With a monthly milk delivery of 85,000 - 90,000 litres, the 1,660 member Kahuru Livestock Breeders Cooperative Society (KLBCS) in Kenya's Murang'a County has expanded its operations with the recent installation of a 5,000-litre capacity cooler by the county government.

The society is among numerous others in the country that have benefited from regional governments and donor initiatives to reduce milk wastage, improve value addition and raise earnings from milk sale.

In the recent past, Murang'a County has constructed modern 5,000-litre milk coolers in each of the 35 elective wards to boost dairying and reduce poverty.

Murang'a County has an estimated 240,000 dairy cow producing about 600,000 litres of milk daily, most of which is consumed unprocessed. County officials estimate that at full capacity, the milk coolers in the country are able to bulk at least 175,000 litres of milk daily.

Beyond the improved hygiene – the

presence of milk coolers boosts value addition as well as giving the society time to look for better markets.

"Most of our farmers are smallholders and it became necessary to pool the milk and negotiate with New KCC on pricing. At the moment, New KCC pays Ksh 34.80 (\$0.41) per litre of milk delivered, with the society paying Ksh 30 (\$ 0.35) per litre to farmers. The difference of Ksh 4.80 (US\$0.06) is used to cater for transport and office expenses," asserted Lucy Mwangi, the society's manager during an interview at their offices at Kahuro Township.

According to Mwangi, the KLBCS manager, the installation of the milk cooler has boosted value addition through chilling of the milk.

"Chilled milk remains fresh for 36 hours during which time the society can seek better markets in case of glut or when prices are low," she noted.

Chilling of milk in the coolers allows the country officials to seek better markers for the produce.

Other counties that include Meru, Tharaka Nithi and Nandi have also installed milk coolers.

On an average, each of the 900 active dairy farmers delivers 4.5 litres daily to one

of the 15 collection centres.

The Bill & Melinda Gates Foundation is one of the organisations that has funded the construction of milk coolers in Bomet and Nandi counties.

"Chilled milk remains fresh for 36 hours during which time the society can seek better markets in case of glut or when prices are low," noted Lucy Mwangi, manager, KLBCS.

A glimpse into Kenya's dairy industry

Countrywide, over 800,000 dairy smallholder farmers produce 80 per cent of all milk consumed in the country.

According to the Kenya Dairy Board, the industry regulator, Kenya has retained its position as Africa's largest per capita consumer of milk. Each person consumed 110 litres of milk per year in 2019 compared to 80 litres in the previous year.

Consumption rose to 165 million litres from 148 million litres over the same period.

Currently, the dairy industry is valued at Ksh 184 billion (US\$1.84bn), according to

the Ministry of Livestock and contributes over four per cent of the gross domestic product (GDP).

Kenya is banking on the ongoing formation of the continental free trade area to find an export market for the milk.

Studies conducted by the Food and Agricultural Organisation (FAO) indicate that 75 per cent of milk consumed in Kenya is accessed informally through milk hawkers and bars.

Less than 30 per cent is obtained through the formal channels mainly processors.

With the large amount of milk marketed unprocessed and the weak monitoring of markets, FAO says there are concerns about public health risks from diseases and drug residues.

Majority of the 800,000 smallholder farmers own two or three dairy cows per households which are milked by hand.

They produce on average between 4.5 litres to 25 litres daily.

Increasingly farmers are turning to machines to quicken the process and save time. However, most of the available milking machines require electricity connection, which is unavailable to many rural-based farmers. **E**



There are various initiatives across Kenya to improve milk sale.

A new programme is set to transform the cocoa sector and impact livelihoods in West Africa.

Reshaping Liberia's cocoa sector

THE EUROPEAN UNION Delegation in Liberia has signed a new partnership agreement with Solidaridad West Africa to implement the Cocoa Value Chain Development Programme in Liberia.

The four-year intervention seeks to reduce poverty by increasing incomes, improving livelihoods and the resilience and competitiveness of the Liberia cocoa sector.

"The government of Liberia recognises and appreciates the work of Solidaridad and the contribution of the European Union to the agricultural sector," Robert Fagans, deputy minister for Planning and Development at the Liberia Ministry of Agriculture, said at the signing. "It is our expectation that all sector-related interventions could be well-coordinated to improve the wellbeing of farmers."

The COVADEP programme comes on the heels of about two years of implementation of the Liberia Cocoa Sector Improvement Program (LICSIP) by Solidaridad to create a vibrant, competitive and profitable cocoa economy within a robust national regulatory and institutional framework.

Solidaridad will support more women and youth as entrepreneurs through incubation centres, and promote premium and certified cocoa through market engagement with international cocoa off-takers.

Until 2023, the Cocoa Value Chain Development Programme will set up 10 additional centres for Cocoa Development to allow more cocoa farmers and allied groups to access several support services to improve productivity and produce sustainable and certified cocoa.

Isaac Gyamfi, regional director of Solidaridad West Africa, pledged Solidaridad's commitment to supporting the continual improvement of the Liberian cocoa sector by contributing its experience



Image Credit: Adobe Stock

The four-year programme seeks to improve livelihoods and the resilience and competitiveness of the Liberia cocoa sector.

in implementing cocoa sustainability programmes across West Africa and around the world.

"We consider our work successful when it improves the livelihoods of farmers, increases national revenue and sector resilience, and maximises benefits for all supply chain actors," Gyamfi said. "We will use our skills, knowledge and expertise to apply the resources at our disposal to improve farmers' living conditions in line with the government's Pro-Poor Agenda for Prosperity and Development."

At the signing of the new Solidaridad-EU agreement for cocoa value development John Flomo, the director general of the Liberia Agriculture Commodity Regulation Authority, under whose leadership Solidaridad supported the authority to develop the first-ever cocoa and coffee policy in Liberia, said, "We look forward to deepening our working relationship with Solidaridad under this new programme to improve the quality of Liberian cocoa, be

competitive on the international market and increase traceability."

Solidaridad will support more women and youth as entrepreneurs through incubation centres and promote cocoa value addition and certification through market engagement with international cocoa off-takers to enhance revenue generation for the Liberian economy.

Under the programme, Solidaridad will support the training of appropriate institutions to enforce inclusive sector policies, incubate new cocoa-related small businesses and develop systems for the supply of improved planting materials and investment incentives to promote downstream development.

Ivan Borisavljevic, team leader for resilience at the European Union, said, "This new contract with Solidaridad expands on our ongoing partnership to improve the Liberia cocoa sector, which is one of the European Union's key sectors of interventions." **B**

With a rise in biological pest management strategies, African farmers are gaining access to improved products and innovations. AgBiTech and UPL enter distribution agreement for baculovirus insecticide products for Africa.

Baculovirus insecticide solutions for Africa

FALL ARMYWORM WAS first detected in Central and Western Africa in early 2016 and has quickly spread across virtually all of sub-Saharan Africa.

Efforts to control fall armyworm by African governments draw on the lessons of all methods and products, including intercropping technology, biopesticides and monitoring systems.

Farmers have been experimenting with traditional pest control methods, as well as trying new ones, including various repellent and insecticidal substances and plant extracts.

As biological means of combating pests and diseases are gaining popularity in integrated pest management (IPM) programmes, African farmers can now look forward to gain access to better management of the menace.

Fawligen, manufactured by AgBiotech, belongs to the new IRAC mode of action Group 31 (host-specific occluded pathogenic viruses). It contains a nucleopolyhedrovirus specific to the fall armyworm pest and has been undergoing several regulatory trials and evaluations across various countries in Africa since early 2018.

It has been tested and evaluated by organisations such as CABI and KALRO in Kenya, ZARI in Zambia, IITA in Nigeria, MINADER/ IRAD in Cameroon, ISRA in Senegal, IASCO in the Côte d'Ivoire and CSIR-CRI in Ghana, among others.

AgBiTech and UPL are entering into a distribution agreement for Fawligen in multiple African countries. Also included in the agreement is Heligen, another host-specific occluded pathogenic virus for control of corn earworm or cotton bollworm. "This agreement is the result of a long, joint effort evaluating the products in Africa and our aligned visions to provide African farmers with effective and safe solutions for integrated pest management," according to Dr. Shachi Gurumayum, Head of Africa for AgBiTech.

AgBiTech Global CEO Peter Berweger says the company continues to invest aggressively in their industry leadership position. "This partnership is an important



African farmers can now look forward to better management of the fall armyworm menace.

Image Credit: Adobe Stock

step for the biocontrol industry. It will give growers more choices to manage hard-to-control pests," he says. "Our portfolio has the potential to become a mainstream foundational insecticide tool worldwide. Our current commercial focus is US, Brazil, Australia and Africa, with other markets under review."

Biological pest control is a complex field offering many different approaches, including introducing into the crop a pest's natural enemies that have been grown elsewhere, and encouraging the growth of predatory species that already exist in the local environment.

UPL Regional Head for Africa, Middle East, Australia and New Zealand, Marcel Dreyer, says, "this range by AgBiTech will add a lot of value to the UPL Bio-portfolio. UPL is focused to use more environmentally friendly solutions in the crop protection market and the availability of both Fawligen and Heligen are excellent tools to lower

Baculoviruses have a number of unique features that have generated interest in their use as biological insecticides.

MRLs on crops and increase applicator safety. UPL is looking forward to bringing these solutions to the African crop markets."

AgBiTech combines field experience with innovative science and proprietary technology, working with farmers, advisors and researchers to develop products that deliver highly effective biological insect management solutions.

AgBiotech's products harness biological control mechanisms, such as baculoviruses, to allow growers to target insect pests selectively.

Baculoviruses have a number of unique features that have generated interest in their use as biological insecticides.

These include high pathogenicity and virulence, limited host range (very low risk to non-target insects), absence of toxic residues on fruit and vegetables and long shelf life.

Recently, there is an increased interest in biological control which involves unleashing predators and parasites against plant pests, as the use of chemical pesticides is causing great concern due to their effect on the environment and health.

Improvements in pest control strategies represent one method to generate agricultural products of better quality, in increased quantity. **E**

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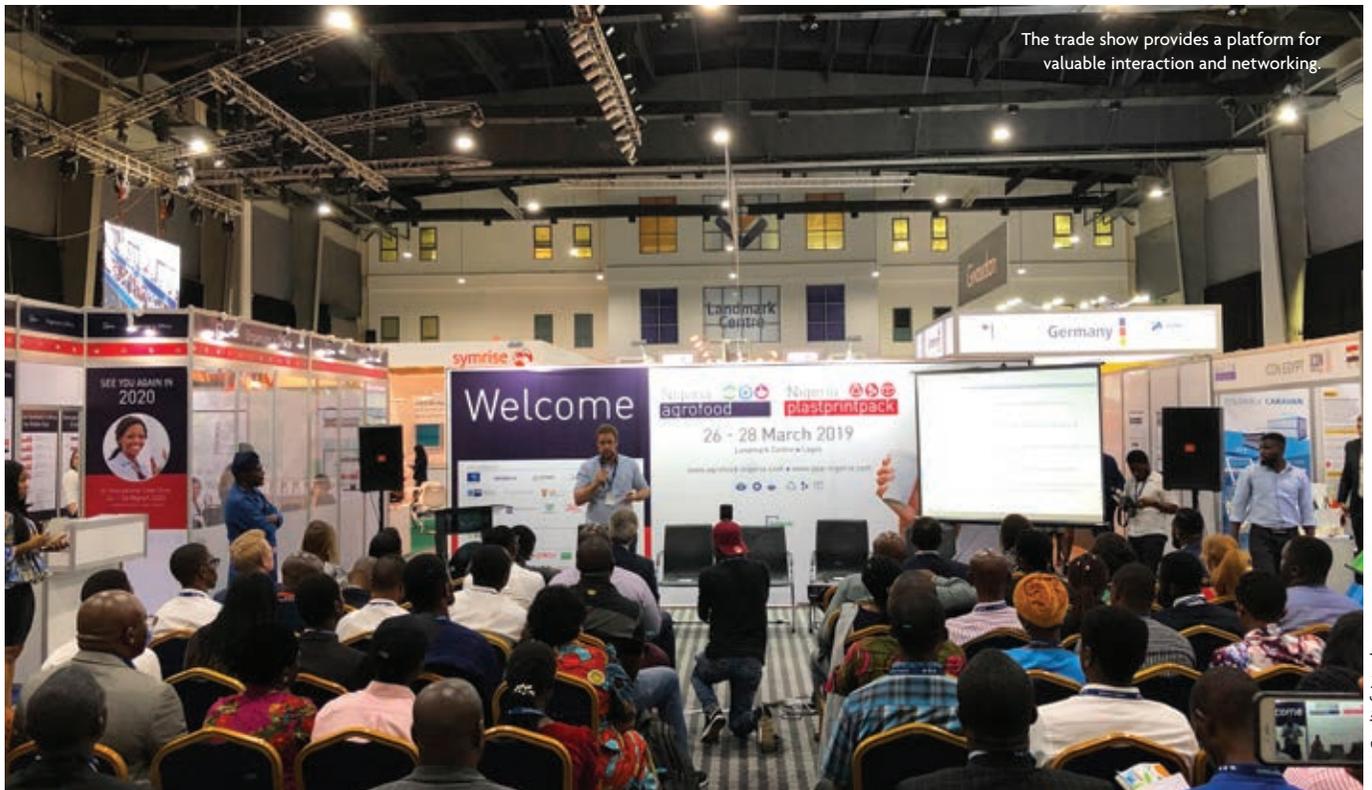
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The event is set to take place from 24-26 March in Lagos.

Growing the future of agribusiness



The trade show provides a platform for valuable interaction and networking.

BASED ON THE encouraging market conditions in Nigeria, the 6th agrofood & plastprintpack Nigeria 2020 is getting ready to continue its success story. Organised by the German trade show specialists fairtrade, the event is scheduled for 24 to 26 March 2020 at the Landmark Centre in Lagos.

Nigerian economy

Africa's largest economy is on the growth track as Nigeria's GDP is expected to increase from US\$ 397bn in 2018 to US\$ 445 bn in 2019 and US\$496 bn in 2020. And due to high and sustained investments in its agrofood and plastprintpack industry and its enormous expected population growth from 200 million in 2019 to 400 million in 2050 (United Nations), it is all too likely that Nigeria will very soon become the number one in Africa for imports of any technology. A position the country is likely to take in the long term.

Agrofood 2020

The trade show provides a platform for

valuable interaction and networking between exhibitors from within Nigerian and all over the world.

Global leaders and official country pavilions already confirmed

Many global leaders have already renewed their participation for the 2020 event, according to organisers. The national group pavilions of Belarus, China, Germany, France, Italy, Kuwait, the Netherlands, Switzerland and Turkey have again confirmed their presence.

Conference programme

agrofood & plastprintpack Nigeria 2020 will again be supplemented by a three day programme.

It covers the entire process chain -

The trade show provides a platform for valuable interaction and networking between exhibitors from within Nigeria and all over the world.

consisting of the following brands:

agro AgroTech Nigeria 2020 is organized by fairtrade in cooperation with the German Agricultural Society DLG. Main topics are agricultural technology, animal production, flori- and horticulture and hot-house technology.

The companies exhibiting are from a range of industries including:

- Agricultural machines, farming tractors, harvesting equipment
- Analytical equipment
- Dryers, cleaner, silos and storage systems
- Feeding equipment
- Fish farming equipment
- Grains, grain systems
- Greenhouse and greenhouse plastics and equipment
- Irrigation systems

food + bev tec Nigeria 2020

Double-digit growth: According to the German Food Processing and Packaging Machinery Association VDMA, Nigeria's imports of food & beverage technology increased by 13 per cent in 2018.

As such Nigeria is the second largest importer of food and beverage technology in sub-Saharan Africa, Nigeria's imports increased by an average of 10 per cent per year over the same period.

Nigeria's imports of packaging technology, between 2015 and 2018, increased by 10.2 per cent annually in 2018.

Double-digit growth is also forecasted for 2019 and 2020.

Food ingredients Nigeria

With 200 million inhabitants, Nigeria has long been the largest food market on the African continent. Expenditure in the F&B sector is growing steadily and F&B production is by far the largest segment of the Nigerian processing industry. Accordingly, the demand for food and beverage ingredients is rising continuously.

So it was only natural that more and more leading international ingredients companies took part in agrofood Nigeria. With food ingredients Nigeria, fairtrade is responding to the request of these exhibitors for their own partial tradeshow under the umbrella of agrofood Nigeria plastprintpack Nigeria 2020.

The exhibitor profile includes:

- Process technology
- Bakery technology
- Confectionery technology
- Refrigeration and air-conditioning technology
- Packaging technology
- Conveying, transport and storage installations

In 2019 the topics included three main sessions on

- Skills development and the value chain approach
- Circular economy and
- Finance, Start-ups and Digitalisation

plastprintpack Nigeria 2020

Nigeria is Africa's third largest importer of plastics in primary forms

With 72 per cent of raw materials imported (mainly from the Middle East, Europe and Asia) and only 28 per cent produced locally, the Nigerian market has great potential for exporters of plastics in primary forms.

In the years 2008 to 2017, for example, imports of plastic raw materials increased annually by 5.2 per cent from 464 kt to 729 kt, +57 per cent. This makes Nigeria, after Egypt and Algeria, Africa's third largest importer of plastics in primary forms!

With 115 million euros in 2018 (+21 per cent compared to 2017), Nigeria is the second largest importer of plastics technology in Sub-Saharan Africa, just behind South Africa (125 million euros). Nigeria's imports increased by an average of 7.2 per cent per year between 2014 and 2018.

Nigeria is the 2nd largest importer of printing and paper processing technology in sub-Saharan Africa (in million Euro). With 158 million euros in 2018, Nigeria is the second largest importer of packaging

F&B production is by far the largest segment of the Nigerian processing industry.

technology in sub-Saharan Africa, just behind South Africa (175 million euros). But while South Africa's imports failed to grow, Nigeria's imports increased by an average of 10.2 per cent per year between 2015 and 2018.

German exhibitors

A German Pavilion will be presented at agrofood & plastprintpack Nigeria featuring German exhibitors displaying their solutions and products.

The German Pavilion is presented by the Federal Ministry for Economic Affairs and Energy in cooperation with the Association of the German Trade Fair Industry AUMA and supported by VDMA Food Processing and Packaging Machinery Association

Many global leaders and official country pavilions already confirmed

Many global leaders have already renewed their participation for the 2020 event. Concerning official national group pavilions, China, Flanders / Belgium, Germany and Italy and will again present themselves officially.

Kuwait, on the other hand, will be represented for the first time with an official pavilion organized by PAI Public Authority for Industry. Ten Kuwaiti exhibitors will show their products, solutions and technologies on 192 sqm.

And the Jordan Chamber of Commerce also joins in for the first time.

Opportunities in the agrofood industry

- Recession caused revival of local food production and "Made-in-Nigeria" trend; political will to expand local food production
- Massive investments in agricultural technology and processing and packaging equipment
- Increase of yields - Reduction of immense post-harvest losses - Reduction of import bill
- Experts foresee Nigeria to become the region's main food supplier
- Medium-term development extremely promising
- Biggest market for food products in Africa - still undersupplied

According to fairtrade, with almost 200 million inhabitants, Nigeria has long been the largest food market on the African continent. Expenditure in the F&B sector is growing steadily and F&B production is by far the largest segment of the Nigerian processing industry.

Accordingly, the demand for food and beverage ingredients is rising continuously. So it was only natural that more and more leading international ingredients companies took part in agrofood Nigeria. **B**



F&B sector is growing steadily in Nigeria

Image Credit: Adobe Stock

The show will feature over 400 exhibitors at the ADNEC in Abu Dhabi from 9-11 March 2020.

Shaping the future of the region's animal production

THE EVENT HAS been making an impact on the livestock production in the Middle East and Africa since 2016.

Visitors from the host country comprise 30 per cent of the audience, and 70 per cent visiting from markets including Iran, Pakistan, Egypt, Saudi Arabia, India, Jordan, Iraq, Oman, and Sudan (top audited visiting countries in 2018). This year, the show is expected to welcome 8,000 visitors, decision-makers, and buyers over three days.

The OECD and FAO Agricultural Outlook 2019-2028 predicts that food demand in regions with high population growth, such as Sub-Saharan Africa, India, the Middle East, and North Africa, will significantly increase in the coming decade. The livestock and poultry sectors in the Middle East are also expected to expand substantially.

VIV MEA, a business-oriented event, aims to support the development of poultry, dairy, and aqua productions by bringing together international and local suppliers of the VIV network, their expertise, and solutions to provide affordable animal proteins in the region. VIV MEA 2020 will address biosecurity and sustainable development regarding the shift from heavy importation to regional production. Experts such as government officials and top supply companies will provide insight into the opportunities rising in both the Middle East and Africa.

The organisers have confirmed that there will be a focus on topics such as biosecurity in farming, water management, food security and sustainable production. The enriched conference programme covers all species from dairy to fish, poultry, eggs, cattle, calves, goat, and camels.

Supported by regional institutions and associations such as the Abu Dhabi Agriculture and Food Safety Authority (ADAFSA), the U.A.E. branch of WPSA, regional chambers of commerce and trade institutions such as the Saudi Arabia Chamber of Commerce, and the NABC. The event will have the support of over 30



Image Credit: VIV

Experts will provide insight into the opportunities rising in both the Middle East and Africa.

regional and international media partners and agencies working to reach a larger number of qualified industry profiles. This year, VIV MEA is once again co-located with the Global Forum for Innovation in Agriculture (GFIA).

VIV MEA 2020 will connect visitors with over 400 companies from Europe, the Middle East, Asia, and America. Topics will include feed, feed ingredients and additives, compound feed milling equipment, feed milling, animal health, pharmaceutical products and ingredients, breeding and hatching, genetics, farm management systems, farm production, slaughtering, processing and handling (food engineering).

Companies represented on the show grounds include Al Dahra, Aviagen, Big Dutchman International GmbH, Biomin GmbH, Boehringer Ingelheim, CEVA Sante Animale S.A., Cobb Europe, Hubbard S.A.S., Imas Integrated Machinery Systems,

Jamesway Incubator Company Inc., Famsun - Muyang Holdings Co., Ltd., Kubbar International, Kutlusan ic ve ticaret a.s., LINCO Food Systems A/S, Marel Poultry, Meyn Food Processing Technology B.V., Pas Reform Hatchery Technologies, Petersime N.V., Poultec N.V., Roots Animal Farming Services, Van Aarsen International BV.

VIV MEA started in 2016 as a biennial B2B international trade show, bringing the Feed to Food concept to an audience of over 6,000 professionally audited visitors from the poultry, aquaculture, and dairy industries in the Middle East, Africa, India and Central Asia. The second edition in 2018 attracted nearly 7,000 confirmed attendees and solidified VIV MEA's grasp in the region.

The combination of VIV trade shows, VIV Online 24/7 and VIV trade forums shapes a unique platform that offers boundless opportunities to the animal protein supply chain players. VIV worldwide developed with dedication a network through 40 years of experience and interactions with the industry, becoming today the leading platform in and for some of the most promising markets of the world. 

This year, VIV MEA will once again be co-located with the Global Forum for Innovation in Agriculture (GFIA).

Preparations are on to deliver international solutions to Zambia's farming community.

Gearing up for AgriTech Expo 2020

ONE OF THE highlights at this year's AgriTech Expo are the crop trial zones, giving seed producers, fertiliser suppliers and agro chemical companies the opportunity to showcase the benefits of utilising their products first hand in the field. The preparation and planting phase continued until the end of January. Presented by the Zambian National Farmers' Union (ZNFU), and organized by DLG Agriculture Ltd. the Zambian subsidiary of the German Agricultural Society, AgriTech Expo Zambia is preparing to once again offer a platform for farmers in Zambia and the region to meet, engage and conduct business with the global agricultural industry.

Jervis Zimba, President of the Zambia National Farmers' Union (ZNFU), said: "It is without doubt that the AgriTech Expo has stamped an indelible mark as the biggest agricultural outdoor showpiece in Zambia and has continued to endear its way into the region and beyond. It is an expo with a core mandate to forge mechanization and technological advancements among farmers with the aim of improving production, productivity and efficiency in this evolving world of discerning consumers that demand quality and proficiency."

In 2019, AgriTech Expo Zambia welcomed over 18,500 visitors and 220 exhibitors across various sectors such as seed producers, chemical fertilizers, irriga-

tion; machinery, construction etc. In addition to that the visitors at the 6th edition of AgriTech Expo witnessed, 26 live crop trials, 50 training workshops, numerous live machinery demonstrations as well as seven international pavilions. With the presence of the leading businesses in agricultural machinery the likes of SARO, AGRICO, ZamSeed, John Deere and many more showcasing their latest technologies and services, both large commercial enterprises as well as small and medium scale farmers will find something of value on offer at the trade fair.

"Farming is the future for Zambia and the region. AgriTech Expo is a must attend event for the Zambian and regional farming community. Climate change is upon us, conservation farming is the way forward. At AgriTech Expo, SARO will display and demonstrate conservation farming equipment that we supply and manufacture, such as our reliable tractors, farm implements, irrigation equipment, post-harvest machinery and solar pumping solutions. I hope to see you all at AgriTech Expo Zambia 2020." This was the message from the CEO of SARO, Gold Sponsor of AgriTech Expo, Ashok Oza.

The crop trial zones are one of the highlights at the show.

In 2020, along with the popular specials from previous editions such as the 4x4 test tracks, the live crop trials, machinery demonstration zones, AgriTech Expo Zambia will debut its exclusive networking zone. The objective is for commercial farmers to engage in an open dialog with the ministry of agriculture as well as creating an opportunity for high level networking amongst top suppliers. Participants at the networking zone will engage in roundtable and Q&A sessions and will have exclusive access to a networking function with other commercial farming enterprises at the event, VIPs, government officials, media partners and top suppliers.

Bernd Koch, Managing Director DLG Agriculture Ltd. organizer of the seventh edition of AgriTech Expo 2020 commented "We are delighted to be at the helm of the organizational activities for AgriTech Expo. We look forward to creating not only a conducive atmosphere for meaningful and productive discussions and deliberations on key issues and challenges currently facing the industry among key stakeholders but also bringing the latest technology, innovation and knowledge to the community in order to find sustainable and effective solutions for the future."

The sharing and transfer of knowledge being a critical ingredient to the development of the agriculture and livestock industry in the region, AgriTech Expo 2020 will also continue its workshop and seminar sessions over the three days of the trade fair. Participants can look forward to thematic presentations covering a variety of trending topics delivered by local and international experts.

The goal of the expo is establishing a marketplace for regional and international industry professionals, young agripreneurs and farmers of all scales, to come together in one location to conduct exclusive agribusiness transactions while being educated on the latest global industry trends to advance into the next generation of food production. **1**



Image Credit: AgriTech

AgriTech Expo 2020 will feature live crop trials, machinery demonstrations, seminars and workshops.

The show will cover Food, Hospitality and Agriculture across Africa.

Foodagro Ethiopia 2020

THE TRADE EXHIBITION to be held from 24-26 February in Ethiopia, will feature industry professionals from all over the continent, including manufacturers, distributors, agents, importers and exporters.

Over the last decade, Ethiopia has had one of the fastest growing economies in the world. In 2017, Ethiopia's real Gross Domestic Product (GDP) expanded by 10.9 percent, and is expected to grow by 8.5 percent, according to the World Bank.

Agriculture is the foundation of Ethiopia's economy and accounts for about 50% of the GDP, 84 per cent of exports and 80% of total employment. This has contributed in making the food processing sector not only the largest manufacturing industry in the country but also one that offers top opportunities for investment.

With an exciting line-up of both local and international companies, FoodAgro Ethiopia 2020 provides an ideal platform for product launches, finding new buyers & distributors, promoting brand names, updating existing customers and updating oneself with the latest trends in the food, agriculture and hotel industry.

Exhibitors from 20 countries and visitors from 11 countries are expected to participate. The main attractions this time around are the European and Asian Pavilions showcasing the latest products and innovations which are now being made available to the Ethiopian industries.

Highlighting key sectors to promote and introduce new products equipment and services to the upcoming Ethiopian market is the primary goal for the trade exhibition. Held concurrently with the Ethiopia International Trade Exhibition, sectors include building and construction, lighting, heavy equipment, tools and hardware, woodworking and sawmill machinery, large



Image Credit: Expogroup

The show provides an opportunity for business interaction for exhibitors from varied backgrounds.

automotive and spare parts, power and energy, consumer products, agriculture, materials printing, packaging and more. The event promises to introduce the Ethiopian market to world class industry leading products and services under one roof.

Special pavilion participation from the Turkey and Belgium is followed closely by companies from China, Saudi Arabia, Egypt, Italy, India, Qatar, Malaysia, Russia, Pakistan and Bangladesh. Companies from the African continent especially from Kenya, South Africa and Ethiopia are also participating among the world's leading global brands.

"Ethiopia is no longer a country that can be ignored. The interest shown by the business community towards the event shows that the industry leaders fully understand the importance and opportunities that are presented by the fair as well as the long term business relations it will create," said Emily Parkson, Event Director from the organizers, Expogroup.

As the biggest business and trade event

in Ethiopia, this event presents an opportunity for all industry leaders, innovators, business owners, importers, entrepreneurs and upcoming traders from various industries and backgrounds to source their needs and interact with international brands under one roof.

Food, hospitality and agriculture is one of the most important sectors of the African economy and is expected to be the driving force behind the alleviation of the continent's poverty. The economies of most African countries are growing faster than anywhere else in the world and agriculture, which accounts for a third of Africa's GDP, is poised to be the next step in the development of the region.

Organised by the Expogroup Worldwide, the show provides an opportunity for business interaction for exhibitors from varied businesses.

Last year, there were exhibiting from 20 countries with a strong international presence from participants.

As a platform to showcase the latest developments in Food, Hospitality and Agriculture, from various organisations, the show has been providing great networking opportunities.

It has been a great place for visitors to meet exhibitors from diverse organisations. **E**

The event presents an opportunity for industry leaders, innovators, business owners, importers, entrepreneurs and traders from various industries and backgrounds to source their needs and interact with international brands under one roof.

Leading the way in Zimbabwe's horticulture

THE HORTIFLOR EXPO 2020 will take place in the capital Harare in the HICC (Harare International Convention Center). Following on the success of the first edition in 2018, this year's event will provide a further boost horticulture exports of Zimbabwean grown vegetables, fruits and flowers.

EFGAZ, the former Exporter Flower Growers Association of Zimbabwe, was re-established and is currently intensively promoting all flower growers to become a member again. Additionally, the Horticulture Development Council (HDC), is being established.

Gorden Makoni, the chairman of HDC, is very enthusiastic about the pace of the developments and opportunities in the production of fresh produce and floral products.

The organisers confirm that Zimbabwe is receiving a lot of support internationally, for its horticultural industry.

The country was for a long time the second largest African exporter of horticulture produce and products. Over the past two years, a lot has already happened in regards to the revival of Zimbabwean horticulture and floriculture. However, challenges including the fluctuations in the currency as well as the slowing down in the development of production and exports



Image Credit: HortiFlor

Zimbabwe is receiving a lot of support for horticulture, internationally.

need to be addressed by the government to revitalise the sector.

Horticulture production, which used to be Zimbabwe's third largest agriculture export sector after tobacco and cotton, declined over the past years due to disturbances caused by the land reform programme.

Since the first edition of HortiFlor Expo, the Zimbabwean horticulture industry has gained strength. The results of the first expo were satisfactory enough to continue to go for a second edition this year. Increasing

interest to participate, especially interest coming from Zimbabwean horticulture companies, will make the exhibition grow this year, is the expectation of the organisers.

Horticulture is not only a source of employment for many people in Zimbabwe, but feeds into other sectors of industry locally, including greenhouses, shade cloth, seed, plant, irrigation and chemical providers. It also has a huge ready market, including local and international players.

Showcasing agribusiness in West Africa

THE WEST AFRICA Agribusiness show will be held from 18-20 February 2020, in Nigeria.

It is an annual exhibition which will provide a practical platform for the convergence of cutting-edge ideas, innovations, solutions, systems, standards and know-hows in the agribusiness sector which are essential for the revolution of food production in Africa.

A large number of exhibitors from a range of industries will be present at the event. The sectors represented include Poultry, Crop Protection, Food Safety and Storage Facility, Agricultural Equipment, Breeding Genetics and Incubation, Research, Supply Chain and Agribusiness management, Macro and Micro Livestock, Feed and feed ingredient, Processing and Packaging, Logistic and Distribution, Animal health, Aquaculture and Grains.

More than 10,000 visitors and 100 plus exhibitors are expected to attend the event.

West Africa Agribusiness Show would bring together Manufacturers, Suppliers, Policy makers, Regional governments, Regulators, Financial institutions, Innovators

and Consumers in the agribusiness industry from the 15 member countries of the Economic Community of West African States (ECOWAS) and around the globe. It will also facilitate development of innovative ideas, solutions and know-hows as spring boards for the West Africa Agribusiness Industry to a competitive position in the World.

For sustainability of the benefits and target outcomes of the show, agribusiness assessment programme using the AI-driven Innovation360's InnoSurvey Platform which is to empower agribusinesses in the region to develop sustainable growth and profitability strategies is introduced.

Salmat, Grand Cereals, Livestock Feeds, among others are sponsors at the event.

The show will help in discovering investment opportunities in the region, promoting business opportunities, launching new products and services and furthering business prospects.

The agribusiness industry in West Africa is expected to witness a rapid development. In the maiden edition of the West Africa Agribusiness show, stakeholders

from various sectors in the Agribusiness industry will receive the opportunity to connect to share ideas, see and experience the latest in equipment, technical know-how, supplies and services deployed in the production and processing of agriculture-related products, according to the organisers.

The West Africa Agribusiness show also hopes to showcase the rich agricultural heritage of the region during the three-day event. It will provide stakeholders the opportunity to interface and collaborate on agribusiness developmental projects.

The event organisers would like to offer organisations from both the governments as well as the private sector to come together to find appropriate solutions that can enhance and empower the agribusiness sector in the region.

It is expected to be an ideal platform to exchange ideas, share knowledge and discuss strategies to bring about transformation across the value chain along the entire West African region, thus bringing with it growth in the GDP of these countries.

A report by Lux Research identifies the impact that digitalisation is having on the food industry.

Digital route to the future of African Farming

A STUDY ABOUT the impact of the effect of digitalisation on the agrifood ecosystem finds that, while other industrial sectors have been quicker to implement digital solutions like artificial intelligence, augmented reality, industrial IoT, and robotics, the agrifood industry is making great strides to catch up.

The report titled "The Digital Transformation of the Food Industry," by Lux Research reveals that a major challenge for players attempting to interface with digital technologies in food production is the tendency to act tactically from a tech-first perspective rather than acting strategically from an issue-to-outcome perspective.

"The ability to address consumers' future needs is the driving force behind the rapidly evolving agrifood sector," said Harini Venkataraman, lead analyst of the report. "To adequately meet this changing landscape, major industry players must act now to build a robust digital strategy that identifies the right set of digital tools for the right products to maximise the value-add for their respective businesses."

Relevance for Africa

In the near-term, digitalisation is set to improve agricultural productivity in developing countries by increasing access to and decreasing the cost of farm machinery to small holder farmers by providing integration of free agronomic data and insight with access to quality assured crop input products, and lastly by connecting small-holder farmers with produce buyers rapidly. The goal is to offset major challenges facing small-holders including bringing food to populations that are set to double in the next 50 years, reducing the yield gaps faced by small holder farmers from an array of factors including poor nutrient management, poor input accessibility, high prevalence of diseases, pests, and weeds, climate-related challenges, and identifying ways to improve limited access to information connectivity. However, while digitalisation is often touted as the solution to agriculture productivity in regions like Africa, commercialising digital



Digitalisation will impact agriculture productivity in developing countries if solutions reflect the agricultural, social, and technological challenges.

Image Credit: Darren Baker/Adobe Stock

solutions for smallholder farmers remains a significant challenge.

The analysts at Lux Research have interviewed numerous companies that have started with this goal in mind but later reassess the strategy and then engage with large commercial growers. Digitalisation will only impact agriculture productivity in developing countries if solutions reflect the agricultural, social, and technological challenges and if a funding system exists to provide the necessary capital for growth. Current digitalisation success in developing countries is defined by financial backing from government or large agricultural companies.

Digital tools influencing African region

For Africa, the tools for digitalisation must be cost effective, must work within technological limitations, and must not drastically alter farmer practices or require significant training. With cost-effective being the most significant factor for digital tool adoption, tools must rely on well trained machine

While digitalisation is often touted as the solution to agriculture productivity in regions such as Africa, commercialising digital solutions for smallholder farmers remains a challenge.

learning or deep learning algorithms rather than custom agronomic support. Secondly, smart-phones or handheld devices drive Africa's digital farming era as this technology and connectivity continues to grow throughout the region, which also indicates that innovative software rather than hardware is vital. Therefore, while digital tools are important, expect business models to be the differentiator and enabler of digital farming in the region. Tools connecting growers with affordable resources will make the most impact. I would discuss this through two success stories in Africa, WeFarm and HelloTractor, both of which Lux interviewed. WeFarm utilises smartphone-based free-ware applications to support small-holder farmers by relying on connectivity and natural language processing to allow the community of users to share agronomic recommendations with one another specific to their needs. This option is affordable and relies on widely available technology, but the company's success will be dependent upon monetising its platform through integration with crop input transactions and distribution networks. WeFarm guarantees access to quality products where distribution connections are available, and this can help overcome nutrient management challenges. HelloTractor takes a different approach to enabling SHF by providing access to machinery services. It collaborates with John Deere, Government

agencies, and other equipment owners and has an “on the ground” understanding of the region enlisting local booking agents that utilise smart devices to book and track services from on tractor sensors. More recently Hello Tractor also developed a collaboration with IBM to provide advanced analytics. Including remote sensing and mechanisation into a low-cost service reduces the financial barrier of entry to digitalisation. It now services farmers in Nigeria, Kenya, Mozambique, Bangladesh and Pakistan. HelloTractor checks the boxes necessary for digital tools to impact developing regions; an understanding of regional needs, strong financial support, and it specifically tackles the issues of small-holder farmers whereas WeFarm’s success remains less certain do to its financial model.

Future of digital farming

Overall, digital farming allows growers and industry leaders to do more with less. By optimising the application of agrichemicals, assessing risks preventatively, and identifying issues early, yields and the quality of produce improve or at least remain stable and do so on limited arable land. For instance, a US contest for corn production reported a new record at more than 600 bu/acre. The result was achieved through a combination of variable rate application, crop health monitoring, and regional crop selection. While not realistic for large scale production, the example indicates that digital farming is also not just about optimising crop inputs, it is about the complete relationship of the crop (genetic background) the environment and the grower’s current and historical practices. Digital farming allows the connection of these attributes and the industry is moving towards developing such tailored solutions. For the smaller grower, digitalisation provides the opportunity to take their success into their own hands and even access financial support. It provides access to historical and current agronomic data on

handheld devices helping to reduce yield gaps by identifying challenges. It serves to connect communities for benchmarking, expand education of the use of modern farming techniques, and reduce the cost of precision agriculture. These same technologies connect growers with reputable and affordable products as well as produce buyers, reducing waste. E-commerce and food aggregators will play an important role in increasing SHF revenue by reducing the middle man and creating local demand for products. But, the impact of digital farming remains dependent on cost-effectiveness.

Impact on climate-change and environment

Changes in climate affect the regional and local weather differently. The one thing that is sure within a changing climate is that weather will become less predictable, and severe weather events or those capable of damaging crops more common. Digital tools provide a platform to understand this environmental variability and link that information to crop health and then to management decisions. For instance, SemiosBio provides hail or pest warning for producers of high-value fruit crops. Many companies are developing digital platforms that provide recommendations targeting environmental sustainability. Land O Lakes Truterra is just such a platform and recently Indigo has developed its own carbon credit system to support regenerative agriculture. When it comes down to it, industry’s support of sustainability depends on competitive production with conventional methods and digital tools provide the means to analyse and assess that potential. Therefore, even though digital tools appear unrelated to sustainability, they will be the enabling technology that supports adoption or supports the improvement of techniques to realise adoption.

“As companies in the food industry are trying to embrace digital transformation, this report is a critical resource to uncover the true potential of digital technologies

applied to the right use cases,” said Venkataraman. “More than in other industries, digitalisation in food will be a common thread across the entire agrifood ecosystem to enable industry players to address consumers’ future needs. The fact is, food companies that resist the digital conversion will not be able to keep up with more digital-savvy innovators, and will face higher R&D costs, longer product development timelines, and shrinking market share.”

The impact of digital tools on the sector will be significant as a means to address consumer demands for personalised product offerings and to manage a more integrated, digital, and omnichannel global supply chain.

Tools connecting growers with affordable resources will make the most impact for Africa-Lux Research.

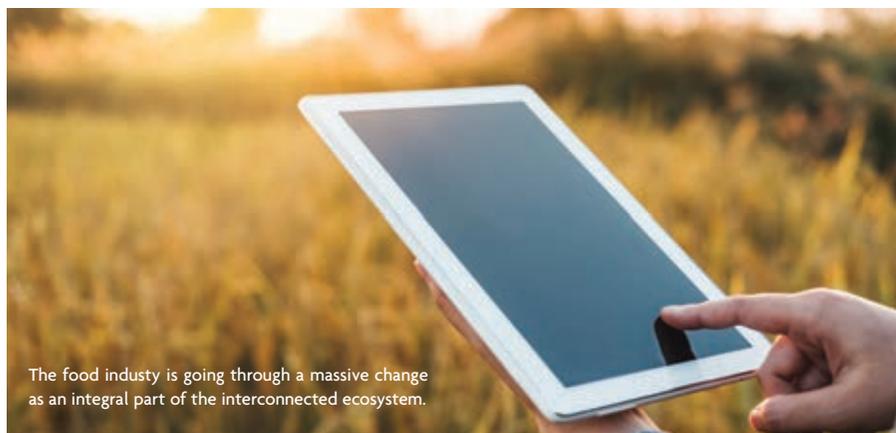
Through a series of data-backed use cases, Lux’s new report, “The Digital Transformation of the Food Industry,” identifies a framework that the agrifood industry players should use to evaluate and implement digital tools for solving specific business issues.

The report is based on the digital framework created by Lux, in which six core outcomes of digital transformation have been identified – uncover invisible insights, predict the future, optimise, upskill humans, make information accessible, and automate – and focuses specifically on the application and unique challenges of adoption in the food industry.

Lux Research points out that the consumer is at the centre of the ecosystem formed by agriculture, food and health, since the consumers’ demands frequently drive changes across the ecosystem – but each part exerts influence on the others. More than other industries, the agrifood and health ecosystem requires companies to think beyond their four walls to identify both opportunities and risks.

As an integral part of the interconnected ecosystem, the food industry is going through a massive change which can be attributed to a number of important external drivers.

The report highlights eight use case examples of digital in the food value chain, including ingredient informatics, cold chain monitoring, automated food quality inspection, and food traceability and transparency, and illustrate how to apply the digital framework to achieve successful digital tool use and avoid dangerous (but easy-to-make) pitfalls. 



The food industry is going through a massive change as an integral part of the interconnected ecosystem.

Image Credit: Adobe Stock

Global Open Data for Agriculture and Nutrition (GODAN) - a UN and UK & US Government supported initiative, driving global efforts to tackle food security, creates awareness about the numerous possibilities that open data offers and how it can be used to improve the agricultural industry.

Open Data enhancing agriculture

AS GROWING POPULATION and environmental challenges threaten food security, governments and multilateral agencies are looking to data for the answers.

Data, once made open, can help shape solutions by enabling more efficient and effective decision-making at multiple levels across the agriculture and nutritional value chain.

Combating climate change

Open data will allow farmers and governments to track temperature changes, map deforestation and biodiversity than they were previously able to. From this, they will be able to devise better decision making and understanding as to what needs to be done. Over time, this will help create a more sustainable and efficient model of farming which is much more environmentally friendly. Pest and disease management

Sharing information on pests and diseases with farmers in real-time can prevent further spread; saving crops, and reducing economic losses and environmental damage. However, information on pests and diseases can be considered sensitive due to trade and export impacts. Access to such information means farmers are likely to only use pesticide when responding to a real threat, saving money and the environment. Immediate action when a disease or pest outbreak does occur can prevent severe crop loss and halt the spread of the problem.

Underpin innovation

By understanding open data, there will be a platform which will enable anybody to look for new and interesting ways to help improve agriculture. With data sharing, knowledge and understanding will grow and spotting interesting patterns within the data can help make changes. This can be in the form of new technology, better farming methods or even new ways to grow crops.

Economic growth

Open data is seen as a driver for economic growth. It reveals opportunities for businesses within the industry, both large and small, to build new services, identify



Image Credit: arrowsmith2/Adobe Stock

Open data can help shape solutions by enabling more efficient and effective decision-making at multiple levels in agriculture.

more cost-effective methods and improve operations. With access to accurate information, farmers are able to maximise their crop yield, meaning more crops can be produced and sold; in turn, this boosts a country's exports. Businesses can also use open data to learn more about the quality of their products to help attract more customers. This improved efficiency will help grow those in the agricultural chain and allow for more prosperity.

Achieving food security

With more than 500 million children undernourished, nutrition is a growing global problem. Good quality, comparable, timely nutrition data is vital for guiding government intervention, for improving existing initiatives, and achieving the 2030 UN SDGs targets of eliminating hunger and malnutrition.

With universal access to a strong data ecosystem, this would enable farmers to

Universal access to a strong data ecosystem, this would enable farmers to develop their farming and production practices.

develop their farming and production practises for the better as well as effectively monitoring factors such as food supplies, weather changes and other crucial information. From this, farmers will be able accurately plant more crops as well as produce better quality ones which provide more food for themselves and society.

What are the characteristics of Open Data?

Availability and Access: For data to be open, it must be available at a reasonable reproduction cost in modifiable form, and be accessible to use, modify and share for any purpose.

Re-use and Redistribution: The data must be provided under terms that permit re-use and redistribution including the intermixing with other datasets.

Universal Participation: Closed data practices limit effectiveness from innovation, progress, value generation and the fair distribution of resources. Everyone must be able to use, re-use and redistribute open data, leaving no discrimination against fields of endeavour or against persons or groups. For example, 'non-commercial' restrictions that would prevent 'commercial' use, or restrictions of use for certain purposes (e.g. only in education), are not allowed. **B**

Economical and ecological ways to weed control go a long way in increasing agricultural yields.

APV launches mechanical crop care solutions

AS MECHANICAL CROP care is gaining significance, APV has unveiled the crop management solutions, Tined Weeder AS, the Rotary Hoe RH and the Tined Weeder Pro VS, all aiding the requirements of weed control.

The APV Tined Weeder Pro has been designed in a way that enables the user to adapt the tine pressure so that only the tine's own weight is working. This option increases the period of use enormously, as optimum weeding results can also be achieved in the sensitive plant stages.

With its innovative tine and spring system, the Tined Weeder Pro adapts precisely to the soil and protects the crop at the highest level. The spring system enables the tines to adapt perfectly to the soil, while the tine pressure remains constant at different time levels. As a result, crops planted on ridges such as potato, carrot or similar, can be harrowed and it is guaranteed that the ridge remains its shape.

The tines, in contrast to the conventional Tined Weeders, are mounted wide. The benefit of this is that the tine can only move downwards and upwards and not to left or right.

The Rotary Hoe - a weeder with rotating tines that can be turned up to 30 degrees in the direction of travel - suitable for mulch seeding. The rotating hoe rings bury or uproot the weeds, promote tillering of the crop, incorporate oxygen into the soil and



Image Credit: APV

Flexible innovations aimed to boost farm productivity.

break up hard soil crusts. Thanks to the rotating rings, the tines remain free of plant and soil material.

The tines of the Tined Weeder AS penetrate the soil while harrowing to a maximum depth of 2-3 cm to break up and crumble the upper soil crust. This ensures

APV offers solutions to break up soil encrustations and decimate unwanted weeds at the same time.

better soil aeration and the capillarity is interrupted.

The main focus is on combating unwanted weeds. While the tines sweep over the soil, the weeds, which are already in threads or germinating, are pulled out and deposited on the soil surface. There they wither and die off. This means that approximately 90 per cent of the weed germs are decimated.

It is important to use the product suited to individual needs in crop protection to defend against weeds, pests, viruses, plant diseases, and other harmful factors. 

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Okuafo Foundation is Ghana's first winner of the global Zayed Sustainability Prize

OKUAFO FOUNDATION, THE agriculture technology solutions service provider, has won the Zayed Sustainability Prize in the Food Category, becoming the first Ghana-based winner of the prestigious award, at its 12th annual awards ceremony, held in Abu Dhabi, United Arab Emirates.

The Zayed Sustainability Prize's 'Food Category' is open to small to medium-sized enterprises (SMEs) and non-profits (NPOs), with the winner receiving US\$600,000 to develop their solution or service. Among many objectives, this category typically rewards organisations that are committed to ending hunger and malnutrition, increasing agricultural productivity, or ensuring sustainable food production systems. Organisations must also demonstrate a vision and long-term plan to further deploy their solution and scale up their impact, as well as inspiring others to follow suit by advancing sustainable and human development.

Okuafo Foundation received the award in the Food category for the development of a smartphone application using AI to determine and diagnose diseases in crops at an early stage – without an internet connection. This has helped 30,000 farmers reduce their crop losses and improve their harvest by 50 per cent, in Ghana, Nigeria, Togo, and Burkina Faso.

"The importance of organisations in driving forward positive changes and



Technological innovations helping farmers reduce crop losses and improve harvests.

Image Credit: Adobe Stock

implementing innovative sustainability practices and solutions will be vital to the world's social and economic development, in the years and decades to come," Dr Lamya Fawwaz, director of the Zayed Sustainability Prize, said.

In recognition of winning the Zayed Sustainability Prize, co-founder of Okuafo Foundation, Mustapha Diyaol Haqq, said, "We are extremely honoured and humbled to be the winners of the Zayed Sustainability Prize, in the Food category. This award comes at a time when it is most needed. We live in times where families are working extremely

hard but gain close to nothing as output. Smallholder farmers are living in extreme poverty and hunger and, despite working all year round to produce food, they get very little returns from their input. The winning prize fund will enable us to empower farmers, across Africa, with sustainable AI-powered solutions that will revolutionise the way they farm, store, and process their yields. This, ultimately, lives up to the legacy and goal of the late Sheikh Zayed Bin Sultan Al Nahyan [the founding father of the UAE] of ensuring no child goes to bed with an empty stomach."

Boosting financial inclusions in rural Uganda

MORE THAN 75 per cent of Ugandans are employed in the agricultural sector – which accounts for 26 per cent of the nation's GDP. To promote meaningful financial inclusion, the UN Capital Development Fund (UNCDF) understood that it needed to directly address the rural population, particularly farmers and other players in the agricultural value chain. In the context of rural digital finance, the concept of a "booster team" is a dedicated team that supports one or several organisations to distribute their products and services to the last mile population. These products can range from financial services, energy products, digital and financial literacy content or any other service.

The booster teams are deployed to rural areas to simultaneously register customers, sell mobile handsets, recruit agents, educate value-chain stakeholders on the benefits of a digital payment ecosystem, and train users on the operation of a mobile phone and mobile money. The basic structure of a booster team is detailed in the report.

The pilot began in Uganda in 2018 and evolved organically through three main phases. The first phase involved market identification and preparation that aimed to locate areas with an economic anchor and prepare those areas for digital ecosystem growth. The second phase was the market storm. In this phase, it was important to work with community members, both rural actors and agents, to make sure they understood their role and that customers could grasp the benefits of a digital ecosystem. The third phase involved the push for sustainability with the aim to ensure the provider and other partners

are profitably able to continue to reach difficult demographics with appropriate financial products. This phase helped UNCDF to analyse usage data and identify additional gaps and improve approaches for the hardest-to-reach demographics.

The pilot generated several learnings and insights that are shared in the report. The first is for all activities of the booster team to be nudged and not pushed. The team is there to build on existing systems and not fundamentally redesign infrastructure. For this to work, the provider must be sufficiently motivated to solve issues that teams may face. The second lesson learned is to recruit experienced talent within a developed digital ecosystem. The third is to make sure participating members of the booster team already have viable businesses running so that they do not have to rely initially on the revenues from the value chain and can use pre-existing revenue to invest in rural solutions as needed. The last insight is for providers to organize mobile money teams in different ways and to be open to adapt to the existing structure when technical experts design the booster teams.

This approach significantly increased penetration in rural areas. These hard-to-reach areas often have low population densities, poor roads and scattered economic activities. Nevertheless, UNCDF has made one of the most concerted efforts in the industry to determine what it takes to breach the rural frontier and to make sure no one is left behind in the digital era.

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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 2021 edition of the Directory can be kept up to date.

Supplier Listings
start on page 33

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start on page 35

Classified Listings

Agricultural Consultancies

ICS

Agricultural Equipment - General

Alvan Blanch Development Co. Ltd.
Baldan/Pan Trade Services Ltd.
ICS

Agricultural Projects

CELLI S.p.A
ICS
Symaga SA

Automatic Chain Feeders

Big Dutchman International GmbH

Bagging plant

Bagtech International (Pty) Ltd.

Bale Handling Equipment

JOSKIN S.A.

Breeding

Hendrix Genetics

Briquetting Plants

Alvan Blanch Development Co. Ltd.

Bulk Storage Equipment

Chief Industries UK Ltd.
Symaga SA

Cages & Batteries

Big Dutchman International GmbH

Cassava Processing Equipment

Alvan Blanch Development Co. Ltd.

Cocoa Production

Alvan Blanch Development Co. Ltd.

Coffee Processing, Handling & Storage

Swingtec GmbH

Colour Sorting Equipment

Alvan Blanch Development Co. Ltd.

Conveyors and Elevators

Big Dutchman International GmbH

Coolers - Environmental

Big Dutchman International GmbH

Cotton Handling & Storage

JOSKIN S.A.
Swingtec GmbH

Crop Drying and Ventilation

Alvan Blanch Development Co. Ltd.

Crop Handling & Storage

Alvan Blanch Development Co. Ltd.
Chief Industries UK Ltd.
Swingtec GmbH

Crop Protection Equipment

Swingtec GmbH

Cultivators

Baldan/Pan Trade Services Ltd.
CELLI S.p.A
Monosem

Disinfectants

Intraco Ltd.

Drinking Systems

Big Dutchman International GmbH

Dryers

Alvan Blanch Development Co. Ltd.

Egg Collection

Big Dutchman International GmbH

Egg Layer Breeding Stocks

Hendrix Genetics

Egg Layer Parent Breeders - Brown

Hendrix Genetics

Egg Layer Parent Breeders - White

Hendrix Genetics

Egg Layers

Hendrix Genetics

Extruders for Food, Feed

Alvan Blanch Development Co. Ltd.

Feed Additives

Evonik Nutrition & Care GmbH Animal Nutrition
Intraco Ltd.
Unipoint AG

Feed Concentrates

Intraco Ltd.

Feed Ingredients

Intraco Ltd.
Unipoint AG

Feed Premixes

Intraco Ltd.
Unipoint AG

Feed Processing Plants

Alvan Blanch Development Co. Ltd.

Feed Supplements

Unipoint AG

Feeders

TATOMA

Feeding Systems

Big Dutchman International GmbH
TATOMA

Fertiliser Mixers

Bagtech International (Pty) Ltd.

Fertiliser Processing Machinery

Bagtech International (Pty) Ltd.

Fertiliser Spreaders

Baldan/Pan Trade Services Ltd.
JOSKIN S.A.
Monosem

Fish Feeds - General

Alvan Blanch Development Co. Ltd.

Fogging Machines

Big Dutchman International GmbH
Swingtec GmbH

Food Processing Equipment

LIMA S.A.S.
Marel Poultry

Forage Feeding Equipment

TATOMA

Fruit Processing

Alvan Blanch Development Co. Ltd.

Genetic Research

Hendrix Genetics

Grain - Drying & Ventilation

Alvan Blanch Development Co. Ltd.
Chief Industries UK Ltd.

Grain - Handling, Cleaning & Processing

Alvan Blanch Development Co. Ltd.
Chief Industries UK Ltd.

Grasscutting Machines - Forage

JOSKIN S.A.

Groundnut Handling Equipment

Alvan Blanch Development Co. Ltd.

Harrows

Baldan/Pan Trade Services Ltd.
CELLI S.p.A

Harvesting Equipment

Alvan Blanch Development Co. Ltd.
JOSKIN S.A.

Horticultural Equipment & Machinery

Swingtec GmbH

ICT Equipment & Services

Big Dutchman International GmbH

Integrated Pest Management

Swingtec GmbH

Irrigation & Drainage Systems

RKD Irrigacion S.L.

Irrigation Equipment

RKD Irrigacion S.L.

Livestock Handling

JOSKIN S.A.

Maize Shellers

Alvan Blanch Development Co. Ltd.

Material Handling

Bagtech International (Pty) Ltd.

Material Handling - Bulk

Bagtech International (Pty) Ltd.

Meat Processing and Packaging

LIMA S.A.S.
Marel Poultry

Medicators

Big Dutchman International GmbH

Milling & Mixing

Alvan Blanch Development Co. Ltd.

Oil Extraction Equipment

Alvan Blanch Development Co. Ltd.

Palletizers

Big Dutchman International GmbH

Pelleting

Alvan Blanch Development Co. Ltd.

Pig Equipment

Big Dutchman International GmbH
MIK International GmbH & Co. KG
Symaga SA

Pig Feeding/Drinking Equipment

Big Dutchman International GmbH

Pig Flooring

Big Dutchman International GmbH
CARFED SA
MIK International GmbH & Co. KG

Pig Housing

Big Dutchman International GmbH
MIK International GmbH & Co. KG

Planters

Baldan/Pan Trade Services Ltd.
Monosem

Plastic Flooring, Poultry

Big Dutchman International GmbH
MIK International GmbH & Co. KG

Ploughs - Disc

Baldan/Pan Trade Services Ltd.

Poultry Equipment - Drinking

Big Dutchman International GmbH

Poultry Equipment/Handling

CARFED SA

Poultry Feeding

Big Dutchman International GmbH

Poultry Housing

Big Dutchman International GmbH
Symaga SA

Poultry Processing Equipment & Supplies

CARFED SA
LIMA S.A.S.
Marel Poultry

Poultry Projects, Integrated

Marel Poultry

Power Units

FG Wilson

Public Health

Swingtec GmbH

Rice Parboilers

Alvan Blanch Development Co. Ltd.

Rice Processing & Milling Equipment

Alvan Blanch Development Co. Ltd.

Roll-out Nests

Big Dutchman International GmbH

Seed

ICS

Seed Cleaning Equipment

Alvan Blanch Development Co. Ltd.

Seed Planting Equipment

Baldan/Pan Trade Services Ltd.
Monosem

Silage

JOSKIN S.A.

Silos

Alvan Blanch Development Co. Ltd.
Big Dutchman International GmbH
Chief Industries UK Ltd.
Privé SA
Symaga SA

Slaughtering Equipment

Marel Poultry

Slurry Disposal

JOSKIN S.A.

Sprayers

GOIZPER GROUP
RKD Irrigacion S.L.

Sprayers - Crop

GOIZPER GROUP

Spraying Nozzles & Components

GOIZPER GROUP

Stored Products Protection

Swingtec GmbH

Straw Choppers/Grinders

TATOMA

Traders in Agricultural Equipment, General

CELLI S.p.A
ICS

Trailer Transporters, Livestock

JOSKIN S.A.

Trailers

JOSKIN S.A.

Transport Boxes

CARFED SA

Transport Crates for Poultry

CARFED SA

ULV Spraying Equipment

GOIZPER GROUP
Swingtec GmbH

Ventilating Equipment

Big Dutchman International GmbH

Waste Disposal Equipment

Big Dutchman International GmbH

Water Pipes

RKD Irrigacion S.L.

Watering Equipment

RKD Irrigacion S.L.

Weed Control

GOIZPER GROUP

Weighers - Animal

Big Dutchman International GmbH

Weighing Equipment

Alvan Blanch Development Co. Ltd.
Big Dutchman International GmbH

Supplier Listings**Alvan Blanch Development Co. Ltd.**

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Fax: +44 1666 577339
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E-mail: info@alvanblanch.co.uk

British manufacturers of agricultural machines and complete processing solutions. Specialists worldwide in drying technologies for all materials. Process engineers with 50 years' experience in the African market; with products ranging from grain cleaning, drying and bulk storage, to milling for feed, flour, rice as well as waste and fruit processing.

Agents:

Cote D'Ivoire - Alvan Blanch West Africa
Nigeria - Alvan Blanch Nigeria
Uganda - Alvan Blanch East Africa

BAGTECH

FERTILIZER MANAGEMENT
AND HANDLING SOLUTIONS

Bagtech International (Pty) Ltd.

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Musgrave Road
Durban
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4062, South Africa
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Web: www.bagtechint.com
E-mail: bagtech@bagtechint.com

More than 30 years of experience in agribusiness, Bagtech has delivered hundreds of successful projects

around the world. Bagtech team is ready to offer fertilizer machines equipped with artificial intelligence online control, enabling the settings adjustments accessible from anywhere. Besides machines, the company offers its wide expertise from consultancy to logistics services for the fertilizers industry.

**Baldan/Pan Trade Services Ltd.**

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**Big Dutchman International GmbH**

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Germany
Tel: +49 4447 8010
Fax: +49 4447 801237

Web: www.bigdutchman.com
E-mail: big@bigdutchman.de

Big Dutchman is the world's leading equipment supplier for modern pig and poultry production. The product

range includes traditional and computer-controlled feeding and housing equipment as well as systems for climate control and exhaust air treatment. The scope varies from small to large, fully integrated turn-key farms.

Agents:

Algeria - SARL Mecafa Algeria
Cameroon - Agroceam
Egypt - Commercial Group Edward Y. Nekhela & Co.
Egypt - Elyasmengroup (Cairo office)
Kenya - Agriculture Equipment Kenya Ltd.
Libya - Agriculture Technology Co.
Morocco - Agri-Art
Nigeria - BD Agriculture Nigeria Ltd.
Senegal - Soproda (Region Dom-Tom + Continent d' Afrique)
South Africa - Big Dutchman South Africa (Pty) Ltd.
Sudan - Sonata Trading Ent.
Tunisia - SEMA Karim Louafi

**CARFED SA**

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20098
Italy

Tel: +39 02 9881140
Fax: +39 02 98280274
Web: www.carfed.ch
E-mail: info@carfed.ch

CARFED SA is a worldwide known Swiss-Italian group that specializes in plastic poultry products.

CARFED SA has the widest range of collapsible and non-collapsible plastic chicken crates, to haul live

birds :

- Mondial CARFED and Mondial "S" of cms 80x60x28
- Multi 100 of cms 97x58x27
- Muti 110 of cms 108x58x27
- Super, not collapsible, of cms. 99x58x26
- CARFED products can be seen in the website www.carfed.ch

**CELLI S.p.A**

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Italy

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Web: www.celli.it
E-mail: info.celli@celli.it

CELLI is a worldwide leader in the production of soil preparation machinery since 1955. The wide range includes rotary tillers, power harrows, stone burier, bed formers, mulchers, spading machines and subsoilers. CELLI distributes its products in over 60 countries and continues to develop and innovate to help the farmers to improve efficiency and profits.



Chief Industries UK Ltd.

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England
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United Kingdom
Tel: +44 1621 868944
Fax: +44 1621 868955
Web: www.chief.co.uk
E-mail: sales@chief.co.uk

Chief Industries has over 60 years experience in grain handling systems, incorporating state-of-the-art design and manufacturing, supplying flat floor silos with capacities ranging from 30 to 30,000 tons, hopper bins with capacities ranging from 2.5 to 1,400 tons, and grain dryers capable of drying up to 300 tons per hour.



Evonik Nutrition & Care GmbH Animal Nutrition

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Evonik is one of the world leaders in the field of animal nutrition. With plants on four continents we are a reliable partner in delivering efficient feed solutions and supporting our customers to produce safe, high-quality and affordable meat, fish, eggs and milk. Through our unique analytical services savings potential can be identified on a fingertip. Feeding the world's population in a sustainable way is one of our goals.

Agents:
South Africa - Evonik Africa (Pty) Ltd.

FG Wilson

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Tel: +44 (0)2890 495000
Fax: +44(0) 2828 261111
Web: www.fgwilson.com
E-mail: web_editor@fgwilson.com
From 6.8 - 2,500 kVA, FG Wilson

diesel and gas generator sets are reliable, efficient and designed, tested and manufactured to the highest UK standards. They have been a feature of many farms and food processing facilities for a long time as they are one of the most flexible and cost-effective way to insure against interruptions in the mains electricity supply.

GOIZPER GROUP

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E-mail: layinghens@hendrix-genetics.com

Hendrix Genetics is the world's leading breeder of brown and white laying hens, which thrive in both traditional and alternative production systems and in different climatic conditions. Their mission is to contribute to profitable and sustainable egg production through continuous genetic improvement of their laying hens achieved via their balanced breeding program.

ICS

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Created more than 30 years ago, ICS has built its consulting and supplier experience in contact with and on behalf of Agri-Holdings and large scale farms in Africa, the Arab countries and Madagascar. Genuine partner of its customers, ICS associates the providing of efficient equipment and adapted seeds with onsite coaching and training of field and technical teams.

Agents:

Cote D'Ivoire - ICS AGRI COTE D'IVOIRE
Egypt - ICS Agri Egypt
Mali - ICS Agri Mali
Saudi Arabia - CANAHILL
Senegal - Terragrisen
Sudan - French Technology Company

Intraco Ltd.

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Fax: +32 3 2269852
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E-mail: intraco@intraco.be

Intraco Ltd. is the specialist in feed concentrates, premixtures, protein meals, feed additives. Primary business is finding an optimal balance of all local parameters, thus providing customer-made, comprehensive solutions which optimize yields in a profitable and responsible way. HI-CONCEPT: Integrated Hygiene Solutions
ADD-OPTIMALS: Innovative feed additives



JOSKIN S.A.

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4630 Soumagne
Belgium
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Web: www.joskin.com
E-mail: info@joskin.com

JOSKIN is a 50 years old Belgian based family owned business, European leader in design and manufacture of agricultural machinery, and specialized in manufacturing trailers and tankers for agricultural use. These can transport liquid and solid farm manure, cereals, livestock, etc. JOSKIN also has a complete range of machines for pasture maintenance.



LIMA S.A.S.

456, route de Rosporden
Z.I. Guelen
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Marel

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E-mail: info.poultry@marel.com

Marel is the leading global provider of advanced food processing systems and solutions. With the most complete product range and the largest installed base worldwide, Marel offers poultry processing solutions for all capacities, from 500 to 15,000 bph, and for all process steps, from live bird handling to further processing and labeling.

Agents:

South Africa - Marel Food Systems (Pty) Ltd.

MIK International GmbH & Co. KG

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56235
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Tel: +49 2922 885600
Fax: +49 2922 885670
Web: www.mik-online.com
E-mail: info@mik-online.de

MIK INTERNATIONAL is your reliable partner for high quality plastic flooring, feeding systems and feeders as well as penning systems for pig, sheep, goat, calf and poultry since more than 50 years.



Monosem

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E-mail:
export.sales@monosem.com

French Company, whose head office is in Largeasse (France), specialized in the manufacture of agricultural machinery and in particular, precision planting for maize, cotton, soya, peanut etc and cultivating equipment.



Privé SA

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Fax: +33 3 26686699
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E-mail: contact@prive.fr

Privé is a French company with more than 70 years experience in manufacturing round corrugated silos for grain storage. Bins and gantries are manufactured in high quality galvanised steel and their design is based on the strictest European standards.



RKD Irrigacion S.L.

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RKD is specialised in the manufacturing of Center Pivot and Lateral Move Systems since 1980.



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- Stock protection
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- Disinfection
- Sprout inhibition of potato
- Deodorization
- Training and special effects

Agents:

Algeria - SARL SANG & SEVE
Cote d'Ivoire - ALM Afrique de l'Ouest
Egypt - Starchem for Services
Guinea - Saref International
Mauritius - Blychem Limited
Nigeria - U-Mond Ltd.
Seychelles - Michaud Pest Control (Pty) Ltd.
Sudan - Gaddis Trade Company
Tunisia - Société Nouvelle du Comptoir CIBO



Symaga SA

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TATOMA

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E-mail: info@grupotatoma.com

TATOMA is one of the world leading companies in the design, manufacture and marketing of TMR feed mixing solutions for the cattle industry. We are offering robust and state-of-the-art mixer wagons (static, trailed and self-propelled) from 4 to 45 m³ adapted to any farmer's needs in the world. We also provide semi-automated feeding centers for big dairies, able to produce >100t of TMR per hour.

Agents:

Jordan - JORDAN TRACTOR
Lebanon - AIDCO AGRI
United Arab Emirates - OPLUS GENERAL TRD



Unipoint AG

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Fax: +41 52 305 20 42
Web: www.unipoint.ch
E-mail: info@unipoint.ch

Klinofeed®: The unique feed-additive with a high capacity to bind Ammonium and Mycotoxins. Klinofeed is also a highly effective pellet binder. Klinofeed is the original product, EU-registered by Unipoint AG, as feed additive No.: 1g568. Please ask us about Klinofeed: info@unipoint.ch

Agent Listings

Algeria

SARL Mecafa Algeria

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SARL SANG & SEVE

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Constantine, 25140
Tel: +213 31 974010/974000
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Agrocemac

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E-mail: pnouga@bigdutchman.com

Cote d'Ivoire

ALM Afrique de l'Ouest

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Fax: +225 21 258818
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Alvan Blanch West Africa

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ICS AGRI COTE D'IVOIRE

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E-mail: rd@ics-agri.com

Egypt

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Saref International

PO Box 3915
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JORDAN TRACTOR

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E-mail: eabubaker@jtec.com.jo

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Agriculture Equipment Kenya Ltd.

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Libya
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Mali
ICS Agri Mali

Quartier Sotuba ACI
Près du Monument des Soldats
vers le 3ème pont
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Mauritius
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Continent d' Afrique)**

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Fax: +33 1 64209123
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Terragrisen

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Seychelles
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Fax: +248 324166
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South Africa
Big Dutchman South Africa (Pty) Ltd.

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Guateng
1610
Tel: +27 11 4521154
Fax: +27 11 6094908
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cuthbert.mamabolo@evonik.com

Marel Food Systems (Pty) Ltd.

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422 Oscar Street
Boksburg
Johannesburg
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Tel: +27 11 8236940
Fax: +27 11 8236920
E-mail: info.poultry@marel.com

Sudan
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Dr Lisbeth Riis at Scarab Solutions outlines the cost, visibility and management benefits gained from using digital solutions to provide a precise and detailed view of pests and diseases across entire farms.

Digital mapping solutions for horticulture



Image Credit: Jackie/Adobe Stock

Using satellites, GPS tracking and mapping software to create Geographic Information Systems, detailed maps can be produced from the data collected.

MAPPING OF PESTS and diseases in horticulture is still often a manual, inaccurate and inefficient process relying on paper-based analysis and individual knowledge.

Scarab solutions outlines how the use of digital mapping by farmers benefit in terms of total yield, better focus of staff and resources on the farm and limit wastage of pesticides and biological control agents.

Manual data analysis quickly becomes unfeasible

Using manual processes to analyse data is complex due to variations in temperature, moisture and risk of physical damage for greenhouses.

Useful parallels can be drawn with the medical world. In Nigeria, one of the three remaining countries facing Polio, teams would go from village to village in remote,

rural regions of the countryside administering the polio vaccination—but would still rely on hand-drawn memory maps to record that data. People running the global immunisation programme soon realised more effective mapping would help track and eradicate the disease.

Critical geospatial information is useful for cut flower growers in gaining a holistic picture for tracking pests and diseases.

Advanced mapping and analytical tools now available

Using this critical geospatial information, administrators could obtain a more holistic picture showing where outbreaks of Polio were, which villages were missed and the number of teams that had to be deployed to contain it.

The same is true for tracking the effect of pests and diseases for cut flower growers.

Advanced mapping and analytics tools are now available to digitise a large portion of pest and disease mapping, tracking and control—changing how the world targets crop pests and disease. It is the analysis stage where mapping can unlock true value—monitoring scout effectiveness, measuring pests and disease outbreaks and gauging intervention success.

Here are three main benefits across the farm:

Reduced Crop Losses

A digital GPS-based map will present a clear basis for problem shooting by correctly mapping out the extent of pests and diseases in an individual greenhouse. Downy Mildew, for example—which occurs in moist and poorly ventilated conditions. Firstly, early intervention from effective

scouting can pinpoint the affected plants. By using scouting data to digitally map the greenhouse, farm managers can see the pattern of activity visually represented.

One of the cases witnessed by Scarab agronomists was the presence of a small amount of Downy Mildew in only some spots at the end of some rose beds in a particular greenhouse. On initial review the farm manager was completely unaware to the presence of the disease in the house, but on inspection it was found that poorly constructed downpipes spilled over water and caused the ideal moist conditions for this disease out of reach of the manager's eyesight.

This is where effective decision-making comes in. If farm managers did not have this map, then things could easily get worse for them. They could run the risk of the disease spreading to other plants, with potentially catastrophic impact to total yield. Instead they can react accordingly—even putting preventative measures in the form of quality control of the farm's works departments to protect plants from being at risk in the same way in the future.

Ecuadorian grower Naranjo Roses implemented a mapping system to manage Powdery Mildew, Head Botrytis and Downy Mildew—in a single year it managed to boost its number of flowers available for export by 7.5 per cent.

Improved pesticide and biological control

Since all greenhouse environments are slightly different—so pest and disease presence and proliferation will vary for each and every one. So, using the same volume and coverage of pesticide spraying across them all makes no sense. With an effective map, farm managers can target spraying to specific areas in specified rows, minimising the volume of pesticide used



The level of excellent mapping, combined with an analytical tool, provides a cornerstone for biological control.

Image Credit: Adobe Stock

across the entire farm.

The same applies to biological control. Let's take the presence of spider mites for example. There is a significant cost associated with the deployment of predatory mites. Excellent scouting and mapping of the locations within a greenhouse allow the spatially targeted release of the predatory mites, specifically where there are spider mites and insufficient numbers of predators. This avoids wasting predatory mites where there are no spider mites, or where there are already sufficient numbers of predators.

This level of excellent mapping, combined with an analytical tool, provides a cornerstone for biological control. One such biological control program at Equinox Horticulture near Mount Kenya in East Africa has benefited significantly from the improved information and analysis delivered by this technology. The company reduced its requirements for *Phytoseiulus persimilis* (a predatory mite) by 60-90 per cent, depending the season.

Better farm management – from the top down

Farm management can be revolutionised

by using software to analyse these huge data sets and graphically represent an accurate view of every greenhouse. This software is available and is being used to great effect in many cut flower farms across the world – in fact, the Scarab Precision system, for example, is already implemented with 25 per cent of rose producers in Latin America and East Africa.

When the data about pests and diseases from every greenhouse is logged into a mobile device it becomes very easy to build an overall picture of the performance of the whole farm.

Daily reports containing the information is delivered directly to the farm or crop protection manager—such as Spider mite presence, Downy Mildew, Powdery Mildew, Head Botrytis, Thrips and damage and much more. Not only does this allow farm or crop managers to track performance daily, but they can also dig deeper into particular focus areas dating back months or years.

They can then make data-driven decisions to focus scouts and farm workers on target areas and report accurate and up-to-date management information to farm owners. **E**

Namibian dairy farm uses biogas for reduced cost

A DAIRY FARM business was in the process of commissioning a biogas generator to use biogas from cattle waste products. Unfortunately, the biogas generator could not accommodate the start-up current of the motor – it was too large compared with the current rating of the biogas generator.

Working with Namibia-based electrical solutions provider, EcoProjects, three 75kW Rockwell variable speed drives (VSD) were installed to bring down the start-up current. The Rockwell drives were selected for their quality and competitive pricing. Notably, EcoProjects is the only certified systems integrator in Namibia for Rockwell products.

EcoProjects required additional power protection equipment, to alleviate problems associated with harmonics and transient surges.

CP Automation joined the dairy farm project and suggested Revcon harmonic filters and a SineTamer surge protection device.

"Since the project finished, everything is running well," explained Carlo van Heerden, engineering solutions manager at EcoProjects. "Cost was a big driver in this project. Not only were the parts supplied price competitive, the customer can now generate electricity at a much cheaper rate – essentially for free."

"This was another successful collabora-

tion with Rockwell and EcoProjects," explained John Mitchell, global business development manager at CP Automation. "A key part of the success was the prioritisation of power quality. While harmonics are generally well-known and understood, transient surges are less commonly acknowledged, but just as damaging.

The project certainly demonstrates the potential for more farming businesses to make use of the naturally occurring biogas available to them. But expert advice, and effective power quality will remain fundamental in implementing this green technology in farms all over the world.

Field robotics researcher professor Arno Ruckelshausen from Osnabrück University of Applied Sciences spoke with Continental at the last edition of Agritechnica.

Sensor technology redefining agriculture

Are farmers soon going to need a degree in computer science to be able to bring in the harvest?

If we look at the innovations presented at Agritechnica over the past 10 years, the degree of innovation has indeed shifted increasingly towards electronics, information technology and sensor systems. Seeding, harvesting and feeding machines are being digitally upgraded.

They are networked and becoming increasingly automated. In principle, agricultural technology is playing a pioneering role for other production industries. For example, today, industrial applications are often networked, but then machines in production plants do not usually move around. In agriculture, on the other hand, the machines are mobile, even under difficult outdoor conditions. In the automotive industry, "autonomous driving" is a major trend, but in agriculture, autonomous working is added on.

Are we witnessing the emergence of agriculture 4.0, a digitally upgraded agricultural sector with smart, networked infrastructure?

Farming 4.0 already exists, and we are even one step ahead of Industry 4.0. In principle, networked and, above all, mobile production plants on wheels are being used in agriculture. It's just that a factory like this is called a combine harvester, for example. The challenge is to make complex work processes more economical and ecological through a digital transformation process. Mobile work processes in the fields run subject to many disturbance variables: rain, storms, snow, uneven, muddy or bone-dry ground. These are huge challenges to the robustness of the technologies used.

What is the significance of this discipline for agriculture?

In actual fact, everywhere where machines are being made smarter or more efficient for use in an agricultural sector, that is increasingly tending towards sustainability. The aim is to use different sensor systems to get an in-depth understanding of every major agricultural issue. In the future, it



Prof Dr Arno Ruckelshausen is one of agriculture's best-known robotics experts.

Image Credit: Continental

could mean no sensors, no harvest.

The field is no longer being regarded and treated as a unit. Imaging optical sensor systems – such as laser scanners, stereo cameras and hyperspectral systems – or radar sensors produce important raw data that can be interpreted in relation to soil properties or plant characteristics. In this way, a field can be broken down into the quality of the individual plants: this is already the object of research. The sensor data is merged with other data, such as soil or weather data. There are already practical solutions for accessing the various data sources, such as the universal, manufacturer-neutral data-sharing platform for farmers, "agrirouter." The main challenges are interpreting the merged data and the resulting action instructions.

The tractor is, in the end, an auxiliary vehicle that mainly pulls other machines. Will it be retired if autonomous field robots take over?

A tractor alone hardly helps anyone – except for the company that sells it, and perhaps the farmer, who can impress his neighbours with a large machine. Apart from that, the tractor is only actually worth

anything when linked, mechanically and digitally, to an implement for agricultural processes. The implement is an important part of the unit because it determines the process.

Whether I am fertilising, collecting hay with a loader wagon or working the soil, the tractor is a tool for a machine that does the actual work. This approach is called Tractor Implement Management (TIM). This means that smart implements for sowing, fertilising or harvesting are networked with the tractor so that they become one unit. In the future, implements are to operate on their own as autonomous machines, i.e. the tractor function is integrated into the self-driving implement, then the good old tractor would actually be superfluous.

How do self-driving machines make agriculture safer?

The development of autonomous systems is – as in the automotive sector – being accompanied by the introduction of hybrid systems, for example in the form of ADAS for autonomous driving and working. This so-called adaptive autonomy also includes autonomous and non-autonomous agricultural machinery working together on a field. **B**

Spotlight on Ethiopia's tree-planting programme



Image Credit: Richard Buchbinder/Adobe Stock

Ethiopia plans to plant four billion trees on 1.5 million ha across the country: 40 trees per person

ETHIOPIA HAS EMBARKED on an ambitious tree-planting programme and planted more than 350 million trees in a day

"Climate change impacts have greatly affected Ethiopia in terms of flooding, drought and food insecurity," said Margaret Oduk, programme coordinator of the UN Environment Programme's (UNEP) Liaison Office to the African Union Commission, the United Nations Economic Commission for Africa (ECA) and Ethiopia.

"In 2017 alone, the country lost more than two million animals due to drought. Furthermore, environmental degradation-exacerbated by increased human use of land, unsustainable agricultural practices, indiscriminate grazing of animals and the collection of firewood for household energy - has contributed to reduced land cover and protection against soil erosion, which in turn is further reducing forest cover," she noted.

Under the country's National Green Development programme—launched in May 2019 to combat climate change and environmental degradation, Ethiopia plans to plant four billion trees on 1.5 million ha across the country: 40 trees per person.

The government has established a five-member expert group to monitor and assess the tree-planting programme. Members are

drawn from four ministries, the United Nations Development Programme, as well as Ethiopia's Environment, Forest and Climate Change Commission. The plan is to devolve responsibility to relevant institutions and local authorities for planting, monitoring progress and improving the survivability of seedlings.

Ethiopia has a huge and youthful population, with 69 per cent of its 104 million people under the age of 29. The prime minister has called for youth to engage voluntarily in their respective communities to support the campaign.

Monitoring

Ethiopia has pledged to restore 15 million ha of degraded forests and landscapes by 2030, as part of the "Bonn Challenge."

"This amount of land will be more than sufficient to absorb four billion trees," commented UNEP ecosystems expert Tim Christophersen.

According to a study published in *Science* in July 2019, there is space for up to one trillion additional trees globally, on 0.9 billion ha of land.

"It is important to note that planting trees and using land for other purposes, such as agriculture, are not mutually exclusive. Agroforestry is the science of combining tree growing with agriculture, often

resulting in higher food yields and/or better-quality soil. For example, shade-grown coffee does well," added Christophersen.

"There are also a number of trees across Africa and elsewhere that can fix nitrogen from the atmosphere as fertiliser in the soil, and thus support agricultural productivity. It would be a mistake to assume that more trees would necessarily mean less agriculture. Sustainable agriculture and forestry practices will need to be a big part of the restoration in Ethiopia and in other countries," he added.

UNEP is working with countries across Africa to stop deforestation and increase forest cover. This is crucial in honouring African countries' commitments to mitigate climate change and contribute to the achievement of the UN Decade on Ecosystem Restoration 2021–2030.

Led by the UN Environment Programme, the Food and Agriculture Organisation of the United Nations and partners such as Afr100, the Global Landscapes Forum and the International Union for the Conservation of Nature, the Decade covers terrestrial as well as coastal and marine ecosystems. A global call to action, it will draw together political support, scientific research and financial muscle to massively scale up restoration.

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Vencomatic Group acquires Van Gent Laying nests

THE EERSEL-BASED VENCOMATIC Group, developer of sustainable poultry systems, takes over Van Gent Laying nests from Renswoude.

Van Gent Laying nests is a player in the breeding and laying sector with presence across the international poultry world.

The acquisition aims to provide quality service across the global poultry sector. "We have always had a great deal of respect for Van Gent with its cast-iron reputation for service and technical results," said Lotte van de Ven.

With the acquisition, Vencomatic Group becomes a supplier of the Van Gent laying nests and strengthens its position in the broiler breeder sector.

Realising yield prediction for growers and crop advisors

HOOGENDOORN GROWTH MANAGEMENT has introduced sustainable training for international growers on how to use their data based on the principles of Growing by Plant Empowerment

Since the start of Data-Driven Growing, it has been made easier for growers by enriching their data to realise a yield prediction.

According to Hoogendoorn, the yield prediction provides a number of benefits for growers and crop advisors.

For growers, it is important to start registering data to achieve more insights and gaining more steering elements. A grower can anticipate the market demand by utilising yield predictions. Therefore, the optimum production quantity can be realised, with which the grower can realise an optimal pricing strategy.

Moreover, when applying the yield prediction, it is possible to deploy your staff efficiently. This way you save time and costs which leads to a higher turnover.

The use of data makes it easier for crop advisors (worldwide) to provide advice to growers. The yield prediction makes it possible to provide specific advice based on market demand. It is made easy for crop advisors to gain insights into the temperature increase per hour for the purpose of yield optimisation.

Based on this, crop advisors can provide growers with better advice for crop management.

Hoogendoorn offers solutions for horticultural automation to make daily work activities for users, clearer and simpler helping them in saving time. Their advanced technology measures and analyses business processes precisely and issues alarms both on time and only when action is necessary.

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