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image Credit: Adobe Stock



Deputy high commissioner, Nigeria and MD of Alain Charles publishing at Agroinvestment Summit. p22



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African Farming

and Food Processing

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Farming Calendar 2018

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2-4	Value Added Agriculture Expo www.valueaddedagri-wa.co.za	ACCRA
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SEPTEMBER

4-6	NIIA West Africa Expo www.niaawestafrica.com	KANO STATE
12-13	Farm-Tech Expo Kenya www.farmtech-expo-kenya.com	NAIVASHA
21-22	Naivasha Horticultural Fair www.naivashahortifair.com	NAIVASHA

OCTOBER

10-13	Addis AgroFood & Pack www.addis-agrofood.com	ADDIS ABABA
22-25	IAOM MEA Conference & Expo www.iaom-mea.com	NAIROBI

NOVEMBER

8-10	Agriworks Expo Stellenbosch www.agriworks.co.za	STELLENBOSCH
22-23	Agriculture, Food and Aqua www.agriculture.foodtechconferences.com	CAPE TOWN
26-28	African Agri Investment Indaba www.agri-indaba.com	CAPE TOWN

FEBRUARY 2019

20-23	Sudan Poultry Expo www.expoteam.info/eng/events.php	KHARTOUM
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Readers should verify dates and location with sponsoring organisations, as this information is sometimes subject to change.

Jamesway Incubator Company appoints new president

DENIS KAN HAS replaced Christopher Omiecinski as the new president of the incubation and hatchery equipment manufacturer, Jamesway Incubation Company.

In his capacity as the COO and director of finance of Jamesway, Kan has steered the company through a slew of new processes. He has used his organisational skills to help Jamesway grow. As president, Kan is expected to sustain the momentum of growth as Jamesway continues to increase its market share in the hatchery sector. Denis brings a strong set of technical and analytical skills in financial management, reporting, and organisation and planning coupled with knowledge in operational monitoring, analysis and control and strong business acumen in strategic analysis and planning and tactical business and process alignment. He has firsthand experience in field sales and national accounts as well as a history of partnering with sales to work with strategic customers. Jamesway has welcomed the senior management change.

Jamesway is the reference incubator company for the global poultry industry. The company plans, designs, installs, and maintains incubation and ventilation systems for hatcheries. Founded in 1890, Jamesway has evolved into an international company with facilities in Canada, USA, China, and Russia that service more than 1,800 customers in 150 countries. Jamesway provides equipment to 17 of the top 20 North American poultry organisations and 12 of the top 20 International poultry companies.



Denis Kan

Image Credit: Jamesway

New World Bank financing provides access to safe water for three million Tanzanians

MORE THAN THREE million Tanzanians in rural areas will be connected to safe water supply, while another four million people will gain access to improved sanitation through a new IDA credit for a Rural Water and Sanitation Program-For-Results approved by the World Bank Board of Executive Directors.

The US\$350mn Sustainable Rural Water Supply and Sanitation Programme aims to increase access to rural water supply and sanitation services in 17 administrative regions and support the government in building strong institutions to sustain access to rural water supply.

"The quality and strength of Tanzania's human capital is critical, especially as it aspires to become a middle-income country," said Bella Bird, World Bank Country Director for Tanzania, Malawi, Burundi and Somalia. "There is a strong relationship between water and sanitation access and improved child health outcomes, which is critical for productivity and learning, particularly for girls whose school completion rates are lagging."

A major issue for Tanzania is the chronic undernutrition which affect one in three children (2.7mn children) and is linked to poor sanitation. Only 11 per cent of rural Tanzanians have access to an improved toilet, only 50 per cent of public schools in rural areas have the required number of toilets, and only 43 per cent with functional handwashing stations. Through this programme, up to 1,250 communities and 1,500 schools will benefit from improved sanitation facilities, which directly supports the Government's National Sanitation Campaign.

The Government's second Water Sector Development Programme (WSDP-2, 2016-2019) is intended to strengthen sector institutions for



Image Credit: Adobe Stock

The World Bank-financed Programme utilises results-based financing instruments.

integrated water resource management and improve access to water supply and sanitation services across Tanzania.

The World Bank-financed Programme supports the WSDP-2 and includes funding to help establish the anticipated new government agency for rural water supply.

The World Bank-financed Programme utilises a results-based financing instruments.

South Africa: The Department of Trade and Industry to establish special unit to drive rural and township economy

THE DEPARTMENT OF Trade and Industry (the dti) will create a project management unit that will drive the implementation of the recommendations of the inaugural two-day Broad-Based Black Economic Empowerment (B-BBEE) Rural and Township Economy Summit that ended in East London.

This is according to the director general of the department, Mr Lionel October. He was addressing the more than 1,400 delegates from across the country who attended the summit, on the way forward after several commissions made a variety of recommendations that need be implemented in order to transform the township and rural areas into hives of economic activity and production of goods and services.

"There are various recommendations and solutions to the challenges that we are facing in our efforts to upscale the township and rural economy. But what came out loud and clear from all the commissions in the summit was that we need a clear and concrete implementation mechanism if we were to succeed in transforming this economy.

"Our response as government is that we are going to create a project management unit that will drive, on a full-time basis, the implementa-

tion of the recommendations and proposals that came out of this summit. It will be an inter-governmental structure that will be located in one of the big institutions such as the Council for Scientific and Industrial Research," said October.

October added it was "crystal clear" from the discussions and recommendations of the commissions that small and medium enterprises in townships and rural areas were not benefiting as they should from the policies, financial support and procurement opportunities of the government.

"There is a gap between our policies, financial support and procurement opportunities offered by government, and the implementation on the ground. This is a big problem that has been identified and government will be working hard to address it," added October.

He also said that the dti would be proposing that the clearing house model that is implemented in Gauteng and North West be replicated in all of the country's provinces and located in the highest offices of the provinces. He explained that the clearing house is located in the premier's office has control of procurement of all government departments and munici-

palities in a province.

"The clearing house is where access to procurement opportunities is given to small, medium and micro enterprises (SMMEs). This clearing house mechanism will take care of all of the concerns and complaints raised in the summit about corruption and gatekeepers, in order to close the gap between the procurement opportunities and the delivery on the ground," said October.

He conceded that currently there were no real funding programmes for the informal and very small businesses. To this end, the dti will proposing to National Treasury the creation of a no frills, hassle free funding model for these kinds of businesses.

October said there will be prioritisation of the three poorest provinces of the country, namely Eastern Cape, KwaZulu-Natal and Limpopo for roll-out of the new government interventions aimed at stimulating the township and rural economy.

"We will also be undertaking a roadshow to enlighten businesspeople about procurement opportunities that are immediately available for various sectors and how to take advantage of them," concluded October.

Agrotop to build one of the largest poultry farms in Africa

AGROTOP, A LEADING global player in livestock turnkey projects, has signed a contract to develop a large-scale poultry integration project with Nutropia Poultry & Feed in Ethiopia. Agrotop will design, build and equip the project and then provide know-how transfer and management services to Nutropia. With headquarters in Addis Ababa, the new farm will eventually produce 24,000 tonnes of chicken meat per year.

The first stage, which is expected to start by the end of 2018, will consist of a hatchery, broiler farms and slaughterhouse capable of providing 4,700 tonnes of poultry meat annually.

Agrotop and Nutropia announced the new project at the VIV Europe 2018 trade show in Utrecht. The vertically integrated broiler and poultry feed farms will provide chicken meat at affordable prices to the domestic Ethiopian market and to the East African and Middle Eastern markets.

Once completed, the Nutropia project will include a parent stock rearing farm, a parent stock production farm, six broiler farms, a hatchery, slaughterhouse and poultry feed mill. Agrotop will provide the latest technology to develop a project that is both economically efficient and environmentally sustainable. Agrotop will provide experienced managers who will work alongside and train the local management so that good results will be assured from day one. The locally trained management will be the core that the future expansion will be built around.

"One of the main reasons for malnutrition in Ethiopia is the unavailability of cheap animal protein. Currently, only 12 per cent of the country's protein intake comes from animals," explained Fasika Eyassu, Nutropia's co-founder. "Nutropia is entering the market with the aim of closing this gap. We aim to restore dignity of mankind by ending hunger and malnutrition. We believe that great businesses tackle great problems."



The strictest biosecurity standards will be adopted to safeguard bird and public health.

Ethiopia's annual average chicken meat consumption is only half a kilo per year per person compared to 2.3 kgs per year per person in the rest of Sub-Saharan Africa and 41 kgs per year per person in Peru. With a population of more than 100mn people, Nutropia is well positioned to meet the growing need for cheap and easily obtained protein.

"After we conducted comprehensive research, we assigned Agrotop to lead the process of building the new farm," Fasika said. "We visited the Chirina project constructed by Agrotop in Georgia and this is exactly what we had in mind."

"The fact that Nutropia chose Agrotop to lead such an ambitious project illustrates our leading position in the field of poultry turnkey projects," said Gavriel Pelleg, Agrotop's CMO and founding partner.



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Evidence indicate probiotics exert selective activation of certain epithelial genes

Probiotics can speed up the maturation of day-old chicks' developing immune systems and can be applied throughout a bird's life to support gut health.

What is a poultry probiotic?

Image Credit: Adobe Stock

POULTRY PROBIOTICS – OR direct-fed microbials (DFM) – are live microorganisms that can be incorporated into diets in order to: Populate the intestine with beneficial bacteria; modulate the conditions within the gastrointestinal tract.

By adding probiotics to feed or water, the intestine is populated with beneficial bacteria avoiding or decreasing the extent of pathogen colonisation (Nurmi and Rantala, 1973). The efficacy of different probiotics has been demonstrated in modern poultry systems. Because antibiotics are being removed from the routine practices of animal husbandry, probiotics are now considered a promising tool to prevent pathogens from causing health and disease challenges.

Probiotic, prebiotic and synbiotic

Probiotics can be combined with prebiotics to nourish the beneficial bacteria and achieve better results. The probiotic plus prebiotic combination is known as a synbiotic.

A prebiotic is a non-digestible additive often consisting of natural dietary fibres such as fructooligosaccharides (FOS) that stimulate the growth and activity of beneficial bacteria in the colon, thus improving host health (Gibson and Roberfroid, 1995).

A synbiotic is a combination of probiotic and prebiotic products (Patterson and Burkholder, 2003), often with the aim of improving efficacy. PoultryStar is an EU-authorised synbiotic (probiotic plus prebiotic).

Probiotics can be combined with prebiotics to nourish the beneficial bacteria and achieve better results.

How probiotics work against pathogens

Several proposed mechanisms explain the mode of action of probiotics against pathogens, namely:

1. Competitive exclusion
2. Bacteriocin production
3. Immune stimulation
4. Improvement on gut health and integrity

Probiotics competitively exclude pathogens

Competitive exclusion refers to the blockage of cellular receptors on the luminal surface of epithelial cells, mechanically avoiding the entrance of pathogens. This can be supported by in vitro assays that show the capacity of selected probiotic bacteria to adhere to

intestinal cells (Pascual et al., 1999; Ibnou-Zekri et al., 2002).

Remarkably, the ability to attach to the surface of intestinal cells varies among different strains of the same species of bacteria (Ibnou-Zekri et al., 2002). Competitive exclusion also considers the consumption of available nutrients by beneficial bacteria limiting resources and space for pathogenic bacteria.

Probiotics produce bacteriocins that target pathogens

Another mechanism that reduces bacterial viability is the production of harmful substances that specifically target pathogens, like H₂O₂ and bacteriocins (Oh et al., 2000; Gillor et al., 2008).

Bacteriocins are amino acid molecules that have bactericidal properties on genetically related organisms. Several bacteriocins have been identified. Small bacteriocins tend to be heat-stable whereas large bacteriocins tend to be heat-labile.

While described bacteriocins are mostly effective against Gram-positive bacteria, there are some bacteriocins already described which are effective against Gram-negative organisms (Ralph et al., 1995; Servin, 2004).

Because of their amino acid origin, bacteriocins are susceptible to proteolytic enzymes. There is another group of non-acid substances that are resistant to heat and proteolytic enzymes and thus belong to a different category of inhibitory compounds produced by commensal bacteria. Most of these are not fully identified compounds but with established inhibitory activity against *Clostridium*, *Bacteroides*, *Enterobacteriaceae*, *Pseudomonas*, *Staphylococcus*, and *Streptococcus* (Silva et al., 1987).

The right probiotics support the immune system

Stimulation of the immune system, or immunomodulation, is another theory that explains the efficacy of probiotics. The intestinal tract of newborns is basically sterile. Bacteria that first colonise the gut influence the gene expression of epithelial cells influencing in turn the subsequent bacterial colonisation of the intestine.

As an immune organ, the intestine has a large component of lymphoid tissue (GALT, or gut-associated lymphoid tissue) which also needs proper stimulation from commensal microorganisms for maturation.

Chickens that have been immune stimulated with probiotics in the diet have shown increased secretion of anti-clostridial IgA antibodies (Hamid et al., 2006). On the other hand, the intestine must peacefully coexist with commensal bacteria and antigens of alimentary origin (oral tolerance). In addition, non pathogenic

bacteria are able to send stimulatory signals to the enterocytes which limit the production of pro-inflammatory cytokines while promoting the production of anti-inflammatory cytokines (Neish et al., 2000). This observation can be supported by germ-free mice that show continuous inflammation and inadequate immune responses against normal dietary antigens (Servin, 2004).

It should be noted that the immune-stimulatory function of commensal bacteria is strain specific and even closely related bacteria stimulate the immune system in different ways (Ibnou-Zekri et al., 2002). Theoretically, probiotics could achieve benefits by either pro- or anti-inflammatory effects. For example, in human medicine it could be desirable to reduce inflammation in patients undergoing chronic inflammation (Crohn's disease). On the other hand, enhanced inflammation and direction of the immune system towards the cellular component of the immune response may help fighting coccidia in poultry.

Stimulation of the immune system, or immunomodulation, is another theory that explains the efficacy of probiotics.

Probiotics support epithelial cells

The indigenous bacteria of the intestine contribute to the healthy development of epithelial cells. Indigenous bacteria can stimulate enterocytes to produce and release active gastrointestinal peptides that impact the regulation of epithelial structure and intestinal endocrine cells (Servin, 2004). The commensal bacteria modulate gene expression of epithelial cells influencing nutrient absorption, intestinal maturation and improvement of mucosal barrier (Servin,



The effects of poultry probiotics are particularly important for young animals in which stable intestinal bacteria have not yet been established

Image Credit: Adobe Stock

2004). Some strains of *Lactobacillus* are able to reduce the epithelial invasion of enterohemorrhagic *E. coli* (EHEC) without decreasing the viability of the pathogen. Since this effect is only observed with live *Lactobacillus*, it is thought that it is the result of the interaction of commensal bacteria and intestinal epithelium that induces protective changes on the enterocytes interfering with the internalisation process of EHEC (Hirano et al., 2003). There is increasing evidence indicating that probiotics exert selective activation of certain epithelial genes. Similarly, the modulation of immune response obtained with probiotics seems to be strain-dependent (Didierlaurent et al., 2002).¹⁵

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The combination of high egg production and inadequate dietary supply of minerals also results in weak bones as minerals such as calcium, are instead mobilised from bones for egg shell formation.

Making a case for bone strength in laying hens

THE DEMAND FOR poultry meat and eggs has significantly increased in the past decade, mainly because of the increasing world population and increased purchasing power and urbanisation in both developed and developing countries. To address this growing demand, poultry production has undergone a lot of intensification, which although necessary, is believed to have resulted in several welfare concerns.

One of the most important of such concerns is the increased incidences of bone fractures and deformities in laying hens. For example, the confinement of birds in limited spaces such as the battery cage housing system limits the ability of the hens to move freely and exercise, which results in weak bones and the consequent high incidences of bone fracture under such management systems. The combination of high egg production and inadequate dietary supply of minerals results in weak bones as minerals such as calcium, are instead mobilised from bones for egg shell formation. Addressing the problem of bone weakness and fractures in laying hens therefore requires the improvement of hen nutrition and the optimisation of housing conditions.

Addressing the problem of bone weakness and fractures in laying hens therefore requires the improvement of hen nutrition and the optimisation of housing conditions.

There is, however, another, and probably the most important, factor influencing bone strength and the incidences of fractures in laying, which is genetic predisposition. In the past, the focus of genetic selection was mainly on production traits such as egg production, while welfare traits such as the strength of bones were not considered in genetic selection decisions. Our hypothesis is that as hens became better egg producers, they also became genetically prone to the incidences of bone fractures.



Image Credit: Adobe Stock

The confinement of birds in limited spaces such as the battery cage housing system limits the ability of the hens to move freely and exercise, which results in weak bones.

In a recent study published in the American Journal of Animal science, Raymond and colleagues (Swedish University of Agricultural Sciences, Uppsala, Sweden, and Roslin Institute and Royal School of Veterinary Studies, University of Edinburgh, Scotland, UK) showed that more than half of the observed differences in bone strength among laying hens can be explained by genetic differences among the hens. In other words, more than half of the total variation in bone strength is heritable or can be transmitted from one generation to the next. This also means that hens with certain DNA variants or variation in their genes tend to have stronger bones and less incidences of bone fractures than those with other types of DNA variants. The study also found specific positions within the chicken genome that had very strong influence on bone strength. A further investigation of these positions showed that they carried genes that play critical roles in bone formation and physiology.

The discovery of such high proportion of heritable variation in the study has huge implications for the improvement of bone strength and ultimately hen welfare. That is because heritable variation is the driving force behind genetic improvement. If there is heritable variation for bone strength, there is a possibility to genetically improve poultry populations to reduce or possibly eradicate the problem of weak bones. Poultry breeding organisations could therefore speed up the process of eliminating bone fractures in our barns by placing a high selection pressure on bone strength in their genetic selection schemes. This not only improve hen welfare, but also improve farm profitability and affords the poultry industry a good consumer and public perception of its operations. **E**

Biaty Raymond, PhD Researcher, Animal Breeding and Genomics group, Wageningen University and Research, the Netherlands.

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Speakers from the poultry industries of Nigeria, Ethiopia and Ghana shared their challenges and opportunities in the afternoon Invest In Africa session on the first day of VIV Europe.

Opportunities for poultry sector in Nigeria, Ethiopia and Ghana



Like Nigeria and Ethiopia, egg consumption in Ghana is low at an average of 20 eggs per capita per year.

Image Credit: Adobe Stock

THE COMMON CHALLENGES included the need for capacity-building, access to affordable, good quality feed, vaccinations and veterinary services, and promoting egg consumption among local markets. However, low consumption was also seen as an opportunity because it means there is room for growth in the markets of all three countries. Other opportunities included growing economies, especially Ethiopia, growing middle classes across the three countries and an increase in supermarkets, hotels and chain restaurants. There was discussion on whether there was a growing market for manufacturing and selling egg products, such as egg in powdered or liquid form, which is currently mostly imported from the US.

Idowu Asenuga, entrepreneur and public relations executive for Poultry Association of Nigeria (PANOG), emphasised the growing population of Nigeria, which currently stands at 200mn and is growing at 2.2 per cent per annum. He said that only 42 per cent of Nigeria's arable land is being farmed which affects the local feed industry. "It is a huge challenge that needs to be fixed," said Asenuga of the unused arable land.

Egg consumption in Nigeria is around 50 eggs per person and the country's egg production is currently worth US\$800mn with 40mn commercial layers producing 10bn eggs per year. Asenuga

described the industry's growth pattern as "steady".

The majority of poultry farms in Nigeria are small holder farms and the sector is "largely disorganised" and "informal", according to Asenuga. The informal egg market is dominated by women with low levels of education and this makes marketing, promotional and branding activities difficult. However, the growth in supermarkets, such as Shop Rite, could change this with more than 40 branches in Nigeria and 100 branches expected by 2020.

"We do not have much voice to facilitate policy," he told delegates. He added that lack of traceability - "a wild, wild west" market - and poor marketing information added to the industry's challenges, as well as security issues in regard to Boko Haram in the country's north-east. However, he was upbeat about opportunities fuelled by Nigeria's economic growth, focus on agriculture after the downturn in oil, access to other West African markets - "that's 400mn people in 15 countries".

Technology could be important for Nigeria's poultry industry development, according to Asenuga: "The growth in mobile and internet usage has created the right platform for precision poultry production and digital marketing."

Dr. Demeke Wondemagegn, board secretary of the Ethiopian Poultry Producers and Processors Association (EPPPA), said Ethiopia had the world's highest growth rate for GDP in 2017 at 8.5 per cent and there are more than 100mn consumers. He described chicken meat consumption as "very low" at just 0.5kg per capita and egg consumption is just 12.4 eggs per person per annum. Other challenges included shortages of good quality day-old chicks, vaccine supplies, veterinary services, knowledge, investment and technical usage; as well as a "lack of diversity of poultry

Investing along the entire value chain was cited by all three speakers as important for ensuring growth and minimising risk through diversified investment.

products and packaging", seasonal fluctuations in demand, such as a drop during the Orthodox church fasts, and limited cooking skills in regard to chicken meat and eggs across the general populace.

To encourage the poultry industry to overcome these challenges, Ethiopia has set ambitious targets of a 235 per cent increase in chicken production by 2020 and an 828 per cent increase in egg production in the same timeframe.

Dr. Wondemagegn identified multiple opportunities, such as a nationwide strategy to encourage consumers to shift from red meat to chicken as a healthier alternative, and the need for investment by companies involved in feed processing, vaccine and breeding companies, as well as slaughtering and processing providers and manufacturers of poultry house equipment and feed machinery.

Victor Oppong Adjei, CEO of VOA Farms and the chairman of the Ghana National Association of Poultry Farmers, emphasised the Ghana's "stable and predictable economy", 26 years of democracy, good governance, rule of law, access to free zones, developing financial infrastructure, excellent fertile, arable land and tax incentives for investing in poultry.

Like Nigeria and Ethiopia, egg consumption in Ghana is low at an average of 20 eggs per capita per year because of "perceived cholesterol even though research has debunked that myth", Adjei told the conference. He added that broiler production is "the mainstream of the poultry industry [for Ghana and] a high source of income for many."

He cited low capital injection, high cost of feed, inadequate financing with a focus on high interest rates and short-term loans, and the dumping of cheap chicken on the Ghanaian market from the European Union, the US and Brazil as challenges. **B**

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Petersime's Project Department has over 35 years of experience in designing and installing tailor-made hatchery air handling and air conditioning systems for the most varied climates.

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Airflow management inside a hatchery building is very important.

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Airflow management inside a hatchery building is very important. Petersime believes that there is no single, standard solution for HVAC: each system needs to be custom-made to suit prevailing conditions. For instance, hatcheries in hot, humid climates require an air conditioning system with cooling water or direct expansion cooling. On the other hand, evaporative cooling is ideal in dry conditions. Petersime's Project Department has more than 35 years of experience in designing and installing tailor-made hatchery air handling and air conditioning systems for varied climates.

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Nan-Dirk Mulder, global animal protein specialist, Rabobank, offered a macro perspective on challenges and opportunities in the African poultry market at the Invest in Africa session at VIV Europe.

With 45 per cent of the world's unused agricultural land in sub-Saharan Africa, there is great potential for the poultry industry to grow.

Image Credit: Adobe Stock

Rabobank offers comprehensive overview of African poultry market

NAN-DIRK MULDER said the African poultry market is currently worth US\$15bn and named 10 countries - Nigeria, Ghana, Cote d'Ivoire, Uganda, Senegal, Angola, Malawi, Rwanda, Kenya and Ethiopia - as the growing markets on the continent, all with expected year-on-year growth in the range of six to ten per cent between 2015 and 2025.

"The potential is there but the yields are still low," was Mulder's summary of the African poultry market. However, he said that the pan-African trend of increased urbanisation was an opportunity for investors because "people who live in cities need agriculture". Nairobi, Lusaka and Kigali were mentioned as cities where the market for agricultural produce "to feed all the people" was strong.

He said that in the past 15 years, the average daily income for the continent had increased from US\$0.90 per day to US\$1.30 per day. The growing middle class of African countries, along with the rise of bigger grocery stores and supermarkets will also fuel growth for the poultry market. In Nigeria, in particular, the middle class continues to grow despite a slowdown in the oil industry, which is the backbone of the Nigerian economy.

He added that Ethiopia has experienced real GDP growth of 10 per cent per year between 2016 and 2018. With 45 per cent of the world's unused agricultural land in sub-Saharan Africa, there is great potential for the poultry industry to grow, according to Mulder.

Additionally, shifting public tastes towards chicken meat and eggs across multiple African countries should stimulate growth. Compared to the production of beef, pork and salmon, Mulder said the benefits of entering the poultry market include the short production cycle and potential for cashflow after just six weeks. With chicken being a cheap source of protein, this makes it an attractive option for consumers and "it should be easy to finance".

With more than 80 per cent of Africa's poultry products coming from outside the continent, Mulder called for an "emphasis on local industries". He cited Angola and Ghana as two countries focusing on achieving self-sufficiency for agricultural products. In regard to the overall ambition to reduce imports, Mulder said that governments are "realising more and more that agriculture is important" and longer-term strategies are required, particularly in West Africa, where the market is most exposed to cheap imports from Brazil, the EU and the US.

Investing along the entire value chain and working towards "international synergy" with smaller African countries working together were put forward as important strategies by Mulder.

The global animal protein specialist of Rabobank said feed grains are an important element of the value chain and urged investment in mills and grain supply businesses.

"Companies can mitigate risks of operating by being in more countries," Mr Mulder said. "If there is a risk in one country, you can still do business in another country [in Africa]. There are always challenges in the business," Mulder told delegates. He listed factors such as land ownership, corruption, FX volatility, access to cold storage and lack of infrastructure as issues to be aware of, advising potential investors to "identify the right markets with in-depth analysis of all the potentials."

He said that access to finance is important and for investors to examine "the competitive position of countries". In regard to distribution, Mulder said Africa's growing middle class - those with an annual income between US\$5,000 and US\$10,000 and rising - will be the target market, particularly with an increase in supermarket shopping within this demographic. The growth of chain restaurants, such as KFC, McDonalds, Wimpy and Steers, will also stimulate the poultry market in multiple African countries. This growth changes distribution patterns and the cold chain needs to be strengthened, representing another investment opportunity. "It's a different dynamic in the African market [and it is important to] organise the supply chain in the region ... setting up successful businesses along the value chain." Mulder said that this can be "capital-intensive but it may be the only option. There is a shift to modern feeds but [the industry] has to create scale."

With underused arable land in Africa, Mulder said farmland for feed grain could be doubled "without touching sensitive environmental areas." **E**

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Dr Sakho, secretary general for Senegal's Ministry of Agriculture, opened the Invest in Africa seminars at VIV Europe 2018 with an upbeat call for investment in the west African country's poultry industry.

Senegalese leaders call for poultry industry investment

DR SAKHO HIGHLIGHTED the advantages of investing in Senegal, including a stable political climate, prioritisation by the government of the poultry industry by creating a group to incorporate all the country's poultry industry organisations, a focus on strong regulations, and support for financial partners.

Capacity building is another priority for Senegal, according to Dr. Sakho. He cited a training programme for agriculture as a means of building capacity and creating a more productive industry. Dr. Makhtar Diouf, director of the National Center for Breeding Improvement, said that investment in Senegal was "obvious" particularly with geographical access to neighbouring countries, such as Mauritania, Guinea Bissau, Guinea Conakry and Mali. He said that breeding improvement among poultry producers had a positive effect on relieving poverty.

Priorities to further improve poultry production in Senegal include working to reduce the impact of diseases such as avian influenza and parasitic conditions, improving habitat, such as ensuring egg-eating snakes are kept away from farms, and seeking to improve the genetic quality of birds. Breeds such as Cobb, Ross, Hubbard and Hyline are popular in Senegal. In terms of keeping disease at bay, Senegal will not accept imports or exports of live birds.

Industry partners are also important, Dr. Diouf told the conference. These include government departments such as the ministries for agriculture and the environment, international cooperation such as USAID and NGOs.

The Senegalese poultry industry is "booming", said Dr Diouf. Year-on-year from 2015 to 2016, there was a 16.96 per cent increase in poultry production and a 45 per cent increase in five years.

A representative from the Interprofessional Poultry Association of Senegal (IPAS) talked about investment along the entire poultry value chain and developing young people in the industry. The four pillars for the industry are capacity-building, feed, boosting production and services to support producers. He outlined the structure of IPAS with its general assembly, executive bureau, colleges and focus on "durable development", research and development, and access to information for producers.

The Horizon 2025 plan aims to boost the industry through approaches such as promoting increased egg consumption with the aim of creating 50,000 jobs and focusing on strategic positions in markets across sub-Saharan Africa.

The Horizon 2025 plan aims to boost the industry through approaches such as promoting increased egg consumption with the aim of creating 50,000 jobs.



In terms of keeping disease at bay, Senegal will not accept imports or exports of live birds.

Meyn seeking opportunities in Africa with high-speed poultry processing

Meyn's latest poultry processing technology made its world debut at VIV Europe, held in Utrecht. The Meyn Grande drawer system M.10 can process poultry at a speed of 15,000 birds per hour. The system offers flexible layouts depending on the requirements of individual plants and can be expanded with the company's Multistage CO2 stunning and automatic trailer unloading and loading. There is 255mm of headspace for the birds, ensuring high levels of animal welfare and preventing heat stress, which can affect the quality of the meat. Other innovations launched at VIV Europe include the Meyn Carousel Rehanger M2.0 for optimising transfers of birds along the production line, and the Meyn Physic cut up line M3.0, which can process 7,500 birds per hour.

Leveraging digital technology was an important theme at the conference sessions at VIV Europe and this was reflected in Meyn's launch of Meyn Connect 1.1, which enables data to be monitored in real time and combined into integrated reports, connecting hardware to software.

Milan van de Beek, Meyn's area sales manager for Africa, told African Farming that it was important in the African market to "turn challenges into opportunities". He cited Tunisia, Libya, Ethiopia, Nigeria, Egypt and South Africa as important markets on the continent for Meyn.

Egypt, in particular, is a market leader, and the poultry industries of the northern African countries are generally more advanced than other parts of Africa, according to Mr van de Beek. However, as poultry producers in other regions of Africa seek to scale up and move away from traditional farming, Mr van de Beek added that more opportunities should arise across the continent. **E**

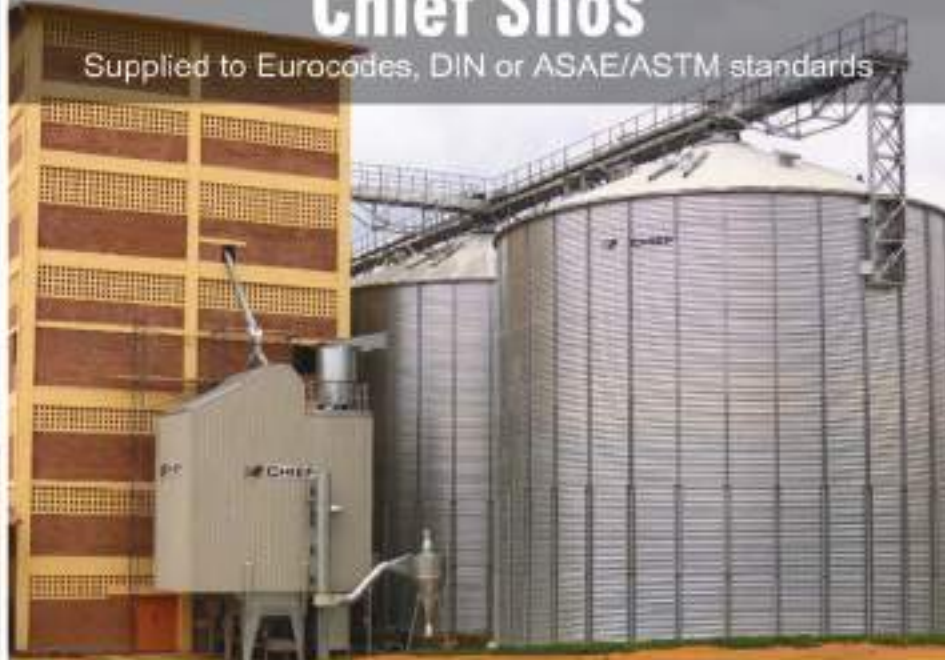
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African Farming held its inaugural Agroinvestment Summit in London in June 2018 and it was a successful event, attracting industry leaders as speakers and delegates. Georgia Lewis reports.

African Farming's debut Agroinvestment Summit a success



The Agroinvestment summit was held at the iconic Guoman Tower Hotel with speakers from Nigeria, Ghana, Tunisia, the US and UK.

Image Credit: Alain Charles Publishing

AGRICULTURE IS BEING seen by many experts as the new oil in Africa. As a result, governments across the continent, particularly in sub-Saharan Africa (SSA) are seeking to diversify their economies. A major part of this process is to encourage public and private sectors to invest heavily across the entire agricultural value chain. Additionally, the need to improve rural infrastructure is an essential part of the process of economic transformation with the aim of achieving goals in boosted productivity, food security, food self-sufficiency and local job creation.

Day 1

The summit opened on Monday 4 June with an introduction from Martyn Diamond Black, representing Alain Charles, followed by an address from His Excellency Kabiru Bala, deputy high commissioner in which he recognised the potential of agriculture across all 54 African countries to eliminate hunger and food insecurity as well as become a major player in the global food market.

This was followed by a podium presentation by Panos Varangis, global lead, Agricultural Finance and Agricultural

Insurance, Finance, Competitiveness and Innovation, Global Practice, World Bank Group. His presentation promoted the benefits of access to longer-term finance for Africa, especially in SSA. He outlined the challenges and opportunities in terms of supply and demand - demand is high and growing with increasing populations across multiple SSA countries, particularly Nigeria. Meeting this demand will require scaling up for farmers, moving away from traditional farming, and investing along the entire value chain.

Varangis cited potential areas for new investments in SSA. These included processing for local food consumption and exports, logistics, cold storage, improved warehousing, local aggregators and linkages between farmers and lead off-

takers, as well as the new technologies for improving productivity, quality, reducing various risks and ensuring that produce gets to market efficiently.

Attracting investment proactively

Varangis' presentation was followed by Yofi Grant, CEO, Ghana Investment Promotions Centre (GIPC). Outlining the vision and strategies on how the country is aiming to become the first destination of choice for investment in Africa, Grant confirmed GIPC plans to proactively market to investors as well as the centre's future plans for trading with other parts of the continent.

"Attracting foreign investment" was the theme of the panel discussion, moderated by Georgia Lewis, managing editor, Alain Charles Publishing. The panellists were Vicky Pryce, economist at Centre for Economics and Business Research UK, and Admir Imami, director of Trade Finance and Supply Chain Finance, CDC Group. In this interactive session, the panellists covered ways in which small-to-medium enterprises (SMEs) can attract foreign investment from a range of sources, including funding houses, major institutions, development agencies and local banks.

Varangis spoke about the importance of technology in helping African farmers scale up their businesses, become more efficient and have better access to markets for their produce.

The power of technology

The afternoon podium presentation for the first day was from Andrew McCoubrey, head of the Trade and Development for UK Department for International Development. He picked up on the themes from the morning sessions in regard to leveraging technology with a talk on digital trade opportunities in agriculture.

Chris Southworth, secretary general, International Chamber of Commerce (ICC), gave a TED-style talk on opportunities for digital growth. He called on investors to lobby African governments to sign up to the ICC's e-commerce trade agreement which will cover at least 70 countries by 2020. While Africans are keen adopters of digital technology, particularly mobile phones, Southworth pointed out there are still barriers to making the most of this technology, such as difference in regulation between countries and data localisation issues, but if these barriers are overcome, particularly in regard to regulatory restrictions, Africa will have greater potential to move ahead in e-commerce and this can benefit trade from the entire agricultural sector.

David Wilke, Industrial Design Director, CNH Industrial, gave the industrial design perspective to a technology-focused afternoon session. He addressed the delegates on precision farming, and trends and innovations that are being used across Africa.

Market outlooks and encouraging entrepreneurship

Josef Schmidhuber, deputy director, Trade and Market Division, Economic and Social Development Department, Food and Agriculture Organisation of the United Nations looked at the medium-term outlook for the global agriculture sector. He highlighted the major drivers the sector will see over the next 10 years, what trends will arise and the direction of trade prices.

This session examined the main drivers of agricultural supply and demand for the next decade, as well as trends in consumption, production, trade and prices, impacts on food security, nutrition and natural resource use.

The first day of the summit concluded with a panel discussion on developing the next generation of agripreneurs. Moderated by Georgia Lewis, the panellists included Frederick Jan Henderik Schreurs, CEO, IITA (a business incubation platform), Leila Ben Hassen, founder and CEO, Bluite Jay Communication, and David Wilke from CNH Industrial.

Making agriculture "sexy" to young people was a strong theme of this discussion. Panellists pointed out the main benefits

of encouraging young people to pursue careers in agriculture, such as ensuring the long-term survival of the sector, creating jobs, protecting the environment, and reducing radicalisation and economic migration.

Day 2

The second day of the summit opened with a podium presentation from Emmanuel Doni-Kwame, secretary general, International Chamber of Commerce. He spoke at length about access to finance and how agricultural development will make a lasting impact on the local economy in Ghana.

Next, Gavin Serkin, founder and

Cooperation between African countries on a regional basis and on a broader pan-African level were strong themes throughout the conference.

Managing Editor, Frontier Funds Media & Intelligence, gave a TED talk-style presentation on scaling for investment. His session looked at the reasons for under-investment across Africa's agriculture sector and urged governments to create business-friendly environments for investment.



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Multiple applications of technology

Following on from the presentations on digital and mobile technology from speakers on the first day, the strong focus on innovation continued into Day 2. Fadzayi Musanhu, Africa M&A research analyst - Transaction Advisory Services, EY, gave a presentation on the fintech ecosystem for agri-business. She discussed the scope of fintech to support digital trade within the agriculture industry for SMEs by harnessing the latest technology, as well as looking at insurance and achieving a complete digital ecosystem for trading.

A wide range of financial services can be made easier via fintech applications, including money transfer and payments, insurance, borrowing, financial planning and managing savings and investments. All of this is made accessible with the high rate of mobile phone penetration across Africa.

Walid Rassaa, technical consultant, Irritec, spoke about the importance of water management, and smart water usage and control, with technology again playing a role. With water conservation and management being an important issue across Africa, Mr Rassaa spoke about the technologies that can be used to ensure crops, including open field, orchard and protected crops, are irrigated without wastage, such as drip irrigation, which offers highly efficient irrigation with minimal environmental impact.

Christabel Blanch, Africa manager, Alvan Blanch Development Company, also shared solutions for agri-businesses in the continent with delegates. In particular, the mobile products attracted interest from the floor, such as the mobile continuous double flow dryer. Ms Blanch cited mobile solutions as a cost-effective alternative to building expensive permanent structures. Her presentation also featured commentary on the challenges of agri-investment and risks which investors need to consider.

Sustainable development and growing businesses

In the afternoon, Frederick Jan Henderik Schreurs, CEO of the business incubation platform IITA (International Institute of Tropical Agriculture), followed on from the theme of encouraging entrepreneurship on the first day of the summit. He examined the development of business models to create and launch sustainable, investor-ready products, developing strong financial processes for ROI and boosting profit margins.

IITA helps bring products to market, stimulate product development and opportunities for market expansion, provides expertise and training in commercial agriculture and farm management, and



Deputy high commissioner, Nigeria. His Excellency Kabiru Bala, and managing director of Alain Charles Publishing, Nick Fordham at African Farming's Agroinvestment summit in London

matches products with investors. In keeping with the focus on technology throughout the summit, Schreurs highlighted the importance of technology in developing and modernising agriculture across Africa.

Currently, IITA is hosting three pilot factories - Aflasafe, a biocontrol product for managing aflatoxin in maize and groundnut; NoduMax, a soybean inoculant that helps fix nitrogen from the air and improves legume yields; and GoSeed, a foundation and breeder seed production facility.

Christopher Isaac, director of Investments and Business Development, AgDevCo, delivered the Spotlight Session on rural transformation and sustainable development through long-term, early financing.

AgDevCo's Smallholder Development Unit works with rural enterprises to develop outgrower schemes. The unit is a five-year initiative which works in Zambia, Mozambique, Malawi, Tanzania, Uganda, Ghana, and Senegal. AgDevCo has been working across different African markets on a range of agricultural projects including macadamia farming and processing in Malawi and mushroom-farming in Rwanda.


Sustainability was the theme of the panel discussion which rounded off the second day of the summit. Moderated by Georgia Lewis, the discussion focused on issues of improving rural infrastructure, boosting productivity and creating employment opportunities. The panel was an opportunity for three of the speakers to add to their presentations and take more questions from the floor, with Panos Varangis joined by Josef Schmidhuber and Christopher Isaac. A lively interaction session with the audience followed on from the panel discussion, with plenty of delegates keen to benefit from the expertise of the panel and share their own experiences as stakeholders in the agricultural sector.

Feedback and conclusions

The summit concluded with a visit from Emeka Ifezulike, FCA, representing Nigeria's Federal Ministry of Industry, Trade and Investment. He announced that the second African Farming Agroinvestment Summit will take place in November 2018 in Abuja, the Nigerian capital. The event is expected to attract a wide range of stakeholders with African Farming receiving endorsements from Nigeria's Ministry of Agriculture and Rural Development and Ministry of Industry, Trade and Investment.

Overall, the summit was a successful introduction to the important topic of agriculture in Nigeria, bringing together investors, government and leading SMEs together to discuss, debate and connect. African Farming and Alain Charles are very excited to be continuing our discussions with a follow-up summit planned in Abuja in November.

Bradley Barr, group managing director of recruitment company CA Global told African Farming at the summit, "We work in special niche skilled areas. For us it is about how we tap into those skills and identify those skills, where they are in Africa and where they are in the world, so when there are specific investments going to an African country they talk to us as they need to identify those skills."

Barr continued, "First of all you are always going to look for your locals in the diaspora. Then you move on to expats. The core thing about an expat is that you only have to be there for two to five years to pass on the skills. Not all companies do that correctly, but that is in the bigger picture. It's about skills development in a three to five year period. Africa is so influenced by commodity sectors, there is not enough investment." 

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There is no evidence to suggest any promotional effect of sprayed nutrients on the growth and activity of plant pathogens under field conditions, however plausible that may seem. Dr Terry Mabbett reports.

Foliar feeding potatoes using a tractor-mounted boom sprayer



Image Credit: Omex Agrifluids

Foliar feeding vegetable crops in Africa's uplands

RICH VOLCANIC SOIL, ample rainfall and an equable climate are core advantages of growing vegetable crops in the tropical highlands. However, the naturally high soil fertility of upland soils in the tropics is not enough to satisfy the nutrient demands of fast growing vegetable crops. Fertiliser application is a crucially important component of any cultivation schedule.

Vegetable crops are now grown extensively in upland areas of Kenya, Tanzania, Uganda, Zambia and Zimbabwe, but growers are not always sold on the benefits of foliar feeding.

Whether it be leaf crops (eg head cabbage, kale and lettuce), fruit crops (tomato, sweet peeper, cucumber, aubergine), or root crops (potato, carrot, onion and garlic), spray application of soluble nutrients is the most efficient and targeted way of meeting the nutritional needs. Foliar feeding with soluble products is almost twice as effective in getting nutrients into a plant compared with the

equivalent amount applied as solid base fertiliser to the soil.

Upland areas across Africa produce 'high-flying' fresh vegetables exported daily by air to lucrative markets in Europe and the Middle East. Vegetable crops are now grown extensively in upland areas of Kenya, Tanzania, Uganda, Zambia and Zimbabwe, but growers are not always sold on the benefits of foliar feeding. Some remain unconvinced, not so much about efficiency but efficacy given the high rainfall and humidity typically experienced at higher altitudes in the tropics.

Allaying farmers' fears

The first and foremost concern for growers almost certainly relates to assumed wash-off effects of frequent and intense rainfall on soluble nutrients deposited by spraying on foliar surfaces. However, an important component of high performing foliar sprays of soluble nutrients is the speed with which individual ions (eg NO₃⁻, Ca²⁺ and Zn²⁺) pass into the plant and integrate into the metabolism. Provided the spraying takes place during a suitably dry weather window then nutrients will have sufficient time to make their way into the plant.

Once inside the plant nutrients are safe and available for use, unlike soil-applied

solid fertiliser which is subject to continual solubilisation and leaching from the soil. It is worth pointing out that the amount of solid fertiliser applied to soil, compared with soluble nutrients applied by foliar spraying, is necessarily large, precisely because of continual solubilisation and leaching with comparatively little taken up from the soil by plant roots.

Vegetable crops grown in the tropical highlands may be at greater risk from foliar disease due to higher rainfall and cloud cover combining to cause long periods of leaf surface wetness and high relative humidity. Growers may logically fear that foliar sprays of soluble nutrients are aggravating existing disease problems due to the extra volumes of water spread over the plant surface and raising relative humidity, especially inside the canopy. And directly from applied nutrients which some growers may mistakenly believe give a nutritional boost to fungal and bacterial pathogens.

However, there is no evidence to suggest any promotional effect of sprayed nutrients on the growth and activity of plant pathogens under field conditions, however plausible that may seem. On the contrary, the fungicidal effects of a number of ions including Cu²⁺, Fe²⁺, Zn²⁺ and Mn²⁺



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are well established and documented. Indeed Cu^{2+} , albeit at much higher levels than used in micronutrient sprays, is the active principle of contact, protectant copper fungicides such as cuprous oxide and used commercially for disease control on most mainstream vegetable crop throughout the world.

Crop insurance and reassurance

Growers worried about the effects and consequences of spraying large volumes of water over foliage already wet from rainfall can always employ reduced volume spraying techniques. By using shoulder-mounted (knapsack) mistblowers growers can cover a typical tomato crop with 30 to 50 litres/ha and even less (5 to 10 litres/ha) using hand-held fan-assisted sprayers (atomisers) or spinning-disc CDA (controlled droplet application) sprayers.

nutrient products and fungicide formulations provided there are no issues around chemical compatibility.

Ultimate insurance is the cultivation of vegetables under open-sided plastic covers which eliminates the effects of direct natural rainfall, but even this has its own risks and dangers related to disease. Diseases suffered by the same vegetable crop grown at various elevations in the tropics are often very different. Early blight caused by the fungus *Alternaria solani* is the disease that most often devastates tomato crops grown in the lowland tropics. But for tomatoes grown in the tropical highlands, late blight disease caused by the fungus-like pathogen *Phytophthora infestans* is the major disease problem.

Growing vegetables under open-sided plastic covers in the tropics irrespective of elevation can create problems from greatly

soluble nutrient products as soluble liquid and soluble powder formulations and used on vegetable crops throughout the world.

"There is no scientific evidence to support any claims that foliar feeding encourages foliar disease," said Peter Prentis, whose remit covers South East Asia where vegetables are typically grown in upland environments. "What's more, Omex's soluble liquid nutrient products contain an organic humectant/sticker which ensures the sustained uptake of nutrients in dry conditions and slows down wash-off during rainfall," said Prentis.

Export director Alan Lowes has extensive experience with vegetable growers throughout east and southern Africa, including Kenya, Uganda, Tanzania, Zambia and Zimbabwe. "The irony is that, in addition to their primary plant nutrition function many of these products also impart disease resilience", said Alan.

First on Alan's agenda for vegetable growers, and logically so, is Omex Bio 20. This product is particularly appropriate for seedling plants to ensure these very early stage crops are provided with a full range of nutrients and simultaneously given a biostimulant boost. "This combination of a full complement of macronutrients and micronutrients, plus a specific seaweed-derived natural biostimulant, maximises yield and quality of vegetable crops which may be at risk of physiological stress brought on by high temperature, moisture unavailability and disease," said Alan Lowes.

He also highlights Omex K41, a highly concentrated liquid potassium foliar feed currently used widely on vegetables in the highland regions of Latin America. Omex K41 contains very low levels of nitrogen thereby minimising soft leafy growth to reduce disease incidence, while maximising translocation of sugars to storage organs (eg onion and garlic bulbs) and fruit such as tomatoes and capsicum peppers.

"Omex DP98 is the classic example of a missed opportunity for vegetable growers who fail to take advantage of foliar feeding," says Peter Prentis. DP98 is custom designed by Omex for its high phosphorous content [N (4.0 per cent); P (37.50 per cent) and K (17.50 per cent)] but crucially with phosphorous (P) as fully water-soluble phosphite (PO_3^-) rather than traditional phosphate (PO_4^-).

"Base phosphate fertilisers applied to the soil regularly fail to furnish crops with sufficient P macronutrient" said Prentis, "due to factors surrounding the type, moisture status and pH level of soils." DP98 can crucially 'step in' during critical periods of plant growth and development with a



Image Credit: Omex Agrifluids

Mechanically harvesting high-value broccoli in Kenya.

These reduced-volume application techniques represent a massive reduction on the 450+ litres/ha required to spray the same crop of tomatoes using a standard high volume, hydraulic, lever-operated knapsack sprayer.

Crop surface coverage comprising a discrete distribution of small droplets achieved by reduced volume spraying lowers the risk of run-off onto the soil and also provides a much quicker-drying deposit. Rapid drying of spray deposits reduces and removes the presence of free water and high humidity conditions that encourage many foliar-infecting microbial pathogens, while increasing deposit resistance to wash off by any subsequent rainfall. Growers requiring even more reassurance can always tank-mix soluble

increased humidity levels caused by reduced air-flow. When cultivation under covers began in Trinidad (West Indies) some 40 years ago tomato crops became infected by *Fulvia fulva*, the fungal pathogen causing leaf mould disease which had rarely if ever been encountered at economic levels on this Caribbean island.

The view from Omex

To obtain a deeper insight into the advantages and benefits of using foliar feeding, even under the ultra-high rainfall conditions typically experienced in the tropical highlands, I spoke with Alan Lowes (regional director) and Peter Prentis (export director) at Omex Agrifluids in the United Kingdom. Omex Agrifluids is a world leading designer and manufacturer of



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Giving Happiness to the Farmers

boost and benefits which are far too large to be explained by plant nutrition alone.

That's because phosphite is a so called 'elicitor' which triggers anti-fungal and anti-bacterial responses in the crop plant, thereby assisting in the prevention of microbial infection and the inhibition of disease development. DP98 also has the ability to rapidly transport cations like calcium and magnesium into plant tissue when used in a tank mix with products like Calmax (22.5 per cent weight/volume calcium and 3.0 per cent weight/volume magnesium). Rapid assimilation of these nutrients prevents their wash off in high rainfall areas.

And last but not least is Omex Calmax with its 22.5 per cent soluble calcium as the core component alongside magnesium and micronutrients. Calmax is a formidable tool for maintaining plant tissue resilience to disease. Calcium in calcium pectate, an 'adhesive' compound which cements the cellulose walls of adjoining cells together to form structurally sound plant tissues, performs key roles in cell division, tissue integrity and the permeability of the walls separating living plant cells.




Potato (*Solanum tuberosum*) is a crucial crop in the African highlands

Image Credit: Omex Agrifluids

As such it plays an important part in mitigation against tissue weakening effects caused by plant pathogens and disease. For instance, calcium deficiency is the primary cause of 'blossom end rot' in tomato, capsicum and aubergine fruit. This physiological damage is subsequently exploited by *Phytophthora* pathogens. Potato (*Solanum tuberosum*) is susceptible to shortfalls in calcium. Calcium deficiency causes internal browning of potato tuber flesh and inferior tuber skin strength and

finish, thus increasing tuber susceptibility to infection by a range of potato storage diseases. These twin effects hit both tuber storage longevity and tuber marketability.

"This group of specialist nutrient and biostimulant products (Omex Bio 20, Omex DP98, Omex K41 and Omex Calmax) are crucially important for vegetable growers, including those in upland environments who must satisfy the nutrient needs of fast growing crops while conferring maximum plant resilience to disease," said Alan Lowes. 

Upscaling my passion

TENDERING MY VEGETABLES every day has been a truly delightful experience.

To my neighbours, the sight of my garden is just refreshing. My home garden is situated beside my house where ample sunlight is available for the plants' growth and development. This is my seventh project and, although the soil has gradually lost its fertility, the internal drainage and moisture holding capacity is still good.

Previously treated as a landfill site, this site has been converted into a home garden to provide a balanced, healthy and diversified 'quick-fix' yearly fresh vegetables for subsistence and collaborative consumption purposes. The green patch has added a lush look to my neighborhood and the food waste from my house has been upcycled to fertilise the home garden.

Peri-urban and urban agriculture is becoming the vogue in my neighbourhood. A



Patricia Akyeampong's home garden

Image Credit: Patricia Akyeampong

few inspired neighbours have already taken up home gardening.


For those without parcels of land to engage, empty bottles and pots have come handy. Experiences, doubts, fears and success stories from neighborhood farmers are communi-

cated on a social platform called Veglife Hub.

The intention is to go organic and nurture my plants without any dependence on chemicals. To that end, I lap up training modules on nursery management, soil enhancement, pest and disease control

on YouTube. My plants are thus cultivated in ways that make them resilient and immune to the vagaries of climate by inculcating Good Agricultural Practices (GAPs).

I have two varieties of tomato and pepper on my site. Tengeru 2010 is a new tomato variety that has great potentials for big fruit, thicker shelf and tastes slightly salty. This seed was sourced from AVRDC. F1 Tikal, is a hybrid hot pepper that tolerates high temperatures and has intermediate resistance to buckeye fruit and root rot disease.

These two varieties are rich in nutrients. Besides, they are also resilient and can survive in less rainfall and also fix nutrients in the soil. Apart from these two varieties, the site is diversified in terms of the cropping system as well. 

Home gardening is the way to go!

(Patricia Akyeampong is a farmer based in Ghana)

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The tradeshow is pegged as a perfect platform for farmers, agronomists, biotechnologists and anyone and everyone who is interested in the fast-changing landscape of agriculture technology to update their know-how.

Fifth edition of Agritec Africa held

THE FIFTH EDITION of Agritec Africa was held on 22 June at Kenyatta International Conference Centre (KICC) Nairobi, Kenya. The three-day international exhibition and conference was jointly organised by the Ministry of Agriculture & Irrigation, Republic of Kenya and Radeecal Communications, India.

Prof. Hamadi Iddi Boga, principal secretary, Ministry of Agriculture & Irrigation inaugurated the trade show. Dignitaries including Mwangi Kiunjuri, cabinet secretary, Ministry of Agriculture & Irrigation, Dr. Hadi Farajvand, ambassador, Embassy of Islamic Republic of Iran, Deillan Morteza, commercial counsellor, Embassy of Islamic Republic of Iran, Song Da Hee, first secretary, Embassy of Republic of Korea, Titus Kavisi Maluki, marketing officer, High Commission of Malaysia, Young Dae Kwon, ambassador, Embassy of Republic of Korea, Jong-ho Kim, managing director, Korea Animal Health Products Association (KAHPA) and Kim Tae Kyeong, deputy director, Korea Trade-Investment Promotion Agency (KOTRA) graced the event.

Agritec Africa 2018 clocked an increased footfall this year with more than 10,500 visitors from across the globe. The tradeshow is pegged as a perfect platform for farmers, agronomists, biotechnologists and anyone and everyone who is interested in the fast-changing landscape of agriculture technology to update their know-how.

The fifth edition of Dairy Livestock & Poultry Expo Africa 2018 was held as a concurrent event.

The 2018 Conference of Agritec Africa, based on the theme of "Transformation of Agriculture through Technology" was organised on the first day of the exhibition. The conference had invited more than 250 high profile professionals from academia, youth organisations and government associations. Development practitioners and progressive farmers were also invited.



The fifth edition of Dairy Livestock & Poultry Expo Africa 2018 was held as a concurrent event.

Image Credit: Radeecal Communications

The conference opened with a special address by C R Chaudhary, minister of State of Commerce & Industry, Government of India. Mwangi Kiunjuri delivered the inaugural address. The speakers spelled out the challenges in the agricultural industry and stressed on the need for exhibitions and platforms like Agritec Africa to improve the agriculture sector.

Facts & figures:

- More than 150 brands participated in the trade show
- Agritec Africa 2018 witnessed the presence of delegates from 25 plus countries such as China, Egypt, France, Germany, India, Iran, Israel, Italy, Kenya, Netherlands, Turkey, UK, Japan, USA, Ireland, Indonesia, South Korea, and Uganda
- Total number of visitors exceeded 10,500 

NIAA West Africa to open on 4 September

AFRICA'S MOST PROSPECTIVE one stop exhibition for Agriculture Chemicals & Agriculture Equipments, Nigeria International Agro Chemical & Agro Equipment Expo (NIAA West Africa) 2018, will open on 4 September. The event is proposed and packaged by CEMS NIGERIA LTD and UTEX INDIA PVT LTD under the patronage of Federal Ministry of Agriculture and Rural Development Nigeria (FMARD) and Federal Ministry of Industry, Trade & Investment Nigeria. The expo is backed up by industry associations like All Farmers Associations (AFAN), Farming Equipment Dealer Associations, Growth Enhancement Associations, Organic Farming Associations, Mill Equipment Dealer and Fabricator



Image Credit: UTEX INDIA

The event will be held at Kano City - the largest agro chemical and equipment market hub of Sub Sahara.

Associations of Nigeria.

CEMS NIGERIA LTD & UTEX INDIA PVT LTD are looking to set up a unique platform for the national as well as international business community while building a bridge between manufacturers, dealers, end users, farmers, distributors, government agencies and other stakeholders.

NIPOLI West Africa has received a huge response and became West Africa's largest poultry & livestock exhibition in two years.

NIAA West Africa Expo 2018 is an exclusive tradeshow targeting agro chemical and equipment sectors. The event will be held at Kano City - the largest

agro chemical and equipment market hub of Sub Sahara.

The major users of the agritech range, from equipment to agro chemical products are from the northern part of Nigeria. Kano City allows easy access for visitors from more than 19 states. It is a major route for agritech trade to other countries in Sub Sahara.

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- Farmland Basic Construction Machinery
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Farm-Tech Expo Kenya will gather key stakeholders, retailers, agents, service providers from across the entire agriculture value chain as well as farmers from small to commercial scale.

Farm-Tech Expo Kenya all set to open on 12 September

FARM-TECH EXPO KENYA will open on 12 September at Naivasha. "In Farm-Tech Expo Kenya you have a winning team with a winning formula, and we can't wait to show the agri sector in Kenya what we managed to achieve with Agritech Expo Zambia during the last five years," says Dominique de Lauwere, the event director of the inaugural Farm-Tech Expo Kenya.

Farm-Tech Expo Kenya will gather key stakeholders, retailers, agents, service providers from across the entire agriculture value chain and farmers from small to commercial scale to provide a unique outdoor and interactive buying platform for all agriculture professionals through live crop trials and machinery demonstrations to free-to-attend training workshops.

"We will have the same winning combination of technology, learning and networking at Farm-Tech Expo Kenya – this has been the key to the success of Agritech Expo Zambia and helped it become a firm favourite on the regional agri calendar," says Dominique.

Spintelligent, the multi-award-winning Cape Town-based organiser of trade exhibitions and conferences across the continent, is putting together Farm-Tech Expo Kenya.

Phenomenal success

The event organisers are Spintelligent, the multi-award-winning Cape Town-based organiser of trade exhibitions and conferences across the continent. Agritech Expo Zambia is one of its flagship events and has won several AAXO ROAR awards, including twice for Best Africa Bound Trade & Consumer Exhibition in the 12,000+ sq m category.

In partnership with the Zambia National Farmers Union (ZNFU) and GART, Agritech Expo Zambia has been a phenomenal success with consistent attendance of on



Agritech Expo Zambia has been a phenomenal success with consistent attendance of on average 18,000 visitors.

average 18,000 visitors (farmers of all scales) per year, 270 local and international exhibitors including several country pavilions and 150 members of the media. Zambian President Edgar Lungu is a regular VIP guest at the event.

'We need to improve yield'

Many of the longstanding partners of the Zambian event have already signed up to be in Naivasha in September, including CASE, Toyota, John Deere, SAME, BASF, Chief Industries, Lindsay Africa, FarmCo, Mascor, Massey Ferguson, QBS, E.A.Seed, Trimble and Yara. The first country pavilion to be confirmed is from Poland.

"Kenya is a regional hub for East Africa and is therefore strategically very important for the region," says Ian Allen, general manager, Agri Mechanisation Department at CASE and Toyota Tsusho East Africa Ltd. (TTEA), gold sponsors at the inaugural Farm-Tech Expo Kenya, adding, "food production is one of the major pillars identified, which the government will focus on in the next five years."

"We are inspired to be partners in developing agri mechanisation in the region in order to produce more food for a growing population. We need to improve

yield and production from less available land through good mechanisation suited for our customers," he added.

"A highlight for us in the last 12 months is the big breakthrough we made into the very competitive sugar belt sector. We also had continuous penetration into the high HP and harvesting sectors. We are also in the process of expanding our network to Nakuru which is located in the heart of the agricultural region in the country," said CASE's Ian Allen.

"Case IH will have a wide range of equipment where customers can come and see and drive machines fitted with the latest technology suited for all types of farming including precision farming," he added.

Multi-award winning event organisers

Spintelligent produces events across the continent in the infrastructure, real estate, energy, mining, agriculture and education sectors. Other well-known events by Spintelligent include African Utility Week, Future Energy East Africa, Future Energy Nigeria, Agritech Expo Zambia, Kenya Mining Forum, Nigeria Mining Week and DRC Mining Week. Spintelligent is part of the UK-based Clarion Events Group. 



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Thanks to the integrated roller and levelling discs, the Kristall 9 leaves behind a firm and structured seedbed. The roller also regulates the working depth of the Kristall 9, and helps conserve moisture.

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In 2009 Chief Industries UK began the production of Continuous Mixed Flow Grain Dryers at their facility in Essex. The basis for their dryer, now even further improved, was the well known and well respected Law Denis dryer.

Chief Industries: The art of strategic grain storage



Image Credit: Chief Industries

Chief Industries has been supplying grain storage silos for over 60 years.

STRATEGIC GRAIN STORAGE is a concept gaining currency day by day. Countries plagued by depleting grain supplies due to natural factors such as drought, floods and pests and economic factors such as rising grain prices, importation costs, war, etc are now committing more resources to find ways to store grain efficiently and effectively. It is surprising how many times excess grain is exported in times of plenty, only to find that later shortages result in the need to import grain, usually at higher prices. So it is imperative to keep the demand and supply on an even keel throughout.

Strategic grain storage is high on the agenda of every grain farmer, miller, grain trader and livestock owner.

The grain farmer needs to store his grain to ensure he can sell it at the best price, not the lowest price which prevails at harvest time. The miller needs to buy grain when it is cheap and plentiful at harvest time, or if he is importing he can choose when the global prices are most favourable.

Grain traders make their money by both buying and selling at favourable prices and to do this they have to have storage facili-

ties. The livestock feeder has to keep reserves of grain, purchased at favourable prices, and ensure he has sufficient stocks to cover any short term interruptions in supplies. Feeding his cattle, pigs, or poultry, is a continuous process. He has to have strategic stocks.

Apart from being able to supply one of the most advanced grain dryers in the world, Chief UK can also service, repair and provide all parts for existing Law Denis dryers.


Chief Industries has been supplying grain storage silos for over 60 years. Projects range from small to large farm installations, to grain millers, to livestock producers, to large government and commercial strategic storage plants, and to large port installations.

Chief Industries UK Ltd is a division of Chief Industries Inc. in USA and deals in project design, and sales of grain storage silos, grain dryers, grain handling equipment and ancillary equipment

throughout Africa, the Middle East and Europe.

In 2009 Chief Industries UK began the production of Continuous Mixed Flow Grain Dryers at their facility in Maldon, Essex. The basis for their dryer, now even further improved, was the well known and well respected Law Denis dryer.

This means, apart from being able to supply one of the most advanced grain dryers in the world, Chief Industries UK can also service, repair and provide all parts for existing Law Denis dryers. Africa is an important and growing market for Chief.

A few examples of Chief Industries UK Ltd installations in Africa are as follows: 6,000 tonne grain storage in Rwanda, including cleaning, drying, weighing and bagging. Intake & outloading capacity 50tph; 15,000T grain storage project in Ghana, 15,000T storage in 10x 1,500T silos. 150t/h mechanical intake and 150t/h handling equipment supplied to fill the silos; 2,000T grain storage project in Uganda, 2,000T storage in 2x 1,000T silos, including silo sweep augers, unloading augers and full aeration systems. Intake and out loading capacity 50t/h. 



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Last month governor Emmanuel commissioned seven new roads with 34 additional roads planned to provide over 2,00 jobs to the state and stimulate commerce in Akwa Ibom. Udemé Etukeyen writes.

Akwa Ibom: Nigeria's prime investment destination

OF NIGERIA'S 36 states, debatably the most impressive is Akwa Ibom state, led by governor Udom Emmanuel. A noted adherent of impact investing, Emmanuel selects projects for his state that add value beyond the sums marked on contracts or the profit margins racked up by contractors. Public benefit must be calculated in far more sensitive and inclusive terms.

Agriculture

With Africa's 65 per cent of its land still unexploited and food imports debilitating local economies, Akwa Ibom's developmental finance strategy included a technical committee on agriculture and food sufficiency which broadened the "Dakkada" mindset in youth people, women and the elderly. With increased acreage of cultivated land growing by over 40,000ha comprising now 11,000ha earmarked for an ongoing coconut plantation, 24,000ha for new rice projects including two rice mills, 3,000ha of cassava plantations with rehabilitated processing facilities for garri, cassava pellets, flour, and ethanol, and the rehabilitation of competitive oil palm and cocoa estates, Akwa Ibom's position as a leading food producer and exporter in Nigeria is assured.

The state government has facilitated thousands of high yield seedlings of oil palm, plantain suckers, maize and citrus seeds to ensure optimal source of farm input for its local population.

The Ibom Greenhouse Project has induced export capabilities for vegetables, tomatoes and cucumber, encouraging a massive response by young farmers to take up various forms of agriculture as a new economic mainstay. The government via partnerships with investors has also established a fertiliser blending plant at Abak, a meat processing facility project at Itam, a cattle ranch at Adadia, and an Akwa prime hatchery at Mbiaya and other strategic agribusinesses and related technical services.

To date over 20,000ha of land have been cleared, providing businesses and economic activity for equipment owners,



farmers, input producers and direct/indirect jobs for households within the state and beyond. Akwa Ibom is positioned to feed her people and indeed the nation, making Akwa Ibom an attractive investment destination for those interested in the agribusiness sector.

With several MOUs and EOIs in place, the state continues to be the second highest destination for FDI in Nigeria, and prospects for growth in the SME sector look promising.

Industrialisation

Leading a much-needed and highly progressive departure from an epoch of oil revenue dependency and federal allocations, Akwa Ibom state has understood that the key to industrialisation is increasing power generation. The governor has seen to this by securing additional licensing for the state-owned power company increasing capacity from 190MW to 685MW, unlocking distribution via massive investment in substations and feeder lines, and installing a network of new power infrastructure around the state, providing parts of

the state capital with 15-18 hours of power per day. Dedicated lines and infrastructure have targeted special projects such as the airport, the Ibom Specialty Hospital and the industrial clusters in Onna, Uyo and Itu.

With both road and power infrastructure being addressed, the state government has pursued its first phase of its ambitious industrialisation agenda by delivering an Electric Digital Metering Plant providing metering solutions that unbundle the legitimate concerns of investors, namely tracking power tariffs.

The state is also proud of its strategic investment in syringe manufacturing with capacity large enough to cater to Africa's 2.4bn-strong demand for syringes by producing 350mn units with capacity to upscale to one billion, adequate to cater for both local and international markets.

The state has also increased progress in a proposed flour mill within the Onna Industrial Cluster.

Hundreds of Akwa Ibom daughters and sons have been trained abroad to take up various technical and managerial aspects of these investments as part of the 350-strong human resources needs of the cluster. International development agencies and the private sector are both positioned to forge the development of the state's growing MSME sector. **E**

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Irritec promotes drip irrigation, which reduces the consumption of water, energy and chemicals.

Image Credit: Irritec

Irritec irrigation systems guarantee the maximum efficiency at reasonable prices with the least environmental impact. Giulia Giuffrè, Irritec group's marketing director, opens up about the company's vision and mission.

Irritec group: Perfecting irrigation systems for a better planet

What makes Irritec stand out?

Irritec is recognised as a high-quality brand and is a point of reference for irrigation systems across the world. We have the widest range of 'homemade' items. We produce all kinds of driplines, filters (in plastic and metal), valves, fittings and accessories.

Africa is in the midst of a huge water crisis. How can Irritec make a difference?

There are many advantages to drip irrigation system. It reduces water consumption by 30-70 per cent and increases produc-

tivity by 30-90 per cent. It allows the use of saline water thereby reducing the stress on groundwater. It speeds up cultivation cycle while improving pest control. Moreover, drip irrigation limits the interruption of agricultural activities throughout the year, increasing the annual production by up to 50 per cent. Also, through fertigation, it improves the application and benefits of nutrients increasing yields by up to 20 per cent. It is also important to make long-term system maintenance possible. To that end, Irritec provides assistance to the locals so that they can develop their skills to become irrigation promoters and local reference persons. Irritec designs and develops high quality products that require minimal maintenance, such as eXXtreme tape, a dripline with the highest resistance to occlusion. Irritec has a commitment to Africa. Irritec spreads the most effective and efficient irrigation solutions so that the land of small-scale farmers can not only support

the food needs of families, but also become a source of income.

Tell us about Agronomic Irritec Team's after-sale services and how the company holds the hands of its customers post installation

We have a team of agronomists who are good at understanding the needs of farmers, not only in terms of irrigation, but also to optimise the use of fertilisers. This works to a great advantage during the post sales phase, because the customer feels supported during the system start-up phase and over the course of the product's lifecycle.

How does Irritec achieve maximum efficiency with minimum ecological footprint?

First of all, Irritec promotes drip irrigation, which reduces the consumption of water, energy and chemicals. Also, Irritec

Irritec provides assistance to the locals so that they can develop their skills to become irrigation promoters and local reference persons.

manufacturing process reduces the waste of raw material.

What are the most popular products of Irritec?

Irritec offers a range of components fit to complete any high efficiency irrigation system. The Multibar pressure-compensating dripline, the light dripline with flat dripper P1 and the dripline with continuous labyrinth Irritec Tape are a few popular items in our product line. The plant is then completed by our filters, valves, fittings and high-performance accessories.

Tell us about Irritec's investment in R&D. Do you have any exciting products in the pipeline?

Irritec's R&D department is constantly improving product performance and designing new ones. We have new drippers and filters waiting in the wings.

We believe in pushing technological progress for the protection of our planet and improving the quality of farmers' lives.

What makes Irritec a preferred choice for irrigation projects across the globe?

Irritec starts a project by analysing the territory and the local community. It is important the local farmers understand the benefits of efficient irrigation. Irritec makes sure this happens before the plants are installed. Also, Irritec provides adequate training for the use and maintenance of the system.

What is Irritec's corporate policy and mission?

Our main value is innovation for development. We believe in pushing technological



Image Credit: Irritec

A drip irrigation system can supply water precisely and in a timely manner.

progress for the protection of our planet and improving the quality of farmers' lives. We strive to add more innovation to our product catalogue and perfecting the manufacturing processes. Irritec's mission is to design, develop, manufacture and distribute highly-technological and reliable irrigation systems all over the world that guarantee the maximum efficiency with least environmental impact at reasonable prices.

What's Africa social garden? Tell us about your outreach programmes

A social garden is an irrigation project where training customers, transmitting their know-how and putting them in a position to use the selected technologies are part of the solution. It is called 'social' because it aims to help families who own a garden to turn it into a source of income, as well as for the sustenance of their family nucleus. This helps the local community to sustain itself on agriculture while respecting the environment. This is easy and feasible with the use of the Irrigo kit, a smart, handy and easy-to-

assemble tool- a precision instrument that works without requiring large amounts of energy resources. This makes it ideal for developing countries and where water and energy resources are lacking.

Please elaborate on your innovative digital solutions for agriculture

A drip irrigation system, even if it includes a digital programmer, can supply water even more precisely and in a timely manner. If the automation control units are connected to the fertigation systems, it is possible to automatically manage water and fertilisers, ensuring the correct supply of nutrients. Irritec has various models. A perfect model for the first approaches to fertigation is DosaBox fertigation system, a device that allows to dose up to 4 fertilisers plus an acidity regulator (premixing), allowing to regulate the suction channels separately, depending on the PH and EC values of the water. Shaker Pro for fertigation with volumetric or proportional objectives (in accordance with the water flow) is another. **E**

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Since the reveal of the autonomous concept vehicle, Case IH has been evolving the technology and further defining automation and autonomy as it relates to agriculture.

Case IH turns attention to autonomous technology

CASE IH IS researching and piloting autonomous technology in real-life scenarios. “While the autonomous concept vehicle reveal in 2016 showed the world what’s possible with autonomous vehicles, it was just that — a concept. This working tractor provided a platform for us to start discussions with farmers and the industry about the technology needed for high-efficiency farming operations today and in the future,” said Robert Zemenchik, Case IH AFS global product manager. “We’re ready to show how automation and autonomy applies across agriculture and how it can advance the precision farming solutions our customers are currently using on their farms.”

Case IH has been in discussions with customers around the world to study how the autonomous technology can be implemented for maximum benefit in their operations.

Five categories of automation for agriculture

Diverse farming operations around the world require varying levels of automation. Through extensive Customer Driven Product Design research, Case IH found that current and future technology needs fall into five categories of automation for agricultural field applications. The categories and types of activities associated with each include:

- Guidance
- Coordination & optimisation
- Operator assisted automation
- Supervised autonomy
- Full autonomy

“It’s exciting to explore the efficiencies that automation and, eventually, full autonomy can bring to each farming operation,” Zemenchik said. “The logic behind the categories is to provide a vision of what’s possible. They are not linear, and a given fleet may even fit into more than one category at a time. Today, many of our customers are already operating in the



Image Credit: Case IH

Diverse farming operations around the world require varying levels of automation.

Guidance and/or Operator Assisted Automation categories.”

The five categories defined by Case IH start with automating specific tasks on a piece of equipment. Case IH led the way by first providing producers automation technology in the 1990’s with AFS AccuGuide autoguidance, and it continues today with more advanced solutions, such as AFS AccuTurn™ automated headland turning technology and AFS Soil Command seedbed sensing technology.

Researching and piloting autonomous technology in the field

In 2018, Case IH is collaborating with Bolthouse Farms on an autonomous tractor pilot program. The goal of the programme is to understand how new autonomous technology can be used and how it meets real-world, on-farm requirements.

“The only way to validate on-farm uses for autonomous technology is, quite literally, with field pilots where farmers use it on their own farm, integrate it into their own fleet and conduct their everyday activities,” Zemenchik said.


As one of the largest carrot producers in North America, Bolthouse Farms is a year-round operation that farms extensive acreage across four states and Canada. The company’s focus on and openness to advanced technology, coupled with their

desire to improve productivity, makes it ideal for the pilot for the Case IH Autonomy and Automation Programme.

The pilot program will focus first on primary tillage and deep tillage — both highly repetitive tasks Bolthouse Farms conducts year-round — and a small fleet of autonomous Steiger® Quadtrac® tractors pulling a True-Tandem disk harrow or Ecolo-Tiger® disk ripper will be used.

This will help evaluate autonomous machine control in a variety of tillage applications, soil types, meteorological conditions and sensing and perception activities.

“One of the primary goals is to receive agronomic and operator feedback on the use of autonomous technology in real-world farm conditions so Case IH can further develop and refine our technological control and machine optimisation systems,” Zemenchik said. “Additionally, we will be able to learn from Bolthouse Farms what uses they envision for automation and autonomy that we might not have already thought of.”

Brian Grant, Bolthouse Farms vice president of agriculture, views the autonomous tractor pilot programme as an opportunity to find new ways to make the company’s operation more efficient and deliver high-quality food for the growing population. 

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INSPIRES THE NEW

ADAS Horticulture, part of UK-based RSK Group, has pioneered new technology for reducing the impact of pest and pathogen attacks that cause significant crop and supply chain losses, Stephen Williams reports.

Pioneering UV to boost crop yields

TO ADDRESS THE problem of pestilence and find a sustainable, environmentally friendly solution, ADAS has spent the last three years working with industry and academic partners to develop new sustainable, non-contact, non-chemical technologies. The project was funded by Innovate UK.

Kenya's roses, carnations and summer flowers, in particular, are renowned for being long-lasting. But the produce is under constant threat of damage by pest and disease. The most problematic disease which causes crop and supply chain losses is *Botrytis* (commonly known as grey mold), but it is not the only problem.

Pests and pathogens are estimated to contribute up to 40 per cent of cut rose yield losses. Standard chemical control techniques involving direct spray applications of pesticides are not always effective and their use is being constantly challenged by consumer and environmental impact concerns.

Explaining the innovative UV technology, Dr Barry Mulholland, director of ADAS Horticulture, said, "We worked with a Kenyan business, which grows and exports roses back to Europe. The technology comprises two strands: firstly, UV light to make crops more resistant to pest and pathogen attack and also improve product marketable quality; and secondly, UV light in post harvest environments to remove ethylene, which is responsible for the accelerated ageing of fresh produce."

This is the first time that UV technology has been used on a crop while it is growing. "The idea of UV being used in a number of agro-food applications has been around for a long time, maybe 10 to 15 years," explains Mulholland. "We have actually driven the technology forward for the fresh produce sector, using various isolated bits of academics research. None of the research to date seems to have really commercialised the findings for application in real horticulture businesses."

What the research shows is that by exposing crops to short pulse low-intensity UV radiation, growers can pre-adapt plant tissues to resist infection of grey mold, the most damaging fungus to both edible or non-edible crops such as strawberries, tomatoes or cut flowers.

The spores of *chlamydia* are generally present in the pre-harvest environment, so you can usually see them, or they manifest later in leaf tissues and can sporelate in the post harvest environment, even moving inadvertently from the production period to the post harvest environment.

This is the first time that UV technology has been used on a crop while it is growing. The research notes that the resistance goes along the full supply chain.



Image Credit: Stephen Williams

This UV technology, which can be retrofitted in pack houses, is clearly affordable

It is potentially more cost-effective to use non-contact, non-chemical approaches rather than conventional chemical control which can often be due to the pervasiveness of the pathogen.

The idea was to research this approach in Kenya, in tomato production under plastic, to see whether in a protected environment situation good control could be achieved. That project started in 2014 and finished in January this year, and provided some excellent data in terms of ascertaining that there was an actual defined benefit of applying set-pulse treatments to growing rose and tomato crops. It indicated that this dissuades infection, and the technology is well on its way to being ready to take to market.

Although Mulholland could not say precisely what the cost of a rig would be, he estimates that the price would come in at around US\$50,000. The UV light would strobe at about three times a second. The rig, similar to an irrigation unit, needs to operate at night, and can be moved from greenhouse to greenhouse.

Mulholland says it needs more work to refine the machinery that can be routinely used safely. "There is a bit of way still to go in the development phase with that project, but we tested it in actual conventional environments for three years and it could be rolled out there to the agriculture sector as a viable, cost-effective alternative to chemicals," he says. "It meets the green credentials and demands of consumers – it is environmentally friendly. It is also good for growers as there is less exposure to chemicals. If you can get this to work, it will give you an uplift in terms of the amount of a crop that is saved from wastage – the process increases shelf life by more than one or two days, which is very beneficial."

The second technology that was researched was photo-catalytic oxidation. It uses UV lamps in pack-rooms, producing hydroxide radicals that zap bacteria. "But, as importantly," Mulholland says, "it breaks down hydrocarbons, which means that it breaks down ethylene, that we call a 'silent killer' – the hormone that accelerates the breakdown of produce in the postharvest environment." **E**

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The new TL30.70 AGRI compact telescopic loader is ideal for poultry and goat farms but also for mixed farming, particularly on small and medium sized crop, livestock and dairy farms.

Bobcat launches new TL30.70 AGRI compact telescopic loader

BOBCAT HAS LAUNCHED the company's new TL30.70 AGRI compact telescopic loader for the agricultural industry. The TL30.70 provides a maximum lift capacity of 3 tonne and a maximum lift height of nearly 7m; the overall width remains at less than 2.1m even with 24 inch tyres.

The new TL30.70 is part of a range of six telescopic loader models from Bobcat covering maximum lifting capacities between 2.6 and 3.8tonne with lifting heights from 6 to 7m. Like all the models in the Bobcat range, the TL30.70 is covered by a three year/3000 hour warranty as standard. There is also the option of extending the warranty to five years/5000 hours. They are all designed and manufactured in France (Brittany) at the Bobcat factory in Pontchâteau.

The new TL30.70 is part of a range of six telescopic loader models from Bobcat covering maximum lifting capacities between 2.6 and 3.8 tonne with lifting heights from 6 to 7m.

The TL30.70 provides an excellent compact and cost-effective alternative to larger 7m models, especially where working spaces are tight and increased manoeuvrability is required. In addition, performance is not compromised in the compact TL30.70, which offers a powerful hydraulic system with flow sharing to combine several fast boom movements simultaneously for increased productivity.

Smooth hydro-vario transmission

Like all Bobcat telescopic loaders, the TL30.70 has a heavy-duty hydrostatic transmission that delivers smooth power quickly and when it is needed. A two-speed range with shift-on-fly optimises speed and torque for each individual job. The hydro-vario transmission delivers the smoothest 0-40 km/h stepless driving experience and allows an impressive 17 tonne towing capacity when equipped with the trailer brake system.



Image Credit: Bobcat

The TL30.70 offers several new features providing higher comfort and productivity.

Bobcat has designed all of its telescopic loaders with the same robust box-welded frame for enhanced rigidity and stability (low load centre). The shielded bottom plate protects vital components and a combination of specific features maximises reliability and reduces total cost of ownership in even the most severe conditions.

New features

The TL30.70 offers several new features providing higher comfort and productivity:

Power lift, an efficient lifting technology that increases boom speeds and productivity at work.

Automatic Parking brake, a unique feature in the market, for enhanced safety and operator convenience.

Automatic Fan inverter, whereby a cycle time can be set for cleaning radiators and the air intake grill; a simple way to maintain efficient cooling.

Boom Cushion Retract that automatically slows down the boom speed when the boom is nearly fully retracted or at min/max angles, increasing safety and operator confidence.

High Comfort Air Suspension Seat, including longitudinal and low frequency suspensions. Many adjustments are

available to allow the operator to find the most comfortable drive position.

There are also a number of tried and tested smart operating features still offered as standard:


SMS (Speed Management System), which allows the travel speed to be adjusted independently of the engine speed.

SHS (Smart Handling System), which allows the speed of the boom movements (lifting, telescoping and tilting) to be adjusted, depending on the type of work being carried out.

AFM (Auxiliary Flow Management), which allows the hydraulic output to be adjusted to match attachment requirements and to set a continuous flow.

FCS (Fast Connect System), which provides quick and easy interchange of hydraulic attachments via an integrated pressure-release system.

TL30.70 - brief specifications

- Maximum lifting capacity: 3,000 kg
- Maximum lift height (24inch tyres): 6,750mm
- Maximum horizontal reach: 3,900 mm
- Maximum travel speed: 40 km/h (option)
- Hydraulic output: 100 l/min with flow sharing distributor
- Engine power: Perkins 100hp. 

Zimbabwe was the second largest African exporter of horticulture products during the 1990s. The HortiFlor expo is an initiative to restore the African nation's place in the horticulture sector.

Three-day HortiFlor Zimbabwe to be held from 9 October

IN THE RUN-UP to the international horticulture and floriculture trade fair, HortiFlor Zimbabwe, the African nation is busy laying the groundwork to put itself back on the horticulture map. The initiative to revive the Exporters Flower Growers Association of Zimbabwe is a sign of things to come. It goes on to show the commitment of Zimbabwe to become one of the biggest exporters of vegetables, fruits and flowers in African continent. Zimbabwe was the second largest African exporter of horticulture products till the business end of the 1990s.

The three-day HortiFlor Zimbabwe expo will be held at the Rainbow Convention Center in Harare from 9 October. HortiFlor is conceived as a platform to bring international suppliers from the fresh flower and fresh produce industry to meet with growers, farmers, traders, investors and non-governmental bodies in Zimbabwe with the goal to increase production, trade and exports of Zimbabwean-grown flowers, vegetables and fruits. For this purpose, suppliers and growers will be able to display their products and produce during the trade fair. Subject matter experts will take the podium to address the issues crippling Zimbabwe's horticulture sector during the conference organised as part of the event. Workshops and seminars will also be held.

HortiFlor hopes to contribute to further the production and consequently exports of floriculture products and horticulture produce to Europe and other regions across the globe.

With this initiative, HortiFlor hopes to contribute to further the production and consequently exports of floriculture products and horticulture produce to Europe and other regions across the globe.

"After putting in place all necessary measures in the horticultural sector, the country expects to breach the US\$143mn export



Image Credit: Adobe Stock

The three-day HortiFlor Zimbabwe expo will be held at the Rainbow Convention Center in Harare from 9 October.

earnings mark reached at the peak in the 1999 /2000 season. Starting from 2018 /2019 summer cropping season, as government, we will be extending Command Agriculture to horticultural sector. This will help the country to earn much needed foreign currency. "We have already agreed with some private players to begin the programme and funds mobilisation is already underway to start the programme next season," said lands, agriculture and rural resettlement minister Perrance Shiri.

"The horticulture sector is now dominated by small-scale production outfits that are dotted across the country and are saddled with technological and skills challenges, inadequate credit lines to finance production hence from a peak of US\$143 mn in 1999, horticulture exports fell to about US\$72 mn in 2005 and US\$40 mn in 2009," he added. **B**

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Grain market participants highlight the role of enhancing supply chain efficiency in Egypt

THE FOOD AND Agriculture Organisation of the United Nations (FAO) and the European Bank for Reconstruction and Development (EBRD) held two workshops on 17-18 July in Cairo on "Grain Market Data Availability and Quality in Egypt" and "Supply Chain Efficiency & National Food Security", in cooperation with the Ministry of Agriculture and Land Reclamation, the Ministry of Supply and Internal Trade, other government agencies, the Egyptian Grain Suppliers Association and other private sector representatives.

The discussions during the first workshop focused on reviewing the methodologies used to collect, prepare and validate Egyptian official estimates on areas planted and harvested, yields, consumption, trade and stocks of grains and oilseeds.

The Economic Affairs Sector of the Ministry of Agriculture and Land Reclamation, the Central Agency for Public Mobilisation and Statistics, the General Organisation for Export and Import Control, The Egyptian Holding Company for Silos and

Storage, and the Chamber of Cereal Industry participated in the discussions. Representatives from grain importing, processing, and handling companies provided feedback on the official data and discussed its availability and quality.

The second workshop focused on identifying obstacles facing grain and oilseed imports to enable a more efficient supply chain that will ensure the availability of strategic commodities and reduce the cost of grain imports in the future.

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