

African Farming

and Food Processing

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

Seed drills
and planters

Poultry housing
for healthy chickens

Coffee -
optimism in East Africa



Brassicas and other crops shown here are being grown under micro-irrigation. p 26



Made for Africa



 **jacto**

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A Massey Ferguson 460Xtra low to mid hp tractor with MF510 planter in a crop field in South Africa. (Image: AGCO)



Zulu sheep, native to southern Africa.



The Lemken Solitair 9 series drill, working with a front-mounted press.

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Farming Calendar 2016

FEBRUARY

15-17	VIV MEA www.viv.net	ABU DHABI
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MARCH

1-2	2nd Cassava World Africa www.cmtevents.com	ACCRA
2-3	Cropworld Global 2016 www.cropworld.com	AMSTERDAM
15-18	Propak Africa 2016 www.propakafrika.co.za	JOHANNESBURG
18-20	Agro and Poultry East Africa 2016 www.mxmexhibitions.com	DAR ES SALAAM
29	2016 FIAAP Animal Nutrition Conference www.fiaap-conferences.com	BANGKOK
29-31	FIAPP VICTAM GRAPPAS Asia 2016-01-08 www.fiaap.com	BANGKOK

APRIL

113-15	AGFOPEX Nigeria www.agfopexnigeriafair.com	LAGOS
14-16	Agritech Zambia www.agritech-expo.com	CHISAMBA
28-30	Nigeria Agrofood www.agrofood-nigeria.com	LAGOS

MAY

7-12	IFFA 2016 www.iffa.com	FRANKFURT AM MAIN
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Readers should verify dates and location with sponsoring organisations, as this information is sometimes subject to change.

Morocco special guest at Africa Agri Forum

THE 2ND AFRICA Agri Forum took place in Abidjan with special guest country, Morocco. With the theme, Green Africa: Agricultural dynamics in motion, Agri Forum Africa analysed the impact of sectoral plans launched in several countries in the region and their impact on the agricultural sector and in society.

It discussed how the countries of the region "face the challenges of agriculture including food security, improved productivity and increased local processing," said committee chair Hassan Alaoui. The opportunity was also given to participants to soak up the approach to the development of agricultural human skills, innovation in financing mechanisms and solutions to modernise the sector.

Agri Forum Africa recorded the participation of 300 leaders from government representatives, international organisations, financial institutions, industrial investors, experts and international consultants, academics, equipment suppliers and several major players involved in agriculture from 25 African countries.

The President of the General Council of Agricultural Development at the Ministry of Agriculture and Marine Fisheries of Morocco, Mohamed Ait Kadi, noted that agriculture contributes to the economic growth of the kingdom. He added that the co-operation between the two countries is achieving miracles in the agriculture sector. "We consider the Côte d'Ivoire to be the nodal point which will allow to centre exchanges between Morocco and the rest of West Africa."

Agritech Expo to gather Zambia's farming community in Chisamba again

"IT IS SO important for the farming community to get together to discuss the current challenges and share success stories in the sector," said Liam Beckett, event director of the Agritech Expo, which is Zambia's leading outdoor agriculture exhibition. "This year we look forward to welcoming some 15,000+ farming professionals - small holders and commercial farmers - as well as agri experts, in Chisamba in April", Liam added. "It is a unique opportunity for them to share the best practice, get training, test and try out new products and technologies and brainstorm about current challenges such as productivity and competitiveness as well as the effects of current adverse weather conditions."

Last year's Agritech Expo, which is owned by the Zambia National Farmers Union (ZNFU), drew more than 11,700 visitors, including the country's President Edgar Lungu, the Vice President, Mrs Inonge Wina, the Zambian and German Agri Ministers and many other dignitaries and agri experts.



"Agritech Expo has been embraced by the Zambian farming community from the get-go and in our third edition from 14-16 April 2016 we will continue to innovate and offer our partners and visitors more technology, demonstrations, free workshops and specialised zones to learn and opportunities to do business. We will have 130 exhibitors, including some of the leading international suppliers to the agriculture industry, 20 live crop trials and 11 machinery demonstration fields. There will also be an extended livestock zone, an irrigation zone, an SME business zone, 4x4 test track, a sprayers' arena and technical and practical workshops for emerging farmers as well as VIP Business lounges for commercial players," said Liam Beckett.

He continued: "Energy is a constant challenge in this sector and we want to show the farming community the different options that are available at Agritech Expo's exciting new 'Energy Park'. We listen to what the sector needs and pride ourselves in servicing the needs of the entire agri-value chain in Zambia and its neighbouring countries."

Meanwhile, more than 540 students and 17 teachers at the Golden Valley Basic School in Chisamba are already reaping the benefits of the Agritech Expo Outreach Programme that was launched last year. The school is situated at the GART Research Centre where the annual expo takes place, and the event organisers decided to raise funds to assist the school with much needed building renovations, equipment supply and management of the school's farm. The Outreach Programme is an on-going project and the next phase is already underway.

Agritech Expo is organised by Spintelligent, leading Cape Town-based trade exhibition and conference organiser, and the African office of Clarion Events Ltd, based in the UK.

AGRIt^ech

EXPO
ZAMBIA

14 – 16 April 2016

GART Research Centre
Chisamba, Zambia

Zambia's leading outdoor agriculture expo

14 April: Commercial Farmers Focus day

15 – 16 April: Open to all agriculture professionals

Meet over
15 000 agricultural
professionals in 3 days



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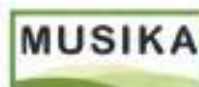
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For more information visit www.agritech-expo.com

New ISO standard for agricultural machinery

TRACTORS AND MACHINERY for agriculture and forestry are an important market, with more than 450 different types of machines manufactured worldwide, including agricultural and forestry tractors, soil working machinery and machines for seeding, crop care and harvesting.

Small and medium-sized companies constitute the bulk of businesses making up the sector and need tools to manage and design agricultural machines in a more sustainable way. A recently published ISO standard on sustainability principles for tractors and machinery for agriculture and forestry will help designers and manufacturers of such machines to integrate sustainability principles, practices and considerations into their organisations and processes.

Yara buys Greenbelt Fertilizers

A NORWEGIAN FIRM, Yara International ASA, has bought Greenbelt Fertilizers, a distributor of agricultural chemicals in Zambia and other southern African countries, at a cost of US\$51mn. This comes following the company opening a US\$30mn fertiliser terminal in Tanzania.

The purchase of Greenbelt represents Yara's first operational step into Zambia, which has one of the fastest growing agriculture sectors in sub-Saharan Africa.

According to Yara chief executive officer for Africa, Bernhard Fonseca, by buying Greenbelt Fertilizers, the Oslo-based chemical company will be providing sustainable crop nutrition for more farmers, increasing crop yield and quality, and also increasing farmers' incomes.

This is a long-term investment in Zambia and in the transformation of agriculture in southern Africa, he added.

Nawa Mutumweno

Farm Africa helps drought-affected pastoralists in Ethiopia

FARM AFRICA IS responding to the serious drought in the Afar region of Ethiopia by opening up sugar-cane byproducts as a new source of affordable animal fodder.

As severe drought continues to affect many parts of Ethiopia, Farm Africa is helping pastoralists in the Afar region access affordable animal fodder.

Pastoralism is the predominant economic and social mainstay of the population of Afar with around 90 per cent of the region's total population depending on rearing and moving with livestock herds.

The drought, which climate experts partly attribute to this year's El Niño effect, has led to extreme shortages of water and pasture. The weight and condition of livestock has deteriorated across the region, reducing their sale value. Demand and prices for livestock have fallen sharply at the time of year when they would normally increase, with this year animals fetching just 40 per cent of their usual prices.

Farm Africa's Market Approaches to Resilience project is responding to the drought as well as improving the availability of fodder in normal years by processing sugar cane byproducts, particularly



tips/leaves and molasses, as an additional, cheap animal feed.

The sugar cane byproducts should allow 30,000 people in 5,000 households to feed their 55,000 livestock.

Matthew Sullivan, Farm Africa's programme manager, commented:

"Ethiopia has done a great deal to build its resilience to natural disasters over the last three decades, so the impacts of this year's drought will not be nearly as bad as in past episodes. However, extreme weather conditions are having an impact on environmentally vulnerable pastoralist communities and Farm Africa is helping to further build their resilience to withstand climate shocks."

In the areas of Afar where Farm Africa is operating an estimated total of more than 500,000 livestock is reported to require emergency assistance, including animal

feed, this year.

Sugar cane was identified as a suitable alternative animal fodder as it produces a greater quantity of carbohydrate than any other tropical crop.

Farm Africa will increase the access to affordable sugarcane by-products, and other animal fodder, through a market-based approach, creating initial awareness of the product and raising demand for it by providing fodder vouchers to herders most affected by drought, and working with the private sector, local traders and co-operatives to stimulate supply, including through provision of credit.

The approach will contribute towards keeping markets functioning during the drought, preventing excess livestock deaths, and enabling vulnerable pastoralists to retain their core breeding herd.

Part of the UK Government-funded BRACED (Building Resilience and Adaptation to Climate Extremes and Disasters) programme, Market Approaches to Resilience is an innovative three year project that will test market-based approaches to improving the resilience of vulnerable pastoralist households to climate change in the Afar.

Olam, InVivo to jointly develop animal feed solutions in Nigeria

GLOBALAGRI-BUSINESS, OLAM International, and leading French feedstock company, InVivo Animal Nutrition & Health (NSA), have signed a consulting agreement to jointly develop expertise in animal feed in Nigeria.

The two-year consulting services partnership agreement signed in December will involve technical assistance and sharing of expertise to jointly develop solutions and products in the animal feed space. The knowledge transfer between the two companies will help develop solutions, formulate animal feed, characterise raw materials and implement R&D trials and protocols to enter the animal feed industry in Nigeria.

As part of this agreement, both companies will tap each other's proven expertise - Olam for its Africa experience and InVivo NSA for its animal feed proficiency. InVivo NSA will support Olam in the design, equipment selection and installation of its feed mills across Nigeria. Its nutrition and formulation experts will work closely with Olam's team to build a strong understanding of the local market and develop cost-effective formulations using local and imported raw materials. InVivo NSA will also train Olam's staff on providing veterinary field support to poultry and fish farmers in order to help deliver consistent product performance. In addition, Olam will gain

access to InVivo NSA's R&D and product development facilities as well as their feed manufacturing units in other developing markets across Asia and Latin America.

Olam's global head of grains, K C Suresh, said: "This partnership follows our announcement in November to enter the animal feed and related businesses in Nigeria. This knowledge-transfer agreement will accelerate our penetration into this space, allowing Olam and InVivo NSA to rapidly scale up commercial activities. In doing so, we look forward to improving productivity and returns for the local fish and poultry producers, who support Nigeria's economy."

Climate smart agriculture key to Africa's development

"COLLABORATION BY VARIOUS stakeholders including governments, NGOs and research bodies is needed now to rapidly scale-up the African agricultural sector to improve food security and resilience to climate change," said Mrs Estherine Fotabong, NEPAD programmes director, at the NEPAD Climate Smart Agriculture (CSA) event held on the sidelines of COP21 in Paris, on 7 December.

Research by NEPAD through the Comprehensive Africa Agriculture Development Programme shows that climate change effects are becoming more frequent and more severe, threatening the reliability and productivity of agriculture, exacerbating the already extreme levels of poverty, and reinforcing persistent inequity and chronic under-nutrition.

The African Union's New Partnership for Africa's Development (NEPAD) is supporting the implementation of CSA in Africa through the Agriculture Climate Change Programme and other related initiatives. These efforts will sustainably increase productivity, resilience and adaptation, as well as build capacity at all levels, especially for smallholder farmers and institutions in order to attain the goal of 25mn African farmers practicing Climate-Smart Agriculture by 2025.

"The African agricultural sector employs 65 per cent of the continent's population, 50 per cent of them are women and climate change is predicted to have a significant impact on agriculture, therefore, constituting a major hurdle for Africa," said Mr Miti Chikakula, COMESA agriculture officer. "By adopting CSA practices, smallholder farmers can reduce the risks they face due to climate change, while enhancing food security and livelihoods," he added.

The side event discussed the continent's approach to climate change and agriculture, showcased progress, experiences, and lessons from recent work to support the scaling up of CSA in Africa and the way forward beyond COP21. Discussions also centered on what efforts are required by both Africans and development partners to bring about practical and grassroots-based actions on agriculture and climate change; and opening up new opportunities for African farmers.

Zambeef positioned to feed nation

CABINET SECRETARY OF Kenya's Ministry of Industrialisation and Enterprise Development, Adan Mohamed, believes Zambeef Products has the potential to be a pan-African brand, capable of feeding the entire continent.

"This is an incredible operation. Zambeef is a business that is African, Zambian, with an international presence being listed on the London Stock Exchange. Africa continues to remain the future food hub of the world and Zambeef is well positioned to not only feed the nation but the entire continent," he said.

Mr Mohamed, who was in the country attending the COMESA policy organs meetings in Lusaka, said this after touring Zambeef's Huntley farm in Chisamba accompanied by his entourage.

Zambeef has approximately 8,150 ha of row crops planted twice a year under irrigation and a further 8,480 ha of rain-fed/dry-land crops available yearly. It slaughters around 55,000 beef cattle, 50,000 pigs and six million chickens, and processes 10mn litres of milk per year from its primary production division that has also incorporated small scale farmers enabling them to participate in the sector at a larger scale.

Zambeef's massive investment over the years in infrastructure, skills training, development of out-grower schemes and many more ventures has contributed towards the economic and social wellbeing of the country through the creation of employment, tax payable to the state as well as corporate social investment programmes. The company employs more than 6,000 staff.



Kenyan High Commissioner to Zambia Sophy Kombe, centre, inspects Zambeef's maize, along with the cabinet secretary of Kenya's Ministry of Industrialisation and Enterprise Development Adan Mohamed and Zambeef staff.

Focus on halal pavilion at AB7 2016

THE HALAL PAVILION at the upcoming Africa Big Seven (AB7) is expected to attract a lot of attention this year, according to the organisers, Exhibition Management Services (EMS).

Around 20 per cent of visitors from Africa and around the world had a particular interest in the halal pavilion last year, and this figure is set to increase substantially in 2016, they stated.

Set to take place in Johannesburg 19-21 June, AB7 is the region's largest food and beverage exhibition. "This spectacular food and beverage exhibition is growing in popularity year by year," said John Thomson, managing director of EMS. "Last year, 267 companies from 49 countries exhibited at AB7, a significant increase over the 225 companies from 35 countries participating in 2014."

While the show looks set to welcome more visitors this year as well, all eyes are specifically on the halal pavilion. Organisers believe that the rising Muslim population globally has placed this market in focus – there are 75 countries in the world with a Muslim population exceeding one million people. By 2030, there will be around 2.2bn Muslims in the world.

The global demand for halal food is set to exceed US\$1 trillion per year, with

manufacturers, suppliers and service providers exploring substantial business opportunities to cater to the growing Muslim population in Africa.

Despite a relatively small Muslim population, South Africa has become a leading producer of halal products worldwide. It has a comprehensive halal certification programme and is also a key gateway supplier to African halal markets.

The East African markets too present a wealth of opportunities for the market, as revealed by a study carried out by the Dubai Chamber of Commerce and Industry. "Demand for halal-certified foods has expanded beyond basic meat and meat products to include franchises, prepared meals, as well as canned, frozen and instant foods," added Thomson.

The South African National Halaal Authority, (SANHA) has been supporting Africa's Big Seven for more than a decade. "AB7 offers participants what no other expo, show or event can – an inter-Africa, intra-Africa platform for all companies in the food supply chain," stated SANHA public relations officer Ebi Lockhat.

Through AB7, the halal business community can network, showcase products and learn about new trends in the market.

GFIA Africa

AN INTERNATIONAL FORUM designed to showcase how sustainable technologies can offer solutions to some of agriculture's most pressing challenges took place recently in Durban. The first African edition of the Global Forum for Innovations in Agriculture (GFIA Africa) organised in collaboration with the Technical Centre for Agricultural and Rural Co-operation (CTA) set out to explore the continent's strong potential for tapping into science, technology and innovation that can revolutionise agricultural production and trade. In the run-up to this event, CTA and farmers' organisations held a continental briefing on Advancing African Agriculture through Agribusiness Development as well as a series of side events. The events explored the challenges and opportunities for agribusiness development in Africa.

FIAPP conferences and exhibitions in Bangkok

FIAAP, VICTAM & GRAPAS ASIA 2016 will be held at BITEC in Bangkok from 29 - 31 March 2016.

This event comprises:

- **FIAAP exhibition** - suppliers of additives and ingredients for animal feeds, dry petfoods and aquaculture feeds.
- **VICTAM exhibition** - suppliers of processing equipment and technology used in the production of animal feeds, dry petfoods and aquaculture feeds and biomass pellets.
- **GRAPAS exhibition** - suppliers of specialist equipment and technology for the milling of rice and flour and also grain processing.

Over 200 exhibitors from all over the world will be displaying the latest products and services for these important industry sectors, and many will be launching new products at the show. There will also be a large display of ancillary equipment that is used within mills and processing plants. These will include silos, conveyors, elevators, dryers, magnetics and bagging.

Simultaneously there will be six conferences:

- Aquafeed Horizons Asia
- FIAAP Animal Nutrition Conference
- Petfood Forum Asia
- Global Milling Conference with GRAPAS Asia
- Biomass Asia
- GMP+ Feed Safety Assurance

Amatheon Agri Zambia opens new livestock centre

AMATHEON AGRI ZAMBIA has established a livestock centre in Mumbwa, Central Province in Zambia, hoping to improve beef exports.

The European agribusiness and farming company unveiled the centre which would provide livestock disease control services with the capacity of supporting more than 8,000 cattle. The company wants to enhance livestock farming in the country and increase Zambia's chances of exporting beef.



The new facility will contribute significantly to domestic production. (Image: Zambia Daily Nation)

Speaking while inaugurating the new livestock centre, Lawrence Evans, deputy minister for fisheries and livestock, said that the export of beef would promote and motivate small-scale livestock farmers and contribute to national development. He cited the government's intent to enhance beef exports as the reason for the establishment of the Ministry of Fisheries and Livestock.

Adding that cattle diseases were one of the biggest challenges in the livestock sector, preventing farmers from exporting their animals for a long time, Evans said that the new Amatheon facility would contribute significantly to domestic production and foster sustainable rural development.

Amatheon director, Troy Minneh, said that the company's contribution to the community stemmed from the intense participation of the hardworking farmers in Mumbwa district. "We are trying to support farmers to be entrepreneurial and be partners with government when it comes to fostering national development," he said.

Zambia's government has been constructing livestock service centres throughout the country to provide extension services such as dipping, spraying, vaccinations, artificial insemination, de-worming, branding and castration. The government is also undertaking the establishment of livestock breeding centres that would assist small-scale farmers to access quality and improved species of all livestock to increase livestock production in the country.

Case IH donate first prize - a JX75T 2WD tractor - to Zimbabwe Farmer of the Year

CASE IH AND its dealer Southern Region Trading Co (SRTC) supported this year's edition of the coveted Farmer of the Year Award, bestowed by the Zimbabwe Agricultural Society (ZAS), and provided the first prize, a JX75T 2WD tractor donated by the dealer. The award was won by Mrs Maengeni Bingandade, a small farmer from Mutare, in the eastern highlands of Zimbabwe.

The farm was shortlisted by the jury in recognition of the quality of their produce presented at the exhibition and how it was displayed. The farm's well-managed homestead and fields, diversified through horticulture, crops and livestock, earned the first prize.

The official award ceremony was held on the Case IH stand at the Harare Agricultural Show, when guest of honour, Mr Filipe Nyusi, President of Mozambique made the



Hon Minister Mandi M. Chimene handing tractor keys to Mrs Maengeni Bingandade with Mr Kasere, general manager of SRTC (right).

symbolic handover of the keys to Mrs Bingandade beside the Case IH JX75T.

The first prize, a JX75T two-wheel-drive tractor, was delivered to Mrs Bingandade's farm on 20 November by Case IH distributor Southern Region Trading Company. The handover was a well-attended event with the participation of most provincial and district administrators as well as farmers from across

Manicaland. It was presided by resident minister and governor of the province, Hon Mandi Chimene and Dominic Kasere, general manager of SRTC, who jointly handed the tractor keys and tool kit to Mrs Bingandade. Mrs Bingandade farms three hectares with diversified crops that include butternut, water melon, beans and maize, and raises cows, goats and chickens. "Our biggest challenges on the farm are the

limited inputs, access to water and the small size of the plot of land," explained Mrs Bingandade. "We farm with a plough and cultivator, so the Case IH tractor will make a big difference to us: we will be able to spend less time in the field and increase the hectares we are farming. To be awarded was a huge honour, and it gave me motivation to strive for greater heights, to work harder." JXT tractors are simple, reliable and economical - true workhorses. The high-efficiency engines consistently deliver a powerful performance with exceptionally low operating costs. The turbocharger increases the oxygen available to the engine, optimising fuel combustion. The result: lower emissions and more power. With their high engine backup torque, they can deal effortlessly with sudden loads at constant engine rpm.

Zambia's cassava output to rise

CASSAVA PRODUCTION IN Zambia is expected to increase following the approval of a US\$30mn loan by the African Development Bank (AfDB) which will accelerate inclusive economic growth and sustainable livelihood.

The loan will support the skills development and entrepreneurship project aimed at supporting women and youth cassava producers.

According to a statement issued by the AfDB mission in Lusaka recently, the loan will support the development of the cassava value chain focusing on the commercialisation of cassava products through local and regional market linkages, technology and innovation and enabling Government policy reforms.

"The industrial clusters will equip 17,000 cassava farmers' associations and co-operatives with business and technical skills for the production and the commercialisation of cassava products to ensure high yields accompanied by timely and efficient production and storage capacity," the statement reads in part.

Under the project, the funds will be used to construct 15 cassava-bulking centres, five of which will be equipped for the piloting of the production of fortified garri, which is a meal made out of cassava tubers, by a co-operative of 500 women. Spillover benefits of increased production will contribute to food security in the region, improved nutrition and early childhood development through fortified cassava products in school-feeding programmes.

"This will also contribute to additional inputs to livestock and fisheries feed and inputs to the paper and extractives industries," the statement adds.

Nawa Mutumweno

Huge benefits from agroforestry in rural Cameroon

COMMERCIAL AGRICULTURE HAS received a major boost and the impact of climate change minimised in Cameroon thanks to the adoption of agro-forestry techniques by thousands of farmers.

The World Agroforestry Centre (formerly known as the International Centre for Research in Agroforestry - ICRAF), an organisation with a vision of rural transformation in the developing world, introduced agroforestry methods to rural farmers in the central African country some 20 years ago.

Also known as agro-silviculture, it's a land use management system in which trees or shrubs are grown around or among crops or pastureland.

These techniques aim to ensure smallholder households increase their use of trees in agricultural landscapes to improve food security, nutrition, income, health, shelter, social cohesion, energy resources and environmental sustainability.

Two decades later, more than 100,000 farmers that have embraced the scheme across the country are reaping the benefits.

Before the advent of agroforestry, traditional cash crop production meant that the opportunities offered by the development of value chains were lost.

Dr Zac Tchounjeu, the co-ordinator of the World Agroforestry Centre for Central Africa, explained the basic difference between cash crop production and agro-forestry practices.

"The cash crop farmer is not part of the value chain. Trees grown through agro-forestry are easily processed and therefore value is added," said Tchounjeu.

While farmers are earning returns from fruiting trees, they have also been encouraged to plant perennial trees.





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- ✓ Cocoa
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AGCO's 'Emerging Farmers' Mechanisation Package'

AGCO HAS HELD its fifth annual AGCO Africa Summit in Berlin. The Summit is a joint initiative of AGCO, Bayer CropScience, Rabobank and De Lage Landen. The 2016 Summit focused on transforming agriculture in Africa through inclusive and sustainable growth. "Africa's agricultural revolution needs to accelerate to increase local food security and feed a rapidly growing world population," said Martin Richenhagen, chairman, president and CEO of AGCO Corporation. "AGCO has grown its local presence by providing African farmers and African agribusinesses with comprehensive agricultural solutions. Our investments in African agriculture will help to ensure a sustainable food supply and lead to economic growth."

There are some 60mn farming entities in Africa. Of these, 77 per cent are subsistence farmers farming by hand, 19 per cent are 'small-holder' or 'emerging farmers' using a small amount of mechanisation and the remainder (around four per cent) are mid-sized or large-scale commercial farmers. For AGCO, 'sustainable' means designing products appropriate for African conditions; building straightforward, modern and dependable products in Africa by developing our local assembly and manufacturing footprint and training farmers and dealers through the AGCO Future Farm, together with first-class parts, service and field support through AGCO's extensive distributor network."

To support this, AGCO has developed an 'Emerging Farmers' Mechanisation Package' through its Massey Ferguson brand that will give emerging farmers in Africa access to modern farm equipment at an affordable price.

"This package, you could call it a 'Farm in a Box,' is a testament



Rob Smith, AGCO senior vice president & general manager Europe, Africa and Middle East, John Agyekum Kufuor, former President of Ghana & chairman of The John A. Kufuor Foundation and Martin Richenhagen, AGCO chairman, president & CEO at the AGCO Africa Summit (Image: Business Wire)

to AGCO's approach to combine the development of mechanisation solutions alongside human capital," explained Rob Smith. "Inclusive mechanisation means leaving no one behind on the path to prosperity. We are working hard to ensure women farmers, young farmers and smallholder farmer families can participate and benefit from mechanisation. Inclusive means bringing all of the participants in African agriculture together on the journey to drive agricultural growth."

A core element of AGCO's mechanisation strategy for Africa is the AGCO Future farm initiative which provides farmers with education in core agricultural practices and trains operators, mechanics as well as local dealers on how to operate, service and maintain agricultural equipment. As part of this strategy, AGCO will break ground on a second Future Farm in Francophone Africa later this year.

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Uganda's potato farmers' trade up

THE DEMAND FOR potatoes in Uganda and neighbouring countries is growing, thanks to emerging consumer trends which favour potato-based fast-foods and snacks.

In many urban areas, potato fries or "chips" are replacing traditional foods like bananas, especially among the young. Potato-based snacks like crisps are also becoming very common. And that is good news for the Kigezi farmers.

Traders with trucks from as far as Juba in South Sudan come to Kigezi to buy potatoes. A number of challenges, however, still eclipse the crop's potential to transform the farmers' livelihoods. These include lack of quality planting material, nutrient-deficient soils, pests and diseases, poor agronomical practices, lack of storage facilities and hindered access to markets due to bad roads and other factors.

IFDC's Catalyst Uganda project, which is funded by The Netherlands, focuses on the cassava, potatoes, rice, soya bean and sunflower value chains. The aim is to sustainably commercialise smallholder agriculture through improving productivity and developing markets.

Since 2013, IFDC has been working with 12,860 potato farmers. These make up 71 agribusiness clusters in 38 parishes in the region to develop the potato value chain—tackling one challenge at a time.

80km of feeder and access roads have been rehabilitated through a Sh4.1b public works grant to the local Governments. The roads will serve an estimated 148,200 people in three districts.

Already farmers are using the roads to look for better markets. Organised in clusters, the farmers collectively hire stores in trading centres from where the traders find them, or hire trucks to take the produce to the market.

So far, there has been an 18 per cent increase in the price attained from sale of potato in the 29 parishes that the roads cover.



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Agri-business Leaders get climate smart at COP21 and aim to make 50 per cent more food available and reduce agricultural emissions by 50 per cent by 2030.

Action2020 – Setting the pace for progress

ON THE AGRICULTURAL thematic day at the COP21 meeting in Paris, leading global agribusiness leaders outlined their ambition to tackle the challenge of making more food available for a growing population while reducing agriculture's greenhouse gas footprint.

Leading companies PepsiCo, Monsanto, Olam and Kellogg Company chaired a working group on Climate Smart Agriculture (CSA) with the vision that by 2030 they will be able to make 50 per cent more food available and strengthen the resilience of farming communities whilst reducing greenhouse gas emissions by 50 per cent.

"Agriculture and farmers are uniquely positioned to make a real difference in driving climate change solutions," said Hugh Grant, chairman and CEO of Monsanto.

"Through advanced technologies and better farming practices, like reduced tillage, farmers around the world have made great strides to reduce GHG emissions and reduce overall resource use. Working together, the global agricultural community has the opportunity to leverage its resources to mitigate the effects of climate change while still meeting the food needs of our growing planet."

Under the banner of the World Business Council for Sustainable Development's (WBCSD) Low Carbon Technology Partnerships initiative (LCTPi), Climate Smart Agriculture focuses on three pillars: productivity, resilience and emissions reductions.

"Today, one in eight people suffer from chronic hunger and more than one billion people are undernourished. Ensuring food security for the growing population of the world will require at least 50 per cent more food to be made available by 2050 to feed nine billion people. The effects of climate change make this an even greater challenge.

Action Plan is part of WBCSD's Low Carbon Technology Partnerships initiative that brings together leading global businesses to accelerate the deployment of low carbon solutions

"It is critical that all members of the global agricultural community find ways to collaborate and scale up initiatives that could make our global agricultural systems more resilient and support those who are most vulnerable to the effects of climate change" said Peter Bakker, president and CEO of WBCSD.

"As the CEO of a leading agribusiness, I have seen climate change rise up the risk register faster than I ever believed possible. And while large-scale farmers and processors such as ourselves are already putting CSA measures in place, it is the world's millions of smallholders providing our daily coffee, cotton and chocolate fix that we have to reach, teach and support. We urge the agri industry and their customers to unite behind the WBCSD CSA framework to help scale the understanding and adoption of climate smart practices by



Extreme drought - seen throughout sub-Saharan Africa - is one of the effects of climate change. (Image courtesy: Reuters)

rural communities" said Sunny Verghese, CEO of Olam.

Climate Smart Agriculture has the support of key organisations such as the World Bank, the United Nations and FAO in addition to many national government aid and development agencies.


"We are focused on helping to improve the livelihoods of farming families and communities who grow our ingredients," said John Bryant, chairman and CEO of Kellogg Company. "Our Climate Smart Agriculture efforts aim to increase productivity and resiliency to help farmers produce more using fewer natural resources."

Working under the strategic and scientific guidance of the CGIAR's Climate Change Agriculture and Food Security (CCAFS) programme, the working group has identified priority actions that support smallholder farmers and bring prosperity through long-term relationships based on fairness, trust, women's empowerment and the transfer of skills and knowledge.

"As researchers we plan to help companies set and meet meaningful targets – not just for emissions reductions, but also for smallholders' standard of living," said Dr Sonja Vermuelen, head of research for CGIAR CCAFS programme.

Importantly, the CSA working group will take responsibility for reporting their achievements, including under the Sustainable Development Goals.

Drawing on the expertise of the global agricultural community, the CSA working group has engaged a range of farming, NGO, research and agri-business organisations through regional dialogues in South Africa, Ghana, India, the USA, Brazil and Europe to develop the action plan for CSA.

The CSA working group is comprised of PepsiCo, Monsanto, Olam, Kellogg Company, Starbucks, Diageo, Coca-Cola, Yara International, Tyson Foods, Walmart, Du Pont, Banamex, Unilever, PwC and Novozymes. 

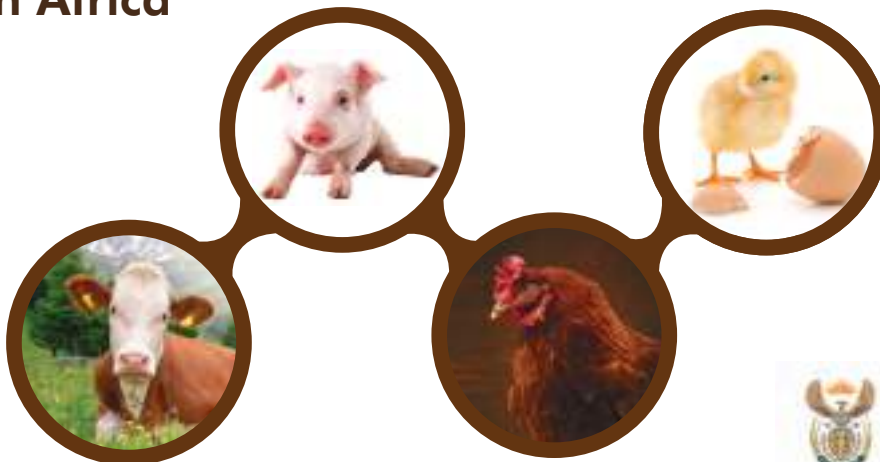
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Getting the cooling and humidity right in poultry housing is essential for optimum production output.

Heat stress and evaporative cooling in poultry



Environmentally controlled poultry shed in Eastern Cape, South Africa. (Image: howzit.co.za)

LAYING HENS AND broilers perform best within a temperature range of 11-26°C. The behavioural and physiological changes that occur with progressive temperature increases beyond the top end of this range are well documented.

The effect of rising ambient air temperature on the physiology of poultry cannot be considered in isolation. When high humidity (over 75 per cent) accompanies high temperature, birds will rapidly succumb to, and die from, heat prostration. Birds lack sweat glands but lose water from facial appendages and by panting. But at high humidity, when the atmosphere of the house is saturated with water vapour, liquid water excreted by the birds fails to evaporate and therefore cannot provide its normal natural cooling effect. Air movement, natural or artificial, alleviates the situation by blowing the air, which is saturated with water vapour, away from the birds, thus allowing water on the surface of their bodies to evaporate with a resultant cooling effect.

Feeding, ingestion and digestion all generate heat which may be useful for birds at low temperature but they just aggravate heat stress for birds at high temperatures. As such, it is hardly surprising that birds react to high temperatures by reducing their feed intake. This poses the question as to

whether accompanying losses in production – eggs decreasing in size, weight and shell strength – are due to heat stress per se or lack of energy-rich feed ingredients, proteins and/or vital nutrients and vitamins. In actual fact, loss of productivity with increasing temperature over and above 26°C is due to a combination of both.

The higher susceptibility of poultry, compared with other livestock, to heat stress is because avian body temperature is much closer to the point of heat death than cold death. At 41.2-42.2°C, the normal body temperature of birds is just 4-5°C below the point at which enzyme protein begins to denature, causing complete collapse and failure of body metabolism. Clearly, the situation is compounded by birds' lack of sweat glands and therefore their ability for intrinsic cooling.

Passive or active cooling

Basic passive measures aimed at keeping poultry cool rely on the design and location of the poultry house. They include orientation and pitch of the roof to minimise the impact of direct sunlight, planting shade trees, and whitewashing the walls and roof for maximum heat reflection.

Making the most of maximum natural air movement by leaving the house sides open is the most common feature of poultry houses in hot climates, although this in itself

demonstrates the ultimate futility and complete inflexibility of trying to custom-design poultry houses to specifically combat heat stress. Having open sides allows rainfall to enter during a hot wet season and is completely counterproductive in situations where there are big diurnal fluctuations in temperature or where summers are hot while winters are cold. Birds suffer all-round discomfort including cold and chilling for significant periods. The poultry producer's policy should be to design and build a house for the efficient management and production of the birds and then add a custom-designed, active cooling system.

The simplest active cooling system is based on electrically-operated circulation fans inside the house. The basic drawback of using a ventilation system based only on circulation is that it just moves around 'in-house' air without removing its heat. On the plus side, they are useful for broilers raised on the floor from which the rate of heat convection loss can be maximised by increasing air speed at bird level with extra fans. Recent research suggests an allocation of one circulation fan every 10-15 metres along the house, mounted two metres off the floor and aimed slightly downwards. In addition, air movement from the circulation fans make the broilers stand up, thus breaking up the layer of stagnant hot air which tends to form around birds.

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Evaporative cooling

The use of evaporative cooling literally takes the heat out of the situation by utilising a basic law of physics. For a liquid (including water) to evaporate, it requires energy in the form of heat, otherwise called the latent heat of vapourisation. Water sprayed into the house in the form of a mist or fog is composed of very small droplets that evaporate readily and rapidly, absorbing heat from the house environment and lowering the house temperature.

Misting systems are useful but the droplets being around 50 micron (μ) in diameter sediment out rapidly, often before they can evaporate, to cause damp and mouldy bedding material, discomfort for the birds and encouragement to pests, parasites and disease.

Fogging systems utilising much smaller droplets of 10μ or smaller avoid these problems. However, these exceptionally small droplets can enter the 'airways' of the birds and lodge in the depths of the respiratory system causing different health problems. The only way for producers to obtain the real and rapid benefits of evaporative cooling, without moisture problems, is to employ a pad cooling/tunnel air system.

Pad cooling

Pad cooling/tunnel air systems comprise a continually wetted filter pad at one end of the house and a powerful extractor fan at the other. Air continually drawn out by the extractor fan is replaced by air pulled in through the wetted filter pad. Water fogged onto the pad in ultra-fine droplets 'flash evaporates', taking heat from air that is drawn into the house. The result is a continuous tunnel of cool air passing through the house. Birds receive the benefits of evaporative cooling without the problems associated with water droplets in the house atmosphere.

Given an outside temperature of 35°C , a high efficiency cool pad system will reduce house temperature down to 28°C with a further 5°C drop to a comfortable 23°C due to the wind-chilling effects of the tunnel airflow. Indeed, producers with a pad-cooled house and having hot weather problems should not jump to the conclusion that the pad system is at fault. Dirty shutters can cut airflow by 30 per cent and a 15 per cent fan belt slippage means an equivalent reduction in airflow. Producers should ensure that the house is air-tight, that air leaks are sealed and tunnel curtains do not block the flow of air into the house.

Hot nozzle tips for cool chicks

For any misting/fogging system, whether designed to be conventional (overhead) or a cool pad system, the nozzle tips are the most important part of the system. They are by far the smallest components but ultimately determine spray characteristics. The nozzle is the final component of the system, through which the water passes to be broken up into droplets according to the interior design of the nozzle, shape and size of its orifice and the water pressure. As such, it determines flow rate, droplet size and droplet size distribution. These characteristics, as well as material technology and the arrangement (size, density and spacing) of nozzles in the overhead system or on the cool pad, determine success or failure in reducing house temperature to acceptable levels.

Of particular interest are nozzles which are precision moulded from polyacetal, a highly stable engineering plastic material. Wear characteristics match the generally more expensive stainless steel nozzles with polyacetal, giving long-life to long stay, intensively used nozzles in poultry houses. Being made from a polymer material, they

do not suffer blockage from green copper chlorides and other oxidation (corrosion) deposits that plague nozzles made of brass and other metal alloys. Polyacetal nozzles offer poultry producers the opportunity for application within a wide pressure range of 3-14 bar (40-200 psi) and fine droplets of less than 50μ , and are considered optimum for rapid evaporation and effective cooling.

Misting and fogging nozzles may be installed in traditional overhead atomiser (nozzle) arrangements using PVC pipe and solvent-welded fittings with three metres between each atomiser line, 2.5-3.0 metres between atomisers in the line and a separation distance of three metres between atomisers and the house eaves (roof rafters or struts).

They are most effective when used as the atomising element in a cool pad/tunnel air system for poultry house cooling. Banks of fogging nozzles are installed so that they are typically deployed 45-60 cm away from the pads, with spray directed at the pads so that they are permanently and uniformly wetted for maximum performance and long life.

Pad designers recommend fogging nozzles with a flow rate of 3.8 litres per hour and a spray angle of at least 80° . A pad of 1.8 metres in height should be provided with three rows of fogging nozzles on pipes 45 cm apart with a separation distance of 450 cm between individual nozzles along each pipe. Several factors, including the thickness of the pads used, will determine efficiency. Carefully worked out arrangements of nozzles, to ensure no dry spots on the pad as well as regular cleaning and flushing of the pads to avoid plugging, is vital. Low-level siting of the cool pad means that nozzles are easy to clean and change. **B**

By Dr Terry Mabbett

BroMaxx crates station broiler harvesting system patented

THE BROMAXX CRATES station is an innovative solution that enables fast, labour efficient and animal friendly harvesting of broilers.

The system is placed behind the BroMaxx broiler colony system and enables convenient supply of empty crates and discharge of full crates. Jansen Poultry Equipment has now received a patent certificate for this innovation.

The BroMaxx crates station is one of the integrated solutions for maximised broiler production. The BroMaxx broiler colony system is designed to produce a maximum number of quality broilers that are free from excessive use of medication and have excellent meat quality.



By harvesting the animals with utmost care the meat quality stays in perfect condition. Broilers stay free from bruises and broken wings and legs. The BroMaxx concept enables delivery of a maximised amount of high quality broiler meat. The optional TransTruck system can be

added to the BroMaxx crates station. The transtruck system transports full crates directly into trucks which enables an even faster and more labour efficient processing of the birds. The system can be easily adjusted in order to match various heights of trucks.

Ugachick poultry company introduces Ugachick SUPA

UGANDA'S MAJOR POULTRY breeder, Ugachick, has introduced on the market Ugachick SUPA, individually quick frozen chicken pieces, conveniently packed and intended for the urban consumers who are busy and would want to make a fresh tasty meal fast.

The company says the latest product is different from other products because each piece is frozen individually to ensure that it is preserved in the same taste of freshness as on the day of slaughter and the consumer doesn't need to cut the chicken before cooking since it has already been done.

"Ugachick SUPA is quick frozen in a rapid freeze process that takes one hour as compared to the traditional eight hours it takes to blast freeze chicken. It is a convenient product targeting busy urban individuals," the company says, adding that all one has to do is open the packet, take out the pieces one wants to cook, and put the remaining chicken back in the freezer.

The company adds that the product is conveniently packed in one kilogram and five kilogram bags to suit any family requirements or functions and is available at supermarkets and other outlets.

Ugachick, which has been involved in the poultry business for about twenty years, notes that all its chickens are bred and raised by the company to ensure that the consumer has a "Farm to Fork" guarantee.

The company is a vertically integrated poultry producer boasting of a parent stock farm, hatchery, broiler farm and a processing plant among others. Its parent stock farm produces hatching eggs which are used to produce day-old chicks while the broiler farm produces broilers for its processing plant.

Geoffrey Muleme

Ovologic - smart egg logistics

THE VENCOMATIC GROUP has introduced a complete packaging solution for the handling and transportation of eggs: Ovologic. Ovologic was designed using its vast knowledge on dividers, a Vencomatic Group innovation and the first step towards automated palletising of eggs. The Ovologic trays, dividers and pallets ensure fast, safe and efficient handling and transportation of eggs from the farm to the grading/packing station or processing industry.



To ensure excellent quality trays, dividers and pallets, Ovologic only uses 100 per cent first quality class virgin plastics in all products. Combined with UV-stabilisers this results in a long lifetime and high durability. These 30-cell trays have a smooth surface and are combined with custom designed dividers and pallets. The packaging materials allow for thorough cleaning and disinfection after each usage, greatly reducing the risk of contamination, in comparison to traditional packaging materials.

Minimising hairline cracks is one of the key topics in egg handling for both layer and breeder farms.

Strong trays, perfect fit and solid stacks results in optimal protection of the eggs. Research on Ovologic has shown a significant decrease in hairline cracks compared to other packaging materials.

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Food security and rural development in Africa depend hugely on the effectiveness and efficiency of livestock production. Tim Guest reports.

Indigenous sheep in a food-secure future

INDIGENOUS BREEDS WITH favourable, regional genetic traits that suit them to life in the extremes of Africa are of particular interest and potentially very important for the future. However, exotic livestock from overseas and crossbreeding programmes are in danger of destroying the very breeds that could ensure Africa's food security for generations. Whether chickens, cattle or, in this case, sheep, endemic breeds need to be part of the future.

The FAO (Food and Agriculture Organisation of the UN) predicts that global demand for animal protein will double by 2040, with developing countries accounting for over 50 per cent of the growth in demand for eggs, meat and milk during this period. For Africa, the organisation also predicts the per-capita meat consumption will have doubled by 2050. It's no wonder, therefore, that scientists are under pressure everywhere to come up with best practice and methods for breeding the most out of any and every form of livestock available to them.

[There is] strong evidence that resistance of sheep to external and internal parasites is heritable and may be improved by purposeful selection.

Sheep potential

In recent issues of African Farming we've looked at some of the genetic issues, breeding methods and best breeds in community and factory poultry farming in Africa, as well as cattle production. However, another animal of crucial importance across the continent is the sheep, with indigenous breeds playing almost as crucial a role in the livelihoods of low-income households as smallholding, community chickens.

Many indigenous sheep breeds can be found on most smallhold rural farms in areas where other forms of agriculture are often difficult or impractical due to terrain and climate. The major reason is largely because these ruminants are typically very hardy and have the ability to withstand harsh climatic conditions and survive on a wide variety of feed; they also have a short generation interval and high reproductive rate which together results in high productivity. Combine these factors with a low initial capital investment, the need for only small land acreage on which to exist and the minimal demands for care and tending they place on the smallholder and his family and the sheep becomes an ideal livestock component with massive potential as an extremely important animal in a food-secure Africa of the future.

Sounds good, but, regardless of these numerous advantages, many indigenous sheep breeds face the threat of extinction posed by the importation of exotic breeds and continuous crossbreeding programmes. This same issue threatens other livestock, (cattle, poultry), and is one of the many themes being researched by Egerton University's agricultural department, which sees a need for the development of strategies to conserve the unique genetic resource of Africa's indigenous sheep.



Zulu sheep, native to southern Africa. Egerton has identified this as a breed at risk. (Image: Enaleni Farm)

Sheep risks

It's a situation the FAO recognised as far back as 2007 in its Global Plan of Action for Animal Genetic Resources, which it pushed out to the international community. The plan provided a framework for the management of the world's livestock biodiversity, which the FAO stated as the 'primary biological capital for livestock development and vital to food security and sustainable rural development'.

In putting forward this plan, the FAO recognised that the value of these indigenous genetic resources had, up until that time, been poorly understood. It's largely the same story today, as, beyond the commentary of the FAO, the value of these resources to regional communities is still being ignored to a great extent and the erosion of genetic diversity continues, as a result. Thankfully, institutions like Egerton University have placed such genetic erosion high on their research agenda.

When it comes to sheep, Egerton has identified breeds at risk, which include the likes of Zulu sheep, native to southern Africa. Genetic traits at risk from gene pool dilution include its ability to store large deposits of fats in its tail and body essential to surviving in areas that are hot and drought-prone. Its hardiness also means it can resist many tick-borne diseases, avoiding the need for medications that many other sheep breeds require. The university suggests the breed 'is on the verge of extinction due to replacement by imported breeds'.

Also at risk is the Red Maasai Sheep, an East African fat-tailed animal found in northern Tanzania, south-central Kenya, and Uganda and primarily used for meat production, though highly

resistant to internal parasites, such as the gastrointestinal nematode, *haemonchus*.

The West African Dwarf sheep is, according to Egerton, the dominant sheep breed raised for meat in southwest and central Africa. One of its key genetic traits is its high tolerance to the effects of trypanosomes in its system.

In South Africa, the Black-headed Somali sheep, which originally inhabited drier areas of southern Africa and north to Tanzania, Kenya, Ethiopia, Sudan and even Ghana, has undergone breed improvement in recent years. This highlights moves to improve overall sheep breeding and husbandry in SA, though moves have been undermined by poor funding, as highlighted in recent scientific studies.

Recent research

The South African Journal of Animal Science recently published a review entitled: The adaptation of the South Africa sheep industry to new trends in animal breeding and genetics, by Cloete, Olivier, Sandenbergh and Snyman. This looks at sheep breeding research in South Africa, as a phased progression from a research and development phase, to the commencement of recording and evaluation, then the expansion of recording schemes; and, most recently, the adaptation of schemes to international benchmarks. However, the authors stated the most recent phase had 'presented scientists with the greatest challenges, namely the inclusion of genomic breeding values in routine sheep recording and of disease-resistance traits during routine evaluation'. They stated a great need for 'the establishment of reference populations for the major South African sheep breeds to estimate genomic breeding




The Black-headed Somali sheep has undergone breed improvement in recent years.

values' but that this presented an 'immediate challenge'.

In their review, one key recommendation was that 'strong evidence of resistance of sheep to external and internal parasites is heritable and may be improved by purposeful selection'. Efforts should, therefore, be made to include all disease resistance traits in national analyses and databases. The review stressed, however, that poor investment in SA in relevant sheep-breeding research would hinder best outcomes in the near-term.

New Egerton livestock breeding web portal

A new research portal offering information and data on all aspects of animal husbandry and breeding practices has been launched by the department of animal science at Egerton University. Called 'Research Gate', it offers 'a general data bank on livestock management research materials that can be accessed by any interested party'. 

For more information contact: Faculty of Agriculture,
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While the future of the East African coffee sector remains optimistic, new challenges such as climate change, volatile global prices and ageing trees have increasingly affected overall production. Mwangi Mumero looks at these challenges.

New challenges for East African coffee

AFRICA ACCOUNTS FOR about 12 per cent of the world coffee production with most of it coming from East Africa. An increasing population and a rise in disposable incomes are expected to increase global demand for coffee by a third to 200mn bags by 2030, according to the International Coffee Organisation (ICO).

Experts say that most East African coffee tends to be pleasant in aroma, rich in acidity and body, sweet in taste with balanced flavours due to mineral nutrients from volcanic soils.

Even with these prospects, coffee production has been on a decline in many of the Eastern African nations - Ethiopia, Kenya, Uganda, Tanzania and Rwanda - in the last three decades.

For instance, while coffee prices have averaged US\$250 per 50 kg at the Nairobi Coffee Exchange, Kenya's production has plummeted, mainly due to climate change, volatile global prices, and aging trees. Younger coffee farmers are also becoming scarce.

Total acreage under coffee has more than halved from 110,000 acres to just 50,000, with production per bush dropping to two kilograms from a previous 10 kg.

Kenya's specialty coffee is in high demand in the UK and US.

Kenya's specialty coffee is in high demand in the UK and US mainly for blending with coffees from different parts of the world.

"Few younger people are taking up coffee farming. Poor returns, high input and labour requirements have conspired to discourage educated and modern youthful farmers into the coffee sector. Many have opted for more lucrative ventures such as dairying or horticulture," observed Mr Migwi Muriuki, a farmer from Kangocho village, Nyeri County on the shoulders of Mt Kenya and one of the Arabica coffee producing regions.

Recent studies have shown that the average age of a Kenyan coffee farmer is 66 years- heralding fears that the sub-sector is slated for decline in the coming years.

Climate change is biggest problem

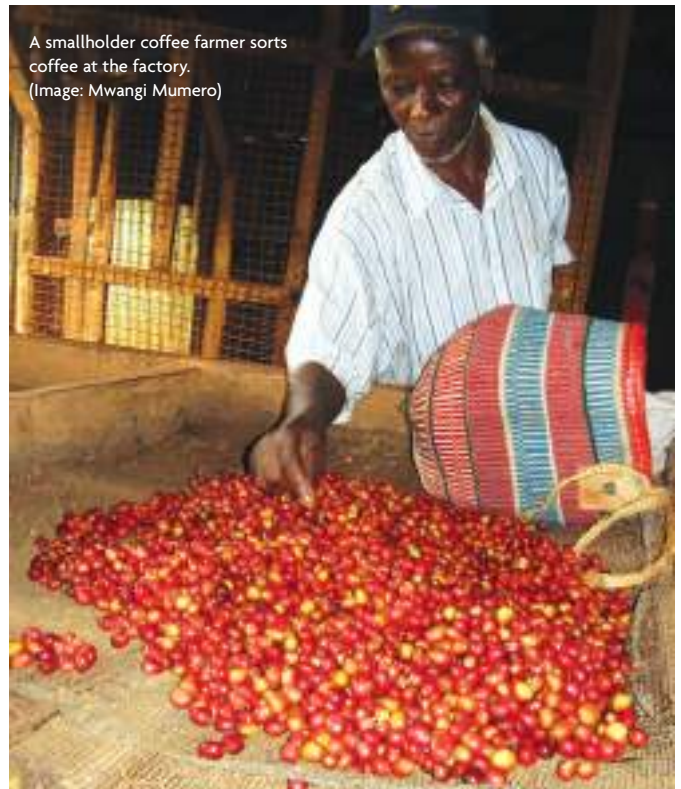
Researchers however warn that the biggest culprit to reduced coffee production has been climate change.

Farmers across the country have had to grapple with the changing coffee production patterns dictated by climate change.

"We will all be affected by climate change. Currently, we have temperatures of up to 25°C in coffee zones", noted Dr Joseph Kimemia, formerly the director of Coffee Research Foundation (CRF) in Ruiru, adding that the best temperature for coffee is 19°C.

According to Dr Kimemia, coffee operates within certain parameters. For instance, flowering requires a dry hot spell followed by rains at a certain period.

"An erratic variation between hot dry periods and wet cool ones by the time of flowering is a challenge. Sporadic or continuous flowering



A smallholder coffee farmer sorts coffee at the factory. (Image: Mwangi Mumero)

also affects farmers as there is no proper harvesting season", observed Dr Kimemia, noting that when this happens coffee cherries mature at different times, making pest and disease control a nightmare to farmers.

According to Dr Kimemia, when coffee harvested at different dates is mixed in the drying beds, coffee quality will be compromised. Tracking which coffee was put on the drying bed will become a management nightmare.

It is not just the production cycle that has been affected. Rising temperatures are bound to increase coffee diseases and pests - notably coffee berry disease (CBD) and coffee berry borers.

Researchers at the Kenya-based International Center for Insect Physiology and Ecology (ICIPE), in collaboration with colleagues in Germany, forecast that by 2050, populations of the coffee berry borer will increase in southwest Ethiopia, the region where arabica coffee is grown. The same effect will be noticed in coffee growing regions across East Africa.

Researchers estimate that the coffee berry borer causes more than US\$500mn in damages each year, making it the most costly pest affecting coffee today. The Kenyan government has however been working hard to mitigate the anticipated effects of climate change in the country by introducing new disease resistance varieties and advising farmers on shading their crops.

Over the last few years, the Coffee Research Foundation (CRF) at Ruiru, near Nairobi, has developed two varieties resistant to Coffee Berry

Disease (CBD) and leaf rust, two main scourges in coffee growing. The two varieties - Batian and Ruiru 11 - are expected to lower the cost of production as the two diseases need huge investment in chemicals and equipment.

"There are considerable savings from the cost of fungicides and labour used to control CBD and Leaf Rust. Batian is a high yielding variety with good bean and cup quality. It is also suited for all agro-ecological zones", intoned Dr Kimemia.

The CRF has prepared a circular for farmers across the country on how to cope with climate change at farm level. Shading the coffee farm by planting selected tree species will reduce temperatures by 4°C according to researchers. It will also reduce extremes between maximum and minimum temperatures.

Shade tree species such as Cordia, Albizia, Macadamia and Malkamia lutea will also help conserve moisture, reduce soil erosion, cut down the effects of hailstorms and even out flowering.

Researchers now recommend that if a farmer is doing new planting, they should establish coffee and shade trees at the same time.

Robusta coffee is grown in lower altitudes and is therefore more resilient to climate change than arabica coffee.

Ethiopia - the cradle of coffee

Known as the cradle of coffee, Ethiopia is Africa's highest producer - mainly due its favourable weather conditions. This mountainous East African country is known for its unique Yirgacheffe, Sidamo and Harar Arabica varieties grown in its ragged rainy highlands.

In the 2013/14 period, Ethiopia produced 450,000 metric tonnes of coffee and a similar output is expected in the 2014/15 year, according to government figures. According to Hussein Agraw, Ethiopian Coffee Exporters Association, exports are expected to rise to 235,000 tonnes by the end of 2014/15 fiscal year generating US\$862mn in revenue.

Effects of El Niño in the Latin American nations of Brazil and Colombia, which are experiencing drought conditions, are expected to benefit African producers such as Ethiopia in the medium term.

With the anticipated effects of climate change, farmers in Yirgacheffe region have been working closely with Oxfam America to promote eco-friendly coffee, fetching premium prices at the international markets.

Among the key initiatives has been the replanting of forests and adaption of eco-friendly processing techniques to reduce wastage.

"Without the shade of sycamore and other indigenous trees, the coffee bushes would produce bitter tasting, inferior quality beans. Our co-operative society will not accept these beans," said Berhanu Beyene, a coffee grower in Werka, Yirgacheffe region.

Through the project, each co-operative was able to access a US\$150,000 interest free loan payable within five years. Using technical advice from the local agricultural bureau, indigenous tree seedlings have been provided. Adoption of eco-friendly processing methods reduced the amount of organic waste from the process of washing as well as cutting water usage by 98.5 per cent.

Meanwhile, like in all East African nations, Uganda coffee is produced by about 500,000 smallholder farmers, the majority of whom have between 0.5 to 2.5 ha of land. Coffee contributes 20-30 per cent of foreign exchange in Africa's second largest coffee producer where liberalisation of the sector two decades ago has boosted production, according to Uganda Coffee Development Authority.

'Gradual replacement of old, diseased coffee trees with new genetically pure and high yielding varieties, at an annual rate of five per cent for robusta and two per cent for arabica, in the last 20 years was expected to optimise foreign exchange and improve payments to farmers,' noted a document from the authority.



Multiplication of seedlings will promote increased acreage under the crop at the Coffee Research Foundation station in Ruiru, Kenya. (Image: Mwangi Mumero)

Both varieties - Robusta and Arabica - are grown in Uganda. Under good management, robusta and arabica coffee can yield 500 kg per ha and 750 kg per ha respectively.

Officials note that low input use among farmers - prompted by poor international prices - has led to low production volumes of coffee exports that hover around 2-3mn, 60 kg bags per year, and unfortunately, financial organisations consider coffee farming risky - with erratic prices, unreliable production and common diseases and pests.

Among recent strategies the government is using to boost production has been replanting in Coffee Wild Disease (CWD) affected areas, replacing old and unproductive trees and supporting commercial coffee production in northern and eastern Uganda.

Other practices have been the adaption of disease and pest resistant robusta clones, pruning and de-suckering coffee plants, controlling soil erosion and controlling pest. In recent years, farmers have also been taught soil inoculation techniques to boost nitrogen fixation.

"Increasing attention to quality - picking only ripe berries, properly drying the crop on the farm and de-husking the coffee on the farm instead of selling the coffee berries fresh," noted Dr Hans Kandel, an extension service agronomist and professor of plant sciences on a USAID supported trip to Uganda.

On its part, Tanzania is a large coffee exporter - selling 50,000 metric tonnes annually and earning US\$100mn, according to Tanzania's Coffee Board. Most of the coffee grown is arabica. However, a recent study by the University of Witwatersrand in South Africa, whose findings are published by the journal Agricultural and Forest Meteorology, indicate that for each 1°C rise in temperature, farmers are like to see a drop by 137 kg of coffee per hectare.

Smallholders in the country produce approximately 225 kg per hectare, highlighting the threat climate change has on coffee farming.

Researchers assert that the country should increase the acreage under robusta coffee, as this variety is grown in lower altitudes and is therefore more resilient to climate change than arabica coffee.

While its coffee production is low compared to other East African nation, Rwanda has been adopting a strategy to position itself as a specialty coffee producer, according to the National Agricultural Export Development Board.

Domestic coffee consumption should increase

Coffee experts aver that East African nations should increase domestic coffee consumption to cushion against volatile international prices. Most East Africans are tea drinkers and coffee is rare in their daily menus.

Only Ethiopia has a high domestic consumption - at 2.27 kg per capita, which is still below other emerging markets such as Brazil at 6 kg and Algeria at 3.2 kg. In the European Union, consumption is nearly 9 kg per person. The emergence of a middle class and the rise in disposable incomes in the region has seen the opening of branded international coffee shops in East African cities. Art Caffe and Java House in Kenya and Kaldi's in Ethiopia are examples where locals can have a cup of coffee. **E**

The FAO is committed to supporting the agricultural, economic and societal potentials of leguminous seeds.

Promoting the power of the pulse

PULSES ARE A cheap, delicious and highly nutritious source of protein and vital micronutrients that can greatly benefit people's health and livelihoods. The UN's core objectives are to boost their production and trade, and to encourage new and smarter uses throughout the food chain. This is the key message underlining the forthcoming International Year of Pulses, recently launched by the United Nations Food and Agriculture Organisation (FAO). The UN has chosen 2016 as the International Year of Pulses to raise awareness of the many benefits of leguminous plant seeds.

"Pulses are important food crops for the food security of large proportions of populations - particularly in Latin America, Africa and Asia, where pulses are part of traditional diets and often grown by small farmers," said FAO director-general José Graziano da Silva. "They have been an essential part of the human diet for centuries. Yet, their nutritional value is not generally recognised and is frequently under-appreciated."

"Pulses can contribute significantly in addressing hunger, food security, malnutrition, environmental challenges and human health." UN Secretary-General Ban Ki-moon.

Economy, society, and sustainable seeds

The importance of pulses cannot be understated. Oilseeds and pulses are staple foods for millions of people, and are important cash crops. Pulses are part of the food culture and the standard diet throughout the globe. They are key ingredients in many signature national and regional dishes, from falafel to dahl to chilli and baked beans. There are hundreds of varieties of pulses grown throughout the world. Popular ones include all varieties of dried beans, such as kidney beans, lima



While small, pulses are packed with proteins. (Image: FAO/ Sebastián Villar)

beans, butter beans and broad beans. Pulses also include chickpeas, cowpeas, black-eyed peas and pigeon peas.

An affordable alternative to more expensive animal-based protein, pulses are ideal for improving diets in poorer parts of the world. Protein sourced from milk, for example, is five times more expensive than protein that can be sourced from pulses. Yielding two to three times higher prices than cereals, pulses also offer great potential to lift farmers out of rural poverty, and processing provides additional economic opportunities.

While small, pulses are packed with proteins – double that found in wheat and three times that of rice. They are also rich in micronutrients, amino acids and b-vitamins, which are vital parts of a healthy diet.

Low in fat and rich in nutrients and soluble fibre, pulses are also excellent for managing cholesterol and digestive health, and their high iron and zinc content makes them a potent food for combating anaemia in women and children. They are a key ingredient in healthy diets to address obesity and to prevent and manage chronic diseases such as diabetes, coronary conditions and cancer. Because of their high nutritional content, pulses are a staple

in emergency food baskets and since they do not contain gluten, they are also suitable for celiac patients.

Animals and the environment

Pulses benefit human health, but they also improve animal and soil health and support biodiversity. Crop residues from pulses can be used as animal fodder to increase nitrogen concentration in the diet, which improves animal health and growth.

The nitrogen-fixing properties of pulses can improve soil fertility, which extends the productivity of farmland, and eliminates dependency on synthetic fertilisers. By improving soil health overall, pulses promote below-the-surface biodiversity, too, as they create a rich home for germs, bugs and bacteria of various kinds. And, because pulses as a group are very genetically diverse, they also hold a great potential for climate adaptation, as they enable farmers to select new varieties to adjust their production to changing climate conditions.

Furthermore, using pulses as cover crops and in intercropping systems – planting them in between other crops or as part of crop rotations – can reduce soil erosion and help control pests and diseases. **D**

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Milltec - a fast growing company in rice milling

RICE MILLING MACHINES manufactured by Milltec are used by one third of rice millers across India, with market share of over 30 per cent and expanding further. Today, Milltec dominates the rice milling segment with the best aftersales infrastructure that once relied on less organised and local suppliers with no guarantee of after sales support.

Milltec is a technology-driven company, under the intelligent leadership of technocrats of Mr R Ravindranath and Mr J Rajendran, who lead Milltec from the front.

Milltec, located at Bangalore, the IT hub of India established in 1998, with a state-of-the-art manufacturing facility equipped with the latest modern technology machines for producing best quality. The R&D facility



R Ravindranath (left) and J Rajendran.

is supported by the best CAD/CAM/CAE tools to yield better return on investment to the customers, constantly evolving with efficiency improvement.

With all its abilities and the dominant position in the market, Milltec attracted the private equity investor Multiples, who have invested, and are a 49 per cent share holders.

Our after sales service guarantees customer on quick response/resolution with the toll free service (first of its kind in rice milling industry) and the service engineers residing in the mill cluster area.

Today Milltec is in such a position that it is the only company globally to offer an end-end solution in the rice milling sector, right from conception to production, this helps to keep the costs at optimal levels and execution of projects on time.

Milltec is expanding to other grains and spices, introducing categories such as pre-processing cleaning, packing & silo manufacturing.

Milltec believes in capitalising on the market leadership to build the brand further, and use the services as a differentiator.

It's time for Africa

THE ESCORTS GROUP is among India's leading engineering conglomerates operating in the high growth sectors of agri-machinery, construction and material handling equipment, railway equipment and auto components. The Agri Machinery Group of Escorts Ltd began its manufacturing operations in 1964 and has since been using their experience and expertise to power and propel change in the farming landscape across the globe.

The customer-centric approach and years of experience has helped them translate global advances into rugged, reliable and cost-effective solutions that are a key to success and prosperity. Their range of tractors has multi-tasking capability which makes them the most versatile and comprehensive product in their class. Escorts is the first Indian company to sell tractors in Europe. With their assembly lines in Poland, these tractors are catering to the versatile needs of Africa, Asia, Europe, South East Asia and the America's.

Farmtrac, the leading brand of tractor, ranges from 12HP - 110 HP. These tractors are committed to serving the farmer, ensuring the fruits of his labour become a bountiful harvest for the nation. With superior technology and dedicated service support, they ensure that



Close to 8,000 tractors have already been delivered to Africa.

progress reaches far and wide in the African farm sector.

Escorts has been present in the African market for over 10 years now, across the East, West, South and North African belt. Their dominance in the African market continues with a high volume of orders received from Nigeria, Tanzania, Ghana, Benin, Madagascar, Burkina Faso and 20 other countries. Close to 8,000 tractors have already been delivered and

continuous orders from Africa are testimony to the confidence in their products - in tractors that are tried and tested for African conditions. Africa adds to the global arena of Escorts with Farmtrac being present in 62 countries including USA, Europe, West Asia and South East Asia. Their products are designed, produced, tried and tested for African conditions. And they continue to nurture the progress of African farmers.

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Micro-irrigation, which is achieved by 'dripping' or 'trickling' drops from carefully controlled volumes of water for precise placement at the root zone, is the answer for the maximum usage and minimum wastage of that valuable commodity called water. Dr Terry Mabbett discusses.

Micro-irrigation for horticultural crops

MICRO-IRRIGATION WAS DESIGNED and developed to secure and sustain crop growth in arid and semi-arid environments and greenhouses where water is always at a premium. Micro-irrigation requires substantial initial investment and also a long learning curve which makes the system particularly appropriate for high value horticultural crops including fruit, vegetables, cut flowers and ornamentals. Installation of micro irrigation brings many advantages for farmers and growers but some disadvantages too.

Advantages and disadvantages

Micro-irrigation will generally use less than half the volume of water required by the more traditional 'watering' systems such as sprinkler irrigation. Lower pressures used mean less energy for pumping while precise placement of more exact water volumes enhances and improves water management. Economically damaging crop diseases are invariably less frequent because the crop canopy stays dry and humidity remains at a lower level. The potential for high degrees of automation means micro-irrigation offers real opportunities for much lower operating and labour costs.

Application is highly targeted with none landing between the plant rows or on to other non-productive areas. Field operations can continue while micro-irrigation is underway because inter-row areas stay dry. Weed growth is minimal while soluble nutrients and some pesticides can be delivered through the micro-irrigation system by fertigation and chemigation. Micro-irrigation installations are suitable for ground terrain and soil conditions with other irrigation systems cannot cope with while the potential for soil erosion and nutrient leaching is minimal.

The main disadvantage of micro-irrigation is the extra start-out and set up costs which can be considerably higher both in total and on a per unit area basis compared with mainstream irrigation methods. Management requirements are high, intense and demanding and any delay in operational decision making risks irreversible



Brassicas (head cabbage) and other crops shown here are being grown under micro-irrigation. (Image:: Omex)

crop damage and big financial losses.

Damage to drip tubes from gnawing rodents, insects or human activities may cause leaks leading to high maintenance and replacement costs and loss of water. All water used in trickle irrigation must be filtered to avoid clogging of the small opening in the trickle line. Water distribution in the soil is clearly restricted by virtue of its precise placement

Applications for micro-irrigation

Micro-irrigation systems are now used profitably in a variety of crop production systems including fruit orchards, citrus groves, vegetable gardens, nurseries and greenhouses and especially on high value crops for export.

Fruit and vegetables are invariably planted in rows so drip tubing with pre-punched emitter holes and called a line-source emitter is traditionally employed to wet a continuous strip along the plant row. Moreover, since the majority of vegetables are grown as annual plants (for just one season), growers may profitably use a thin-walled disposable tubing (4 or 8 mm thick)

with a correspondingly short working life of the same single season. Growers with operational versatility and costs firmly in focus will generally place less emphasis on the use of buried mainlines and sub-mainlines. This allows them to dismantle the system and move it as appropriate from one growing season to the next.

The costs of micro-irrigation installation and application can be high so growers should set themselves the goal of designing and developing a cheap but functional system which gives maximum production at minimal cost. It is probably cheaper for farmers and growers to design their own system using bought in components, rather than purchasing an entire dedicated system from a dealer. That said, help from a technically competent dealer when designing the system can pay huge dividends by avoiding problems further down the line.

Water supplies may be drawn from a variety of sources including wells, ponds, lakes, reservoirs, canals, municipal lines or pits. As a general rule, well water sources are fairly clean and only require a screen to

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remove mineral particles, although precipitates and other mineral and chemical contaminants in the water should be determined by a water quality test before to consider whether to feed a micro-irrigation system. Municipal sources of water will generally come with documentation of water quality testing and this will make it much easier to identify any potential contamination and blockage problems. Surface water from streams, ponds, pits or rivers will contain bacteria, algae or other aquatic life and sand filters are therefore essential.

Key components of a micro-irrigation system

The main components of a standard micro-irrigation installation are:

- **Delivery system** - mainline distribution to field; submarine (header-line); feeder and drip tube
- **Filters** - sand, disk or screen
- **Pressure regulators** - spring or valves
- **Valves or gauges** - hand-operated, hydraulic, or electrical

Delivery of water

The foundation of the delivery system is a mainline distribution conduit into the field which may comprise an underground plastic or PVC pipe or an over-ground aluminium pipe to deliver an uninterrupted supply of water from source to the sub-mainline.

For the sub-mainline (header) it is usual to employ a vinyl 'lay flat' hose which is durable and, as its description implies, lies flat when not in use, so that equipment can be safely driven over it. The lay-flat hose and feeder tubes will be retrieved after each growing season and stored until the following crop.

Feeder tubes are small plastic tubes that connect the sub-mainline and each drip tube: Water flows to the drip tubing through these feed tubes which can be directly inserted into the vinyl hose.

Drip tubing is designed with an inner and outer chamber to allow uniform distribution of water over a wide range of conditions. Tubing is invariably made of polyethylene black plastic, 4-8mm thick and with holes (perforations) located at intervals of 20-60 cm along its length. As a general rule the sandier the soil the closer the hole spacing that is required. Drip tubing is shipped flattened on a roll and commonly called drip tape.

Water filtration

Filters are critical to the operation of any micro-irrigation system. For water sourced from wells or provided by a municipality then a screen or disk filter is usually OK. Screen filters (150-200 mesh screen) are



A smallholder farmer in Zambia using drip irrigation. (Image: iDE)

generally available in a range of sizes from 2 cm to 15 cm. Some screen filters will incorporate a valve which serves to open and flush the filter. Disc filters operate through a series of discs stacked vertically to separate out small solid particles of contamination. They are more expensive but more reliable and easy to clean.

Where water comes from an open or surface source then installation of sand filters is absolutely essential. They are installed in pairs of sand-filled canisters which can be back-flushed for cleaning. Timing and frequency of sand filter cleaning is gauged by monitoring any loss of pressure through the filter. This is achieved by installing pressure gauges on either side of the filter with a pressure difference of 5-7 psi indicating the need to clean. When stream or river water is used then a sand separator is invariably required to remove suspended sand from the water before it enters the filter.

Pressure regulation

Most drip tubing has always been designed to operate at 8-15 psi pressure with 10 psi being regarded as the standard operating pressure. A spring-type or diaphragm-type pressure regulator may be used to maintain water pressure at a steady level. Both types are inexpensive and adjustable, although pre-set types are also available.

Control

Several fields or sections of one field can be irrigated using just one water source by utilising a zone system that employs valves to open and close the different lines. If fertilisers or chemicals are injected into water taken from a well or municipal water resource then a backflow/auto-siphon valve is absolutely necessary. Manually-operated gate or ball valves or electronic

solenoid valves may be used to automate the system by utilising a time clock, water-need sensor or automatic controller box.

Management of water resources

Micro-irrigation is a unique method of water delivery involving close manipulation and measured application of water supplies through precise placement at the root system. The secret of success is the application of a small supply of water to the plant as required usually on a daily basis. A grower's goal is a high level of efficiency for maximum yield from minimal amounts of water. As the plants grow, root systems become more extensive and leaf area index increases, and so will the relative amount of water required, though still small by normal irrigation standards. Under hot, dry conditions relatively more water will be required to replace the amount lost by transpiration from the crop.

The most simple and accurate method of determining the daily crop water requirement for drip irrigation is by utilising a tensiometer. This is a porous, porcelain-tipped tube of water with a vacuum gauge at the top located at root zone depth with the porous lip buried in the soil. As the water moves from the porous tip a vacuum reading indicates the soil water status. Tensiometers are typically installed in pairs called a 'station', one at 15 cm depth and the other deeper at 30 cm depth.

System maintenance

Micro-irrigation system filters must be checked daily and cleaned as appropriate. Clogged and blocked screen filters may be cleaned by using a stiff bristle brush while immersed in water, but sand filters must be back-flushed. Lines should be monitored for excessive leakage and an extensive wet area in the field invariably indicates a leaking drip tube.

Excessive mineral precipitates in drip lines can be dissolved by using acids such as phosphoric acid. Tapes buried under plastic mulches are much less apt to become clogged by precipitates. Bacteria, algae and 'slime' in the line are eliminated by injections of chlorine or commercial bacterial control agents applied through the fertigation system.

Frequent flushing of the mainline, sub-mainline and drip tape is recommended as best proactive practice for avoiding blockage problems. Adapters are available for the ends of each drip tape to each irrigation cycle. Alternatively they can be manually opened to allow a few litres of water to flush in from the end, to avoid any build-up of contaminating solid matter at the end of the drip line. **E**

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Michael Williams looks at some of the latest developments in the seed drill and planter market.

Seed drills and planters

ONE OF THE biggest developments in the drill and planter market last year was the news that John Deere, the world's largest tractor and farm machinery manufacturer, is to buy the French based Monosem company, Europe's market leader for precision seeding equipment. It is a move that offers important benefits for both companies, bringing John Deere one of the most successful planter ranges while the availability of Monosem equipment is likely to extend to new markets through John Deere's international distribution network.

Monosem makes a wide range of precision planters in France and in the United States, with distributors established throughout much of Africa. An unusual model in their range of planters is the TR or Twin-Row model that plants seed for crops such as maize in double rows which are 20 cm apart with seeds arranged in a zig-zag pattern in the double rows. The Twin-Row idea was developed more than 20 years ago by a Monosem research team in the United States where the aim was to increase the plant population per hectare by 10 per cent with the double row arrangement allowing each plant more equal access to soil moisture and light.

“Customers using Twin-Row planters for maize report a 10 per cent increase in seed used per hectare.”

Carrotech, the South African distributor for Monosem equipment, says customers using Twin-Row planters for maize report a 10 per cent increase in seed used per hectare compared with conventional sowing. Increased access to soil moisture and sunlight produces stronger crop growth, helping to suppress weed competition, and yield increases are typically between eight and 16 per cent.

The potential for increased yields offered by double-line planting has also attracted engineers in the German based Lemken



One-pass crop establishment with the McConnell Seedaerator needs at least 160hp.

company. They have developed the DeltaRow seeding system for their Azurit precision drill which was field tested last year sowing maize on a number of German farms, and the trials will be extended this year to cover additional crops. On the Azurit machine each pair of double lines of seed is sown by a single planting unit, and the performance includes precision spacing both down the row and between the rows for maximum crop growth.

Lemken already established in parts of Africa

While the Azurit planter is not yet available commercially, other models from the Lemken seed drill range are already established in some African countries. The Lemken Saphir 7 mechanical seed drill has achieved particular success in Ethiopia, and the 9 KA model from the Solitair pneumatic drill range is popular in a number of countries including South Africa and Zambia for establishing cereal crops and for soya beans. Solitair 9 series drills are available in rigid and folding versions with working widths from 3.0 to 6.0 metres and hopper capacities are 1,100 or 2,300 litres with 150mm maximum inter-row spacing.

Sfoggia offers a comprehensive range of seed drills, planters and transplanters that are made in Italy and are available in Africa through an established dealer network. The list of precision planters includes the

Gamma Plus series available in a range of sizes from four to 18 rows for crops such as maize or sunflowers, and there is a soya bean version planting up to 24 rows. The options include fixed or telescopic frames plus mounted or trailed versions and the standard specification includes a mechanically operated automatic row marker, with a hydraulically operated marker and electronic seed monitoring on the options list. Gamma Plus features include a maximum 4cm drop height for seeding accuracy, the gearbox has 42 seed space settings and the operating speed is up to 10 kph.

The Sfoggia range also includes the Elektra precision planter designed to offer a high level of accuracy at speeds up to 15 kph. It is available in six or eight-row versions and a special feature is the new Elektra Drive control system operated by a touch screen in the tractor cab. Elektra is vacuum operated with an electric motor, and the control unit includes a memory that can store seed rate settings for future use.

A popular choice in the Amazone range for sowing grain crops in a number of African countries is the D9 series mechanical seed drill which has a reputation for reliability and easy maintainance. D9 models are available in widths up to 12m, but the smaller sizes from 2.5 to 6.0 metres attract customers with a

limited cropping area and restricted tractor power. Another reason for the D9's popularity is the ability to work in traditional seedbeds or for mulch seeding, and it also has the flexibility to work on its own or in combination with a variety of cultivators including power harrows and rotary tillers. Amazone also offers a range of drills designed for large scale crop production, including the Cirrus combined seed drill and disc harrow and the 12 to 15m width Citan models.

Farm machinery production is also expanding in South Africa.

For precision planting, Amazone offers the standard ED series air type seeder which is available in rigid and folding versions with widths from 3.0 to 6.0 metres. Seed hoppers with 60-litres capacity are provided, but an additional front container is available to provide extra capacity. There is also an EDX range of precision planters designed for 10 to 15 kph working speeds.

A recent arrival in the seed drill market is the French based Sky Agriculture. The company was formed as a partnership between a farmer and the owner of the Sulky farm machinery company to specialise in seed drill design and production. The drills have been available in some European countries for up to three years, and Sky is now making distribution arrangements outside Europe.

The two principle models are the MaxiDrill designed for use with minimum tillage systems and in traditional cultivations, and the EasyDrill can also be used as a direct drill in uncultivated soil as well as sowing seed into cover crops and into prepared seedbeds. Both drills are available in a 3.0 working width with a rigid frame plus 4.0 and 6.0m drills that to give a 3.0m transport width. All models have a hopper divided into grain and fertiliser sections with separate distribution systems for each, or the divider can be removed to provide a larger seed only capacity.

Special design features on the EasyDrill include a 3.5° disc angle to reduce soil disturbance and minimise the germination of weed seeds and seeds remaining from the previous crop, the skim coulter has a carbide tip for wear resistance and the depth control for the suspension system is said to provide the same level of accuracy as a precision drill, even in uneven soil conditions. Up to 250kg of pressure can be applied through each disc to ensure penetration in hard ground conditions.

The Seedaerator single-pass seed drill is a recent addition to the machinery range



The MaxiDrill from Sky Agriculture can work in conventional or minimum cultivation systems, and in light soils it can be used for direct drilling in uncultivated soil.

from McConnel, a British based subsidiary of the American owned Alamo Group. It is designed to sow seeds directly into residue from the previous crop, using deep working tines to prepare narrow cultivated strips where the seed is sown, while leaving the area between the strips undisturbed. The working width is 3.0m and the seeding strips can be 60 to 150mm wide with the main tines providing a maximum working depth between 100 and 300mm. The tines are equipped with automatic break-back protection and the Seedaerator is available with 600 or 1250kg hopper capacity and is supplied with radar controlled seed metering.

Benefits claimed for the Seedaerator's one-pass crop establishment include a big reduction in time and fuel consumption per hectare, there are long term benefits to the soil structure and reducing the soil disturbance can also increase moisture retention to withstand dry conditions. The Seedaerator is tractor-mounted and has a 160hp plus tractor requirement.



Lemken Solitair 9 series drill working with a front-mounted press.

Farm machinery from Brazil

The long term dominance of American and European companies in farm machinery design and production is facing an increasing challenge from a long list of countries including Brazil, where the Baldan company is based. Baldan was originally formed in 1928, and it now makes more

than 200 machinery products which are sold in a long list of export markets including 15 countries in Africa.

Baldan machinery production includes a comprehensive range of seed drills and planters covering mounted and trailed machines to suit tractors from 45 to 340hp and designed for all requirements from no-till crop establishment to conventional plough-based cultivations. There are nine different planter series for rowcrops such as soya beans, maize and cotton covering from 2 to 45 rows, as well as drills for rice, wheat and other small seeds. A popular choice in many African countries is the SAB series trailed drill available in four widths from 11 to 17 rows and suitable for tractors in the 55 to 85hp range. It provides 170mm minimum row spacing and the hopper capacities are between 333 and 468 litres of fertiliser and from 182 to 297 litres of seed.

Farm machinery production is also expanding in South Africa with Picket Implements offering seed drills and planters including a selection of machines for no-till crop establishment. The range includes the No Till maize planter available with 1 to 6-row versions, and the No Till grain drill can be supplied in 16 to 28-row versions to suit tractors with minimum outputs from 64 to 112hp.

An unusual addition to the Picket machinery range is the recently introduced No Till animal drawn planter designed for small farms that do not have tractor power. The drill weighs about 100kg, it can be pulled by a pair of oxen or donkeys, and it can be used for a wide range of crops including maize, cereals and beans. The drill can work in uncultivated soil or in a prepared seedbed, and it is designed to work in stubble and residue from previous crops. Each drill has three separate hoppers, one for granular fertiliser plus one each for large and small seeds. **E**

African Farming looks at some other innovations at the recent Agritechnica, that were not included in the last issue.

More innovation at Agritechnica 2015

Silver Medal for more energy and structure in maize silage

CLAAS INTRODUCED A new addition to its range of cracker rollers in the form of the new MCC MAX for conditioning maize silage and this new product was awarded silver DLG innovation medal.

Equipment users, researchers and the agricultural machinery industry are constantly looking for new ways to further improve kernel shredding, digestibility, compressibility in the silo and the ensiling properties of maize silage. This is based on the desire to increase the energy availability of the crop. Forage quality is the most important success factor, especially for dairy producers who are currently under intense production and cost pressure, but also for the operators of biogas plants.

The MCC MAX is a new conditioning system which fulfils these requirements. The MCC MAX rollers have been developed for conditioning maize silage with chop lengths of between 7.0 and 22 mm, which is the most popular application range. They have a sawtooth profile and each features 30 annular segments. The positioning and special geometry of the annular segments mean that the chopped crop is not only processed by friction, but also by cutting and shearing forces. This allows even more intensive conditioning of the grain kernels as well as shredding of the stalk material. Compared with conventional corn crackers, the MCC MAX is suitable for a much larger range of chop lengths and dry matter percentages while still achieving excellent conditioning results. "The more intensive kernel shredding increases the digestible starch quantity of the maize silage. This allows more milk to be produced from maize silage and the amount of supplementary feed can be reduced", explained Alexander Kirchbeck of product management at CLAAS Selbstfahrende Erntemaschinen GmbH.

The greater shredding of the crops also means that the MCC MAX concept achieves the desired proportion of large crop surface areas over a wide range of chop lengths. This offers many advantages: Farmers who supply dairy operations and biogas plants with forage from one and the same silo can use this method to produce silage which has the optimal structure for both use cases. Farmers who want to feed longer-cut silage to their animals can produce a shredded forage structure with excellent kernel shredding using the MCC MAX. At the same time, the MCC MAX offers farm contractors and machinery collectives a new technical solution, which allows them to optimally fulfil a very wide range of customer requirements for forage conditioning without having to adjust the equipment of their machines.

Manitou with an emphasis on innovation

The Manitou Group presented its new products for the European agricultural market.

The group's research and development was under the spotlight because there were no fewer than five new products, six new functions and a preview of an innovative test eco-concept, which were exhibited at the event. In close contact with its customers and their requirements, the group has developed a TCO approach that was exclusively presented at the show.



Claas has further developed its Multi Crop Cracker concept for its range of Jaguar forage harvesters.

Michel Denis, chief executive of the Manitou Group: "We are highly attentive to the requirements of farmers, for whom the machine is the daily work tool. With this in mind, we worked on improving ergonomics and profitability through new functions. We have developed an innovative concept, presented as a test at the show, to enable them to improve energy management within the machine itself.

The role of a leader is also to improve practices in one's sector. Associated with this new concept, we have emphasised service by perfecting a tool to raise awareness of the total cost of use. Through our Reduce TCO programme, a component of the Reduce approach, we also wish to support them in optimising their energy efficiency, in complete transparency, with the consumption of our machines."

The agricultural range of telescopic trucks from Manitou is composed of 10 models offering lifting heights going from six metres to 10 metres, and capacities of 2.5 to six metric tons. Developed in co-operation with users, these machines are totally adapted to the specifics of the agricultural market and fulfill requirements in terms of comfort, performance and robustness.

This range is available in three levels of finish, Classic, Premium and Elite, which include different functions such as fan reversal for optimal cooling, the Easy Connect System which enables attachments to be quickly changed by removing the pressure from the hydraulic circuit, and boom suspension, offering greater comfort for the user.

The group's customers can also count on a wide range of Gehl and Mustang skid loaders and articulated loaders. Designed for demanding requirements, they include continuous improvement thanks to feedback from customers, so that they fully correspond to their requirements.

The skid loaders were developed mainly to respond to the requirements of the agricultural market, but also to the demands of contractors, municipalities, landscape gardeners. Of robust design, they are highly versatile on the farm and the numerous attachments offered enable a wide range of applications.

The articulated loaders are also becoming increasingly used in the agricultural market. Versatile and compact, they enable numerous different types of work to be performed while limiting damage to the soil.

Entire range from Sfoggia on show

Sfoggia Agriculture Division decided to present its entire product

range in two different pavilions, and came back home with news links from strategic markets.

On the cereals stand there was particularly interest in the new hoppers for seeds, fertiliser and pesticides of Sigma 5/ Discover/Sigma HWS with the new cover closing and the bigger capacity.

Elektra Drive, the electronic system applied to the sowing (updated and modified), was very well received, especially among the young people who particularly enjoy the challenge of innovative agriculture.

Its strengths are the touch screen console, located in the cab of tractor, the new feature tramline and the satellite connection GPS, as well as the automatic selector which permits quick configuration and exactly the settings of sowing.

Vibrogerm for better seedbed preparation

AGRISEM exhibited its new tillage machine, the Vibrogerm, and expanded its range, with a new seedbed cultivator which combines all tillage operations to prepare a seedbed in one pass.

The front Cross-board, with hydraulic depth control as well as the crumbling roller of 460mm diameter, first allows a good levelling and crumbling of the soil surface. This is followed by two or four rows of tines according to the configuration of the machine:

- Configuration with two rows, with 16, 20, or 24 tines (4, 5 or 6 meters width). The tines are mounted with 3D security of 25 mm



Sfoggia's entire range was on show



Seedbed preparation in one pass - Agrisem's Vibrogerm.

section, with wing shares and the space between rows is 25 cm. This configuration, with this type of share, can scalp the soil over the whole width, with an aggressive tillage to obtain a broken up surface layer.

- Configuration with four rows, with 40, 50 or 60 vibrating tines 45x10mm (4, 5 or 6 meters width). This configuration allow an intensive and shallow cultivating, warming and ventilating the soil surface before seeding.

Whatever the configuration of the machine, the tines are mounted on an independant frame with hydraulic working depth adjustment, enabling precise control from the tractor cab. The accuracy of the working depth control provides a perfectly straight field, ready for seeding and promoting a uniform crop emergence. The tines allow burying of the finer soil particles to favour the germination with a good contact between the soil and the seed. Finally, a double 400mm diameter cross-kill roller presses the upper level of the soil again to prevent loss of moisture, before passing an optional finisher roller of 320 mm diameter. **E**








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

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

While every care has been taken to avoid errors and omissions, they may occur; the Editor would like to be notified of these so that the 2017 edition of the Directory can be kept up to date.

Suppliers' Listings
start on page 38

Agents Listings
start on page 43

Classified Listings

Abattoirs

USE Poultry Tech

Agricultural Consultancies

Escorts Agri Machinery
Fieravicola - The International
Poultry Fair in Italy

Agricultural Equipment - General

Alvan Blanch Development Ltd
Baldan/Pan Trade Services Ltd
Bentall Rowlands Storage
Systems Ltd
Case IH
Challenger
Escorts Agri Machinery
Eurodrip SA
Fliegl Agrartechnik GmbH
Great Plains Manufacturing, Inc
Massey Ferguson
New Holland Agriculture
Nogueira/Pan Trade
Services Ltd
Pöttinger
Valtra

Agricultural Projects

Bentall Rowlands Storage
Systems Ltd
Escorts Agri Machinery
Eurodrip SA
Sfoggia Agriculture Division
S.r.l.
Symaga SA

Animal Health Products

Ayurvet Ltd

Applicators for Granular Insecticides, Herbicides

Guarany Ind. Com. Ltd

Automatic Chain Feeders

Big Dutchman International
GmbH

Bagging plant

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

Bale Handling Equipment

Nogueira/Pan Trade
Services Ltd

Biofuel/Biodiesel

Bentall Rowlands Storage
Systems Ltd

Biogas Technology - Dosing & Drying Technology

Fliegl Agrartechnik GmbH

Breeding

Draminski SA

Briquetting Plants

Alvan Blanch Development Ltd

Buildings

Escorts Agri Machinery

Buildings - Structural Steel

Escorts Agri Machinery
Fastpan

Bulk Storage Equipment

Bentall Rowlands Storage
Systems Ltd
Chief Industries UK Ltd
Kepler Weber
Symaga SA
The GSI Group South Africa
(Pty) Ltd

Cages & Batteries

Big Dutchman International
GmbH

Cassava Planters/Harvesters

Sfoggia Agriculture Division
S.r.l.

Cassava Processing Equipment

Alvan Blanch Development Ltd

Centre Pivot Equipment

Valley Irrigation

Cocoa Production

Alvan Blanch Development Ltd

Coffee Processing, Handling & Storage

Swingtec GmbH

Colour Sorting Equipment

Alvan Blanch Development Ltd

Computers & IT Equipment

Big Dutchman International
GmbH

Construction Products (eg. cement mixers, asphalt transporters)

Fliegl Agrartechnik GmbH

Consulting Services

Fieravicola - The International
Poultry Fair in Italy

Conveyors and Elevators

Awila Anlagenbau GmbH
Big Dutchman International
GmbH
Kepler Weber

Coolers - Environmental

Big Dutchman International
GmbH

Coolers - Evaporative

LUBING Maschinenfabrik
GmbH & Co KG

Cotton

Sfoggia Agriculture Division
S.r.l.

Cotton Handling & Storage

Swingtec GmbH

Crop Drying and Ventilation

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

Crop Handling & Storage

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Bentall Rowlands Storage
Systems Ltd
Chief Industries UK Ltd
Griffith Elder & Co Ltd
Swingtec GmbH

Crop Protection Equipment

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Systems Ltd
Challenger
Jacto/Pan Trade Services Ltd
Massey Ferguson
Swingtec GmbH
Valtra

Cultivators

Baldan/Pan Trade Services Ltd
BCS SpA
Challenger
Escorts Agri Machinery
Great Plains Manufacturing, Inc
Lemken GmbH & Co KG
Massey Ferguson
Monosem
Pöttinger
Sfoggia Agriculture Division
S.r.l.
Valtra

Cultivators - Rotary

Challenger
Escorts Agri Machinery
Great Plains Manufacturing, Inc
Massey Ferguson

Sfoggia Agriculture Division
S.r.l.
Valtra

Cultivators - Tined

Bomford Turner Ltd
Challenger
Escorts Agri Machinery
Great Plains Manufacturing, Inc
Maschio Gaspardo SpA
Massey Ferguson
Valtra

Disinfectants

Intraco Ltd nv

Drills

Great Plains Manufacturing, Inc
Maschio Gaspardo SpA
Pöttinger
Sfoggia Agriculture Division
Srl

Drinking Systems

Big Dutchman International
GmbH
LUBING Maschinenfabrik
GmbH & Co KG

Dryers

Alvan Blanch Development Ltd
Fliegl Agrartechnik GmbH

Egg Collection

Big Dutchman International
GmbH
LUBING Maschinenfabrik
GmbH & Co KG

Exhibitions and Conferences

Sfoggia Agriculture Division
S.r.l.

Extruders for Food, Feed

Alvan Blanch Development Ltd

Feed Additives

Ayurvet Ltd
Evonik Industries AG
Intraco Ltd nv

Feed Concentrates

Intraco Ltd nv

Feed Ingredients

Intraco Ltd nv

Feed Premixes

Ayurvet Ltd
Intraco Ltd nv
Tithearn Ltd

Feed Processing Plants

Alvan Blanch Development Ltd
Bentall Rowlands Storage
Systems Ltd

Feed Supplements

Tithearn Ltd

Feeding Systems

Big Dutchman International
GmbH

Fertiliser Mixers

Bagtech International (Pty) Ltd

Fertiliser Processing Machinery

Bagtech International (Pty) Ltd

Fertiliser Spreaders

Atespar Motorlu Araclar San.
Ve Dis Tic. Ltd Sti.
Baldan/Pan Trade Services Ltd
Challenger
Great Plains Manufacturing Inc
Guarany Ind. Com. Ltd
Maschio Gaspardo SpA
Massey Ferguson
Monosem
Valtra

Fertilisers

Omex Agrifluids Ltd
Sfoggia Agriculture Division
S.r.l.

Fish Feeds - General

Alvan Blanch Development Ltd

Fogging Machines

Big Dutchman International
GmbH
Swingtec GmbH

Foliar Fertilisers

Omex Agrifluids Ltd

Food Processing Equipment

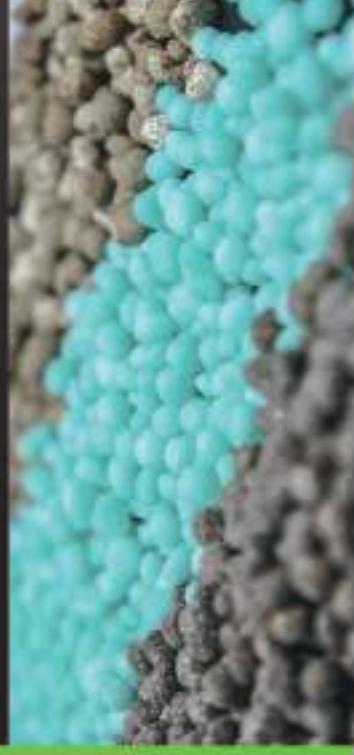
Escorts Agri Machinery
Marel Stork Poultry
Processing

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Fruit Processing

Alvan Blanch Development Ltd

Generating Sets

Escorts Agri Machinery

Grain - Drying & Ventilation

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Awila Anlagenbau GmbH
Bentall Rowlands Storage
Systems Ltd
Chief Industries UK Ltd
Kepler Weber

Grain - Handling, Cleaning & Processing

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Awila Anlagenbau GmbH
Bentall Rowlands Storage
Systems Ltd
Chief Industries UK Ltd
Fastpan
Kepler Weber

Grain Moisture Testers

Draminski SA

Grains, Grain Projects & Edible Oils

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Systems Ltd
Milltec Machinery Pvt Ltd.

Grass

Sfoggia Agriculture Division
S.r.l.

Grasscutting Machines - Forage

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Bomford Turner Ltd
Challenger
Massey Ferguson
Nogueira/Pan Trade
Services Ltd
Pöttinger
Valtra

Grasscutting Machines - Lawn

BCS S.p.A.

Groundnut Handling Equipment

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Harrows

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Escorts Agri Machinery
John Deere (Pty) Ltd

Harvesting Equipment

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BCS SpA
Bentall Rowlands Storage
Systems Ltd
Challenger

Escorts Agri Machinery
John Deere (Pty) Ltd
Massey Ferguson
New Holland Agriculture
Nogueira/Pan Trade
Services Ltd
Valtra

Hedgecutters

Bomford Turner Ltd

Horticultural Equipment & Machinery

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Escorts Agri Machinery
Guarany Ind. Com. Ltd
Massey Ferguson
Sfoggia Agriculture Division
Srl
Swingtec GmbH
Valtra

Integrated Pest Management

Omex Agrifluids Ltd
Swingtec GmbH

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Valley Irrigation

Irrigation Equipment

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Eurodrip SA
RKD Irrigation S.L.
Sfoggia Agriculture Division
S.r.l.
Valley Irrigation

Land Clearing Equipment

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Fliegl Agrartechnik GmbH
Massey Ferguson
Valtra

Maize Shellers

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Bomford Turner Ltd
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Services Ltd

Manure Composters & Dryers

Fliegl Agrartechnik GmbH

Material Handling

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Bentall Rowlands Storage
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Escorts Agri Machinery

Material Handling - Bulk

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Systems Ltd
Escorts Agri Machinery

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Processing

Mechanical Services & Equipment

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Massey Ferguson
Valtra

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GmbH

Micronutrients

Omex Agrifluids Ltd

Milling & Mixing

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Awila Anlagenbau GmbH
Big Dutchman International
GmbH

Mills

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GmbH
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Mills - Grain

Awila Anlagenbau GmbH
Bentall Rowlands Storage
Systems Ltd
Fastpan
Nogueira/Pan Trade
Services Ltd
Sfoggia Agriculture Division
S.r.l.

Mills - Grinding

Awila Anlagenbau GmbH

Mills - Hammer

Awila Anlagenbau GmbH
Nogueira/Pan Trade
Services Ltd

Moisture Meters

Draminski SA

Monitoring Equipment

Valley Irrigation

Mould Inhibitors

Ayurvet Ltd

Oil Extraction Equipment

Alvan Blanch Development Ltd

Palletizers

Big Dutchman International
GmbH

Pelleting

Alvan Blanch Development Ltd
Awila Anlagenbau GmbH

Pig Equipment

Big Dutchman International
GmbH
LUBING Maschinenfabrik
GmbH & Co KG
MIK International GmbH &
Co KG
Symaga SA

Pig Feeding/Drinking Equipment

Big Dutchman International
GmbH
The GSI Group South Africa
(Pty) Ltd

Pig Flooring

Big Dutchman International
GmbH
CARFED SA

MIK International GmbH &
Co KG

Pig Housing

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GmbH
MIK International GmbH &
Co KG
Symaga SA

Plant Protection Chemicals

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Ve Dis Tic. Ltd Sti
Baldan/Pan Trade Services Ltd
Challenger
Great Plains Manufacturing Inc
John Deere (Pty) Ltd
Massey Ferguson
Monosem
Sfoggia Agriculture Division
Srl
Valtra

Plastic Flooring, Poultry

Big Dutchman International
GmbH
MIK International GmbH & Co
KG

Ploughs - Disc

Atespar Motorlu Araclar San.
Ve Dis Tic. Ltd Sti
Baldan/Pan Trade Services Ltd
Challenger
Escorts Agri Machinery
Massey Ferguson
Valtra

Ploughs - Mouldboard

Challenger
Escorts Agri Machinery
John Deere (Pty) Ltd
Lemken GmbH & Co KG
Massey Ferguson
Pöttinger
Valtra

Poultry Consultancy Services

Fieravicola - The International
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Poultry Equipment - Drinking

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GmbH
LUBING Maschinenfabrik
GmbH & Co. KG
The GSI Group South Africa
(Pty) Ltd

Poultry Equipment/Handling

Bentall Rowlands Storage
Systems Ltd
CARFED SA
USE Poultry Tech

Poultry Export Trade

Fieravicola - The International
Poultry Fair in Italy

Poultry Feeding

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Systems Ltd
Big Dutchman International
GmbH

Poultry Housing

Big Dutchman International
GmbH
Symaga SA

Poultry Processing Equipment & Supplies

CARFED SA
Marel Stork Poultry Processing
USE Poultry Tech

Poultry Projects, Integrated

Marel Stork Poultry
Processing

Pregnancy Testers & Detection Equipment

Draminski SA

Project Management

Fastpan

Public Health

Guarany Ind. Com. Ltd
Swingtec GmbH

Rice Parboilers

Alvan Blanch Development Ltd
Milltec Machinery Pvt Ltd

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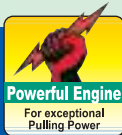
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