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African Farming

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in East Africa

Poultry health -
sound broiler management

Post harvest
technology

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African Farming and Food Processing

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Farming Calendar 2016

JANUARY

27-28	Agribusiness Congress East Africa *www.agri-eastafrica.com*	DAR ES SALAAM

FEBRUARY

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

MARCH

1-2	2nd Cassava World Africa *www.cmtevents.com*	ACCRA
2-3	Cropworld Global 2016 *www.cropworld.com*	AMSTERDAM
18-20	Agro and Poultry East Africa 2016 *www.mxmexhibitions.com*	DAR ES SALAAM

APRIL

13-15	Fresh Produce Africa 2016 *www.hppexhibitions.com*	NAIROBI
13-15	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
17-20	NAMPO Harvest Day *www.nampo.co.za*	BOTHAVILLE

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

Interactive discussions to cover topics across all areas of agri market

THE UPCOMING AGRIBUSINESS Congress East Africa taking place from 27-28 January 2016 in Dar es Salaam, aims to create an enabling environment for all farmers to participate. Now in its third year, more than 700 visitors and over 50 exhibitors are expected to attend the two-day conference and exhibition that is hosted by ACT – The Agricultural Council of Tanzania - and supported by the Ministry of Agriculture, Food Security and Co-operatives as well as the Ministry of Livestock and Fisheries Development.

In order to create a platform for all farmers to participate; Agribusiness Congress East Africa will once again run the Hosted Farmers Programme where 50 commercial and emerging commercial farmers can attend the event free of charge.

"The Hosted Farmers Programme ensures that Agribusiness Congress East Africa is an all-inclusive event allowing farmers of all scales to benefit from the platform we are creating. These interactive discussions cover topics across all areas of the agri-market and aim to provide viable solutions to the challenges faced by small-emerging farmers as well as deliver the information required to boost productivity for these farmers," said Agribusiness Congress event director, Emmanuelle Nicholls.

This year, the two-day conference and exhibition will bring together local and international stakeholders, investors and suppliers from across the agri-value chain to set strategic plans relating to regional growth and market accessibilities in the East African agricultural corridors. The conference programme takes into consideration some of the major challenges faced by the sector and includes panel discussions and presentations such as access to markets and cross border trading, the promotion of livestock production and productivity to match supply and demand and ensuring food security and commercial market viability.

According to Agribusiness Congress East Africa conference producer, Shanaaz Adams, "The event will analyse critical strategic and practical issues, including actualising development and growth in agriculture, turning farming into a profitable business and decreasing post-harvest losses amidst the challenges posed by climate change."

FIAAP/VICTAM/GRAPAS International 2015 - a resounding success

GLOBAL INDUSTRY EXECUTIVES from the animal feed, flour and rice milling, grain processing and biomass pelleting industries descended on Cologne in Germany at the beginning of June to visit the 2015 edition of the renowned FIAAP/VICTAM/GRAPAS International exhibition and conferences.

Thousands of visitors came through the doors of the KölnMesse exhibition centre, from as far away as Australia and every continent was represented. The exhibitors, of which there were 276, were busy with serious trade enquiries and discussions, many lasting a long time. There was much to see for the trade professionals and also a wide range of new products that were launched at the show.

During the three days of the show there were the following conferences:

- The FIAAP Conference
- Aquafeed Horizons
- AEBIOM Pellet Workshop
- Petfood Forum Europe 2015
- GMP+ International Feed Safety
- Assurance certificate
- The IFF Feed Conference
- The Global Milling Conference with GRAPAS International 2015

A truly international exhibition for the animal feed industry.

Additionally Victam arranged for free tours to the Vitelia feed mill and the newly opened Feed Design Lab in the Netherlands. These proved very popular with the visitors.

Massey Ferguson introduces entry-level tractors

MASSEY FERGUSON IS introducing a new range of 50hp-85hp tractors for selected African and Middle East markets. This latest move will further strengthen its product offering in the lower horsepower tractor sector in these territories and offer a broader choice to farmers looking for a rugged and reliable multi-purpose machine. In addition, to complement these new MF 300 Series tractors, a new line of Massey Ferguson-branded implements is also being unveiled for the region.

"Simple, yet powerful, the MF 300 Series tractors are tried and tested, with a strong reputation for straightforward operation and robust dependability - they are ideally equipped to meet the tough challenges of African and Middle East agriculture," said Thierry Lhotte, Massey Ferguson vice-president marketing, Europe/Africa/Middle East. "More than 1.5mn units based on this renowned design are already at work in the world."

Affordable and economical to run, these entry-level 'do anything' tractors will have strong appeal as the main power source for smallholder farmers or local community groups looking to mechanise or upgrade their agricultural operations. The models can also be a valuable addition to a machinery fleet on larger farms or estates requiring a cost-effective workhorse.

Initially, a choice of six Massey Ferguson matched implements, covering cultivation, planting and transport, will be available for the MF 300 Series. These include a 1.6m-width disc harrow, 0.5m-width fixed-disc plough, 2-tine subsoiler, 2-row planter, 3-tonne trailer and transport box. Plans are in place to develop and expand the implement range according to market demand.

"As true multi-taskers, the MF 300 Series are equally adept at cultivation, planting, transport or yard duties, working across a wide range of farm sectors including arable, livestock and horticulture," explained Lhotte. "Low cost of ownership, easy servicing and maintenance plus expert support from the Massey Ferguson local distributor ensure a fully-sustainable and inclusive farm mechanisation package."

Consisting of six models in total, three MF 300 Series models are set for release in early 2016 – the 50hp MF 345 two-wheel-drive (2WD), 75hp MF 375 (2WD) and 85hp MF 385 (2WD and 4WD). The longer wheelbase 50hp MF 350 (2WD), 60hp MF 355 (2WD) and 60hp MF 360 (2WD) will follow later in the year.

MF 385 4WD (85hp) pulling a three-furrow conventional plough.

Fuel-efficient power comes from Perkins 3-cylinder AD 3.152 and 4-cylinder AD 4.41 diesel engines. The well-proven mechanical transmission offers four gears in two ranges to provide eight forward and two reverse speeds. Powerful hydraulics are based on the renowned Ferguson hydraulic 'Scotch Yoke' pump delivering full draft, position and response control. Fingertip hydraulic operation of implements above or below ground is by means of the familiar quadrant control. Lift capacities at the rear linkage range from 1,415-2,145 kg. A dual-stage clutch ensures efficient drive- and PTO-engagement, while the oil-immersed multi-disc brakes allow safe and secure stopping. For reduced driver fatigue, the MF 350, MF 360, MF 375 and MF 385 models are fitted with power steering.

The MF 300 Series tractors boast a spacious operator's environment equipped with a spring-suspension deluxe seat. All controls are well laid out and fall neatly to hand. Depending on the model, the tractors are available in footstep or semi-platform configuration.

Women farmers receive multi-crop planters

A TOTAL OF 100 women farmers in the Upper West region of Ghana have received multi-crop planters. This will modernise agricultural practices in the region and empower female farmers who play a crucial role in the welfare of their communities.

The Feed the Future Ghana Agriculture Technology Transfer project presented the technology to the women as part of the project's larger initiative to inspire agricultural innovation in the region.

Agricultural bank sources US$150mn for farmers

NIGERIA'S BANK OF Agriculture (BOA) is to secure US$150mn from international financial institutions for on-lending to farmers for the development of agriculture in the country.

The BOA managing director, Professor Danbala Danju, said that the financial institutions were the African Development Bank (ADB) and the Islamic Development Bank (IDB). He said that the loans would be used by farmers to enhance their productivity and support other activities in the agriculture sector.

"To develop agriculture, you need to inject a lot of resources and provide support in terms of supply of fertilisers, seeds, land clearance and extension services," Danju said.

He said that the funds would impact significantly toward boosting agricultural productivity, guarantee food security, create jobs and alleviate poverty among Nigerians.

Danju said the bank was being repositioned to provide the necessary services in developing the sector and that the bank's management had begun discussions with traditional leaders, state government officials and other stakeholders on the modalities for disbursing the loans.

Brazilian farmers tour Zambian agribusiness giant

ZAMBEEF PRODUCTS, THE largest integrated agribusinesses in Zambia has pledged its long-term commitment to the agriculture sector and urged other farmers to follow its lead in developing the sector for generations to come during a tour of its operations by farmers from Brazil, according to spokesperson, Gillian Langmead.

Langmead reported that Zambeef Joint CEO, Francis Grogan, urged farmers to move away from the idea of short-term investments in the hopes of making quick returns and see agriculture for what it truly is, a long-term commitment. Grogan emphasised the broad-based nature of the food company's shareholding structure, in which every working Zambian has a stake through the National Pension Scheme Authority (NAPSA), which is Zambeef's single largest Zambian shareholder.

Saturnia Regna Pension Fund, Barclays Bank Pension Fund, Bank of Zambia Pension Fund, Zambia State Insurance Company (ZSIC), KCM Pension Fund, Workers Compensation Fund and Professional Insurance Pension Fund are also shareholders in the company.

Relationships, whether farmer to farmer, customer, government, financial institutions etc, play a vital role in sustaining the agriculture sector, Grogan said during the tour.

Grogan was speaking after a group of Brazilian farmers toured Zambeef's Kalundu dairy farm in Chisamba as part of a farming exchange programme organised by the Sao Paulo branch of Netherlands bank Rabobank in conjunction with its Zambian affiliate Zambia National Commercial Bank (ZANACO).

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.

"I was very surprised; we noted that the landscape and climate here is similar to some parts of Brazil. Zambia has the potential to play an important role in agriculture… we face similar challenges… although at different levels, such as logistics and infrastructure," said Fabiana Alves, executive director for rural banking, Rabobank Brazil, commenting on Africa and Zambia experiencing an agriculture revolution.

Wallace Mawire

Seed company launches pesticide, new tomato hybrids for farmers

SYNGENTA NIGERIA LTD, a seed company, has launched a new pesticide product known as Ampligo and two tomato hybrid seeds for use by Nigerian farmers.

Speaking at the launch in Abuja, Dr Shachi Sharma, director, Syngenta Nigeria, said it was part of the company's commitment to play a leading role in the transformation of Nigerian agriculture.

Sharma said that the pesticide was not only the best in the world, but it was simple and provided a solution against many insects destroying crops.

"Ampligo is a simple and fast acting crop protection product for use any time against insect pests, especially against Tuta absoluta. This is a deadly pest, that, if not controlled, can destroy up to 100 per cent of tomatoes in the field. Thousands of Nigerian farmers have suffered great losses due to this pest and Ampligo is here to provide an effective solution to their problem. Ampligo works against a wide variety of sucking and biting pests in vegetables, potatoes and field crops, giving up to 21 days protection,'' he said.

Sharma further stated that Syngenta was also launching Chibli, a tomato hybrid variety for farmers, who grow for both home and industrial use.

He said that the variety has grown well across multiple agro-ecological zones and had high solid content, suitable for tomato paste processors.

Sharma said 'Kilele,' a second high-quality hybrid tomato variety, could be harvested over a 10-week period compared to the local varieties that spent just four weeks. This long harvesting period extends farmers' sales window and increases their ability to optimise their return.

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DuPont enzymes give millers a better process

DUPONT HAS DEVELOPED two wheat processing enzymes that save time and energy and improve extraction rates in global flour mills. In wheat milling trials, the new POWERMill enzymes, from the DuPont Danisco ingredients range, reduced wheat conditioning times by as much as 50 per cent and saved up to 10 per cent on energy consumption.

"POWErMill enzymes open and soften wheat kernels faster, giving a smoother milling process. This can lead to higher extraction rates and a more premium flour," said senior application specialist at DuPont, Andy Flounders.

The Middle East and Africa (MEA) are growth markets for millers, industrial bakers and improver houses. Although cheaper artisanal breads still dominate the market, sales show that more consumers are willing to pay extra for packaged breads of higher quality.

The quality requirements of hotels and international fast food chains are also setting new standards for bakery products such as burger buns, baguettes and croissants.

"At DuPont, we experience that the changing market conditions in MEA have brought many new enquiries about the functional ingredient solutions we can provide. For example, it's a fact that consumers today expect more or less the same quality from an international burger chain regardless of the country they're in," Flounders noted.

Mozambique and Guinea-Bissau want to co-operate in the cashew sector

MOZAMBIQUE AND GUINEA-BISSAU plan to co-operate in the cashew sector, according to Mozambican daily newspaper Notícias, citing sources from both countries who took part in the International Cashew Conference held in the Mozambican capital.

The newspaper also reported that representatives of the two countries have initiated contacts and that Guinea-Bissau, the second largest producer of cashew nuts in Africa with an average of 200,000 tonnes per year, is seeking information about Mozambique's experience in industrialisation of cashews.

Mozambique, the fourth largest African cashew producer and one of the leaders in cashew nut processing in Africa, intends to improve its knowledge of cashew production.

Africa produces half of the cashew nuts sold worldwide, estimated at three million tonnes, but only processes 10 per cent of this production, and Filomena Maiopué, director of the Cashew Promotion Institute (Incaju) of Mozambique, advocated an increase in the processing in countries where cashews are produced, "to guarantee jobs and income that the population needs so much."

The director of Incaju said during the conference that Mozambique plans to produce about 100,000 tonnes of cashews in the 2014/2015 season, 20,000 tonnes more than the previous season, but about half of what the country produced in the 1970s when it was the world's largest producer with 200,000 tonnes per year.

The International Cashew Conference is the world's largest forum for the product, linking research with production and the market by discussing issues such as business, ethical trade and organic production.

Philip Morris supports sustainable agriculture

PHILIP MORRIS INTERNATIONAL (PMI), the largest buyer of tobacco in Tanzania, is ramping up efforts to implement its sustainable tobacco production model among the nation's 65,000 contracted tobacco-growing families. PMI purchases tobacco from three suppliers in Tanzania, contributing more than US$150mn annually to the economic development of the country's rural areas.

PMI director Leaf Africa Ben Jowett said that as part of its tobacco sourcing commitments in Tanzania, PMI supported a number of initiatives to improve the sustainability and efficiency of tobacco farmers.

"PMI recognises that with improved agricultural practices, farmers can increase their yield and quality of the leaf thus helping increase their returns," he said.

Jowett said the focus across Africa remained on encouraging sustainable tobacco production. PMI strived to ensure the efficient and competitive production of quality tobacco in conditions that limited as much as possible the impact on the environment and improved the socio-economic conditions of the people and communities involved.

"PMI is working with suppliers and farmers on tangible projects aimed at minimising the impact tobacco farming has on the environment, such as reforestation programmes, which last year alone saw more than six million trees planted by smallholder farmers and more than one million on commercial woodlots," he said.

PMI general manager Eastern Africa Harjeet Grewal said that, in conjunction with Tanzania Leaf Tobacco Company, considerable work was being done on agribusiness training and research through the Urambo Seed Farm, which has helped assess the processes on farms from which suppliers source tobacco and identify opportunities for improvement.

Tackling the challenges of food security and global climate change presents a daunting set of measures that include the need to provide insurance cover to vulnerable small-holder farmers – and technology holds the key. Stephen Williams reports.

Technology in alliance with agriculture

SINCE 2003, THE World Bank Group has been working together with governments, insurers, reinsurers, financial institutions, agricultural input suppliers and others to support more than 35mn farmers from more than 40 countries so as they can benefit from Index insurance.

Sometimes called Parametric Insurance, Index insurance is based on the premise that a verifiable index that measures temperature, precipitation and/or crop yield can cover very large numbers of small farmers in a given region, without the need for expensive and time-consuming claims procedures.

The World Bank Group's Global Index Insurance Facility (GIIF) is a response to the risks associated with climate change, and the continuing need to increase food security through support and insurance products for small-holder farmers, particularly in the developing world.

The inaugural GIIF annual conference, organised by the World Bank Group in Paris less than three months before the December COP21 Summit in the French capital, drew together stakeholders to discuss progress and investigate future trends.

Mobile solutions have great potential to increase incomes for smallholder farmers . (Image courtesy: Technoserve)

One of the speakers at the GIIF conference was Benjamin Njenga Njogu, who heads Business Analytics at Acre Africa (formerly the Kilimo Salama weather index insurance programme).

A former employee at Safaricom Ltd, the leading Kenyan telecom business that pioneered the M-Pesa financial services initiative, Njenga joined Acre Africa

bringing his extensive experience in interactive mobile technology and micro-insurance product design.

But Njenga's contribution to East Africa's Index insurance industry is just one side of the technological picture; the other is the advances made in climate monitoring by satellite.

One of the key partners in this development is EUMETSAT. The European countries that have joined forces in EUMETSAT have made the support of Africa a strategic objective, combining their efforts with the EU, the AU and the World Meteorological Organization.

A number of projects and initiatives have already taken place to help the African meteorological community meet national and regional objectives in terms of severe weather warnings, water and agriculture management, and mitigation of the effects of natural hazards and climate change.

This overall objective is expressed in the wider framework of the joint 2007 Africa-EU Strategy (updated as recently as 2014) and the World Meteorological Organization's Strategic Plan.

These strategies and agreements define various priorities, notably related to climate and environment and to assist the meteorological communities in Africa to more easily access EUMETSAT data, products and services as well as supporting projects and initiatives in Africa.

More than 70 per cent of the land surface in the EUMETSAT's satellites' field of view is in Africa, so the data and imagery the satellites provide is crucial to enhance weather forecasting and monitoring capabilities across the African continent and support the climate and environmental observation applications that underpins Index insurance. This data is also complemented by an increasing number of terrestrial weather stations across Africa.

Speaking with Acre Africa's Benjamin Njenga, this magazine learnt that his organisation received support from the World Bank Group under the Global Index Insurance Facility. This funding allowed Kilimo Salama ('Safe Agriculture' in Swahili) – a partnership of Syngenta Foundation for Sustainable Agriculture, UAP Insurance, and telecoms operator Safaricom – to develop a number of index insurance products for small-holder farmers.

"Before, we used to target individual farmers but in 2013 we changed the strategy and started reaching farmers through aggregators," Njenga explained. "That was important as we were able to really reduce the transaction costs involved."

The aggregators were those companies and institutions that were already providing inputs to farmers; selling seed, pesticides and fertilisers, and also those financial institutions providing credit. Njenga said that this was a positive move as Kilimo Salama was able to reach large numbers of small-scale farmers economically, and the aggregators were also able to explain to the farmers about the insurance product.

Then in 2014, after the proof of concept period, Acre Africa was established. "We were able to transition to Acre Africa which is a social business with a profit focus," Njenga said. "We are registered in three countries; Kenya, Rwanda and Tanzania, but because of differing regulatory frameworks, we have slightly different models in each country. In Kenya we are registered as an insurance surveyor while in Rwanda and Tanzania we operate as insurance agents. We are a service agent to the insurance companies, not an insurance company as such."

It is clear that Acre Africa has far more capabilities than the mainstream insurance companies and their agents to offer insurance products for small-scale farmers, simply because they have worked on developing smart kinds of distribution channels.

One of the main types of distribution channels is the financial institutions, the banks, the micro-finance institutions and so on, that bundle the insurance product up with their credit facilities. This is an important way of reaching the small-holder farmer, but by no means the only way.

Replanting guarantee

"One of the products we offer is a replanting guarantee that benefits farmers in the event of drought for example," Njenga said "We are targeting small holders, those with less than two acres."

The Replanting Guarantee Product (RPG) is distributed through packets of seed (maize) with cards packed inside having unique codes for insurance registration. This registration is done using the phone in the farm and covers the germination period of two weeks. Rainfall insufficiency during the cover period triggers an automatic payment to the farmer mobile number via mobile money transfer (Safaricom M-Pesa), equivalent to the recommended retail price of the bag of seed. This enables the farmer to repurchase another bag of seed and replant during the planting window.

Njenga said that the procedure also creates a lot of useful data that can be used to advise farmers through SMS messages, such as the best times to plant their crops. The uncertainty of current weather patterns means that it may not be appropriate to just use the traditional calendar to make these decisions.

In the event of a claim, the money can be paid through M-Pesa. It is a brilliantly simple concept that leverages mobile technology to make the lives of small-holder farmers a whole lot more secure against extreme weather risks which are expected to become ever more frequent as climate change begins to bite.

Poultry producers must be adept in recognising digestive disorder at early stages to ensure sustainable commercial production. Dr Terry Mabbett discusses.

Good gut health leads to sound broiler management

GUT HEALTH IS the key to optimum feed efficiency and successful broiler production is all about bacterial balance in the intestine. Contrary to popular belief, many bacteria play important roles in helping broilers digest rich and bountiful feed rations. But any imbalance will most certainly cause digestive problems and significant degradation in intestinal integrity.

Feed composition and the viscosity of gut contents impact the development and composition of gut micro-flora, particularly those found in the small intestine. Bacterial overgrowth (dysbacteriosis) causes diarrhoea and intestinal damage leading to diseased birds and poor performance. Overgrowth is the result of bad bacteria greatly outnumbering good bacteria within the bird gut. This permits bad bacteria to exert a considerable influence with consequent detrimental effects on the gut epithelium and digestion. Maintenance of sound avian health and welfare requires firm farmer focus on intestinal integrity.

Mike Eckman of Auburn State University in the USA has likened the intestinal system of the broiler bird to the engine that drives all others, claiming 'its integrity from first day to market is paramount in the expression of the genetic potential of the broiler.' Any digestive disorder must be diagnosed as early as possible with any changes in bird faeces being a very first indicator of deteriorating gut health. By monitoring flock health such as measuring the fluid content of the faeces, broiler producers may get a good idea and indication of how the digestive system is functioning.

Monitoring flock health such as measuring the fluid content of the faeces will help broiler producers get a good idea of how the digestive system is functioning.

Causes of gut ill-health

Many factors contribute to the loss of intestinal integrity but the immediate interface between environment and bird are the established main causes. The first is immune-suppression caused by common pathogenic viruses responsible for Mareks disease and Gumboro disease, which is routinely controlled by vaccinating the flock.

Other health problems including those caused by infectious bronchitis (IB) and variants and challenges from coccidiosis have phases which replicate in the gut to significantly damage the epithelial cells that line the gut. Even the slightest damage to intestinal cells can disrupt bacterial balance thus permitting malign bacteria to multiply. Sound biosecurity and robust coccidiosis control programmes based on the measured application of anti-coccidial products is crucial for control of such a challenge and resulting concurrent intestinal disease.

Veterinary anti-microbial chemicals are widely used in poultry with little consideration of their non-target effects on the natural micro-flora of the avian intestine. Highly targeted (selectively acting) chemicals are always preferable to the broad blast from those with a wide spectrum antimicrobial action.

Intensive factory farming of chickens in broiler houses, South Africa

Specific physical problems arising from poor management of the inhouse environment may provide conditions that encourage bad bacteria to become a reservoir for infection. A classic example is failure to properly manage and replenish poultry litter. .

Many poultry diseases including Salmonella and avian influenza are successful pathogens of poultry because they are able to persist for long periods of time within the poultry environment. Two other classic examples are clostridial disease and coccidiosis. Clostridium bacteria produce spores that survive for long periods of time even when challenged by disinfectants, thus persisting to infect new batches of birds at a much later date. Coccidiosis oocysts (eggs) possess the same level of longevity.

Feed factors also play an important part. Domestic chickens have been bred from their wild omnivorous ancestors but legislation in many countries forces producers to only use plant-based feeds such as soya, maize and wheat. Poultry nutritionists, therefore, play a critical role in ensuring that broilers are able to utilise all the feed ingredients provided in rations. It only takes one relatively small dietary component such as an enzyme to be inappropriately mixed or applied for gut health and intestinal integrity to be seriously compromised.

Recognising gut ill-health

Intestinal integrity is assessed by what you don't see rather than what you see during post-mortem examination of birds. Absence of inflammation and disease, with no excess secretion (mucus and watery contents) within the intestinal tract, are measures of good intestinal integrity.

Provided the gut contents are not excessively watery with no mucus visible along the tract and an intestine that curls round on itself when opened is regarded as good to excellent. Conversely, if contents are excessively watery or there are signs of inflammation and the gut wall is obviously thin, then intestinal integrity is wanting.

It only takes one relatively small dietary component such as an enzyme to be inappropriately mixed or applied for gut health and intestinal integrity to be seriously compromised.

Mucus is a natural product of the intestine produced by cells in the intestinal endothelium (inner lining) in response to irritation and inflammation. Mucus production is an inherent intestinal mechanism used to avoid and manage infection. That said, mucus can actually aggravate some infections by enhancing multiplication of some dangerous pathogenic bacteria such as Clostridium perfringens. This particular pathogen can use mucus as a substrate for energy utilisation in growth and reproduction. This bacterium is responsible for dysbacteriosis and its ability to utilise mucus is the cause of necrotic enteristis.

Peyers patches exist as groups of immune cells along the interior length of intestine and their presence and action is vital in the bird's ability to fight against disease. When exposed to infection they become raised and reddened and this is a sure sign the bird is delivering an active immune response against a microbial challenge.

Feed passing along the alimentary canal without being digested is an irretrievable lost opportunity for the broiler and its performance will suffer accordingly. Failure to properly digest feed is a common condition occurring in tandem with dysbacteriosis. Faeces rich in undigested feed is a signal of a malfunctioning digestion and is often caused by an infection, which facilitates the feed to move too quickly along the gut and without sufficient time for digestion.

Presence of watery contents in the bird's gut is due to excess secretion of fluids by the intestinal tissues or an inappropriate diet that pulls water into the lumen from the gut lining. Excessive secretion occurs when cells lining the gut are damaged by infective agents or poisonous substances already in the feed and/or subsequently produced by bad gut bacteria. These events are often the result of using sub-standard ingredients in feed rations and/or electrolyte imbalance in the feed.

Inflammation of the gut lining is the response to an infective agent inside the gut. In response, the broiler's body increases the supply of blood with its white blood cells and antibodies used to fight the infection. This may, in turn, cause excessive secretion of fluid from the gut wall and into the lumen (central space) of the intestine.

SA to resume US poultry imports by end year

SOUTH AFRICAN AND US veterinary experts have agreed to ensure that US poultry imports to South Africa resume by the end of the year.

In June the two countries agreed on an annual quota of 65,000 tonnes of US chicken imported into South Africa. However the quota has not been implemented due to South Africa's concerns about avian flu in the US.

In turn, the US had warned that if barriers to US meat imports were not lifted, South Africa could lose the duty free access to the US market.

The poultry protocol will provide the technical basis to allow for the continued import of poultry from the non-affected areas in the US in the event of renewed outbreaks of avian influenza.

Push for poultry farmers in sub-Saharan Africa

A PROJECT AIMED assisting smallholder poultry farmers, especially women, in sub-Saharan Africa has been launched. The African Chicken Genetic Gains (ACGG) project is expected to benefit more than 2,400 households engaged in poultry farming. Speaking at the launch of the project, acting director general of Tanzania Livestock Research Institute (TALIRI), Dr Daniel Komwihangilo, said that the primary objective is to make women in sub-Saharan Africa productive.

He explained that the project focuses on women smallholder farmers because they comprise 70 per cent of poultry keepers in Africa, making them the key drivers of transformation of the chicken value chain. He added that the Bill and Melinda Gates Foundation had contributed close to US$1.48mn to the project.

Antibiotics strategies must target resistance, not use

THE OBJECTIVE OF any antibiotic strategies should be to reduce resistance to antibiotics and not their use, the International Federation of Animal Health (IFAH), including IFAH-Europe, reiterated at the conference *Farmers and veterinarians together to tackle antimicrobial resistance*.

Conference attendees called for policies regarding antibiotics use to be based soundly on science and for the focus to be on responsible use, with care taken to ensure that any restrictions on antibiotics in veterinary medicines do not adversely impact animal health and welfare.

In September, following the publication the *European Commission's Guidelines for the prudent use of antimicrobials*, IFAH-Europe, while welcoming the publication, noted that the goal of responsible antibiotic use is to come to a use of antimicrobials "as little as possible, as often as necessary," and that this does not automatically equate to a reduction of use in all situations. Some national targets have shown that simple reduction targets can lead to antimicrobials being used incorrectly, a risk highlighted by the guidelines, noted the association, pointing to prescribed courses not being completed and lower dosages than prescribed to keep records low.

This could be counter-productive to the real objective of reducing antimicrobial resistance development, which involves correct use and the elimination of unnecessary use.

Changing weather patterns in Eastern Africa are increasingly being felt within agricultural systems not only by policy levels but also by small farmers. There is a particular concern over tea. Mwangi Mumero reports.

The East African tea sector

THE TEA SECTOR in East Africa continues to grow in terms of volumes and contributions to the local economies.

The sector employs millions especially in the rural mountainous regions of the East African highlands – from Central Kenya, Southern Tanzania, the rolling hills of Rwanda and the western regions of Uganda.

But farmers in the East African region are coming to terms with reduced production mainly due to the effects of climate change.

Research carried out in Kenya by the Food and Agricultural Organization (FAO) in collaboration with the Tea Research Foundation of Kenya shows that tea farmers may lose over 30 per cent in cash earnings due to the impact of climate changes in the coming years.

Tea picker in Kenya. (Image courtesy: Café Direct)

Climatic changes across the country

"Climatic changes have occurred across the country with the dry spells becoming longer and rainy erratic seasons. Sometimes the rainy season is delayed thus affecting tea production and yields," said Jesse Wandimi, a 70-year farmer from Mumwe, in Nyeri County, who has grown the crop for the last three decades.

Increasingly, farmers have been planting shade trees such as Grevillea Robusta and Hakea spp in their tea farms to create cool microclimates.

Diversification has become the norm

Diversification of farm enterprises has become the norm as tea farmers come to terms with declining tea production and earnings.

"As farmers, we now have to diversify the tea enterprise with other projects to cope with reduced yield. We now have to engage in dairy farming as well as grow vegetables commercially," noted Mrs Julia Wandimi on their farm by Mumwe River.

Farmers have been taught to identify new pests moving into the tea growing zones as a result of warm weather.

Farmers have also been advised to grow drought-tolerant crops such as sweet potatoes and cassava to supplement their food resources and save and invest their tea earnings.

At least 5,600 farmers recently underwent training on coping with the effects of climate change on their tea farming.

The project is funded by the Governments of Denmark and Norway and implemented by the Ethical Tea Partnership and the Kenya Tea Development Agency (KTDA).

Farmers have been taught to identify new pests moving into the tea growing zones as a result of warm weather. Mulching has also been identified as a water saving technique farmers should adopt to conserve water.

Making of compost manure to help improve soil quality and water retention in the soil has also been recommended to farmers now facing the prospects of a bleak future.

"As rivers are drying up due to deforestation, there are farming methods that farmers have to learn to help conserve water in their farms as well as reduce wastage", observed Joseph Gitau, a trainer with KTDA working under the project.

However, even with the climate change challenges, Kenya remains the region's powerhouse in tea production, notwithstanding the high cost of power and farm inputs, that have strained earnings for smallholder producers in the country.

The tea industry in Kenya comprises both plantation or large scale producers as well as smallholders.

The plantations – mainly located in Kericho and Nandi Counties - are run by multinational companies.

The over 500,000 smallholder producers sell their produce to 65 factories located in tea growing regions across the country.

These factories are managed by the Kenya Tea Development Agency Ltd (KTDA).

Areas where tea is grown include Kisii Highlands, Cherangani Hills, Nandi County, Mau Escarpment, Kericho Highlands, the Aberdare regions and the Mt Kenya areas.

These entire regions have cool and rainy conditions and straddle the Equator rising to between 1,500 metres and 2,700 metres above sea levels.

Overall, KTDA-affiliated farmers earned US$636mn for the 2014-15 crop, a 21 per cent increase from the US$526mn earned in the 2013-14 year.

Prices of tea at the Mombasa Auction averaged US$2.60 in the 2014/15 financial year up from US$ 2.43 in the previous year.

A total of 240mn kg of processed tea was made from 1.039bn kg of green leaf delivered to factories in the 2014/15.

This was a drop in overall green tea production. which was 1.124bn kg

A worker is seen at a tea plantation near Kasese town, some 500 km west of Kampala. (Image courtesy: Reuters)

delivered in the 2013/14 financial year, resulting in 256mn kg of processed tea.

Four hydropower plants to be built

To curb the high energy costs, the KTDA is investing US$48mn to construct four hydropower plants to meet electricity demand in some of its 65 affiliated factories.

The anticipated 10.9 MW will power some factories with the rest sold to the national grid.

"Energy accounts for about 30 per cent of the operation costs in tea factories. Electricity alone accounts for 17 per cent. The hydropower plants will cut operation costs as well as earn income through the sale of excess power," said Lerionka Tiampati, KTDA's chief executive officer.

On average, according to KTDA, each tea factory spends between US$30,000 and US$65,000 on electricity annually.

KTDA is also building a new 21.37 sq m-warehouse to offer centralised and cheaper storage facilities to its affiliated factories. This is expected to significantly lower costs for the 65 factories.

The agency has also procured 77,050 metric tonnes of fertiliser for the farmers at a competitive rate this year - to increase usage and boost green tea production.

For its part, Uganda has over 31,000 hectares under tea, making the country Africa's third largest exporter after Kenya and Malawi.

According to the Uganda Tea Association, production in 2014 was 62 metric tonnes, an increase from the 61 metric tonnes in 2013.

New plantings of tea over recent years have boosted yields, according to George William Ssekitoleko, the Uganda Tea Association executive secretary.

Good climate and soil conditions in the western Rift Valley and the region around the Ruwenzori Highlands have contributed in producing some of the world's best quality tea.

Uganda needs further research and education

Writing in a local publication, the Daily Monitor, Nicholas Katsigaire, a Ugandan who works in a local tea plantation observed that 'tea has not been given enough attention in terms of research by the government '.

According to the writer, the Ugandan government also needs to invest in farmers' education to be able to adapt to imminent climate change that is expected to reduce the suitability of land for tea growing over the next few years.

The International Centre for Tropical Agriculture notes in a recent report that the climatic suitability of much of Uganda's tea growing areas will decline significantly with production anticipated to disappear almost completely by 2050.

"This is a wake-up call for everyone involved in the tea sector in Uganda. We need a research institute specifically for tea to help us know the status of our soils and advise the farmers accordingly," he mused.

Tea production up in Tanzania

In Tanzania, tea production during the 2014/15 financial year grew by 8.18 per cent to reach 36,268.163 kg from 33,524,741 kg in the 2013/14 period.

Overall, Tanzanian farmers earned US$46,177,539 through the export of 29,570,391 kg at the Mombasa Auction.

The amount sold this year was an increase of 6,810,393 kg from the previous year, according to a report by the Tea Board of Tanzania. Farmers also earned more cash through the sale of 5,521,557 kg of tea that was blended and packed and sold in the local market.

More than 30,000 smallholder farmers grow the crop making it the fourth largest export crop in the country.

This is a wakeup call for everyone involved in the tea sector in Uganda.

Enough rainfall in most tea growing areas was the main factor in production as most of the growing is rain-fed.

Tanzania has three main tea growing areas, namely the southern Highland Zones of Mufindi, Njome and Rungwe district; the North East Zone of Lusotho, Korogwe and Muheza districts and the Northwest Zone areas of Bukoba and Muleba district.

Research, however, has identified that the supply of green tea to factories has been on the decline mainly due to the inability or unwillingness of farmers to add fertiliser to their crops.

Another challenge is that reduced production has lowered earnings, making Tanzanian farmers the lowest paid in the East African region.

Experts say that the farmers take a smaller share of the sector earnings - just 27 per cent of the sale price in 2009, compared to 51 per cent received by their counterparts in Kenya.

While the small East African nation of Rwanda has seen unit prices and volumes of tea dropping, the country is already planting over 18,000 hectares of tea bushes.

In 2013, tea receipts declined by 16 per cent earning farmers US$55.5mn compared to US$65.7mn the previous year.

State Minister for Agriculture, Tony Nsanganira said that increased acreage of tea plantations and the use of more fertiliser will boost production.

"We have invited investors to develop 10,000 hectares of land with the government developing the remaining 8,000 hectares," he said.

At the same time, the government plans to privatise its tea plantations. In the past decade, the government has sold its controlling shares in 11 of its plantations and factories at a cost of US$25mn, according to the Rwanda Development Board.

Tea production is concentrated in the hilly area of Byumba, Cyangugu, Gikongoro, Gisenyi and Kibuye.

Impacts of climate change is already being felt in tea growing areas of Malawi. In addition to producing a large volume of tea which is sold in bulk and used in blending, Malawi also produces some artisan teas, including white tea, which is a relative newcomer to the tea production scene in regions outside of China and Southeast Asia.

International expert skill-sets in genomics and bioinformatics enhance our capacity to breed improved forages for Africa.

Accelerating forage breeding to boost livestock productivity

THE GENOME ANALYSIS Centre (TGAC), with partners in the UK, Colombia and Kenya, bring together their leading expertise in forage breeding for animal nutrition, cutting-edge genomics and phenomics technologies to accelerate the improvement of Brachiaria, a vital livestock feed crop in central Africa and Latin America.

More than 80 per cent of the world's agricultural land is for grazing to support the ever increasing demand for meat and milk for an expanding and growing urban population, while boosting the income of rural families. The scarcity of grass feed is a worrying constraint standing in the way of this livestock productivity.

Originally from Africa and bred in South America, Brachiaria grass is gaining popularity among cattle farmers in Kenya.

Strengthening and improving livestock forage systems will contribute to the sustainability of food production.

Some Brachiaria species have been cultivated as forage grasses, providing nutrition for ruminants across the globe. As well as nutrition, the grasses have desirable genetic characteristics linked to drought and pest resistance and adaptation to poor and acidic soils. Over the past 25 years, several African species of Brachiaria have been used commercially as forages in the tropics.

With its combined high nutritional value and stress-resistant properties, the Brachiaria breeding programme at the International Centre for Tropical Agriculture (CIAT) is crossing different species to produce new varieties with superior traits. A particular Brachiaria species, B decumbens, grants resistance to aluminium, which has a high concentration in acid soils. Most low-income livestock keepers live in tropical grasslands in countries in central Africa with great grazing potential, but are vulnerable due to the growing problem of increasing acid soils and longer extreme weather seasons.

TGAC is working to identify high aluminium-resistant genes and chromosome regions in the Brachiaria genome, contributing to the international breeding programmes developing the new generation of forage crops. This genomic approach to forage breeding will help to produce varieties with high nutritional value under physical stresses, such as low soil fertility.

Strengthening and improving livestock forage systems will contribute to the sustainability of food production, while helping to reduce carbon dioxide and mitigating the effects of climate change. The international team of scientists will apply next generation sequencing (NGS) technologies and genomics to help improve forage breeding by reducing the length of the Brachiaria breeding cycle.

Ultimately, these approaches could be applied to other crop species. Future developments of the CGIAR (Consultative Group for International Agricultural Research) Research Programmes will provide opportunities to leverage UK investment to support the internationalisation and expansion of UK agri-science.

Project lead, Sarah Ayling, crop genomics and diversity group leader at TGAC, said: "Our scientists are working towards a common goal of increasing sustainable agriculture, and collaborations like this allow us to exploit our combined expertise to contribute to the important issue of food security. This project will deepen our interactions with international centres in Africa and Latin America, and improve forage breeding for livestock production."

Jose De Vega, co-project lead and post-doctoral scientist in crop genomics and diversity at TGAC, added: "The most valuable part of the project is in relation to the link between tropical forage improvement and reducing poverty and ecosystems degradation. Improving livestock forages will give many small farmers in the tropics the opportunity to improve their livelihoods.

"Our experience in genomics of temperate forage species (cool weather species) will assist with the tropical species of forage grasses in our cross-continent collaborative project, bringing the power of genomic technologies to tropical forage breeding."

This project is in partnership with the Institute of Biological, Environmental and Rural Sciences (IBERS), UK, CIAT, Colombia, and the International Livestock Research Institute (ILRI), Kenya. These activities are supported by a BBSRC International Partnering Award, which aims to support the development of long-term international collaborations, and funding from the Research Councils UK (RCUK) and British Council's Newton Fund, which through science and innovation partnerships, promotes the economic development and welfare of poor people in partnering countries.

International Livestock Research Institute

About half of the world's population is alive today because of increased food production fueled by minerals. The VFRC is looking to future fertiliser research to overcome the challenge of feeding nine billion by 2050 under worsening climate conditions.

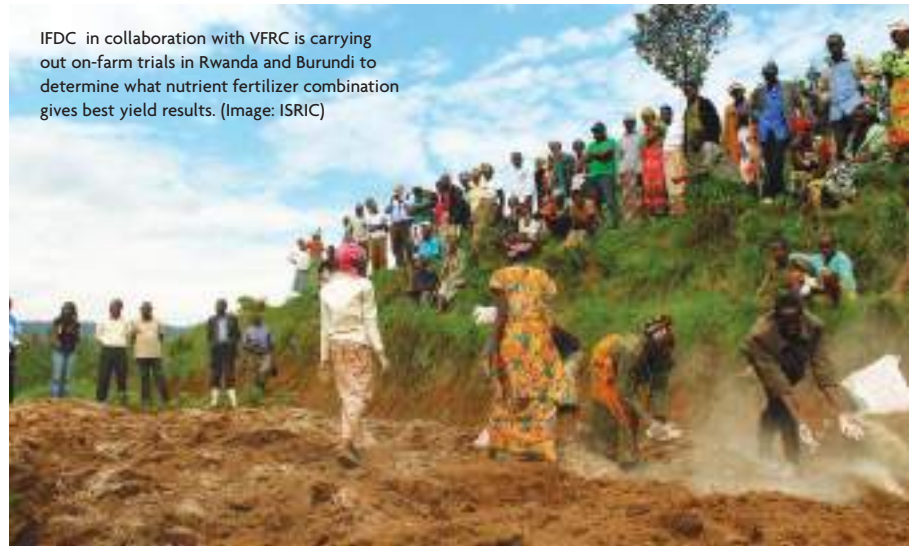
VFRC advances new packaging of nutrients

OVER THE PAST 35 years, no "new" more substantially efficient fertiliser product has been developed – particularly no product affordable for use on food crops by farmers in less developed countries. New and improved fertilisers are critical to help feed the world's growing population, provide sustainable global food production and protect the environment.

When mineral fertiliser research and production began in the early 20th century, scientists focused on producing large amounts of product to address nutrient depletion in cultivated soils where fertility and productivity had declined.

The Haber-Bosch Process was no exception. It set the stage for an industrial fertiliser revolution. Now the nitrogen fertilisers produced via that process significantly contribute to feeding half the earth's population. But it is a double-edged sword, with fertiliser overuse harming the environment and humans. The Virtual Fertilizer Research Center (VFRC) collaborates with global scientific teams to create fertilisers that provide these needed nutrients but mitigate environmental harm.

"Application of primary nutrients only (ie, nitrogen, phosphorus and potassium [NPK]) mine soils of secondary and micronutrients (SMNs). This depletion levels off yield potential," says Christian Dimkpa, VFRC research scientist. "In addition, the overuse and poor management of nitrogen results in contamination of water sources and emission of greenhouse gases."



IFDC in collaboration with VFRC is carrying out on-farm trials in Rwanda and Burundi to determine what nutrient fertilizer combination gives best yield results. (Image: ISRIC)

Fertiliser research should move beyond NPK-only fertilisers

In other cases, though, underuse of NPK fertilisers limits yields and intensively mines soil nutrients. This situation, according to the World Bank, is "a scenario for disaster over the long run." Therefore, fertiliser research should move beyond NPK-only fertilisers and, considering crop needs, incorporate other nutrients alongside these primary nutrients.

Current fertiliser technology can be very effective if properly used. But we can certainly make future products more efficient.

NPK alone does not guarantee long-term universal yield increases because crops require 14-17 nutrients, depending on the crop. Adding boron, calcium, magnesium, sulphur and zinc and a number of other SMNs will be required to sustain yields. The

The jury is still out on how SMNs reach the grains. (Image: IFDC)

VFRC researches SMN interactions with crops to identify specific crop needs. "The use of fertilisers should be about feeding the crop and not the soil," argues Dimkpa. Current nitrogen use efficiency (NUE) sits at a low average of 33 per cent, with most of the nutrient being lost via denitrification, leaching, runoff and volatilisation. The addition of SMNs to widely-used fertiliser formulations – and for specific crops and locations – creates the potential for higher NUE. The underuse of N is a similar story.

Proper packaging enhances the effects of better uptake and, therefore, lessens environmental harm.

SMN needs must be met

Soils in Africa, Eastern Europe and, to a lesser extent, the Middle East and South America, are deficient in not only SMNs but also nitrogen and phosphorus. The impacts of underuse are at first obvious: if crops are not "fed," they will not grow. Over time, the planting of highest-calorie-per-acre crops (such as maize and rice) drain soil nutrients to the point of intense degradation.

SMN needs to be met for optimal yields

Application of the primary nutrients and best management practices (such as residue management and legume rotations) proved the foundation for reinvigorating these tired croplands, but optimal yields will only be achieved when SMN needs are met. Many of these nutrients enhance the efficiency of nutrient uptake by plant roots, especially of N and P – ultimately leading to healthier plants and larger yields.

Proper packaging enhances the effects of better uptake and, therefore, lessens environmental harm. Simply, innovative fertiliser packaging means rethinking the form in which nutrients are encapsulated and presented to plants. Currently, fertilisers are available in prill, granular powder, liquid and briquette forms, among others. Some of these are more efficient than other forms, but the VFRC believes significantly better improvements can be made.

"We envision that future fertiliser research will advance from bulk engineering and chemistry to fine bio-nano-chemistry," said VFRC executive director Prem Bindraban. While packaging technologies this way may result in higher costs for farmers in the short run, overall, they will use less fertiliser – saving money and reducing fertiliser's environmental footprint. "This strategy may be particularly relevant for micronutrients that are required in small quantities but have high yield effects," Bindraban said.

The VFRC aims to create synergy between research organisations, universities and the private sector to lead the way in future fertiliser research and overcome the challenge of feeding nine billion by 2050 under worsening climate conditions. "Can it be done? Of course," Bindraban noted, "But we must collaborate with a sense of urgency and correct vision. Current fertiliser technology can be very effective if properly used. But we can certainly make future products more efficient."

The Virtual Fertilizer Research Center (VFRC) is a research initiative that fosters the creation of the next generation of fertilisers and production technologies to help feed the world's growing population and provide sustainable increases in global food production. The VFRC comprises the work of multiple research institutions around the world co-operating to advance a unified research agenda.

Harnessing fertiliser market information for an African Green Revolution

WITH 60 PER CENT of the world's uncultivated, arable land, Africa has tremendous potential for substantial increases in agricultural production. To boost food security, the continent needs a vibrant agricultural supply chain and relevant market information. Farmers, business actors and policymakers require statistics on fertiliser trade, production and consumption to inform their strategies and develop a profitable agribusiness sector. However, data on African fertiliser use and markets remain insufficient.

To address this challenge, AfricaFertilizer.org (AFO) was launched in 2009, facilitating the exchange of information on soil fertility, fertilisers and good agricultural practices in Africa. AFO brings together the world's most reliable resources and expertise from global leaders in the fertiliser industry and makes the information available in an easy-to-access platform. The initiative equips fertiliser actors with rich resources and market information on fertiliser products, supply and operators.

Women applying fertiliser to cassava plants in Nigeria. (Image: Flickr/IITA)

In 2015, AFO launched a new version of its web portal with expanded features and content. The revamped website addresses a critical information gap – by providing the data needed to develop an informed and powerful response to address Africa's food insecurity.

Features include:

- A fertiliser directory providing a comprehensive listing of agribusiness and fertiliser production companies operating in Africa.
- A searchable database of officially traded fertilisers, with accompanying production capacity data and market prices.
- Data visualisation tools to create graphs and see trends, enabling real-time data comparisons and analysis.

IFDC leads AFO in partnership with IFA, the African Fertilizer and Agribusiness Partnership (AFAP), the Food and Agriculture Organization of the United Nations (FAO) and the African Union (AU) Commission. Working with the private sector, research institutions and multilateral organisations, the initiative is dedicated to facilitating the right policy and business decisions to feed the soils that feed Africa's people.

Milling is a crucial step in post-production of rice. The basic objective of a rice milling system is to remove the husk and the bran layers, and produce an edible, white rice kernel that is sufficiently milled and free of impurities.

Rice milling - a crucial step in post-production

DEPENDING ON THE requirements of the customer, rice should have a minimum number of broken kernels.

Most rice varieties are composed of roughly 20 per cent rice hull or husk, 11 per cent bran layers, and 69 per cent starchy endosperm, also referred to as the total milled rice.

In an ideal milling process this will result in the following fractions: 20 per cent husk, 8-12 per cent bran, depending on the milling degree, and 68–72 per cent milled rice or white rice depending on the variety. Total milled rice contains whole grains or head rice, and broken kernels. The by-products in rice milling are rice hull, rice germ and bran layers, and fine broken kernels.

A rice milling system can be a simple one or two step process, or a multi stage process.

- In a one-step milling process, husk and bran removal are done in one pass and milled or white rice is produced directly out of paddy.
- In a two-step process, removing husk and bran are done separately, and brown rice is produced as an intermediate product.
- In multistage milling, rice will undergo a number of different processing steps. Depending on whether the paddy is milled in the village for local consumption or for marketing, rice milling systems can be classified into the categories village rice mills and commercial mills.

The objective of commercial rice milling is to minimise grain breakage and produce uniformly polished grain.

Women pounding rice in The Gambia. (Image courtesy: Gambia Help)

Village milling

Hand pounding of paddy in a mortar with a pestle is the traditional milling process in remote villages. Pounding the paddy induces upward and downward forces on grain against grain that removes the husk and bran layers. The pounding also breaks up fissured grain. The final cleaning is by winnowing in a woven bamboo tray. The winnowing process to separate unmilled paddy grain is an art.

Village-type rice mills can be found in rural communities and are used for service milling paddy of farmers for home consumption.

The single pass rice mill is an adaptation of the "Engleberg" coffee huller from the United States, modified for milling rice. In earlier days this type of rice mill was very popular in most rice-growing countries. It is still the mainstay technology for milling parboiled paddy in many African countries. The "iron hullers", or "single pass mills" which all refer to the same mill are notorious for breaking the paddy grain. Because of the high breakage, the total milled rice recovery is 53-55 per cent, and head rice recovery is in the order of 30 per cent of the milled rice. The fine brokens are mixed with the bran and the ground rice hull. This by-product is used for animal feed. In many rural areas, Engleberg mills are used for custom milling the rice requirements of households. The bran produced is left to the miller as the milling fee.

Single pass, single stage mills are small capacity two-stage rice mills, 0.5 to 1 ton per hour paddy input. They are also used for custom milling services in the rural areas. A typical compact rice mill consists of a 15-cm diameter x 15-cm wide rubber roller husker, and a friction whitener. The friction whitener has a very similar design configuration as the Engleberg except that is has no husking knife. The milling performance of the compact rice mill is superior to the single pass Engleberg huller. Milling recoveries are normally above 60 per cent.

Commercial rice milling systems

Commercial milling systems mill the paddy in stages, and hence are called multi-stage or multi-pass rice mills. The objective of commercial rice milling is to reduce mechanical stresses and heat build-up in the grain, thereby minimising grain breakage and producing uniformly polished grain. Compared to village-level systems, the commercial milling system is a more sophisticated system configured to maximise the process of producing well-milled, whole grains.

The rice milling facility comes in various configurations, and the milling components vary in design and performance.

Olam's state-of-the-art rice mill in Nigeria's Nasarawa State.

"Configuration" refers to how the components are sequenced. It has three basic stages,

- the husking stage,
- the whitening-polishing stage, and
- the grading, blending and packaging stage.

In modern rice mills, many adjustments (eg, rubber roll clearance, separator bed inclination, feed rates) are automated for maximum efficiency and ease of operation. The whitener-polishers are provided with gauges that sense the current load on the motor drives which gives an indication of the operating pressure on the grain. This provides a more objective means of setting milling pressures on the grain.

Objective of commercial milling

A commercial rice miller will have the following objectives:

- produce edible rice that appeals to the customer ie, rice that is sufficiently milled and free of husks, stones, and other non-grain materials
- maximise the total milled rice recovery out of paddy minimise grain breakages

Timely harvesting, threshing, drying, and storing properly can result in the production of good quality milled rice. Mixtures of chalky and immature kernels, mechanically stressed grain during harvesting threshing, delays in drying, and moisture migration in storage can result in broken and discoloured milled rice.

Blending/mixing different varieties with different physic-chemical properties during the post-harvest operations contribute to the lowering of the milled rice quality produced. Purity is related to the presence of dockage in the grain. Dockage refers to material other than paddy and includes chaff, stones, weed seeds, soil, rice straw, stalks, etc. These impurities generally come from the field or from the drying floor. Unclean paddy increases the time taken to clean and process the grain. Foreign matter in the grain reduces milling recoveries and the quality of rice and increases the wear and tear on milling machinery.

It is not possible to produce good quality milled rice with poor milling equipment even if the paddy quality is optimal and the operater is skilled.

It is equally important to service and maintain the mill properly. The rice mill should always be clean and well maintained and should be operated by a skilled operator.

In properly designed mills there should be very little adjusting required with the machines, once a steady state in the grain flow is attained. Mills however are often dusty, dirty, with ducts and bearings worn-out. Tales of improper mill operation include paddy in the rice husk exhaust, rice husk in the separator, broken kernels in the bran, excessive bran recovery, and under-milled rice. Training of operators in the operation and maintenance of rice mills is crucial in improving rice quality.

Dr Terry Mabbett discusses the ideal way to preserve the quality of cereal grain - to maintain optimum in-store conditions of temperature and humidity.

The acid test for feed grain preservation

ONCE OPTIMUM IN-STORE conditions of temperature and humidity are achieved, an equilibrium moisture level which inhibits mould growth is maintained throughout transit and storage from farm gate to feed mill. But this is a high energy and costly process and especially when cooling and drying grain during hot and humid tropical ambience.

There is an alternative chemical option for feed grain including that destined for the poultry industry. This involves treatment with selected organic acids for grain preservation throughout the entire period of transit and storage. The method is well established and safe to use and has been commercially practised for almost 50 years.

A range of carboxylic acids inhibit fungal and bacterial growth on grain. Of these, propionic acid is generally the most efficacious, universally accepted and permitted and therefore the most widely used. The chemical can be used in its 'pure' acid form which is corrosive, or more commonly as a salt (calcium or sodium propionate) which will be slower acting but more user-friendly and safer to 'handle'.

Propionic acid is a saturated aliphatic carboxylic acid with a structural formula of CH3-CH2-C(=O)-OH. With a boiling point of 141°C and a melting point of –21°C, it exists as a colourless oily liquid at 'normal' ambient temperatures. Propionic acid, like other 'low chain' aliphatic carboxylic acids, is volatile and emits a penetrating odour which in this case is pungent, acrid and irritant. That said, it has been used successfully to preserve damp grain since 1965 mostly as its calcium or sodium salts. Propionic acid is an entirely natural fatty acid and its derivatives and intermediaries play important roles in animal metabolism.

The benefits of using organic acids to preserve grain and feed materials extend to bacteria and may also operate further down the 'feeding line'.

Barley most commonly treated grain

Worldwide, barley is the most commonly treated grain but propionic acid has also been used to preserve maize, wheat, oats and legumes. Barley grain inoculated with the aflatoxin-producing mould fungus Aspergillus parasiticus and treated with propionic acid at 3kg/tonne was kept completely free of mycotoxin.

Benefits of using organic acids

The benefits of using organic acids to preserve grain and feed materials extend to bacteria and may also operate further down the 'feeding line'. Numerous feeding trials have confirmed the safety of propionic acid when ingested by poultry and other livestock. Organic acids have been widely used to destroy pathogenic bacteria like Salmonella and E coli in feed materials and feed. The action of propionic acid on Salmonella is especially significant because the heterogeneous nature of Salmonella, and its ability to survive in dry materials, makes this particular pathogenic microbe generally difficult to control.

Every time it is unloaded and loaded from truck to barge or silo to ship, damp grains on the surface will be mixed in with drier grains inside the bulk.

What's more, organic acids can also inhibit pathogenic bacteria in complex high moisture environments such as the gastrointestinal tracts of farm animals. Microbial inhibitors based on organic acids, including propionic acid, have proved useful in reducing Salmonella contamination in the gastrointestinal tract of live birds (chickens). More specifically a propionic acid-based product was shown to be instrumental in alleviating turkey poult enteritis and mortality syndrome.

Acid application

Propionic acid is a versatile and useful inhibitor of microbes when used in grain preservation, but application of the chemical is not all plain sailing. There are a number of factors conditional on its success. For instance, propionic acid is applied purely as a protectant and preservative and therefore complete and uniform coverage of the grain bulk is essential.

Exposure to high relative humidity and moisture as precipitation or condensation will only be experienced at the peripheral surface of the grain load or bulk. But every time it is unloaded and loaded from truck to barge or silo to ship, damp grains on the surface will be mixed in with drier grains inside the bulk. This means patches of damp grain and potential 'hot spots' of microbial growth will be randomly distributed throughout the load. This calls for treatment using small particles or droplet sizes and appropriate application technique to give an adequately high and well-distributed coverage of the grain.

Application rate will depend on the moisture status of the grain with higher levels of moisture requiring higher rates of acid. All sorts

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of 'ad hoc' methods of application have been used but in accuracy, efficacy and operator safety best results are achieved when proprietary equipment is used.

A typical treatment scenario is a grain conveyor equipped with an auger and an acid metering unit, with active material sprayed onto the grain during its passage through the conveyor. The role of the auger is to maintain a constant grain throughput and to maximise the distribution of the acid throughout the grain. Throughput of augers is determined by the moisture content of the grain being conveyed and the angle at which the augers are inclined. All proprietary applicators require calibration. And even those with the auger incorporated into a receiving hopper where its angle of inclination is unlikely to change. Calibration is achieved by weighing the mass of grain delivered during a fixed time interval.

Propionic acid is a volatile chemical and therefore treated grain should not be conveyed pneumatically for at least 24 hours after treatment. To do so increases the risk of losing active chemical and therefore exposing the treated grain to microbial growth and spoilage. Propionic acid is also corrosive to many metals including mild steel and, as such, treated grain must not be stored in metal silos. The working life of applicators and other metal parts, with which acid comes into contact, can be extended by washing each time after use. Most residual acid will be removed from augers if untreated grain is passed through after use.

Despite the relatively simple chemistry of propionic acid and the length of time it has been used commercially, its mode of action is still unclear. It inhibits the germination of fungal spores and stops microbial growth by interfering with energy-producing reactions in the fungal and bacterial cells. But the dividing line is thin. When applied at an appropriately high rate it will inhibit microbial growth, but at low concentrations bacteria and fungi may start to use the propionic as a substrate to produce energy and accelerate growth.

Combine harvesting grain and loading it into a truck. (Image: Charles Knowle/flickr)

Grain store operators using products based on organic acids or their salts must wear the full complement of safety equipment and protective clothing as advised on the product label. Depending on the product, formulation dosage and method of application this may include a respirator. Ⓔ

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Michael Williams looks at some of the latest developments in hand-operated knapsack or backpack sprayers as in well as tractor-mounted, trailed and self-propelled models.

Sprayer progress

HAND-OPERATED KNAPSACK or backpack sprayers are a popular choice, offering cost-effective pest and disease control on small farms and for intensively grown specialised crops such as vegetables and ornamentals.

The relatively low price of knapsack sprayers, plus the fact that they avoid the cost of a tractor, has encouraged worldwide popularity, and they are available from a large number of manufacturers. There are nine different knapsack models in the Jacto range from Brazil with tank capacities from 12 to 20 litres and including the 20-litre PJH model which is said to be the world's biggest selling sprayer of this type.

A feature of all the Jacto knapsack sprayers is mounting the pump inside the tank. This avoids the risk of chemical contacting the operator if the pump leaks, and it also reduces the effort needed to pressurise the pump chamber. All models have either mechanical or hydraulic agitation inside the tank and the spraying lance is made of stainless steel. Recent developments include replacing the 12 and 16-litre capacity SP series sprayers by updated XP models featuring an improved pump design. A 12-litre XP sprayer weighs 3.5 kg with an empty tank, increasing to 3.6 kg for the 16-litre size.

Jacto also offers tractor-mounted, trailed and self-propelled models including the Vortex 3000 trailed sprayer with air-assisted application for improved droplet penetration in crops with a well developed leaf cover. The boom width is 18 metres and the working height is adjustable between 61 and 155 cm to suit a wide range of crop requirements, and air assistance is provided by a fan operating at 3000 rpm to deliver a 96 km/hr air flow.

A feature of all the Jacto knapsack sprayers is mounting the pump inside the tank. This avoids the risk of chemical contacting the operator if the pump leaks.

Specification improvements were annouced for the Kuhn Metris trailed sprayers in 2015.

The Jacto range includes tractor powered and self-propelled sprayers as well as the knapsack models.

Electrostatic spray system

A special feature on the K800 knapsack mistblower in the Martignani range from Italy is the electrostatic spray system, which is also available on the company's tractor-mounted and trailed crop sprayers. Each droplet produced by an electrostatic spray system carries a tiny electrical charge, and this attracts the droplet towards plant material.

Tests have shown that the process can achieve increased spray application, including the underside of the leaves, improving the efficiency of the spray while reducing drift risks. It can also produce financial and environmental benefits by allowing a reduction in the amount of chemical used per hectare. Martignani's K800 mistblower has a 14-litre tank capacity and a 72.4 cc single-cylinder petrol engine powers a fan to direct the mist. The weight of the K800 with an empty tank is 12 kg.

The electrostatic system is also available on Martignani 3P series tractor-mounted Whirlwind sprayers powered by the p-t-o. These include the M120 for fruit, vineyard and general spraying, designed for tractors of 40 hp plus and equipped with a suction type fan producing an 80 m/sec air flow. The Whirlwind M616 is more powerful and can be used on bush and tree fruits including olives, papaya and mangoes, using a 65 hp tractor.

There are two knapsack sprayers in the BP series from Hardi, part of one of the most comprehensive sprayer ranges available. The knapsack models are the BP15 and BP20 with 15 and 20-litre tank capacities, suitable for applying a wide range of chemicals including herbicides, fungicides and insecticides, and both models feature a piston type pump powered by a lever that can be either left or right hand operated.

The Hardi range also includes the Alpha Evo self-propelled sprayer with a recently updated specification that includes an improved management system for the 217 and 245 hp Deutz engine options. The transmission is also new and offers better traction and stability, and the redesigned cab offers increased all round visibility from the driver's seat.

Hardi also offers an extensive choice of mistblowers for orchards and vineyards, with four different trailed models providing tank capacities up to 4000 litres, plus two linkage mounted models with tank sizes from 300 to 1200 litres. The smallest mounted models are the Zebra series with a fan unit producing up to 30,000 cu m per hour air flow, and this increases to 120,000 cu m per hour for

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Micron Varidome spray equipment controlling weed growth in sugar cane

the Mercury models at the top of the trailed range.

Recent trailed sprayer developments include major improvements for the Metris range made in France by Kuhn. The new version is the Metris 2 series announced in 2015 and is available with 3,200 or 4,100 litres tank capacity and with aluminium booms in a range of widths from 24 to 36 metres. The list of design changes includes an improved suspension system on the axle and on the drawbar giving a smoother ride to allow faster working speeds. The new versions are also easier to use and are offered with three levels of operator control covering all the main working functions.

The Household company in the UK has been supplying sprayers to Africa for many years, with Namibia and Zambia currently the principle markets. Although tractor-mounted models are available, most of the Household sprayers sold in Africa are either trailed or self-propelled. There are two trailed ranges starting with the budget priced EcoStar series with boom widths up to 24 metres and three tank sizes from 2,000 to 3,000 litres. The high specification AR trailed models have comprehensive electronic controls, air suspension, a steering axle, tank capacities up to 4,000 litres and up to 36 metres boom width.

Household's biggest-selling self-propelled model in African countries is the Spirit, an entry level sprayer aimed at customers grading up from a trailed machine. The weight, with a 140 hp Caterpillar engine and with an empty 3,000-litre tank, is only 6,000 kg and boom widths are up to 28 metres. Self-propelled sprayer options also include the Merlin models with tank sizes up to 6,000 litres and with Household's Air Ride suspension system included in the specification.

The self-propelled sector

Kverneland is moving into the self-propelled sector of the sprayer market with two models available in 2016. The iXdrive 4240 and 5420 sprayers are both powered by 240 hp Perkins engines and have tank capacities of 4,000 and 5,000 litres respectively. Special design features include four-wheel steering with three settings, and the chassis can be adjusted to give 1.3, 1.5 and 1.7m ground clearance to suit different crop heights. Row width settings are hydraulically adjusted with up to 2.95 metres available on the 5420 model.

Booms up to 40 metres wide are available and feature Kverneland's iXflow sprayline recirculation system, and the spraying

system is designed to work with a GPS link. The boom is mounted on a suspended parallelogram for stability and there is hydro-pneumatic suspension on both axles to give both the operator and the boom a smoother ride.

Amazone increased the tank capacity on its self-propelled Pantera model at the end of 2014. The latest 4502 version has a 4,800-litre tank and the output from the 6.1 litre Deutz engine was increased to 218 hp. Other design changes include solenoid valves to make the spraying, washing and mixing functions easier to operate and the wheel track adjustment system has increased torque and can work with large tyres. Special wide track and high clearance versions of the Pantera are now available to work in a bigger range of crops.

Large choice of knapsack sprayers from Berthoud

Berthoud is among the leading European sprayer manufacturers with a range that includes one of the biggest selections of knapsack sprayers and extends up to the Raptor self-propelled models. The Raptor is available as a standard model with a mid-mounted cab and there is also the FC or forward cab version with the cab at the front of the sprayer. An unusual feature of the FC cab is that it is mounted on two hydraulic rams that raise or lower the cab between ground level and the working height. Apart from avoiding the use of steps to enter or leave the cab, the raise-and-lower feature helps isolate the operator from engine noise and it also allows the operator to choose a height setting that gives the best view of the spray boom.

Raptor sprayers are available with four cab options between 2540 and 5240 litres and with boom widths up to 44 metres. Deutz 180 or 200 hp engines can be used to power the hydrostatic wheel motors giving field and road speed ranges with a 40 kph maximum.

Shielded spraying equipment

Shielded sprayers provide a different approach to weed control in row crops and offer important advantages including significant reductions in the amount of chemical and water used per hectare while achieving a big reduction in the risk of spray drift. Micron was one of the pioneers of shielded spraying development and their Varidome range is used in a number of important crops such as cotton and sugar cane as well as vegetables and ornamentals.

The Varidome release spray droplets beneath plastic shields positioned between the crop rows, concentrating the chemical on the weeds while protecting the crop plants from the herbicide. Spray drift can be reduced by more than 95 per cent, and the extra efficiency achieved through more accurate targeting can reduce chemical costs by 50 per cent and there are also significant reductions in the amount of water used per hectare.

Flexibility is achieved by mounting the spray units on a toolbar that allow a spacing adjustment to suit different row widths, and the application width is adjusted by changing the angle of the shields.

Micron is British based and has more than 50 years' experience of supplying spray equipment to Africa. Major markets currently include Cameroon, Chad, Mali, Mozambique, Senegal and Zambia where the popular products include the Handy sprayers for row crops such as cotton and the Ulva+ Controlled Droplet Application or CDA sprayers for fungicide and insecticide application.

Precision farming is becoming more sophisticated all the time.

Satellites for ease and precision

HIGH-TECH EQUIPMENT is becoming more and more available for many aspects of the agriculture business. For instance, now a farmer can get an automatic tractor or combine harvester that runs on satellite-created maps. They can run automatically while the farmer gets updates on the GPS navigation system about the machine's exact location.

Using this gear can reduce fuel consumption and make fertilising and harvesting more precise. This system makes life easier for the agriculturalist, who no longer has to drive through the rain or sun.

The goal of precision farming is that a farmer can use these tools to create the ideal combination of diverse crops.

Yara N-Sensor ALS mounted on a tractor's canopy – a system that records light reflection of crops, calculates fertilisation recommendations and then varies the amount of fertiliser spread.

Technology involved in precision farming

The farmer sees on a screen the information that he or she needs to know: how far the vehicle has gone, how much is harvested each hour, how wet the grain is, or how many tons are unloaded per hectare, for example. Sensors on the combine harvester take in the information and send it to the driver. That way, the driver has the ability to easily adjust the speed of the machine according to the crop density, and can even use this computer to make plans about future operations on the farm.

The goal of precision farming is that a farmer can use these tools to create the ideal combination of diverse crops on his or her farmland and therefore get an ideal crop rotation system in the works, resulting in higher crop prices.

Crop yield forecasting

When laboratories analyse a farm's crops, that data can be input into the computer, thereby informing the farmer when lime is needed or how much fertiliser is required on the variety of soil types present. In addition to this, anticipated sowing, spraying and fertilising information input into the computer helps a farmer budget year by year.

A farmer can use precision farming in tandem with market analysis to better plan his or her crops. Precision farming can ensure that all parts of a field are utilised to their greatest potential.

In the past, lack of information would require a farmer to spray lime, water, or fertiliser evenly across a field. But with such accurate analysis of every field, those resources can be used in the exact locations they are most needed. In addition to this, precision spraying lessens the risk that phosphorous or nitrogen may leach into surrounding water.

To make precision farming work, the agriculturalist must know, in detail, about every area of every field. He or she must also be able to control every function of the combine harvester or tractor. Thereby, a farmer could, for instance, have information about exactly how much fertiliser is needed and in what part of the field. The equipment, controlled using a GPS navigation system, knows the exact location of the tractor and can adjust how much fertiliser is being put out accordingly. In this way, GPS equipment makes the overlap that occurs while farming almost invisible.

Traditional machines generally re-cover about 10 per cent of their own width. With GPS farming, this is reduced to a few centimetres, cutting down on how much time and fuel a farmer spends. This is a financial and environmental asset, but the benefits are only realised on larger farms. Agriculture may well be headed towards more precise farming — some are even calling for farmers to care for plants one by one.

Monitor Crops Via Satellite

In addition to GPS and GIS, satellite crop monitoring is available to farmers. This service can give daily updates regarding weather and other conditions of a field in real-time. This would mean that the farmer spends less time investigating vegetation stage and planning fertilisation and harvesting. **FAO**

Agritechnica is a driving force for innovation and a source of inspiration for agriculture around the globe. Here agricultural machinery makers presented their latest innovations for modern-day agricultural practitioners worldwide.

Innovation on display at Agritechnica 2015

THE SIGNIFICANT NUMBER of visitors from overseas is an impressive endorsement of Agritechnica's reputation as the world's leading exhibition in this field. There were some 1,200 visitors from African countries.

Agritechnica is known for its technical programme. Its 'specials', congresses and pre-exhibition events and forums, provided an opportunity to look ahead to the future and to discuss topics in a variety of contexts with international experts.

Agritechnica served as a trendsetter for important questions concerning the future of agribusiness and agricultural machines.

Agriculture is facing major challenges. Farmers currently have an enormous need for information and Agritechnica provided not only an innovations platform for modern machinery and equipment, but also supplied ideas and impetus and served as a trendsetter for important questions concerning the future of agribusiness and agricultural machines.

Agricultural machinery and equipment are required to make an essential contribution to producing food more cost-efficiently and with less stress on the environment.

Valtra launched its fourth generation N series tractor.

New Holland T7.315 tractor

The brand new New Holland T7.315 tractor was crowned with the coveted "Machine of the Year" 2016 in the L category. It was rewarded for its technical innovation and the benefits it brings to customers, with selection criteria focusing on innovative features, performance, productivity, cost of operation, ease of use and operator comfort.

Carlo Lambro, New Holland agriculture brand president, stated, "This award represents an important recognition from the industry of New Holland's approach to product development that focuses innovation on meeting our customers' needs with technologies that enable them to run their farming businesses efficiently, profitably and sustainably. The T7.315 reward is testament to our development teams' capacity to understand our customers' demands and provide effective solutions."

Valtra fourth generation success continues

The brand new Valtra N Series won the prestigious Machine of the Year 2016 award in the category of lower mid-range tractors. Valtra launched the 4-cylinder N Series in October. With deliveries starting already from September, the tractor range has proven to be a success among dealers, customers and the international press. Only a few days earlier the N174 Versu, one of the

new N Series models, was honoured with the 'Golden Tractor for the Design' award.

"The Machine of the Year is an important recognition for Valtra and AGCO. We are overwhelmed by the positive feedback which we have already received from our dealer network and customers," commented Mikko Lehikoinen, marketing director of Valtra Inc.

The fourth generation of the Valtra N Series has a completely new design with six models ranging from 115 to 185hp. It offers unmatched versatility whether you are doing mixed farming, dairy farming, municipal work or contracting. The best power/weight ratio in its class, compact design and a high level of functionality, ergonomics and comfort make the N Series tractor a real workhorse.

ArmaTrac very active in Africa

ArmaTrac exhibited its 504e, 804 Lux, 904 Lux, and 1104 Lux cabin tractors at the Agritechnica Exhibition this year. These models are tailored specifically for the German agricultural sector, as they demonstrate the very latest emission technology specified by the EU's environmental standards.

Although the African tractor market has substantially different requirements, with regional differences to boot, ArmaTrac is currently very active in this segment, with dealerships in Algeria, Ethiopia, Ghana, Morocco, Somalia, South Africa, Sudan, and Tunisia. The most popular models sold around the continent fall between the 80-90 HP range, and the 1104 Lux is another top favourite. ArmaTrac tractors are powered by Perkins engines.


ArmaTrac's 504e tractor

ArmaTrac represents state-of-the-art engineering in the medium bracket of tractors for modern farming practices. They manufacture a wide selection of tractors that are noted worldwide for their excellent fuel efficiency, high performance and durability. The brand prides itself on its promise to always be there on the field with the farmer, no matter what, and their sales team conducts frequent visits to Africa throughout the year to ensure customer satisfaction.

Remote farm management solution

AgSense remote irrigation management products from Valmont Irrigation use digital cellular technology to remotely monitor, start, and stop a centre pivot. It is a remote farm management solution, where you can monitor and manage farm components through any web-connected smartphone, tablet, or desktop computer.

And everything is managed by WagNet, a global network built specifically for the agriculture industry. WagNet (Wireless Agriculture Network) captures data, aggregates it, and delivers it back to you, so you can put the information to work. It provides unlimited, real-time remote management for your operation.

The Field Commander ultimate precision irrigation package combines various AgSense technologies into one kit for unmatched versatility in remote monitoring and management of virtually all irrigation equipment, regardless of brand, age or current capabilities. It allows growers to remotely monitor and precisely control centre pivots and pumps, along with monitoring flow, pressure and weather. Capabilities include variable rate irrigation and custom prescription programming by growers or their agronomists. Soil moisture monitoring can also be added.

More hightlights will be shown in the January/February edition.

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Case supersize baler feeds cogeneration power plant


The Case IH LB 434R baler.

SUGARCANE IS A crop highly efficient in converting solar energy: current technologies in use in Mauritius can produce over 500 kWh of electricity per tonne of bagasse. This is the high-energy raw material that Terragen Ltd uses to produce electricity during the sugarcane harvest season, which runs from July to December, switching to coal during the intercrop season. Terragen Ltd's 70.6 MW thermal power plant produces around 400 GWh of electricity annually, contributing about 15 per cent of Mauritius' yearly national electricity consumption. To feed its thermal power plant, Terragen Ltd – a joint venture between Albioma and Mauritian group TERRA – is running a sugarcane trash harvesting programme in collaboration with the Mauritius Sugar Industry Research Institute (MSIRI) and in partnership with TERRA's agricultural division.

Terragen chose the new Case IH LB 434R baler to collect and bale the sugarcane trash. These high performance balers consistently deliver maximum productivity, producing perfect high-density bales in under 60 seconds. They feature a new high-speed pickup and an additional feed roll for high speed work in all conditions.

"We received the LB 434R in time for the beginning of the sugarcane harvesting season, in July. Throughout the season it will be working eight to 10 hours a day, with a daily output of 20 bales/hour on average," explained Lauriane Mietton, Terragen's agronomist in charge of Biomass Projects. "We chose the LB 434R for three main reasons: the high-density bales, the rotor cutter system, and the optimal bale dimensions for transport and stocking. So far we are very pleased with it: the quality of the bales is consistently high, they remain nice and compact."

Flow control from Senninger

SENNINGER IRRIGATION INC, a global leader in agricultural irrigation manufacturing, is proud to announce the release of the Flow Control. This was specifically designed for growers who have longer lateral lines and those irrigating over undulating terrains.

The device works with their mini-wobblers and xcel-wobbler sprinklers. It allows the discharge flow at the head to remain relatively constant regardless of pressure fluctuations. This helps provides a more consistent wetted pattern and greater uniformity.


The flow control is available in five flows.

The flow control is available in five flows (0.5 to 2.5 GPM or 1.9 to 8.5 LPM) colour-coded to correspond with specific nozzle sizes. It is designed for operating pressures ranging between 1.73 - 3.45 bar.

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Pulsroll: purpose-designed for hulling pulses

THE BUEHLER GROUP has launched its Pulsroll huller to support processors in their quest to produce innovative pulse products and tap into the burgeoning market for tasty and nutritious food alternatives in which nutrient-rich pulses play a leading role. With this, Bühler has introduced a dedicated pulse hulling solution that removes the hull from multiple pulses, efficiently, hygienically and cost effectively, allowing worldwide pulse processors to capitalise on the compelling value-added opportunities emerging in this industry.

Pulsroll huller.

There is a growing recognition of the exciting potential that pulses hold for the creation of a wider range of food products and that is driving demand for further processed pulse-based products. Not only are pulses gluten-free and high in protein, they represent an excellent substitute for meat. Flours made from the grinding of pulses, such as chickpeas and peas, are increasingly finding their way into conventional foods such as pasta, tortillas and noodles, while ready-to-eat snacks are also benefiting from novel pulse developments that boost their health appeal.

This dynamic trend is set to expand yet further during 2016, which the United Nations has proclaimed as 'International Year of Pulses'; and this places even greater pressure on pulse processors to provide fully processed and added value pulse products to meet market demand.

Stainless smart pump

AUSTRALIAN PUMP INDUSTRIES has launched a new version of their "Smart Pump" range with the pump body manufactured from 316 stainless steel. Called the Smart Pump I series, the new pump's design offers a low cost, reliable solution to handling corrosive liquids in agricultural applications including fertilisers and herbicides.

"We call it the Smart Pump because of its versatility," said Aussie Pumps product manager, Brad Farrugia. "Its simple self-priming design primes first time, every time, and there's a wide range of different drive systems to suit specific applications," he said.

The pump offers flows of up to 650 litres per minute. Total head is as high as 23 metres. It will self-prime from six metres vertical lift.

The porting on the pump is unique because is compatible with both 1½" and 2" pipework. It achieves this with a smart port design that doubles as 1½" female BSP or 2" male BSP connection.

The new I series Smart Pump offers leak free chemical transfer of corrosive liquids.

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