

A newsletter of the African Agricultural Technology Foundation

IN THIS ISSUE:

- Pg1** QualiBasic Seed Company holds its inaugural Board Meeting in Nairobi
- Pg2** African states urged to adopt Bt maize to control armyworm
- Pg4** Mozambique begins confined field trial of GM maize
- Pg5** IIAM to develop legal framework on IP management
- Pg5** Good progress in developing NEWEST rice
- Pg6** Farmers in Malawi and Zimbabwe to benefit from improved crop varieties
- Pg6** New staff
- Pg7** Pictorial

QualiBasic Seed Company holds its inaugural Board Meeting in Nairobi



The QBS Board members from left: Donald Mavindidze, Deputy Chair and AATF management representative, McLean Sibanda, Board Chair and AATF Board of Trustees representative, Tim Johnson, President of Illinois Seed Foundation, Caroline Muchiri, Board Secretary, Mick Mwala, Dean of School of Agricultural Sciences, University of Zambia, Andy Watt, Managing Director, Lauren Good, Seed Systems Lead at Bill & Melinda Gates Foundation

The QualiBasic Seed Company (QBS) held its inaugural Board meeting on 12 - 13 June 2017 in Nairobi, Kenya following successful recruitment of the company's managing director, Mr Andy Watt, and constitution of the board.

Andy is a seasoned agriculturalist with extensive commercial experience in business management; strategy development and implementation and, business restructuring and development. He worked as a consultant at Kibeni Agriculture Ltd. He also served as head of Syngenta East and Southern Africa.

Commenting on Andy's appointment, Denis Kyetere, Executive Director at African Agricultural Technology Foundation (AATF) said he is excited that Andy is finally on board despite the long search. "We expect him to put up in place the right structures in place and get the company running to accomplish the need it was set up for," he added.

In his maiden speech to the company's board of directors, Andy expressed confidence in the new task. "I will be looking to you founders for guidance, I need everybody's help with building the new challenging business," he added.

The Chair of the Board, Maclean Sibanda, congratulated Andy on the appointment and joined in welcoming him to the company. Mclean, a member of the AATF Board of Trustees, is from the Innovation Hub in South Africa. Other members of the Board include Tim Johnson, President, Illinois Foundation Seed Inc, Dr. Mick Mwala, Dean of School of Agricultural Sciences, University of Zambia, Donald Mavindidze, Director Commercialisation, AATF, and Lauren Good, Senior Program Officer, the Bill & Melinda Gates Foundation.

QualiBasic was established by AATF with financial support from the Bill & Melinda

Continued next page >>>

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Gates Foundation as the first foundation seed production company in Sub-Saharan Africa (SSA). The entity will effectively and efficiently supply high quality foundation seed to small and medium sized seed companies in Africa.

The Gates Foundation has committed an initial five year investment of US\$ 8.4 million to the company that will be based in Nairobi, Kenya.

While unveiling the company in January 2017, Denis said QualiBasic was established to address the difficulty faced by majority of SME seed companies, in production and maintenance of high quality foundation seed due to technical, infrastructural and financial challenges. These SME companies reach more than 60 percent of smallholder farmers in Sub-Saharan Africa.

‘Low access and use of poor quality foundation seed by seed companies result in low crop yields and in some cases crop failure, in effect perpetuating the

perennial food insecurity in the continent,’ said Denis.

Mr Enock Chikava, Deputy Director, Agricultural Development at the Bill & Melinda Gates Foundation, spoke of the huge investments made by donors through various global public crop improvement programs for the benefit of African farmers. ‘These breeding programs have released high yielding and very adaptable crop varieties like maize hybrids. However, the benefits of these products are yet to be realised by smallholder farmers due to delayed seed production or in some cases low quality seeds,’ he said.

Enock reiterated the commitment by the Bill & Melinda Gates Foundation towards partnering with AATF and its collaborators in the QualiBasic Seed Company venture saying that ‘that will ensure integrity of the foundation seed availed to seed companies and in turn increase the productivity of land and labour, increase incomes and nutrition for the small holder farmers and hence trigger the much needed agricultural transformation in Africa.’

According to Donald Mavindidze, Commercialisation Director at AATF, operating a functional foundation seed production system is expensive for many SME seed companies who would require approximately US\$ 0.5 million per year regardless of size of company. He said that investing a similar amount in a centralised system that services needs of various seed companies would make seed production more effective and efficient due to economies of scale. ‘Similar models have been successful in other parts of the world such as the USA and India,’ he said.

QualiBasic operations will start with production of foundation seed for maize in east and southern Africa before servicing other cereals and legumes across SSA when fully functional. Three foundation seed production hubs with seed processing and storage facilities will be established in Kenya, Zambia and South Africa by the second and third year of operations in order to meet demand for products in a timely manner, and avoid lengthy delays in seed movements.

African states urged to adopt *Bt* maize to control armyworm

Dr Emmanuel Okogbenin, Director Technical Operations, AATF has called on African governments to adopt genetically modified (GM) maize alongside other measures to control armyworms currently ravaging maize farms across Sub-Saharan Africa.

The dreaded fall armyworm (FAW) that is indigenous to the Americas was first reported in Nigeria in January 2016 but has since invaded other countries in Africa with devastating impact on crop productivity, especially maize, leaving in its wake a risk of vulnerability to food insecurity.

By end of March 2017, the FAW had spread to 20 countries in Africa putting hundreds of millions of lives at risk of starvation. The insect is expected to cause up to \$3 billion damage to maize in next 12 months and serious food shortages. ‘This is science fiction turned fact,’ said Dr Boddupalli Prasanna, Director –



Fall army worm on a maize plant in Funyula, Western Kenya



Charles Weko, a farmer from Western Kenya, stares in despair at his maize crop as he holds fall army worm larvae in his hand

Global maize Program at the International Maize and Wheat Improvement Centre (CIMMYT).

During an emergency stakeholder workshop held in Nairobi on 27–28 April to address the crisis, Dr Prasanna said that ‘The fall armyworm is much more evil than other [pests] because I don’t think it can be eliminated. Meanwhile, the range of options available to tackle it are limited and the cost of these options is expensive.’ In Kenya, the traditional breadbasket regions of Western Kenya and Rift Valley have been ravaged forcing the Ministry of Agriculture to form a commission to address the problem.

Emmanuel warns that if not controlled, the FAW has the capacity to spread to all maize growing areas of Africa with the risk of wiping out vast areas cultivated with maize and other crops.

Unfortunately, use of pesticides to control the FAW is not only expensive, but also not entirely effective. In an interview with the Financial Times online news, Joe DeVries,

Vice-President of the Alliance for a Green Revolution in Africa (AGRA), said it costs Brazil an estimated US\$600 million a year to control armyworms that can breed all year round. Attempts to apply pesticides to control the FAW invasion in Sub-Saharan Africa have not been successful owing to a multiplicity of factors.

According to Emmanuel, one of the ways the US has been able to mitigate the armyworm’s impact is through the use of genetically-modified maize, ‘but this is rarely planted in Sub-Saharan Africa, where there is widespread opposition to such crops.’ He adds.

The high reproductive rate of the moths and self-protection mechanisms of the armyworm make chemical control difficult. The female moth lays between 150 and 200 eggs on the host plant which are covered with a protein sheath to protect them from attack by natural enemies and pesticides. In her lifetime, a single female lays 1,500–2,000 eggs. Upon hatching, the destructive larvae of the FAW feed mainly at night, conveniently hiding in

leaf whorls during the day to evade sprays and predators.

Emmanuel says the insect-resistant maize is genetically modified to incorporate a gene derived from *Bacillus thuringiensis* (*Bt*), a soil-dwelling harmless bacterium that effectively controls stem borers which belong to the same order with armyworms – *Lepidoptera*. ‘In all lepidopteran insects (including stem borers and armyworms) the most destructive phase is the larval stage and the target for control,’ he explains, adding that the larvae are killed when they feed on the *Bt* maize.

The ability for *Bt* maize to contribute towards controlling the FAW has further been demonstrated in the Water Efficient Maize for Africa (WEMA) Project confined field trials in Uganda and South Africa with *Bt* maize (MON810) and GM maize stacked for drought tolerance and insect resistance (MON89034). In the Uganda CFTs, the FAW ravaged up to 70 percent of the conventional maize but only affected 30 percent of the GM maize under trial.

Mozambique begins confined field trial of GM maize



The Administrator of Chókwè District speaking to the media during the maize field day at the WEMA CFT.

Mozambique has planted her first confined field trial (CFT) of genetically modified (GM) maize (*Bt* maize) under the Water Efficient Maize for Africa (WEMA) Project. This follows the Government's amendment of the law to allow for research, development and commercialisation of GMOs.

The Mozambican Agricultural Research Institute (IIAM), which is spearheading the trials, planted the GM maize at the Chokwe Experimental Field Station in Chokwe District, Gaza Province on 18 February 2017.

The stacked GM maize (MON87460) has been developed for drought tolerance (DT) and insect resistance (Bt).

'WEMA's drought tolerant and insect-pest protected maize can increase yields by 20 to 35 percent under moderate drought,' stated Dr Sylvester Oikeh, WEMA Project Manager, AATF.

The WEMA-Mozambique Country Coordinator, Dr Pedro Fato, said that farmers are greatly in need of new technologies to overcome new production challenges brought by climate change.

'The WEMA DT and *Bt* maize will help farmers cope with droughts and pests which have negatively impacted on crop production in Mozambique,' he added.

The trials will be conducted over the next three years. This first planting during the rainy season aims to evaluate the efficacy of MON87460 against stem borers – a pest that can reduce maize yields by up to 90 percent. The next planting is expected later this year during the dry season when there is virtually no rainfall in Gaza. It will test the GM maize for drought tolerance.

The planting of the CFTs in Mozambique is another great milestone for the WEMA Project that is funded by the Bill & Melinda Gates Foundation (B&MGF), the Howard G. Buffett Foundation (HGBF), and the United States Agency for International Development (USAID). The project has now successfully established CFTs in all its five project countries – Kenya, Mozambique, South Africa, Tanzania and Uganda.

Tanzania established the MON87460 CFTs in October 2016 in Dodoma. Uganda is currently compiling its

MON810 environmental release dossier for submission to the Uganda National Biosafety Committee Secretariat.

South Africa commercialised *Bt* maize (trademarked TELA™) among smallholder farmers in February 2017 in Eastern Cape. Additionally, it has completed CFTs on stacked DT-*Bt* events and targets to submit the application dossier for environmental release to the authorities by end 2017.

Kenya applied and got approval for environmental release of *Bt* maize (MON810). However, the national performance trials have been delayed following policy complications and delayed decision making by the National Environment Management Authority (NEMA) regarding issuance of the required licence to enable progress to National Performance Trials. Meanwhile, the second set of stack gene trials (DT-*Bt*) are continuing in Kitale after the successful trials conducted last year.



Carlos Santana, the WEMA Mozambique legal and regulatory lead, at the stacked maize field trial at the Chókwè Agricultural Research Station in Mozambique

IIAM to develop legal framework on IP management

The Mozambique Agricultural Research Institute, (IIAM) will from this year have legal frameworks on Intellectual Property (IP) for use by scientists.

This follows a directive from the Director General at the institute, Dr. Olga Faftine that a committee be formed to draft an IP Policy for consideration and adoption by IIAM Management.

Dr. Faftine gave the directive in March during a two-day training on intellectual property conducted by the Water Efficient Maize for Africa (WEMA) Project Legal

and Licensing Team for the IIAM scientists in Maputo. She urged the team to commence the process as soon as possible.

The IP training was aimed at creating awareness on IP laws, policies and guidelines among scientists.

The topics covered in the training include IP Regime in Mozambique; Introduction to Copyright, Patent, and Trademarks; and

Plant Variety Protection. The scientists were also trained on how to draft IP and Confidentiality Policy.



Dr Olga Faftine, Director General of IIAM during the training on intellectual property conducted by the Water Efficient Maize for Africa (WEMA Project) Legal and Licensing Team (LLT) for the IIAM scientists in Maputo in March 2017

Good progress in developing NEWEST rice

The Nitrogen-use Efficient, Water-use Efficient and Salt-Tolerant (NEWEST) Rice Project has identified three promising events that have consistently outperformed the checks with about 15 percent yield advantage.

According to Kayode Sanni, the NEWEST Rice Project Manager, the three Nitrogen Use Efficiency (NUE) events – NUE 12, NUE 9 and NUE 2 – were selected out of eight that are under trials following advanced analyses of NUE Confined Field Trials (CFTs). ‘This development shows that the project is nearing the final selection of an NUE lead event which is expected to signal the commencement of the deregulation process,’ said Kayode.

Kayode made the revelations during the project’s annual review and planning meeting held from 16–17 February 2017 at the International Institute for Tropical Agriculture, Ibadan, Nigeria. The meeting brought together 22 project partners and Project Advisory Committee members to review progress and chart the way forward on project activities and milestones for subsequent years.

The project, funded by the United States Agency for International Development (USAID), has two project pipelines: the NEWEST pipeline that combines three stacked gene traits; and the NUE pipeline that has a single gene trait. While NEWEST pipeline is yet to commence confined



Kayode Sanni, Rice Project Manager at AATF, speaking with the Press after his presentation

field trials (CFTs), the NUE pipeline has conducted several CFTs in Colombia, Uganda, Ghana and Nigeria.

Dr Denis Kyetere, Executive Director AATF, applauded the project for the successful CFTs noting that the development of NEWEST rice will greatly contribute to food security in Africa. ‘Nitrogen deficiency is a major constraint to rice production in Africa. NEWEST rice will help farmers reclaim abandoned croplands and get better harvests,’ said Denis.

The project expects that an additional 1.3 million tonnes of rice will be produced in Africa each year, reducing the current deficit by 10 percent with improved varieties.

Dr Samuel Agboire, Executive Director, National Cereal Research Institute

(NCRI), Nigeria who was represented by the Institute’s Chair of the Biosafety Committee, Dr. Mohammed Ishaq, emphasised the importance of the NEWEST Rice Project to the people of Nigeria and Africa at large. ‘Rice demand exceeds production in most Sub-Saharan Africa affecting the well-being of farmers who depend on rice for their livelihoods.’

Denis thanked, USAID represented by Dr Joseph Huesing at the meeting, for their continued support to the project. He urged all the partners including Arcadia Biosciences, International Center for Tropical Agriculture (CIAT), national agricultural research systems of Uganda, Ghana and Nigeria and other partners to continue their unrelenting efforts at developing the technology.

Farmers in Malawi and Zimbabwe to benefit from improved crop varieties

Improved sorghum, pearl millet and tomato hybrids suitable for use by smallholder farmers in Malawi and Zimbabwe have been identified through the Seeds2B Project that is coordinated by AATF and the Syngenta Foundation. The hybrids which were accessed from various technology owners based in South America, Sub-Saharan Africa and Asia-Pacific regions, are being evaluated at various sites in the two countries.

‘The identified hybrids have a range of desirable traits for farmers and consumers such as adaptability to local environments, higher yields, resistance to key pests and diseases, and improved postharvest attributes, said Edgar Wavomba, Seeds2B Project Coordinator at AATF.

The Seeds2B Project has forged new partnerships with the technology owners and seed enterprises in Zimbabwe and Malawi to ensure that smallholder farmers



Farmers assess the field performance of pearl millet hybrids accessed by the Seeds2B Project during a field day held in Save Valley, Zimbabwe

have access to quality seed of the high performing hybrids.

Funded by the Syngenta Foundation for Sustainable Agriculture, Seeds2B Project

facilitates the transfer of better-performing, locally adapted and market-appropriate crop varieties developed by public and private breeders based in and outside Africa.

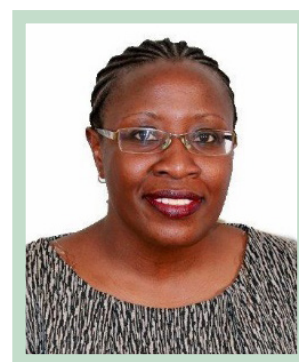
New staff



Sofia Tesfazion joined AATF in January 2017 to head the newly created Directorate of Resource Mobilisation. Sofia holds a Master of Science degree in International Business Administration and Economics from Uppsala University, Sweden and a Certificate in Change Leadership from Cornell University, USA. She joins AATF from Plan International, where she was the Regional Head of Resource Mobilization for Eastern and Southern Africa.



Suleiman Okoth joined AATF in December 2016 as Project Officer, OFAB. He holds a Master of Arts degree in Communications Studies (Strategic Communication) from New Mexico State University, USA; a Bachelor of Arts degree in Mass Communication from Curtin University, Australia; and a Diploma in Advertising, Multimedia and Broadcasting from Limkokwing University, Malaysia. He joins AATF from Innovations for Poverty Action (IPA) where he was a Policy Associate.



Nancy Juma joined AATF in December 2016 as the Corporate Communication Officer. Nancy holds a Master's degree in Business Management from University of Free State, South Africa and a Bachelor of Arts degree in Communication and Marketing from Daystar University, Kenya. She joins AATF from the Geothermal Development Company where she was the Chief Officer, Corporate Communications.

Pictorial

Uganda Minister for Science and Technology visits the AATF Office



The Uganda Minister for Science and Technology, Hon. Dr. Elioda Tumwesigye (center), led a delegation for a visit to AATF on 6 March to discuss AATF's mandate, vision and achievements to date. The delegation was briefed by Dr. Denis Kyetere (right) on ongoing projects and developments and AATF's presence across Africa. Accompanying the Minister were Dr. Peter Ndemere, Executive Secretary, Uganda National Council for Science and Technology (UNCST), Hon. Eng. Kafeero, Chairperson, Parliamentary Committee on Science, Technology and Innovations and Mr. Philip Chemonges, OFAB Coordinator, Uganda Chapter. Key during the discussion was the importance of improving access to affordable, high-yielding, reliable seed made more urgent by Uganda's rapidly increasing demand for food due to fast population growth. Latest census results show that population growth has been increasing twice as fast as the increase in food production, raising fears of increased incidences of hunger and higher food prices. To manage this AATF in partnership with other players within the agricultural sector are presently developing technologies such as the Water Efficient Maize for Africa (WEMA) to ensure maximum yields even with limited rainfall.

Further, with the recent attack on maize field by fall armyworms, crop losses were between 30–100%. This can easily be addressed by using the WEMA Bt maize that had registered a 70% survival rate.

Key visit by Academia Sinica Representative



Prof. Teng Yung Feng of Academia Sinica, Taiwan (Center) stresses a point during a meeting at the AATF offices. With him are (from left) Moussa Elhadj Adam, Director Finance & Administration; Alhaji Tejan-Cole, Director of Legal Affairs; Gospel Omany, Senior Manager, Projects Management, and Nancy Muchiri, Senior Manager, Communications and Partnerships. Prof. Feng, a technology provider and member of the Project Advisory Committee of the Bacterial Wilt Resistant Banana and Potato, gave a talk at the International Livestock Research Institute (ILRI) titled 'Technology for cropping under global warming: transgenic and microbiomics' during the visit.

Academia Sinica has adopted various measures to promote the internal integration of research activities in the three research disciplines of mathematics and physical sciences, life sciences, and humanities and social sciences; to improve the planning, implementation, and evaluation of long-term projects in order to enhance the impact of the research activities; to harness basic research results for applications and technology transfer; to engage the entire academic and research community in Taiwan in a modern and forward-looking collective academic vision; to cultivate an intellectual environment that is conducive to the nurturing of young scholars and the recognition of outstanding scholarship in Taiwan; and to promote international cooperation and scholarly exchanges that will accelerate the overall development of academic research in Academia Sinica and the Republic of China.

AATF Board of Trustees tour Hybrid Rice National Performance trials in Kisumu



Members of the AATF Board of Trustees listen keenly to John Mann from Hybrid East Africa Limited (HEAL) when they visited the hybrid rice NPT site in Kisumu, Kenya. HEAL is developing rice hybrids and parental lines for use by seed companies in collaboration with AATF. The NPT is evaluating performance of the hybrid rice compared to local varieties as part of Kenya's variety release process. The hybrid rice varieties mature earlier and produce more grain.

Africa will soon have its own rice hybrids, thanks to the Hybrid Rice – Breeding by Design Project. Kenya will be among the first countries to benefit from this pioneering breakthrough with release into the market expected late in 2017 or early 2018. This will be a game changer for many farmers with an expected output of up to 7 tonnes per hectare compared to the 3 tonnes per hectare that they presently harvest. On the national front the increased production will bridge the gap of 400 tonnes of rice presently imported for local consumption. The project is funded by the Bill and Melinda Gates Foundation.