

NIAB Focus

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STAYING IN
TOUCH WITH
THE WORK
OF NIAB

NIAB is hitting the headlines with its commitment to invest in new technology, new approaches and new thinking, delivering technical advantages to farming businesses all over the UK. NIAB Focus is an opportunity to catch-up with the latest research, work and news from the National Institute of Agricultural Botany including:



NIAB's 'superwheat' research features on BBC TV's *Countryfile* with national and international media coverage and is a finalist for BBSRC Innovator of the Year



New state of the art conference facility opens and is nominated for an international 'green' construction award



NIAB CEO Dr Tina Barsby appointed to the UK Government's Agri-Tech Leadership Council with NIAB research featuring in the UK Agri-Tech Strategy document



Cambridge University Farm's Potato Agronomy Unit becomes part of NIAB, strengthening potato agronomy research and crop modelling capabilities

NIAB innovations earn high level recognition

NIAB was short-listed for three prestigious awards in early 2014. The team behind our ground-breaking synthetic wheat research was nominated for the 2014 BBSRC Innovator of the Year Award, while the new NIAB Innovation Farm Visitor Centre was an international 'green' construction award finalist and the NIAB CUF team won the Oxford Farming Conference and Royal Agricultural Society of England *Practice with Science Award* for its work on a potato modelling system.

Such high-level, independent recognition is an endorsement of NIAB's direction and focus, not only in terms of the excellence and impact of our research, but also through the facilities and infrastructure we need to transfer plant science into practice.

The new centre, named the Sophi Taylor Building, has set the standard for

NIAB's ambitious plans for the redevelopment of the Park Farm and Huntingdon Road sites at Cambridge, part of our 'Centenary Project'. And it underlines and reflects our commitment to delivering sustainable and innovative solutions in all aspects of our work.

The short-listing of NIAB's 'superwheat' research for the BBSRC's 2014 Innovator of the Year award acknowledges the scientific leadership shown by Professor Andy Greenland and his pre-breeding colleagues, and recognises the increasing importance of applied and translational research in boosting prospects for food security.

This, alongside NIAB CUF's award,



George Freeman MP for Mid Norfolk, Defra minister Lord de Mauley and NIAB CEO Dr Tina Barsby tour the MacLeod Complex at the opening of the Sophi Taylor Building at NIAB Park Farm.

celebrates our research in bridging the gap between the laboratory and the field, and reflects the renewed political emphasis on unlocking the economic potential of agri-science. This is an exciting time for NIAB and we look forward to the future.

Dr Tina Barsby

NIAB Chief Executive & Director

New training initiative links research and farm

NIAB is part of a consortium of industry organisations that have come together to ensure farmers, growers and agronomists have direct access to agricultural and horticultural research outcomes through a new industry training programme.

Project leader David Neill explains that ARTIS – Agri-tech Register and Training for Innovation and Skills – will focus on improving technical competencies of farmers and agronomists, aiming to improve the industry’s sustainability and profitability. “The project involves NIAB, G’s Growers, LANTRA and East Malling Research but new training materials will be commissioned from researchers and technical sources in the UK and abroad.”

The initiative has been developed as a response to general industry concerns



NIAB trains over 1,000 farmers, advisors and agri-industry staff every year across a range of topics.

that new and efficient agronomic and horticultural practices with the potential to significantly improve productivity are not always being translated into knowledge which farmers and growers can use.

“ARTIS aims to up-skill our industry and improve the consistency and quality of training for farmers and growers in

the arable, vegetable and fruit sectors. It is a great opportunity to positively influence the level of technical skill in the industry and proliferate efficient practice to raise productivity and we’re delighted that NIAB, and the great range of training courses it already provides, will be part of this programme,” says David.

Sophi Taylor Building success

In the first 12 months of NIAB Innovation Farm’s stunning new visitor centre opening over 2,500 people enjoyed the facilities and hospitality the building has to offer.

Opened in April 2013 the Sophi Taylor Building, at NIAB Park Farm near Cambridge, is the main venue for NIAB Innovation Farm, a pioneering knowledge transfer initiative established by NIAB to support the translation of plant science discoveries into practical application by linking the science base and industry.

“As a conference and visitor centre, the building is an inspiring and tangible vision of the future for NIAB. The development of the Sophi Taylor Building – named after a generous benefactor who took a keen interest in plant genetic innovation – represents an important milestone, establishing NIAB’s leadership role in bringing industry and scientists together. This also reflects a renewed

political emphasis on unlocking the economic potential of agri-science,” says NIAB Innovation Farm’s Lydia Smith.

Funding for the construction of the stunning new £1.5 million building came from the European Regional Development Fund (ERDF) and the NIAB Trust. The building is used for exhibitions, lectures, seminars and workshops, catering for up to 100 people. It includes meeting and office spaces and a show-garden that doubles as a meeting area as well as a display area for new plant varieties and species.

With a roof covered by living plants and photo-voltaic cells, rainwater harvesting, automatic ventilation, biomass boiler and a zero carbon construction, the Sophi Taylor Building has

some of the most outstanding green building credentials in the UK.

It was designed to meet the needs of users with minimal electrical needs, making the most of the energy available to it from the sun and the users themselves and conserving these resources for release when required. The building was one of only five construction projects short-listed for a BREEAM 2014 award in the ‘offices’ category, in recognition of the building’s environmental credentials in construction and management.



Make way for superwheat

UK wheat yields could be boosted by up to 30% with the introduction of a new wheat bred by NIAB from a wild grass species.

Wheat arose from a rare prehistoric hybridisation between a wild grass and primitive wheat grown by early farmers. This introduced many important genes into the modern wheat crop which today provides 20% of the world's food calories.

NIAB researchers have repeated this hybridisation using wild goatgrass and durum wheat. "This new genetic diversity from the wild, including new sources of yield improvement, drought tolerance, disease resistance and input use efficiency, is being introduced back into modern wheat by crossing these re-synthesised genomes into varieties already grown by farmers across the UK," explains project leader Dr Phil Howell.

NIAB's Synthetic Hexaploid Wheat breeding programme, christened 'superwheat' by the BBC1 *Countryfile* team, has tapped into the current

recognition of the importance of translational science and agricultural research in ensuring food security. It has also featured in the farming press, national papers and TV news programmes as well as internationally.

Thousands of pre-breeding lines are being tested in the field and the best delivered to industry. This unexplored diversity and its integration into elite backgrounds is unique, with initial tests indicating it represents a step change in UK wheat yield potential. Early trials have recorded yields 30-40% above the elite parent.

"Even a 15% yield improvement above current varieties could translate to an additional income of £416 million/year for UK farmers and around ten-fold that amount for downstream end-users such as millers, bakers and the animal feed industry, directly benefiting the entire wheat supply chain from field

to plate," explains Phil.

The original pre-breeding work was funded by the BBSRC under their Crop Science Initiative, with additional industrial funding from three leading breeding companies, the HGCA and the NIAB Trust, using material from the original CIMMYT programme. The project is now funded through a BBSRC 'Super Follow-On Fund' award with in-kind contributions from the three breeders involved in the project (KWS, Limagrain and RAGT), and through BBSRC's WISP Consortium www.wheatisp.org.



NIAB's pre-breeding team: Alison Bentley, Andy Greenland, Richard Horsnell and Phil Howell.

NIAB part of eastern Agri-Tech Cluster

NIAB hosted the formal launch of the new East of England Agri-Tech Cluster in late 2013. The Cluster is aimed at linking the world-class research capability within Cambridge and Norwich, including NIAB and the John Innes Centre, alongside the highly successful food and farming sectors in the rural areas in Norfolk, Cambridgeshire and Suffolk, opening up new funding for research and investment.

The event was organised by Cambridgeshire and Norfolk County Councils and the local Enterprise Partnerships with keynote speeches from George Freeman, MP for Mid Norfolk and Sir Leszek Borysiewicz, Vice-Chancellor of the University of Cambridge. Dr Tina Barsby, as NIAB CEO and member of the UK Agri-Tech Strategy Leadership Council, chaired the event.



From left to right: Prof Jeremy Sanders of the University of Cambridge, Alex Plant, Cambridgeshire County Council, Richard Horsnell, NIAB Research Scientist, Professor Mike Bevan of John Innes Centre, Dr Tina Barsby, Chief Executive of NIAB, George Freeman, MP for Mid Norfolk, Councillor Steve Morphey, Norfolk County Council and Sir Leszek Borysiewicz of the University of Cambridge.

Link-up for NIAB International and NIAB Innovation Farm

NIAB has a long history of providing training and support to the agricultural supply chain outside of the UK and Europe. Over the past 40 years we have collaborated on numerous aid-funded and technical assistance projects in developing countries, contributing skills and experience in plant breeding, agronomy, seed testing and on-farm advice.

To ensure this activity continues successfully NIAB International was launched in 2012, working with organisations and charities in developing countries to connect innovations at the genetic or varietal level with the appropriate agronomy and knowledge transfer on farm.

Since then NIAB has been working on the possibility of establishing the NIAB

Innovation Farm concept in various African countries including Uganda, Kenya and Ghana; linking scientific research with agricultural practice through themed exhibitions and events. "The work is funded by the John Templeton Foundation through the Biosciences for Farming in Africa project, consulting with representatives of all key organisations involved in producing and disseminating improved plant varieties to farmers as well as farmer organisations," explains NIAB International's Dr Tinashe Chiurugwi. "We've established an operational model and potential hosts and partners identified."

The work has also identified opportunities for NIAB International to work with relevant partners to optimise the processes of variety evaluation and registration, seed certification, and knowledge transfer to farmers and other stakeholders.



Dr Kwadwo Obeng-Antwi, maize breeder and head of cereals at the Ghana Council for Scientific and Industrial Research's Crop Research Institute (CSIR-CRI) and NIAB Innovation Farm's Dr Lydia Smith at CRI's main centre in Kumasi, Ghana

NIAB history goes online

The first stage of archiving papers, letters, photos, literature and research stretching back to NIAB's beginnings in 1919 has recently finished with an archive catalogue now available online for researchers, part of NIAB's Centenary Project.

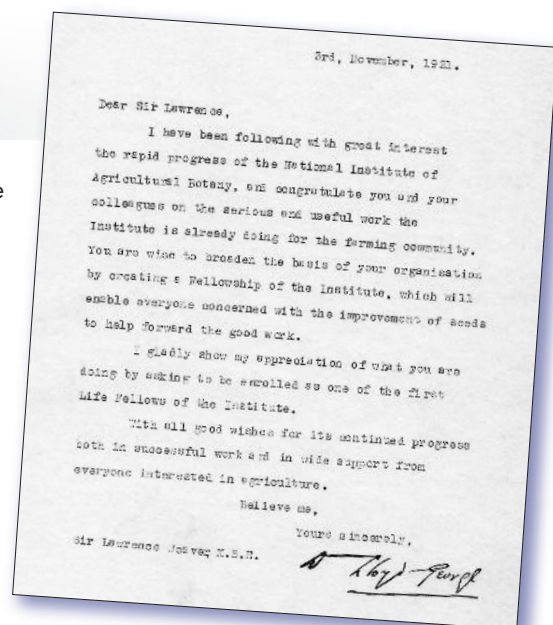
Work by Leeds University History PhD student Dominic Berry over the past three years has turned the NIAB Archives into a much-valued resource, supporting and expanding the work begun by NIAB's in-house archivists Tricia Cullimore and Paul Thompson. Dominic focused on the period 1919 through to the late 1960s, but plans are in progress to continue his work through to the present day.

"As NIAB moves towards its centenary celebrations in 2019, the

Archive is now a fitting historical tribute to the incredible work and research that generations of NIAB staff have undertaken, and emphasises the important role NIAB has played in the development of UK agriculture over the past 100 years," says NIAB CEO Dr Tina Barsby.

"The work also highlights NIAB's original aims and objectives in supporting the development of improved crop varieties and seeds to safeguard food supplies as are relevant today in terms of addressing food security concerns as they were in 1919."

So if you are looking for the handwritten minutes of the Official Seed Testing Station's committee meeting from 1921, the UK's first Recommended



List for wheat varieties leaflet or a personalised note from the British Prime Minister David Lloyd George asking to become one of the first NIAB Fellows – come and take a look in the new NIAB Archives Room.



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