Landwards

@IAgrE

The professional journal for the Institution of Agricultural Engineers

IAgrE Professional Journal www.iagre.org
Volume 78, Number 2 - **Summer2023**

See iagre.org for the latest information

In this issue...

AGRICULTURE HORTICULTURE FORESTRY ENVIRONMENT AMENITY

SocEnv
Society for the Environment

"The launch of REnvP is a landmark moment for environmental professionalism, providing more individuals with the opportunity to gain professional registration and achieve external verification of their competence."

Dr Emma Wilcox
Chief Executive Officer of the
Society for the Environment

Progress your career with REnvP

launched in partnership between the Institution of Agricultural Engineers (IAgrE) and the Society for the Environment is the new grade of Registered Environmental Practitioner (REnvP).

This is a huge step forward to ensure high standards of professionalism and proven competence are met by those working to enhance and protect the environment across every sector.

This registration is timely and relevant for agricultural engineering and the associated technology sectors and the intention is that professionals in the industry will apply. The industry includes many different disciplines which need people to apply a professional approach and the Registered Environmental Practitioner grade is ideal for this.

Why should I register?

- Improve your career and salary prospects
- Stand out from the field
- Join a network of dedicated professionals
- Demonstrate your competence and skills.

Register through IAgrE now:

t: +44 (0) 1234 750876
e: membership@iagre.org
w: www.iagre.org

Although the standards are high, IAgrE makes the process simple.

IAgrE

Contents:

farmsmart publishing

Landwards is published on behalf of the IAgrE by FarmSmart Publishing Limited.

Editor – Andy Newbold 01539 620255 andy@farm-smart.co.uk

Design – Ann Newbold, Smart Design and Print www.smartdesignprint.co.uk

Jane Carley, winner of the 2023 IAgrE journalism award Jane receives her award and prize money from CEO Charlie Nicklin at the recent British Guild of Agricultural Journalists Beer 'n' Bangers reception at the Cereals Event on 13 June.

Editors Welcome

The editor usually (and deliberately) leaves writing the welcome until last, for obvious reasons, in yours truly's case procrastination has a role to play! However, in this edition there is quite a lot to look forward to reading.

Alongside the usual commentary from Charlie and Steve (CEO and president respectively), this edition has the latest activity from the Douglas Bomford Trust, branch reports and and some selected papers from Biosystems Engineering.

We had the chance to celebrate the Institutions members personal and professional achievements at the annual Awards ceremony held in May. All I will say at this stage is that I am humbled and flattered to have been on the receiving end of an award and you will have to turn to p16 for more.

Whilst its correct to recognise achievement, this edition also says goodbye to an eminent figure of the Institution and the wider farming industry. Professor Gordon Spoor was known to many, and his work and influence extended far beyond his personal and professional circles. Dick Godwin has kindly penned a reflection from p12.

Earlier this spring I received an email with the ominous words 'you have been selected to take part in the 2023 IAgrE review of CPD'. When the joy had sufficiently subsided, I checked my records, and whilst MyCareerPath on the IAgrE website needs an update with my latest training, there is a decent record available, phew. Have a read from p22 for one member's experiences whilst bringing their CPD records up to date.

There's lots more food for thought in this edition, read on..

Andy Newbold Hon FIAgrE

Editor

andy@farm-smart.co.uk

Reminder:

Associate Members can upgrade free to Member grade

If you are an existing Associate Member you have the option to upgrade to Member grade providing you have completed 5 or more years in a relevant career.

However, if you prefer, you can remain as an Associate Member for as long as you wish.

For more information please see

https://iagre.org/upload/1621421462.pdf

or contact Alison at

membership@iagre.org.

Watch again

YouTube

For all lunchtime lectures watch in full on the IAgrE's YouTube channel see:

https://www.youtube.com/channel/UCCiJwRVjGiz-SE3EZ-KQ3uVg

Watch again:

Don't forget that most of the Institutions lunchtime lectures, some branch meetings and last year's conference papers are available on the Institutions YouTube channel. https://www.youtube.com/@iagrevideos5783/videos Highlights include:

Enabling per plant prescriptions with Robotics and Artificial Intelligence –

Dr Tom Walters, the Small Robot Company

Small Robot Company is working to re-imagine farming with robotics and artificial intelligence to make it more efficient, profitable and sustainable. Our survey robots gather high-resolution imagery from across whole fields of arable crops, and we use the data to inform decisions on application of fertiliser and herbicide, generating spot-spray maps for existing machinery that allow farmers to apply extra inputs to the field only where they are needed. The scale of data gathered by the robots is enormous, with a typical survey of a 20 hectare field yielding a terabyte of high-resolution images. We train machine learning models to detect the individual plants in these images and couple these detections with image-based assessments of plant biomass to produce very high-resolution field maps to inform targeted crop treatment. In this talk, I will explore the systems that allow us to do this at scale.

Dr Tom Walters is currently Chief Technology Officer at Small Robot Company (SRC), and previously led the AI and data science team responsible for analysing the data gathered by SRC's field survey robots. Tom's background is in applied machine learning; prior to SRC he was a Research Scientist at DeepMind in London working on applications of artificial intelligence to a range of problems including speech synthesis for the Google Assistant. Tom joined SRC in 2021, having found a role that combined his previous experience with a newfound interest in sustainability.

IAgrE Professional Environmental Registration with SocEnv

The Institution of Agricultural Engineers (IAgrE) offers it's members Professional Registration with the Society for the Environment. Chartered Environmentalist (CEnv) and Registered Environmental Practitioner (REnvP). This video explores the benefits of registration and the registration process with IAgrE with its registered members. Contact Alison, IAgrE Membership Secretary, for more information -

https://iagre.org/secretariat

Taming the Dragon: Understanding machinery safety circuit architecture Mike Whiting MIAgrE - certification and compliance engineer at Newmac Ltd

As experienced mechanical engineers we're typically well versed with all aspects of physical drives and 'things that move'. However developments in machinery design and operation means that electromechanical safety systems are now a common factor in agricultural engineering. Mike has spent the past few years 'relearning' the principals to the level where he can provide a roadmap through the maze of standards, component specifications and genuine misinterpretations. After leaving Harper Adams in 1993 with a BEng (Hons) in Agricultural Engineering, Mike took up a career with management roles within the Animal Feed Industry. This exposed him to the full range of engineering disciplines, including mechanical, electrical, PLC systems and steam raising plant, whilst managing operational changes to achieve 24/7 shift patterns. Projects included Capital Expenditure Installations to increase capacity with programmes of continuous improvement to minimise plant downtime.

In 2011 Mike moved into a compliance engineers role with the safety consultancy, Newmac Ltd. The current client portfolio covers the UK, Europe, North America and includes the agricultural, food packaging, forestry and construction service sectors.

The subject of safety related parts of Control Systems has received much greater focus over recent years, and is an important factor in the design specifications for autonomous machinery.

Methane Power LNG Prototype Tractor wins Green Good Design Award 2023

- Model is the world's first liquefied natural gas-powered tractor.
- Green Good Design Award honours the most innovative and cutting-edge projects that encompass sustainable design to benefit the environment.
- Prototype tractor created by CNH Industrial's in-house design team, inspired by natural influences, and featuring New Holland's new signature design style, accenting the brand's sustainability commitment.

The New Holland T7 Methane Power LNG *(Liquefied Natural Gas)* prototype tractor is the winner of the 2023 Green Good Design Award.

The award, which is bestowed by the Chicago Athenaeum: Museum of Architecture and Design and The European Centre for Architecture Art Design and Urban Studies, identifies and emphasizes the world's most important examples of sustainable design, with the aim of heightening awareness among the general public about the best efforts of global companies to adopt sustainable design.

From architecture and landscape to urban planning projects, products, packaging and graphic designs, the institution receives hundreds of submissions from around the world. For 2023, projects from over 32 nations were granted Green GOOD DESIGN 2023 awards, representing the world's most important manufacturers and design firms and leading FORTUNE 500 corporations focused on more sustainable design and environment worldwide.

Founded in Chicago in 1950 by Eero Saarinen and Charles and Ray Eames, the GOOD DESIGN program remains the oldest and most important design awards program worldwide. This is the 15th year of this very specialized edition of the original GOOD DESIGN program. It is judged by a jury of distinguished design professionals and leading industry specialists, recognizing outstanding examples of Green Design.

Presented for the first time during CNH Industrial Tech Day in December 2022 in Phoenix, Arizona, the T7 Methane Power is the world's first LNG tractor. It builds on the heritage of the commercialized T6 Methane Power, fuelled by compressed natural gas, but this new model will more than double the autonomy of New Holland's current methane-powered products.

Carlo Lambro, Brand President of New Holland Agriculture says: "We are honoured to receive this Green Good Design Award, an authority in the design sector, and even more proud that the recognition is given to such a ground-breaking prototype tractor set to represent a significant expansion in New Holland's alternative energy tractor range. The New Holland T7 Methane Power LNG marries great design with great tech and innovation, the result of our continued investment of our energies in creating something that is not only useful, sustainable, and functional, but also beautiful to see. I want to thank all the teams who worked on this special project and, as always, our internal design teams for the great creative job."

IAgrE Members sustainable tech offer from Dell

Transform your tech experience while preserving the environment with Dell Technologies! Dell's cutting-edge sustainable devices are designed to help reduce your environmental impact and take a step towards a better future. With

built-in features that revolutionize device management, you can ensure sustainable management throughout the device's life cycle.

As an exclusive member, you have access to unbeatable prices for our latest line of sustainable devices. Combine your member discount with special offers to maximize your savings. Upgrade your tech game today and make a positive impact on the planet.

Get a coupon code and get your sustainable device from Dell Technologies.

- Visit the Exclusive Member Offer page https://email.cloud.secureclick.net/c/4214?id=282501.5103.1.1e268e0de7b7e-658b8268ab671226647
- Enter your email and IAGRE as your Unique Member Password
- Apply coupon code at the Dell checkout! Or by referencing your discount coupon code to our trusted advisor via chat/phone/ WhatsApp chat.

From the CEO's desk

Charlie Nicklin CEng FIAgrE

Its amazing how fast things happen with efficient productive equipment and a decent bit of weather! Certainly around my area in south Cheshire the maize harvest was over in a flash, along with subsequent re-drilling and now silage and hay making done and dusted as well. By the time Landwards appears through your letterbox the UK cereal harvest will no sooner have been with us and gone.

All these activities happen because of the engineers and technicians researching, developing and supporting the products and processes in our industry. Technical support is fundamental, and I've mentioned previously about the staffing shortfalls in technical education being a key challenge at present. This shortfall limits college capacity which in turn is restricting the industry's ability to enable young people to enter the sector. The land-based colleges desperately need industry people to come into education and teach the future generations of technicians. I've been involved in a number of discussions with the AEA, BAGMA, colleges and industry about how we can support this. There is no silver bullet, but we certainly need to make teaching more appealing and easier to get into than it currently is, plus highlight the benefits of a career in education, of which there are many.

Recognition

Talking of careers, in May we had the opportunity to celebrate some of our members careers in our annual awards ceremony. For 2023 we decided to separate the awards from the AGM, primarily to allow the AGM to be an on-line event and therefore be much more inclusive to members by removing the need for travel. The awards ceremony was very much a face to face event, held in sunny Doncaster at Amazone's relatively new facility. Our host's put on an excellent display of equipment and their knowledgeable staff talked us through some of the innovative features on their products. The awards are covered in more detail from page 16. My personal congratulations goes to all the award winners and my thanks goes to Amazone for hosting the event for us, and of course the attendees who I'm sure enjoyed the day.

Evidence

As many will know, horticultural engineering sits under the umbrella of what we call agricultural engineering, and the subject has figured in government discussion and the press a number of times recently. Its importance to the UK economy has been acknowledged by the House of Lords who have set up a select committee with a call for evidence. With thanks to IAgrE Fellow Dr Andrew Marchant, we have compiled and submitted evidence highlighting the importance of technology and engineering which underpins horticulture, which has been accepted. The UK has a proud record of innovation and still houses a substantial manufacturing base and strong engineering service sector. Many of our members have an in-depth knowledge of both the UK and global horticulture, therefore it's important we are represented on such committees allowing our views to be put forward.

From an operational perspective internal audits of our membership process have been completed with no major issues highlighted. These audits are there to ensure we continue to work with the utmost professionalism in membership and registration activities and of course seek continuous improvement. Annual license reviews have also been completed for both the Engineering Council and the Society for the Environment, which additionally allows us to feedback our thoughts on both bodies' activities, as well as reporting our own. We have also been busy on the Biosystems Engineering front searching for new editors for our scientific journal. I am pleased to announce James Taylor from the French agricultural research institute INRAE will be joining the team from July as a Senior Editor as he transitions back to the UK.

And finally, thank you to those that have paid their subscriptions to date. It's worth noting you pay £5 less using direct debit and it also reduces a significant amount of administration for us for annual subscriptions.

Please contact Jo at;
finance@iagre.org
for further details.

President's Musings

Steve Constable

A forward looking statement

The Institutions 2023 awards ceremony was held near Doncaster kindly hosted by Amazone UK and we are very grateful to Simon Brown MD and his team for making us feel so welcome.

I was particularly interested in the level of technology incorporated in the equipment being produced and the reasoning behind its inclusion, it is not merely tech for tech's sake, but each development has sound principles behind its introduction offering tangible benefits in accuracy, efficiency, and cost reduction of establishment to the farmer and the planet.

Amazone is a prime example of an agricultural manufacturer who listens to their customers whilst operating at the cutting edge of research and development to produce the best outcome for all parties highlighting the open mindedness, skill, and persistence of their staff. The ability to identify an issue, work to solve the issue and then adapt to overcome is the bedrock of our industry and should be applauded.

Technical developments are racing ahead with vengeance so where is this all leading? I wonder what our agricultural industry will look like in 10, 50 or 100 years, will there be any need for human input? This might sound a little fanciful however automatous robots are here and as the tech reduces in cost and system capacity increases, they will become mainstream.

Technology

A recent article in Forbes stated.

"Agriculture is one of the most fertile industries there is for AI & machine learning".

They argue that machine learning is the perfect technology to combine massive data sets (big data) and provide constraint-based advice for optimising crop yields. Ground sensor data of moisture, fertiliser, and natural nutrient levels to analyse the growth patterns for each crop over time coupled with live video streaming and drone footage, allows experts access to entirely new data sets not previously available which can be incorporated with the yield mapping results.

It's all well and good to capture data but the challenge we face is analysing the data and acting on the results in the most appropriate way, this is the element that still proves a challenge to all of us. How many of us have large and growing data bases that we are only using a fraction of, AI deployed appropriately might provide a solution to this challenge.

Time lapse camera recording trial plots

There have of course been mixed views in the press and some people believe that artificial intelligence might eventually lead to the destruction of humanity, a similar viewpoint conveyed by a judge commenting on the great gin craze that hit London in 1751.

Whatever viewpoint you hold regarding this topic; the aging farmer population, reductions in farm labour availability, increasing labour costs, increasing fuel costs, increasing population, food safety fears and the need to efficiently grow more from a declining available land mass because of the green energy and new housing requirements is exerting increasing pressure on all of us in the industry to adapt, change and develop solutions.

Forbes states that: -

"Spending on AI technologies and solutions alone in Agriculture is predicted to grow from $1 billion in 2020 to $4 billion in 2026, attaining a Compound Annual Growth Rate (CAGR) of 25.5%, according to Markets & Markets."

Vital role

On the 16th May the government held a Food to Fork summit at number 10 in order to understand farming and highlight its importance. At that meeting the PM Rishi Sunak unveiled several incentives aimed at supporting the farming sector and stated: -

"I'm determined to build resilience, strengthen our food security and champion the best of British at home and overseas,"

As professionals in the land-based sector, it is our responsibility to ensure that we influence and exert pressure on the powers that be to do the right thing and make available adequate funding in our industry.

Funding of research, funding of education, and support where necessary for the private sector should be considered vital, with the correct and targeted support, we will be well placed to be world leaders in the inevitable tech boom which is coming soon near you.

Biosystems Engineering

Biosystems Engineering, owned by the IAgrE, and the official scientific journal of EurAgEng, is published monthly with occasional special issues.

Head to https://www.sciencedirect.com/journal/biosystems-engineering to view the full article list of the latest edition and to find out more about depth and breadth of articles accepted for publication.

Reduced subscriptions are available to IAgrE members. Go to **https://iagre.org/biosystemsinformation** for details of the preferential rates for both paper and electronic versions.

Biosystems Engineering

Volume 226, February 2023, Pages 238-251

Determining the onset of heat stress in a dairy herd based on automated behaviour recognition

Hang Shu, Jérôme Bindelle, Leifeng Guo, Xianhong Gu

Chinese Academy of Agricultural Sciences, Beijing, China

Institute of Animal Sciences, Chinese Academy of Agricultural Sciences, Beijing, China

Dairy cows have various strategies for dealing with heat stress, including a change in behaviour. The aim of this study was to propose a deep learning-based model for recognising cow behaviours and to determine critical thresholds for the onset of heat stress at the herd level. A total of 1,000 herd behaviour images taken in a free-stall pen were allocated with labels of five behaviours that are known to be influenced by the thermal environment. Three YOLOv5 machine learning architectures were trained by the transfer learning method. The results show the superiority of YOLOv5s with a mean average precision of 0.985 and an inference speed of 73 frames per second on the testing set. Further validation demonstrates excellent agreement in herd-level behavioural parameters between automated measurement and manual observation. The proposed method enables a low-cost herd-level heat stress alert without imposing any burden on dairy cows.

Biosystems Engineering

Volume 227, March 2023, Pages 52-67

Field factory for the automated harvesting of forestry tree stock

Benjamin J. McGuinness, Mike D. Duke, Kit C. Au, Hin S. Lim

University of Waikato, New Zealand

Radiata pine is the most widely grown plantation forestry species in New Zealand and is a major contributor to its economy. Most forestry tree stock is grown outdoors in prepared nursery beds. Tree stock is harvested and sorted manually in winter and on-sold to forestry companies. Harvesting consists of lifting tree stock from the ground, removing the soil from the roots, root trimming, and sorting according to a grading criteria. Harvesting needs to be automated to reduce cost, health and safety issues, and damage to tree stock. This article presents an approach to mechanise these sub-processes and integrate them into a field factory to establish an automated harvesting line where tree stock is boxed in the field. A prototype is implemented and tested at a nursery under real conditions in winter. It shows that it is feasible to increase productivity with a field factory capable of harvesting and sorting forestry tree stock in the field.

Biosystems Engineering

Volume 228, April 2023, Pages 31-48

Real-time control of high-resolution micro-jet sprayer integrated with machine vision for precision weed control

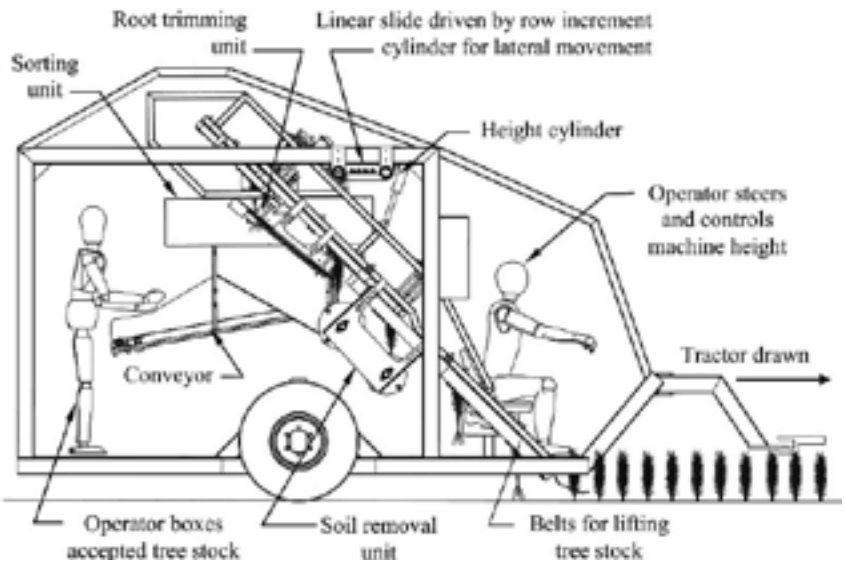
Rekha Raja, David C. Slaughter, Steven A. Fennimore, Mark C. Siemens

Department of Biological and Agricultural Engineering, University of California, Davis, CA, USA

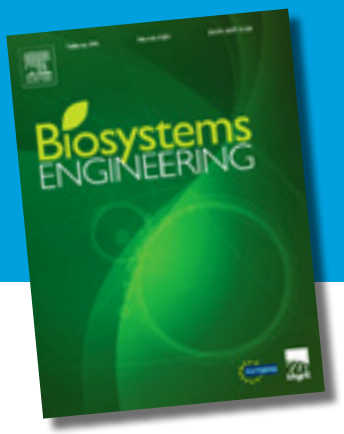
Department of Plant Sciences, University of California, Davis, CA, USA

Department of Biosystems Engineering, University of Arizona, Tucson, AZ, USA

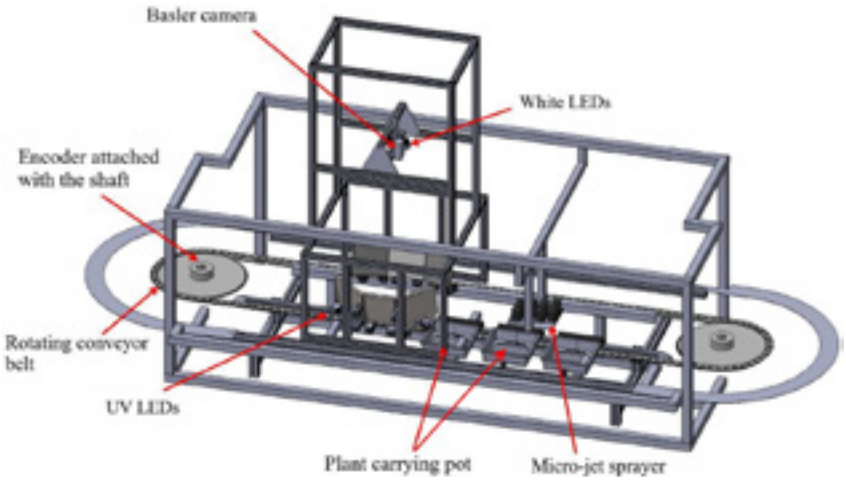
The advent of automated technology in agriculture employing robots allows researchers and engineers to automate many of the tasks in a semi-structured, natural farming environment where these tasks need to be performed. Here we



The managing editor of Biosystems Engineering, Dr Steve Parkin, has kindly summarised a selection of papers published in the past three issues, which will be of interest to IAgrE members.



propose a fast-intelligent weed control system using a crop signalling concept with machine vision and a precision micro-jet sprayer to target in-row weeds for precision herbicide application. Crop signalling is a novel technology invented to read crop plants by machine to simplify the task of differentiating vegetable crops from weeds for selective weed control in real-time. In-row weed control in vegetable crops like lettuce requires a very precise herbicide spray resolution with a fast response time. A novel, accurate, high-speed, centimetre precision spray targeting actuator system was designed and experimentally validated in synchronization with a machine vision system to spray detected weeds located between lettuce plants. The analysis of the overall performance of the system to kill weeds in indoor experimental trials is discussed and presented. Findings indicate that 98% weeds were correctly sprayed which indicates the efficacy and robustness of the proposed systems.



A word from **Peter Demeyer**, the new Editor-in-Chief

I am trained at Ghent University as a bioscience engineer (1988) with specialisation in chemistry and bioprocess technology. In 1993 I graduated as Doctor of Bioscience Engineering (Ghent University). For about 10 years I was active in laboratory management and technical quality assurance in the field of environmental research (water, soil and air quality). I operated as Technical ISO 17025 Auditor on behalf of the Belgian accreditation body BELAC and briefly held the position of professor in analytical chemistry and soil science at the Ghent University College.

In 2005 I joined ILVO (Flanders Research Institute for Agriculture, Fisheries and Food) as Environmental Technology Research Leader within the Agricultural Engineering department. Our research focusses on the characterization of environmental impacts (emissions) related to agricultural activities and the development of mitigating technologies. Applied methodologies involve combinations of both measuring and modelling approaches at different scales (practice farms, test infrastructures, scale models). My main activities in this field consisted of scientific project management (national and international) and taking up the role of PhD promotor.

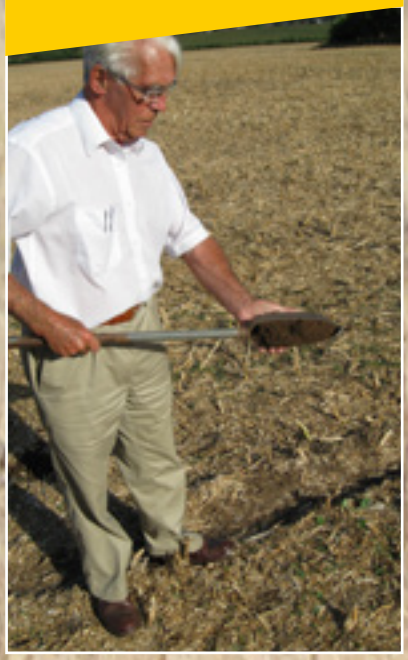
Next to my research activities, I have a yearlong experience in scientific advice for (national and international) policy makers. For 7 years I held the Chair of the Scientific Committee which advises the Flemish Minister of Environment on the certification of emission low animal housing systems. I also advise governmental bodies in The Netherlands on environmental technologies for livestock production. I was board member for Flanders in VERA (multinational collaboration for testing and verifying environmental technologies for agriculture) and external expert for ETV (European Technology Verification).

Taking up the role of Editor-in-Chief for Biosystems Engineering*, I remain active at ILVO in my (international) expert capacity and as PhD-promotor.

* Peter will be taking up the role of Editor in Chief from July.

People

Obituary



Professor Gordon Spoor, MIAgrE

Gordon Spoor sadly died on the 4th of April 2023 aged 85 at his home in Maulden, Bedfordshire. He will be widely remembered as the internationally renowned Professor of Applied Soil Physics at the National College of Agricultural Engineering (NCAE) in Silsoe, that was more recently known as Silsoe College.

Obituary - Professor Gordon Spoor, MIAgrE

Following his time at Wallsend Grammar School and practical farm experience in Northumberland, Gordon graduated with a BSc Agriculture and MSc Agricultural Engineering from King's College, University of Durham, Newcastle. His first appointment was as a Lecturer in Agricultural Engineering in the Faculty of Agriculture, University of Khartoum, Sudan where his research improved irrigation methods to permit more efficient mechanisation. Having been offered a Lectureship at the newly established NCAE, his farsighted boss in the Sudan, permitted him to break his contract early to take up the Silsoe post in 1963, as he thought that this would be of greater benefit to the world. How right he was, as the NCAE/ Silsoe College went on to train students from over 70 countries in a single year.

At Silsoe his role as a Lecturer in Soils and Soil Mechanics initially focused upon the establishment and delivery of the appropriate syllabi, and the design of the laboratory facilities. Having established these, Gordon strengthened his portfolio of

professional interests by enrolling on a 3-month Land Drainage course at Wageningen in Holland in 1967. Following this with 30 years of research on improved drainage practices led to Gordon's entry as the 20th honouree into The Ohio State University based "Drainage Hall of Fame".

Gordon developed a reputation with his students for his excellent lectures and research project supervision which built a strong programme of research in soil mechanics, cultivation techniques, compaction management, land drainage and nature conservation. This resulted in his promotions to a Reader in 1975 and Professor in 1982. The sentiments of two former students below embody the thoughts of the very many: -

While he thoroughly enjoyed his classroom and conference presentations, Gordon was probably happiest standing in a soil profile pit explaining the principles of good soil management to farmers, growers and advisers. This he did not just in the UK but worldwide, as reflected in the thoughts of a New Zealand agriculturalist and former farm machinery dealer.

"It was my pleasure and great privilege to have known Gordon for so many years, and to have been able to learn so much from him. I count myself so very fortunate. His knowledge, and the principles embodied within has never once let me down, returning to those sound principles once in a while is good practice and always does me a power of good".

Philip Wright

"What a bloody good bloke Gordon Spoor was and who better to put across the essentials of soil mechanics, kicking clods throughout the seasons with those brown "farmers" shoes of his. Several years later I found myself as Product Support Manager in Basildon for the UK Market for Ford Tractors and became the first point of contact for the tyre manufacturers, they were quite happy to talk to someone that understood the job".

Roger (Bruce) Giddings

In addition to the above Gordon undertook a number of international consultancies, for example: Water Harvesting in the Yemen, Drainage Requirements in the Yellow River area and Heilongjiang in China, Peat Reclamation in Malaysia, and Drainage Design for the Great Man-made River Project in Libya.

From the early 1990's as the UK policy pulled away from production agriculture, Gordon's skills were needed by "conservation" bodies, such as the Royal Society for the Protection of Birds, Wildlife Trusts, the Environment Agency and Natural England to assist with wetland development and improvement. This work continued well past his retirement from Silsoe College in 1999 until 2012 when he finally hung up his spade, auger and dumpy level.

In addition to his activities with the IAgrE he was active in the establishment of the International Soil Tillage Research Organisation and the International Drainage Organisation. Gordon was a member and President of the British Society of Soil Science, a founding Member of the Institute of Professional Soil Scientists and their first President. He was appointed Fellow of the Royal Agricultural Society of England and received The Award of Merit from the IAgrE for his "Outstanding Contribution to Soil Science".

Gordon frequently talked about his former students and was extremely proud of their achievements. These students forged very substantial careers in industry, academia,

"It doesn't seem real yet that Dr Soil has left us. I spent last night looking at some old Power Farming articles featuring him".

Jeremy Talbot

government, international agencies and farming - they never forgot Gordon and the impact he had on their lives and are extremely proud of their Silsoe roots. Following the closure of the "College", he took the lead, working with the property developers, to erect a plaque commemorating the work and memory of the "College" on the northern wall at the entrance to Obelisk Way on the former NCAE site.

Following the news of his death there were very many letters and emails of condolence, one that captures the sentiments of many came from a former student and colleague working in New Zealand, is given below: -
He and his wife, Kathleen, finally moved into a newly restored bungalow in Maulden a month before he died. Hence, achieving his ambition to ensure that Kathleen was best placed for the future. He is survived by Kathleen, daughters Dorothy and Suzanne, son Andrew and their families, to whom we send our sincere condolences.

Our thanks to Dick Godwin for this reflection.

In maori wisdom the tōtara tree is the king of the forest, and there is one special whakatauki (traditional saying) used when respected elders pass on.

"Kua hinga te tōtara i Te Waonui-a-Tāne." (The tōtara tree has fallen in Tāne's great forest.)

Nothing is more appropriate for Gordon.

Marc Dresser

Soil Masterclass

The Landwards podcast

A series of podcasts have been commissioned with a monthly news podcast and a monthly interview with an agricultural engineer or influential person in the land based sector. The Landwards podcast is on

iTunes, Spotify
or click on
https://www.buzzsprout.com/1067353/episodes
for the latest one.

People

Awards

The 2023 awards were kindly hosted by Amazone UK at their Doncaster headquarters

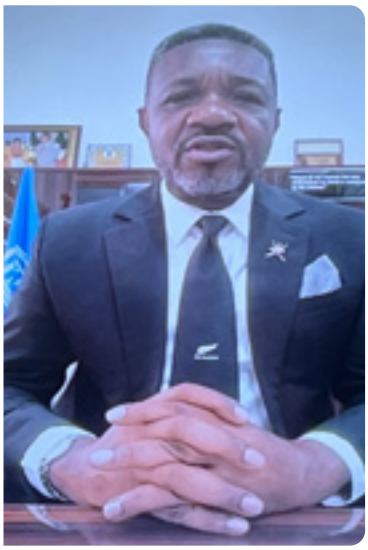
IAgrE Awards 2023

It was great for members to get together in Early May at Amazone UK's headquarters, near Doncaster to recognise and celebrate the achievements of Institution members and significant others in agricultural engineering.

The Douglas Bomford Trust Award

The Award is offered to the author or authors of a paper which, in the previous calendar year, was published in full in the Institution journals "Landwards" and/or "Biosystems Engineering". At least one of the authors must be a member of the Institution.

The winner of the Award this year, for his contribution to the paper "Exploring novel carbon footprints for improved refrigerated containers usage and a more efficient supply chain", Tarl M. Berry, Thijs Defraeye, Alemayehu Ambaw, Corné J. Coetzee, Umezuruike L. Opara, Biosystems Engineering, Volume 220, 2022, Pages 181-202, ISSN 1537-5110



Umerzuruike Linus Opara CEng FIAgrE - Linus was unable to attend the event as he lives in South Africa, but he was delighted to receive the Award and sent a video message of thanks.

The IAgrE Student Awards

IAgrE CNH Industrial Award

Made on the basis of a dissertation or thesis undertaken by an undergraduate or postgraduate student as part of their studies demonstrating innovation and practical application in the land based industry.

Undergraduate award

Jack Ball, University Centre Myerscough

For his final project "The viability of retrofitting existing agricultural machines to run on directly injected hydrogen fuel"

Postgraduate award

Philip Pinn, Harper Adams University

For his MEng thesis "Optimising Clamp Silage Compaction" Phil is pictured here receiving his award from Rob Alker of CNH Industrial, the award sponsors. Phil has arranged a visit to CNH, which is part of the prize.

IAgrE Safety Award

This award has been established to encourage and recognise innovation in safe design or operation of equipment or processes by students studying agricultural engineering or subjects related to the application of engineering and technology to the land-based sector.

Matthew Brown, University Centre Myerscough

For his undergraduate project "How do advanced driver assisted systems affect driver awareness in agriculture?" President Steve Constable presented the Award to Matthew and congratulated him on his achievement.

Student Project Award

This award is given to the best final year project submitted as part of a course leading to ND, NVQ Level 3, or similar qualification in land-based engineering.

Sadly, no student projects were submitted to the Awards Panel.

The IAgrE Team Achievement Award

This was awarded in recognition of successful teamwork and demonstrates what can be achieved through collaboration.

Wiltshire College, Lackham Campus

For their commitment to student development. Sadly no-one was able to attend on the day to receive the Award but it is hoped that the Western Branch will be able to make the presentation later this summer.

The President's Award 2023

(Formerly the Michael Dwyer Memorial Prize)

The prize is to a mid-career engineer who has made outstanding progress in the agricultural engineering industry.

The Institution is delighted to make the award again this year:

Craig Grant IEng MIAgrE

For his enthusiasm and dedication to hydraulic engineering.

The Awards Panel was delighted to recognise a long-time supporter of IAgrE, actively engaged in a quest for significant improvements in hydraulic system efficiency with huge environmental benefits.

Branch Meritorious Service Award

Made to members who have consistently rendered outstanding service to their Branch of the Institution or a Technical Group over a number of years.

Stuart Martin CEng FIAgrE - West Midlands Branch

For his enthusiasm and drive in supporting the West Midlands Branch.

As he collected his award from the President, Stuart thanked the Institution for the Award and also thanked the Secretariat for the support of the branches.

IAgrE Award For Contribution to the Land-based Sector

This Award is made to those who have made sustained contributions to the land-based sector throughout their career.

Ben Taylor-Davies - "Regen Ben"

For his immense contributions to the promotion of regenerative farming and soil health.

Ben is a true pioneer in the **'regen ag'** movement which is gaining so much interest and traction lately. His ethos is to use sound biological, peer-reviewed methods to produce crops in a way that doesn't require huge amounts of artificial input.

Ben was unable to attend the event as he was in Africa but he did send a video message and plans to collect his award in person in 2024.

The Environmental Engineer Award

A new award sponsored by the Douglas Bomford Trust for an individual who has made a substantial contribution to improving any aspect of the environment.

Mark Kibblewhite CEnv FIAgrE

For his distinguished contribution to environmental professionalism throughout his career.

The Institution was delighted to award the inaugural Environmental Engineer Award to Professor Mark Kibblewhite, in recognition of his outstanding contributions to better understanding and management of the environment.

He has held senior posts in Government (Head of Land Quality - Environment Agency), industry (Divisional Managing Director, Hyder Consulting) and as a Head of Department at Cranfield University (2002 to 2011). Mark was also a founding member of the Society for the Environment, seeking to promote professionalism in this area.

Much of Mark's work is published widely in international, peer-reviewed publications, so demonstrating his impacts within the environmental sector to a wide audience.

Mark received his Award from Richard Robinson, Trustee of the sponsor, The Douglas Bomford Trust. Mark was honoured that his work has been recognised in this way and was grateful to the IAgrE family for its friendship and support during his membership.

The IAgrE Award Of Merit

The Award of Merit is made to a person distinguished by their work in agricultural science or engineering or one that has rendered outstanding service to the Institution.

Hugh Crabtree FIAgrE

For his distinguished work on agricultural ventilation systems and for his service to the Institution.

Hugh is an internationally recognised authority on ventilation systems for pig production. He is well known and respected in the UK pig industry and has more than 40 years of commercial experience in supplying technology to farmers.

Hugh has been a member of the IAgrE since 1997, becoming a Fellow in 2001. He has served on the IAgrE Council and Executive from 2016 to 2022, always providing wise counsel and considered advice. There is little doubt that Hugh has had a distinguished and influential career in agricultural engineering and his association with IAgrE has been of substantial benefit to the Institution.

Graham Higginson IEng REnvP FIAgrE

For his outstanding service to the Institution and his dedicated support to students of agricultural engineering.

Graham is a stalwart of the Institution and a great example of a career Agricultural Engineer. This is a winning combination!

Graham is a great supporter of IAgrE. He sits on the Executive, the Membership Committee, the Professional Development Committee and represents IAgrE on various committees with SocEnv and as an EngC liaison officer. All of this is very good for the reputation of IAgrE as an open and supportive institution. He is keenly involved with the Wrekin Branch of IAgrE and has held various committee positions over the years. With his encouragement, students attend informative and development technical talks.

Graham was very happy to receive the award and thanked the Institution and his colleagues at Harper Adams for their support of his activities.

The Environmental Engineer Team Award

A new award sponsored by the Douglas Bomford Trust for a team who have made a substantial contribution to improving any aspect of the environment.

New Holland T6 Methane Tractor Team led by Alistair Walshaw

For the development of the world's first serial production methane powered tractor, using on-farm captured fugitive methane.

L-R former IAgrE President and a Trustee of the Douglas Bomford Trust Richard Robinson presents the award to Jahanara Rashid, Martyn Reynolds and Alistair Walshaw from the New Holland T6 Methane Tractor team.

Hugh Crabtree

Graham Higginson

The Honorary Fellowship Award

An Honorary Fellowship is the highest commendation awarded by the Institution. It recognises outstanding service to both the Institution and to the Agricultural Engineering Profession.

Andy Newbold CEng FIAgrE

For his outstanding service to the Institution and to the land-based Sector.

When the Institution is looking for an independent person to chair a technical discussion, lead a meeting or interview key people, then Andy Newbold is now the "go to" person. The combination of his engaging personality, experience of organizing a wide range of events, knowledge of our subject area, and the people involved in our business means that he is uniquely placed to make an enormous contribution to the work of the Institution. A contribution both within and outside the Institution that fully justifies the highest award the Institution can make of Honorary Fellow.

Andy is pictured here with IAgrE President Steve Constable. He mentioned that he was thrilled by the honour and very grateful to the IAgrE for the support and friendship it had given him throughout his career.

Profession

Continuous Professional Development

I would urge everyone to take time to complete their CPD in a timely manner.

Better late than never

Angus Lindsay reflects on his career via completing his CPD records.

My career started on arable farms in central Scotland, a rewarding couple of years doing VSO in Egypt working with the Ministry of Agriculture followed then four years on a cotton plantation in Northeast Nigeria. After this, I returned to the UK and successfully completed a master's degree in Agricultural Engineering and Mechanisation Management at Silsoe. This was 1991, and I joined the IAgrE feeling it would be the right move for my career, a period in Yemen with Massey Ferguson was curtailed by a serious road accident and in early 1994 I found myself moving to the UK grounds maintenance and landscaping sector.

A bit of departure from my intended career in agriculture but having spent time abroad I was struggling to find a suitable opening in the UK market. Taking the position as Machinery Manager with a fledgling grounds maintenance contractor was the start of nearly thirty years where I eventually reached the position of Group Head of Fleet and Assets with the UK arm of Europe's largest green services contractor.

Enrolment

In May 1996 I received a letter from Dr Michael J Dwyer the then President of the Institute, inviting me to enrol in the Continuing Professional Development Scheme, I still have the letter, folder and floppy disc that came with it. Great idea, the perfect way to document my career but unfortunately that was as far as it got, it wasn't until 27 years

Health and safety was a different matter

What CPD recording looked like in 1996

later that I got round to doing something about it.

There can always be excuses for not doing something, especially with work and personal pressures, but compiling the highs and lows of your career as it progresses is a great initiative and should be done at the time and not left to a later date, it's challenging playing catch-up. You probably won't have the detail and if you do it will be on a series of floppy discs which you can't access or in files buried in the loft whose recovery can lead to further unwelcome tasks.

A photographic memory?

Photographs were the one thing that helped me pull everything together, I took lots of images during my career and along with diaries and notebooks was able to piece together and retrieve from memory the relevant highlights; had I done this at the time it would have been considerably easier and considerably more accurate, we live and learn.

It was easier to compile with information on USB's and CD's, though on several occasions it made me step back and take stock of how much I had actually done during my time within grounds maintenance sector. Numerous articles written for industry publications and managing the largest fleet in the sector was no mean feat and deserved documentation, even if only for my own benefit.

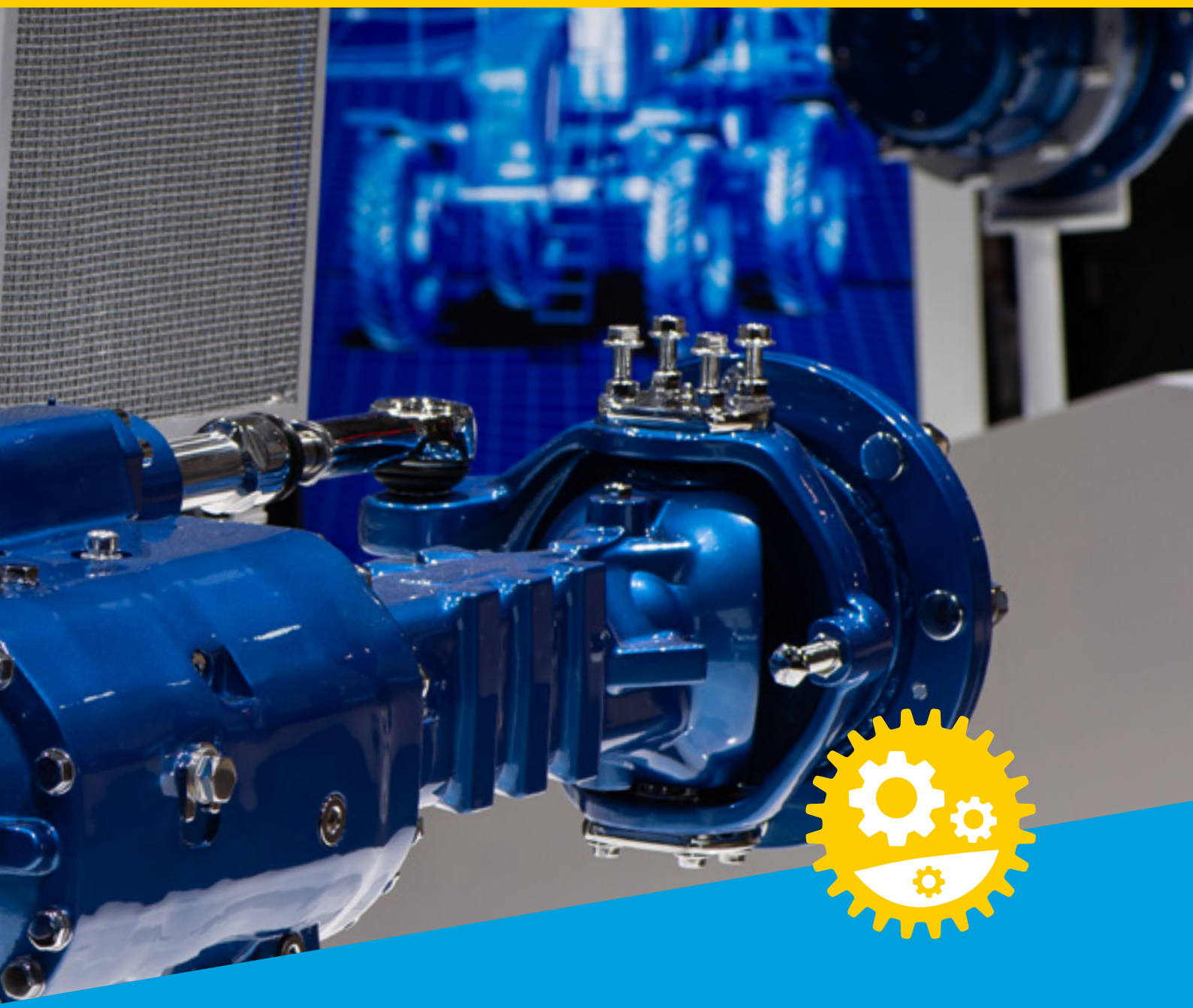
I would urge everyone to take time to complete their CPD in a timely manner, it focuses the mind and helps take stock of decisions which can shape your career and could help with future employment Most of all it gives a comprehensive record of achievements and a bit of self-esteem, which is no bad thing.

Practice

Electrifying Machinery

Electromobility in agriculture and off-highway, from hybrid to 100 percent electric drive solutions

*Electromobility is not only increasingly important on the road but also in the off-highway sector. The leading technology suppliers are consistently driving electrification with integrated system solutions. The full potential of mobile machinery and commercial vehicles will be on display from 12 to 18 November 2023 at **SYSTEMS & COMPONENTS**, which is scheduled to take place in parallel with Agritechnica.*



Electrifying drive technology is changing off highway machinery development

Innovations in drive technology for mobile machinery used to be based on diesel engines and hydrostatic drives but today's focus now lies with electrification. Looking ahead to SYSTEMS & COMPONENTS 2023, this trend towards electromobility is no longer limited to passenger cars but also plays a central role in agriculture and forestry, as well as construction and mining, further increasing the productivity of mobile machinery.

The advantages of electric drives are obvious, containing fewer moving parts and needing less frequent servicing than combustion engines, as well as offering higher efficiency, reduced emissions and increased performance.

However, the increasing size and complexity of the systems are presenting developers with a challenge. Simply electrifying the drivetrain by, for example, replacing the diesel engine with an electric motor, falls short as a potential solution. Mobile machinery, be it an excavator, a dumper truck or a tractor, is invariably equipped with hydraulic systems that, in the best case, should also be electrified. Alternatively, the diesel engine could become part of a hybrid drive or the vehicles could be equipped with battery-powered electric drives or diesel generators. Such questions have to be answered at the start of every electrification project.

Scalability from the modular system

Engineers and developers will find answers to these issues at SYSTEMS & COMPONENTS. The B2B platform

will be focused on practicable solutions for electrification that are easy to integrate and, with pioneering driving and work functions, will lead to new business models. To achieve this, the technology providers are supplying installation solutions, customisable for application, operating area and engine output. From synchromesh, powershift and stepless gearboxes with corresponding electronic control systems, up to and including rigid and steering axles, the right equipment is available for every requirement.

Modular platforms developed specifically for the off-highway sector, including not only electric motors and inverters, but also gearboxes, software and accessories as well as matching battery and hydraulic systems, will be shown. Compatible with a wide variety of designs, the performance range covers the entire spectrum from compact to heavy-duty working machines. The high voltage portfolio includes variable output motors designed to be used, for example, as generators in diesel-electric applications. With peak outputs of up to 400 kW and maximum torques of over 2,000 Nm, such motors offer the maximum possible design freedom for the electrification of new and existing vehicle architectures. Further key components, such as DC/DC converters and on-board chargers, will round off the range of products on display at the trade fair grounds.

Into the future with zero emissions

The increasing use of alternative drives in off-highway applications is also being encouraged by exhaust emission legislation. In some cases, the strict European Off-Highway Stage V and US Off-Highway Tier 4 regulations are compelling manufacturers to rethink their designs. Although exhaust emission technology is well understood, using electric drives eliminates

Komatsu's 'eDumper' is the worlds largest electric vehicle

the concern about tighter exhaust emission limits. The "eDumper" demonstrates how manufacturers are tackling this issue in a sustainable manner. Based on a Komatsu model HD 605-7, this dumper truck is not only thought to be the world's largest electric vehicle, but, according to the manufacturer, it is also fitted with the highest capacity battery (700 kWh) ever installed in a vehicle. With a payload of 65 t, the truck can transport both limestone and marlstone from the quarry area to the transport system. While moving downhill, the electric motors slow the fully-laden vehicle and feed the resulting energy into the battery. The heavier the load, the more the vehicle needs to brake and the more electricity is recuperated. The energy stored in the batteries is then used for traveling uphill without a load.

Volvo's electric conversion of a wheel loader has the same performance as its diesel counterpart

Working together

The shifting of the market towards zero emission mobile machines and vehicles with battery and fuel cell drives is not only demonstrated by proof-of-concept vehicles such as the eDumper. Above all, technology partnerships with selected OEMs are paving the way to the zero emission construction site – an approach that machine and vehicle manufacturers are pursuing in parallel with the continuous development of their own solutions, and one that is intended to enable faster market launches. Depending on the customer's requirements, diesel-powered wheel loaders, excavators or dumper trucks can be converted to electric drives.

One example of this is the L120H Electric Conversion from Volvo CE, a 20 t wheel loader offering the same performance as its diesel counterpart, but with zero exhaust emissions and near silent operation. With a battery capacity of 240 kWh, it has an operating time of around five hours in medium-duty applications and can be fully recharged within two hours.

System optimisation through electrification

Agricultural machinery manufacturers are also continuously extending their portfolio of electric machines and are transforming the industry, moving it towards a climate-neutral future. High- and low-voltage generator systems for stepless tractor gearboxes are just some of the components that will be on display at the exhibition grounds in Hanover. However electrification is not limited to the drivetrain. Hydraulic drives currently control linear actuation in agricultural machinery but electric actuators are increasingly gaining in importance. To achieve the necessary performance breakthrough for tractors and attachments, focus is increasingly shifting to modular electric drive systems with which synergies can be achieved with other applications. Increased efficiency and reduced wheel slip are some of the optimisation objectives of electrically distributed traction management.

John Deere is showing the form that this can take with eAutoPowr – a stepless gearbox that replaces hydraulic with electrical components. This gearbox with electromechanical power split is available for three tractor model series. The electrical system is powerful enough to not only supply the electric motor, but can additionally provide up to 100 kW for external consumers via 480 V variable-frequency three-phase alternating current. John Deere has developed an initial application together with the Belgian agricultural machinery supplier Joskin. In combination with a slurry tanker drive, two axles are driven electrically, and the weight of the tanker is used to transfer tractive power, leading to increased traction, less slip and better track guidance. Speeds of up to 5 kph are 100 percent electric, enabling fast and smooth changes of direction. The driver also benefits from precise speed regulation and improved acceleration behaviour.

eAutoPowr - a stepless gearbox

Find out more

Head to

AGRITECHNICA

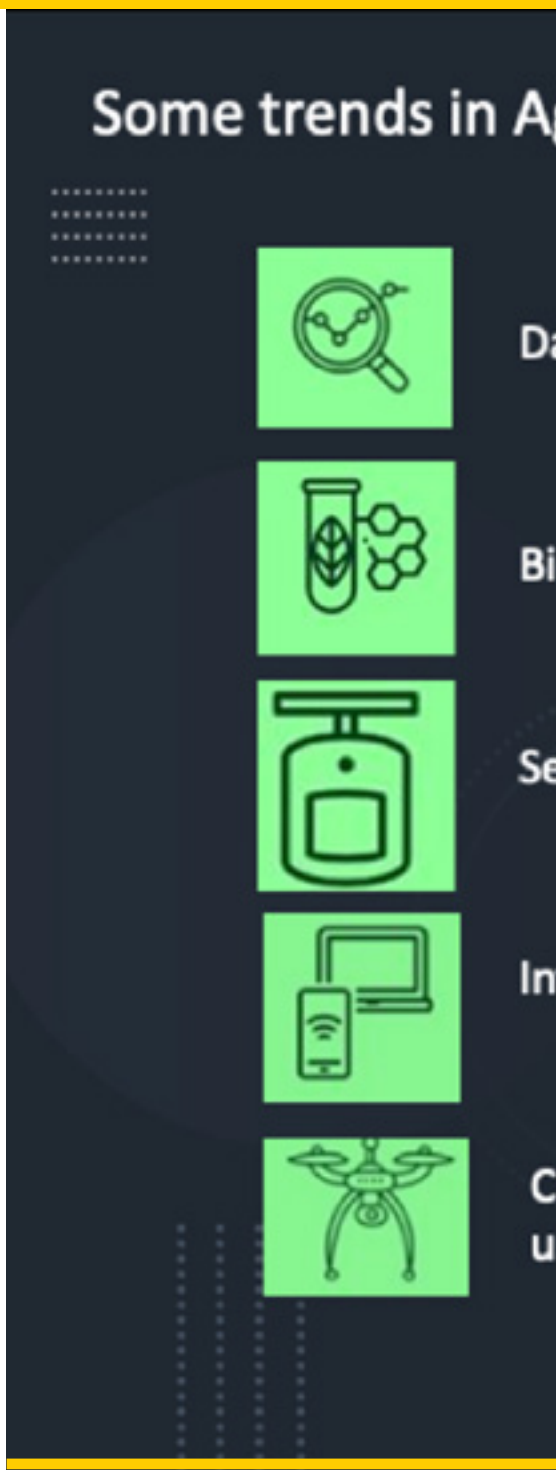
Hanover, Germany
from
12-18 November

To experience the whole world of machinery developments.

https://www.ag-ritechnica.com/en/

Profession

Melanie Gardner



The future of agricultural machinery

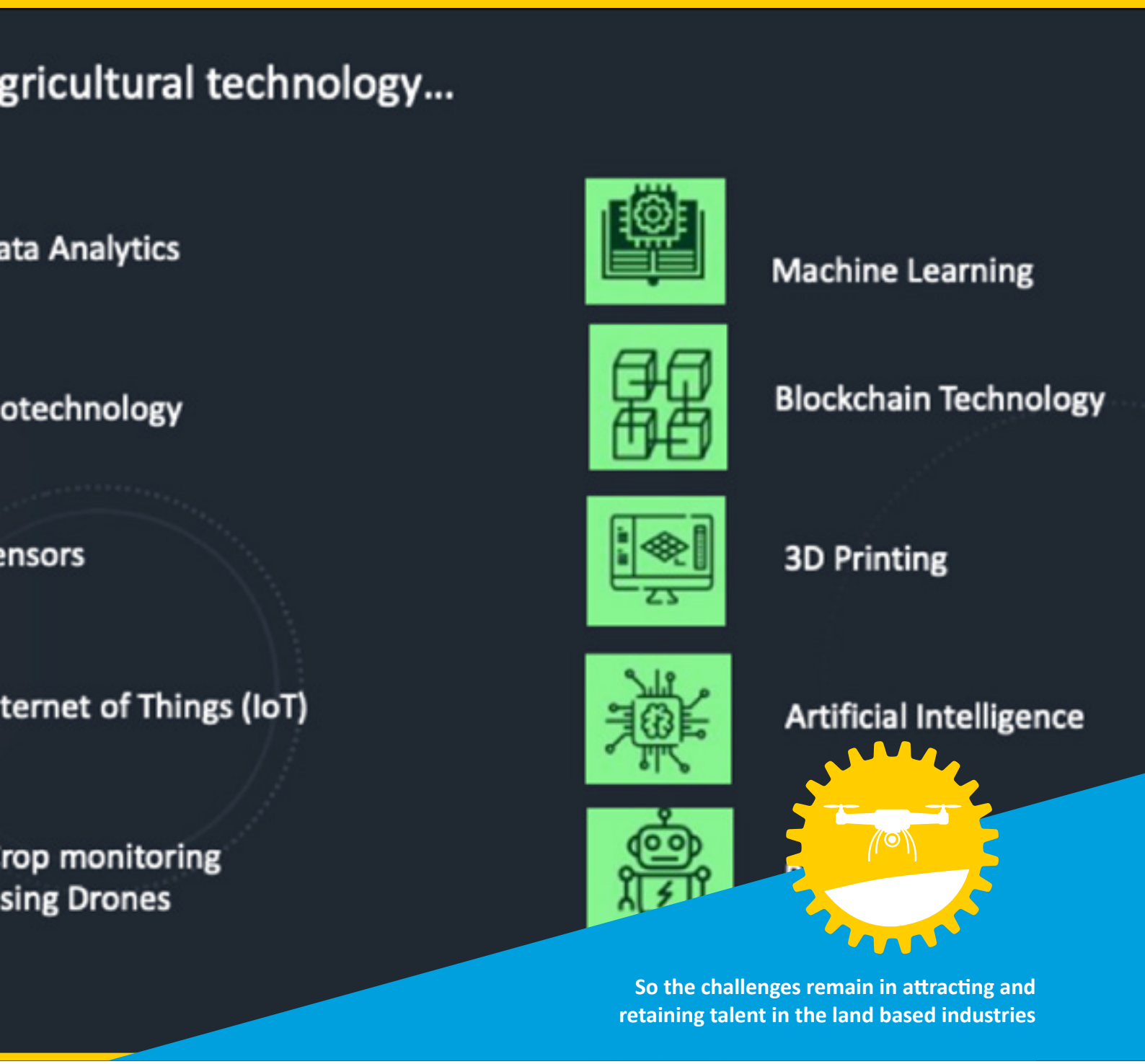
Melanie Gardner, the General Manager of Pottinger's UK operation addressed the Institutions annual awards ceremony. This is a summary of her reflection.

Recently Melanie was invited to the Austrian Embassy in London with Advantage Austria , who are the connection for Austrian owned businesses in the UK. This was an opportunity to network, discuss and learn with a whole host of interesting organisations and colleagues – the theme being "stormy waters and rays of hope!"

Once the delegates were rounded up ('by the biggest cow bell I had ever seen!") there was the opportunity to share what was and wasn't working (post pandemic).

Common challenges emerged:

- Recruiting key talent
- Supply chain disruption
- Complexity
- Increased costs



In context

Continuity – the business of agriculture carried on. Farmers kept on farming, the supply chain supported – the wheels kept turning;

Demand – the demand for consultancy, equipment and associated support in agriculture was high, majority of manufacturers reported healthy uplift in order intakes (despite the supply chain issues that followed);

Technology – organisations were quickly forced to think about technology which would enable connection/communication with employees, customers, B2B relationships – an attempt for some normality, personal touch had a certain value; a "care currency."

People – people are important. Peopled needed care, working from home, vulnerable … a different way of working.

Health – mental health and well-being really came to the fore ….

Interesting analysis showing how UK labour inactivity changed since Feb 2020… long COVID, furlough and then not returning to work.

Certain charities, even today are continuing to help the farming community to talk, reach out and be safe.

Whilst there has been a "calming down" we are still dealing with challenges namely attract/ retention, mental health and rapid increase in technologies

Help needed:

In 2050 there will be 9.8 billion people on the planet, with less arable land than ever before.

Population growth in Africa will be significant and the largest population being in India – food demand will put tremendous pressure on agriculture to develop sustainable methods of food production.

How will we cultivate more using less and define the future of farming for generations to come? Who or what will be the disrupters to our industry? How do we protect and sustain our environment for future generations?

Technology and smart farming

This continues apace, globally farming is adapting its practices to tackle climate change and population growth.

Some of the tools being used include:

- Data and machine learning;
- biotechnology - plant and animal breeding for traits to counter climate change;
- blockchain for transparent assurance across supply chains;
- sensors for real time data collection and analysis;
- 3D printing to reduce waste and locally produce spare parts;
- Internet of Things (IoT)
- Artificial Intelligence (AI)
- Drones and remote sensing
- Robotics and autonomous vehicles

But what about the people?

Whilst it is not a new discussion, there is a limited pool of talent to work with for our industry … it is not a "sexy" industry.

So the challenges remain in attracting and retaining talent in the land based industries. And, how do we do this whilst protecting mental health and wellbeing?

The future?

The good news is that there are already organisations close to home IAgrE, AEA, NSL, manufacturers addressing the need to provide information, education to support the raising of awareness about our industry to younger generations (Gen Alpha) and their guardians. We also have charities like Forces Farming recognising that there is a group of service leavers with technical capabilities which could today fulfil needs in agriculture and the automotive sectors.

Melanie is in the company of some amazing female contributors and leaders – "I have a responsibility to make sure the next generation of women are educated, encouraged and empowered to take on the challenges of meeting the world's growing food, fuel and fibre needs" she commented.

In closing Melanie urged us all to continue with gusto the conversation, collaboration and promotion to a wider, younger population now, so our industry can win the talent needed for the future.

Meet Melanie Gardner

Melanie is a former HR director for a flagship academy school, followed by working for John Deere at Langar and she now works for an Austrian owned business, Pottinger Landtechnik Gmbh. Manufacturing arable, grass and mechanical weeding farm technology to customers in 17 countries, manufacturing in 5 locations across Austria, Germany and Czech Republic. This is done with slightly over 2000 employees globally along with an enduring dealer partner network. Established in the UK in 2012 and with 12 employees.

Aberdeenshire farm grows upwards to fill a fallow time of year

A farm in the north-east of Scotland is experimenting with growing alternative crops, including nutrient-dense microgreens and vanilla, as part of its diversification to fill a fallow time of year.

The 300-acre Waterside Farm, which grows wheat, barley, rye for distilling and hemp, recently invested in a vertical farm tower to grow alternative crops throughout the year and secure income year-round for the farm. Graeme Warren, who manages the farm and the vertical farm business, Vertegrow, for owner Martin Dickie, Managing Director of Brewdog, explains:

"There's not much that grows in the north-east of Scotland outside April to October, so we were looking at ways we could diversify the business to fill the other six months of the year. With Martin's background in food and drink, we knew there was demand for fresh, local produce from the restaurant trade and local retailers. With consumers and businesses also increasingly discerning about how their food is grown and its sustainable credentials, and accustomed to buying outside seasonality, the vertical farm ticks a lot of boxes. It's like another piece of farm machinery that helps us produce good food efficiently and effectively - and to meet our own ambitions to be a carbon neutral business."

The main focus at Vertegrow has been on growing leafy and micro greens and herbs in the nine-metre tower, which was installed on the farm last Autumn following two years of experimentation in shipping containers. It was built by Scotland's Intelligent Growth Solutions (IGS), which in addition to the engineering of the vertical 'farm in a box', has an extensive team of crop scientists based alongside the James Hutton Institute in Dundee who are constantly researching the perfect 'recipe' of conditions – airflow, light, nutrients and water – for different crop types.

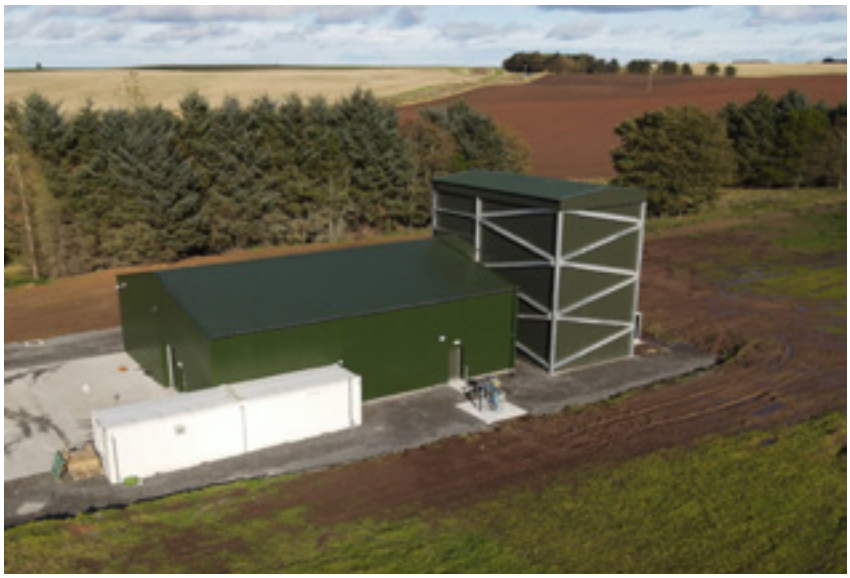
Vertegrow has just this month been awarded research funding alongside the Hutton and the Rowett Institute to work with a major retailer to improve the nutrient profile of certain plant products for the health-conscious consumer. Other trials using the IGS tech include tree saplings to meet the extraordinary demand for forestry planting, 'ripen at home' produce, and bringing on strawberry plants for Scotland's fruit growers.

With a world shortage of vanilla, Vertegrow is also currently experimenting, with the support of IGS' crop scientists, to see if it can generate 3-4 annual flowerings as opposed to the 1-2 in the crop's origin countries such as Madagascar and India.

Over 350 IGS towers are currently being built for customers across four continents. These have been commissioned to combat challenges such as land shortages in Singapore, retaining freshness and flavour of Caesar salad leaves by reducing the distance from source for New York's restaurants and water scarcity in the Middle East.

Here in the UK, IGS CEO David Farquhar cites the absence of salads on our supermarket shelves earlier this year to illustrate how by growing some produce in these controlled conditions, we could reduce our reliance on imports and give farmers greater certainty:

"Vertical farming complements, not competes with, field-scale farming. We can reduce our reliance on imports across a range of produce that we couldn't grow otherwise but also the environmental burden these incur. It also gives farmers a greater control over costs and management: it removes the weather or disease unknowns and the need for chemical inputs or fuel and uses only the energy and water needed to create the perfect conditions to maximise yields. Not only can it provide diversified income for UK farmers but the potential lies in how it could offset labour shortages, attract a different, tech-orientated demographic into agriculture and produce more food from less land, while all the time reducing the impact on the environment on a number of levels."



Technical

Simon Brown

Harvest to harvest specialist

Alongside the annual awards ceremony at Amazone in early May, delegates were treated to a guided tour of the company's British headquarters and found out more about their work.

MD Simon Brown welcomed visitors to Amazone and explained that they are 'harvest to harvest' specialists, with a long pedigree in bringing innovative solutions for farmers. Amazone's turnover exceeds 800 m Eu and they manufacture in 8 separate plants worldwide.

Amazone UK opened their doors for visitors to the Institutions Awards ceremony

The company's products focus on:

- **Soil tillage** – ploughing, min-till and scratch tillage
- **Precision sowing** – maize, beet, oilseed rape and potentially cereals
- **Fertiliser spreading** – from 24-54m, up to 60Ha/h at speeds of up to 30 km/h.
- **Spraying** – with technologies which are working towards 'per plant' application
- **Mechanical weeding**
- **Seed drilling** – with direct, min till and conventional drills, multi product application at varying rates in differing zones.
- **Groundcare equipment**

Spraying equipment is the largest contributor to the company's global turnover.

Amazones investment in AgXeed enables autonomous native machine design

Looking forward

The company has recently made a strategic investment in AgXeed, the Netherlands based autonomous technology company, to enable the development of autonomous native machinery which works straight out of the box.

Visitors were given a full tour of the recently built facilities and had the opportunity to find out more about aspects of the company's work.

Soils project

Harper Adams engineering student David Thompson has utilised the facilities at Amazone for his dissertation which was regarding the development of a variable depth cultivation system.

Using yield maps as the base to identify zones and generate a soil texture map, enabled the trial to consider different zones, uncompacted, and compacted with 2 different tractors, and then run six different cultivation regimes across each of the three zones. The regimes were No till, shallow tillage, deep tillage, extreme variable depth tillage, shallow variable depth tillage and deep variable depth tillage.

The variable depth tillage was conducted with an Amazone Cenius 3m mulch cultivator which has the ability to adjust the cultivator depth on-the-move.

David Thompson (L) and Oliver Watson (R) explain the variable depth cultivation work

Spreader tech

Whilst sprayers may hold the top slot for turnover globally within Amazone, spreaders are the largest product group by numbers sold. Amazone reckon to have a significant share of the British market. Liam McSherry, territory after sales manager for Wales & West England, was on hand to take us through the complexities of a modern fertiliser spreader.

Being able to accurately spread fertiliser in the wind has always been a challenge and Amazone has developed WindControl, which alters the application pattern to compensate, in real time for the effect of wind. The unit has a pole mounted sensor above the spreader and in response to cross winds will alter the throwing trajectory of the fertiliser to ensure an even spread.

Sprayer trends

Rupert Batho, the company's Territory Manager for the South and East talked us through the latest developments in crop spraying technology. The range runs from a 900l mounted unit with a 12m boom, through trailed models (including a monster 12000l machine) to a 4500l self-propelled sprayer with up to 45m booms.

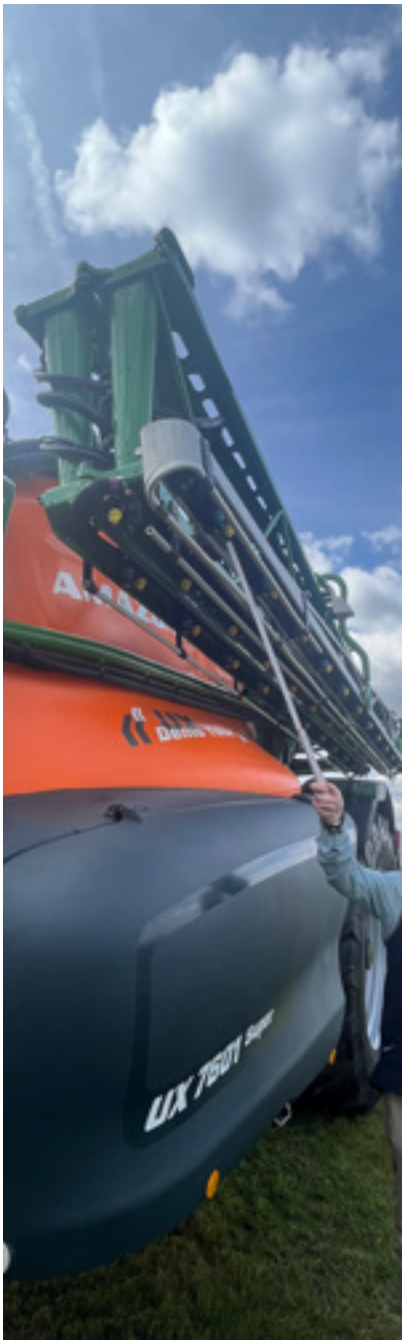
Trends are towards wider booms and larger tanks, with an increasing focus on the accurate application of active ingredients. To this end available technology includes individual nozzle control, to provide turn compensation and change flow rate to ensure even application across the full width.

AmaSelect is the name given for the company's nozzle control system, which allows on-the-go nozzle switching to maintain droplet size irrespective of forward speed changes. The system also allows individual nozzle shut off, for instance when moving on or off a headland.

Boom sensors are also available to ensure that the product is applied at the correct height for the crop, regardless of speed or ground contours.

DirectInject has just become available to enable a second crop protection product to be applied simultaneously (without being part of the tank mix). This works by injecting the chemical directly into the spray line as required. This is controlled via a button in the cab terminal.

The Institution would like to thank Simon Brown and the team from Amazone Ltd for such a fascinating and stimulating day.



Amazone

When Heinrich Dreyer founded the company “H. Dreyer Factory for Agricultural Machinery and Equipment” in Gaste near Osnabrück on May 1st 1883, he was not to know that Amazone would eventually develop into one of the leading global manufacturers of agricultural machinery.

His family-owned company has been offering innovative products to farmers for 140 years now.

In 1883, the founder, Heinrich Dreyer, initially started with the production of a grain cleaning machine and soon realised: ‘We must go out into the world’. The first grain cleaning machines were sold to Valparaiso in Chile as early as 1906, thus forming the foundation for the strong export market enjoyed today by the Amazone Group.

Heinrich Dreyer’s sons, grandsons, and great-grandsons have set significant milestones along the way, for product development and have continued the success story up to the present day. It was in the sixties, in particular, that the ZA mounted twin disc fertiliser spreader and the legendary D4 seed drill developed into genuine best-sellers.

The production facilities need to be expanded, and this led to the creation of the first branch, the factory in Hude near Oldenburg, which, in 2009, was expanded to become the Hude-Altmoorhausen facility aimed at the production of modern high-performance seeding systems. With their entry into the field of soil tillage, Amazone was the first manufacturer to develop PTO-driven equipment for working in combination with its seed drills. In addition, since 1998, passive soil tillage machinery has been brought onto the market with its subsidiary, BBG in Leipzig.

The Amazone takeover of the plough manufacturer, Vogel & Noot, in Mosonmagyaróvár, Hungary in 2016 markedly expanded both its soil tillage range and manufacturing capacity. To supplement the factories in Gaste and Leeden, a new production facility in Bramsche, to the North of Osnabrück, was opened in 2018.

Schmotzer Hacktechnik, a company with its roots in mechanical weeding systems and with its headquarters in Bad Windsheim, has been part of the group since 2019. This represented an important step in the expansion within the field of crop protection.

These days, the core competences of Amazone are the active and passive soil tillage ranges, seed drills and precision seeders, fertiliser spreaders and crop protection sprayers. An additional mainstay is the production of groundcare machinery for parks and lawn maintenance along with winter road gritting, located in the facility in Forbach/France.

40 years in the UK.

Since its inauguration in 1983, Amazone Ltd has been pioneering arable technology.

GB managing Director Simon Brown said “The shape of the machines over those 40 years has certainly changed when we considered the ZA-U 1001 twin disc spreader and D7/30 EC-N conventional drill in combination with the REV 30 reciprocating harrow as the state-of-the-art products at that time.”

“Nowadays we have the 15 metre wide Condor 15001-C direct tine seeder, the ZA-TS spreaders capable of spreading up to 54m, work rates up to 60 ha/h and with spread pattern accuracy monitored by radar along with wind speed and direction catered for during spreading. Spraying moves rapidly towards plant by plant application with the realisation of spot spraying and DirectInject.”

Membership Matters

Northern Ireland Branch

The New Holland methane tractor and farm biogas production in Northern Ireland

Report by Terence Chambers

Branch members and guests recently enjoyed presentations at The Agri-Food & Biosciences Institute (AFBI) Hillsborough on both the biogas production research there and the commercial development story of the world's first methane powered tractor from New Holland.

Dr Gary Lyons , AFBI described the features and performance of their Anaerobic Digestion plant. It was initially set up in 2008 to process slurry from the dairy herd and now includes the co-digestion of 7,000 cubic metres of slurry with 1,000 tonnes of grass silage each year. Co-digesting 20t of slurry with 1.5t silage doubled biogas production to 216kWh per tonne of input.

Slurry is pumped from a reception pit to the 650 cubic metre insulated digester tank which is heated to 39^{0}C. The process produces 600-1,000 cubic metres of biogas / day which is scrubbed through a carbon column to remove excess hydrogen sulphide before collection in a bulk gas-holder vessel.

The gas is then used to fuel a 95 kW CHP "Combined Heat and Power" electricity generator unit. The electricity is used on the site complex and heat from the engine's cooling system is directed to maintain digester temperature and provide heat for the site's buildings district heating system. A biogas boiler site is used to provide heat when the CHP is not operational. Records kept for the first 7 years of operation confirm that the AD plant used 43,000 t of slurry, 1,400 t of grass silage and 40 t of concentrates to produce 1,200,000 m³ of biogas, 1,100,000 kWh of electricity (worth around £1 m in ROC payments and purchase offsets at present values), 3,600,000 kWh of heat and 43.000 t of fibrous digestate. The latter is a valuable retained source of plant nutrients, for return to the land, with the advantages of the plant available N fraction being increased by around 20% and a reduction in the slurry pathogenic organisms.

New Holland's T6.180 methane tractor in action at Tillage-Live last year

Operational updates to improve performance during that time have included the installation of a higher capacity macerator and small recirculating mixer to prevent fibre crusting. A recent plant overhaul involved sludge removal from the base of the digestion tanks and installation of a Landia Gas Mix system on the main digester. Output is now around 1,000m³/day.

The plant's main income is via the "ROC" (Renewable Obligation Certificates official scheme which encourages and rewards energy production from renewable sources) payments and is about 11 times greater than its costs of service and maintenance. However, there are additional costs of managing the feedstock and digestate, plant service, maintenance and waste management fees.

Fortunately AFBI have a further

8.5 years to run on the ROC scheme and the plant is expected to maintain its reliable ongoing service-life for more than 10 years.

Methane example

Potential future options for the AFBI plant include supplying electricity to the grid, supporting green hydrogen gas production, trading carbon credits or providing fuel for farm vehicles such as the methane powered tractor. To power a tractor the gas would need to be cleaned / concentrated to contain at least 83% methane and held at a specified pressure in a special storage tank. The AFBI example of 1000 m³ of biogas /day could produce, after on-site energy demands, 424 m³ of refined methane fuel to power the T6.180 tractor for 15 hours at maximum working capacity. There are also some commercially run AD plants in Northern Ireland now producing methane, from various sources of organic feedstock, which can be further refined and compressed for use as fuel for vehicle engines.

Mr Brian Magee, Northern Ireland Area Sales Manager for Case New Holland (CNH) was joined by his colleague Mr George Mills (based in SE England.) Their joint presentation described how their company's commitment to its Clean Energy Leader Strategy has led to production of the world's first 100 % methane powered tractor. This implements CNH's policy of introducing their "energy-circle" concept where harvested field crops (and other farm "waste" products) feed an anaerobic digester to produce biomethane. When processed this subsequently powers the tractors used to do the field work, in establishing and harvesting the next crop, to provide the feedstock for continuing biomethane production fuelling the tractors again for the next crop.

Development of the methane powered tractor

From 2006 CNH started with biodiesel in the process of trying alternative fuel options.

A hydrogen fuel-cell powered tractor prototype was produced and tested in 2009. A methane-powered version of the popular T6 series tractor was first shown in 2013 at its Basildon development base where both the T6 and T7 New Holland tractor ranges are built for export to 120 countries. By 2017 the NH T6.180's methane-powered version was chosen to start production, from 2022, as the world's first commercially available methane-powered tractor. Its engine is a re-engineered version of the current diesel 6.7 litre 6 cylinder FPT unit with a special cylinder head, to facilitate gas injection to the individual cylinders, and spark plug ignition. The air / fuel mixture is precisely controlled and there is an air to air turbo intercooler to increase efficiency. Drive-by engine noise is reduced by 5 dBA which is a reduction of more than 50%. Noise in the cab is also reduced to under 70 dBA.

A cleaner exhaust

The exhaust gas passes through a maintenance-free 3-way catalyst without the need for exhaust gas recirculation or SCR treatment. By comparison with the diesel version, exhaust pollution is further reduced:- particulates by 98% , non-methane hydrocarbons by 90%, carbon monoxide by 75%, carbon dioxide by 11% and nitrogen oxides by 62%.

Engine power (145 / 175 hp boost) and Torque (740 Nm) is equivalent to that of the current T6.180 diesel version. At current fuel prices, running cost is reduced by up to 30%.

CNH Industrial is a sister company to the manufacturers of both FPT engines and IVECO trucks. Their methane powered HGVs are now in common use with long distance hauliers across Europe. FPT have more than 20 year's experience of supplying around 50,000 natural gas engines to a range of world industries.

On-farm testing

The methane powered T6.180 tractor has now been test-driven on farms across the UK and globally. All the usual working features are unchanged and operators have reported their satisfaction in using it.

A new era

In terms of cleaning exhaust gas emissions, reduction of reliance on imported fossil fuels, utilisation of eco-friendly on-farm energy generation and the commercial availability of the world's first methane powered tractor marks a welcome significant new era in how the agriculture industry can apply science and engineering to improve the environment.

The detailed question and answer session, which followed, reflected the knowledge, enthusiasm and commitment of the presenters. We thank them all for making it such an inspiring, enjoyable meeting and AFBI for the use of their venue.

Northern Ireland Branch

Branch visit to SlurryKat, Co Armagh

Report by Terence Chambers

The tour was led by Jonathan Hassin (Operations Manager) and Michael Crozier (Design Engineer). They covered many aspects from Computer Aided Design of innovative products through the use of up to date technology and quality materials to manufacturing of the now well known range of SlurryKat machinery.

Company history

From the 1990's Company founder Garth Cairns began his farm contract business providing local farms with silage harvesting and slurry spreading services. This experience, coupled with his own design and fabrication skills, led to acquisition of

the SlurryKat brand which, by 2007, had commenced manufacturing equipment for the umbilical slurry spreading system. Since then SlurryKat has developed its own new designs and innovative concepts with special emphasis on the safe, efficient and environmentally friendly utilisation of farm slurry. Cairns Contracting continues to provide its services to local farmers. This is an effective way to evaluate machine performances in local conditions and to stimulate new ideas for production. SlurryKat's own agricultural, land adjacent to the factory site, has high-volume slurry storage facilities and is used for machine research and development.

The range

SlurryKat machinery product range now includes umbilical pumping and spreading (dribble bar, trailing shoe, soil injection and aeration) systems. Hose reel management equipment, high capacity pumps, lagoon mixers, tank mixing agitator pumps, mobile buffer tanks and tankers. Tanker sizes range from 7,000 to 25,000 l and offer a wide range of specialist options for both transport and spreading.

SlurryKat also manufacture a range of trailers including tippers for grain / silage, flatbeds, low-loaders, dumpers and general purpose types. There is also a range of handling implements for tractors / telehandlers / loaders including buckets / shear grabs and brushes.

The main emphasis for our tour was on the manufacturing of the tankers and field slurry spreading systems.

SlurryKat proudly states its aim to be "The world's leading slurry handling equipment manufacturer" and are active registered members of the ISO 9001 Quality Management System which applies to both its manufacturing processes and company management style.

The designs for all their machines are held on Computer Aided Design systems. They are part of the up to date technology system directing the choice, use and processing of the materials. For bespoke designs, such as the tankers, the system keeps a specific record of the details of each customer order through the production process and for ongoing warranty and spare part identification purposes.

A manual is prepared for each machine and accompanies it through from design to completion.

We saw how the sheet components, of chosen specification, are precision cut using a fibre-laser cutter before being folded into the required shapes.

In 2021, SlurryKat installed its own liquid nitrogen gas generator. The technique supports clean precise metal cutting and replaces the need to bring in oxygen.

Following the tour of the impressive modern facilities IAgrE Branch Chairman Ken Gardiner thanked both Jonathan and Michael for sharing all their information so effectively and wished them, and all at SlurryKat, continuing success.

Note: due to available space both Northern Ireland reports have been heavily edited.

The full versions are available on the IAgrE website at :

https://iagre.org/northern-ireland-branch-reports

West Midlands Branch

NSTS puts nozzles and vanes under the workshop spotlight.

Mike Whiting reports.

Lackham College's workshop heater was cranked up for an evening's education from Ian Forman, Manager for the National Sprayer testing Scheme (NSTS). With both a powerpoint presentation and a new Amazone UX6200 trailed sprayer on show, Ian set about this talk.

Mandatory testing of all pesticide application equipment (PAE) was introduced in the UK in 2016. This is covered by legislation in the form of the Sustainable Use Directive (SUD) and NSTS is the delegated body to provide PAE testing in the UK and Northern Ireland. Most assurance schemes require annual testing of sprayers, but the legal requirements are covered by wider timescales.

Agricultural sprayers make up the highest proportion of machines which face the check list. Although the amenity, leisure, airport, and


AMAZONE

NSTS – Facts and figures		
Number of machines tested annually (2022)	16,000	
First test within five years Retest every three years	Boom sprayers over metres Train and aircraft sprayers Air blast sprayers	
First test within five years Retest every six years	Booms 3 metres and under Weed wipers Seed treating equipment Slug pellet applicators Micro-granular applicators	
Trends on machine boom width	24m	Typical boom width in 2013
	36m	Noticeable increase to this width from 2021
Percentage of sprayer tests recording zero faults following NSTS assessment	48%	2008
	55%	2022 (An indication of the move to newer machines under the control of professional operators)
Most common fault in sprayers assessed by NSTS: 2022	Leaks in drip control valve (DCV)	
ISO 16122	Agricultural and forestry machinery – Inspection of sprayers in use. Part 1 - General	

sports sectors all operate machines which come within scope for assessment. These are areas which Ian is keen to engage with further to ensure chemical applications remain safe and efficient. The specialist market of fruit sprayers totals approximately 1000 machines per annum.

There are currently 280 test centres which support 700 qualified examiners with a high proportion based in the eastern side of the country. To become certified with NSTS interested parties are given full training and are then required to achieve a Level three City and Guilds qualification. Test equipment needs to be purchased and once approved, examiners are re-assessed by Ian's team once every five years. The NSTS schedules annual meeting programmes for their examiners during the early winter covering all aspects of testing and current best practice.

Getting down to the detail of testing criteria the inspection consists of 50 test items. The machine is assessed with clean water and must have all physical guarding in place. The checklist is based on the International Standard ISO 16122, which is also applied in principle by our European colleagues. Although the NSTS does stipulate some additional requirements such as physical labelling on all actuator taps.

A robust control measure given the potential for operators to operate different machine specifications. Pressure gauges must be calibrated, with Ian recommending the system is exposed to five bar to check for leaks. This is typically 40% above that required in the field. Nozzle outputs deviating by more than 10% of their rated output requires the full set to be changed. Regular blight spray applications for potatoes are reported to accelerate nozzle wear. Fore and aft measurements of the boom need to be within tolerance ensuring a 32 m width isn't reduced to 31.5 m. In addition to achieving a consistent height of 50 cm above the application zone. Images within the presentation illustrated clogging

of filters, the result from lack of agitation within the tank and poor operator maintenance.

Ian gave us some insight into the financial implications of the test on the growers cropping budget. The cost of one tank refill for a high-capacity towed sprayer could be £3K or above. In addition, Syngenta report that product specification is typically only 45% of the agrochemical's efficiency at plant level. Meaning there is a significant reliance upon the accuracy and consistency of the application process. Although fertiliser nozzles don't require mandatory testing it seems counter-productive to not include them with the assessor's schedule.

All test data collated by the NSTS is submitted to DEFRA for review and consideration when updating guidance and legislation.
The NSTS also provide another important service with fertiliser spreading testing. The exponential rise in cost of this 'granular gold' from £250 / t to £850 / t has focused attention on accurate placement. Trays capture broadcasted fertiliser to determine the coefficient of variation (C of V) which ideally needs to be below 10%.

The implications of 20% C of V result in striping and subsequent yield and quality loss. 'Unseen' effects include loss of combining efficiency with modern threshing mechanisms selecting a mid-point setting to cope with constant variations in throughput.

The NSTS is actively promoting this sector of their business, with environmental factors having a big influence. Wildflowers which are established to meet the requirements for greening payments require soils with low nutrient values. Headland runs need to create an 'invisible curtain' to keep fertiliser within the target area. Ian referred to the high specification of new machines which can monitor wind speed and adjust angles to compensate accordingly. Although there's no substitute for getting out the toolbox and maintaining discs, vanes, and agitators. In addition to a thorough clean down and greasing before uncoupling from the tractor and parking in the shed.

The students and western branch members thoroughly enjoyed the evenings presentation which concluded with Ian's 'walk round' of the machine on display. As to the future, Ian was asked about how increased levels of automation will influence this sector. His response was that robotic systems will inevitably reduce physical size, although the focus on safety and efficiency will remain in the spotlight. Particularly with the ongoing discussions regarding drone spraying. We look forward to following the NSTS's continued role and influence within the industry.

About the National Sprayer Testing Scheme

The NSTS provide testing for all types of pesticide Application Equipment (PAE) and fertiliser spreaders. The scheme was introduced in 2003 following the introduction of a voluntary scheme set up in 1997 by the Agricultural Engineers Association (AEA) and today tests more than 20,000 machines annually.

Within agriculture all pesticide application equipment applying professional plant protection products must be tested. The requirements are contained in the Plant Protection Products (Sustainable Use) Regulations 2012 - Sustainable Use Directive **(SUD)**

NOTE: Scottish Quality Crops (SQC). From 1st August 2022 SQC require all sprayers that are more than 1 year old and a boom width over 3m must be tested annually.

Red Tractor Crops and Fresh Produce Schemes

Currently require annual testing of boom sprayers over 3 m and micro-granular applicators applying nematicides. All other machines use the time-scales as set out in the SUD.

Red Tractor Livestock Schemes

Require all application equipment to be tested using the SUD time-scales, annual testing is not required.

https://www.nsts.org.uk

Membership Changes

1/02/23 to 30/04/23

Admissions

Fellow

Member

Professor Kenneth Sloan (Wrekin)
Mr Mike Seaman (East Anglia)
Mr Ryan Dixon (Yorkshire)
Mr Alastair Wilson (Scotland)

Associate Member

Affiliate

Mr Francis Towers (Southern)
Dr Trisha Toop (Wrekin)
Mr Phillip Baxter (East Midlands)
Mr Peter Gallagher (Northern Ireland)

Technician

Student

Cranfield University

Arjun Babu
Nikolaos Toumasis
Nagulash Bharathi
Temitope Yumi-Owojori
Lois Maren
Odera Uzodinma
Priyanka Bhavsar
Pooja Padmanabhan

CAFRE

Cahal Moss
Ben Woods
Matthew Young
Luke Brown
Feidhelm Magee
Matthew Rogers
Thomas McDonnell
Adam Kennedy
Jonathon McMullan
Cormac Nugent
Henry Kernohan
Conleth McCallion
Sam Kirk
Ronan McPeake
Deane McCoy
Luke Magee
Daniel Farrell
Patrick Boylan
Kieron Dalzell
Evan Thompson
Scott Hanna
James Henning
Charlie Stewart

Harper Adams University

Alexander Pearson
Josie Allsop
Josh Clack
Soloman Sequeira
Arthur Bates
Samuel Rushent
James Trumper
Toby Boyling
Abigayle Wilkes
Oliver Robertson
Archie Maclean
Spencer Watson

The Open University

Oliver Wilcox

University of Lincoln

Temitope Lateef
Olanrewaju Osadola
Ayodele Olatimetin
Esther Olayinka
Oladapo Odetayo
Karthikeyan Manivasakan

Coleg Sir Gar

Kayne Wilson
Sion Davies
Alex Lewis
Owen Davies
Rhys Sexton
Dafydd James
Scott Pope
Osian Davies
Carwyn Harris
Nathan Phillips
Cai Jones
John Woolgar
Dion Davies
Deiniol Lewis
Ifan Wheeler

Hartpury College

Finley Wootton

Plumpton College

Fergus Bruce
Jessica Hastings
Jamie Stevens
Rob Hutchison
Oliver Bodman
Oliver Thomas
Jack Childs
Anna Stanford-Taylor
Johnny Newman
Oscar Jones
Finlay Clarke
Callum Martin
Piers Baldock
Adam Denness

Suffolk New College

William Russell

University of Bristol

Swapnil Mane

Readmission

Affiliate

Member

Deaths

We have recently learned of the death of the following members and we send our condolences to their family and friends:

Mr Ian D T Walker-Munro, IEng MIAgrE

A member of the Institution for 46 years. Mr Walker-Munro joined as an Associate Member in 1977. He then transferred to Member grade in April 1978 and went on to gain his Incorporated Engineer registration with the Institution in June 1978.

Professor Gordon Spoor, MIAgrE

A member of the Institution for over 60 years. Professor Spoor joined as an Associate Member in 1961 and went on to transfer to Member grade in 1969.

Mr Ronald J Roberts, IEng MIAgrE

A member of the Institution for over 60 years. Mr Roberts joined as a student member in 1959, then transferred to Associate Member grade in 1961. He moved to Member grade in 1969 and went on to gain his Incorporated Engineer registration with the Institution in 1973. Mr Roberts also served on the IAgrE Membership Committee for a number of years.

Transfers

Fellow

Member

Mr Damian Kilshaw (Belgium)

Associate Member

Mr Ieuan Evans (Yorkshire)
Mr Gareth Goodchild (South East Midlands)

ENGINEERING COUNCIL

Registrations

CEng

Mr Ray King (Western)

Long Service Certificates

	Name	Grade	Date of Anniversary
50 years	John Charles Lewis Welwood	MIAgrE	4 April 2023
	Robert Booth	MIAgrE	4 April 2023
	Paul Robert Brooks	MIAgrE	4 April 2023
	Stephen John Hasell	MIAgrE	4 April 2023
	David Hugh Charles Spratt	MIAgrE	17 May 2023
	Keith Howard Shelbourne	FIAgrE	17 May 2023
35 years	Alan Drake	MIAgrE	21 April 2023
	Alistair Lance Richard House	MIAgrE	21 April 2023
	David Alan Cotterell	MIAgrE	28 April 2023
25 years	Brendan Joseph Jackson	MIAgrE	15 April 2023
	Michael McKee	MIAgrE	15 April 2023
	Alexander David Brawn	MIAgrE	11 May 2023
	Stephen Hill Mends Aikins	AIAgrE	22 May 2023
	Andrew N M Bolton	AMIAgrE	1 June 2023
	Ian Henry James Cromie	MIAgrE	1 June 2023
	Thomas Charles Kindred	AMIAgrE	4 June 2023

Academic members

Askham Bryan College
Askham Bryan, York, YO23 3FR

Berkshire College of Agriculture
Hall Place, Burchetts Green, Maidenhead, Berks, SL6 6QR

Bishop Burton College
York Road, Bishop Burton, Beverley, HU17 8QG

Brooksby Melton College
Asfordby Road, Melton Mowbray, Leics, LE13 0HJ

City College Norwich
Easton, Norwich, Norfolk, NR9 5DX

Coleg Cambria – Llysfasi
Rhuthin, Sir Ddinbych, LL15 2LB

Coleg sir Gar
Gelli Aur Campus, Llandeilo, Carmarthenshire, SA32 8NJ

Cranfield University
Cranfield, Bedfordshire, MK43 0AL

Duchy College
Stoke Climsland, Callington, Cornwall, PL17 8PB

Greenmount College
CAFRE, 22 Greenmount Road, Antrim, Northern Ireland, BT41 4PU

Harper Adams University
Newport, Shropshire, TF10 8NB

Hartpury College and University
Gloucester, GL19 3BE

Lincoln Institute of Agri-Food
Technology, Lincoln University, Lincoln, LN6 7TS

Manchester University
School of Electrical and Electronic Engineering, C39, Sackville Street Building, Sackville Street, Manchester, M1 3WE

Munster Technological University
Tralee Clash, Tralee, Co Kerry, Ireland

Myerscough College
Bilsbarrow, Preston, Lancashire, PR3 0RY

Newcastle University
King's Gate, Newcastle Upon Tyne, NE1 7RU

Plumpton College
Ditchling Road, Lewes, East Sussex, BN7 3AE

Reaseheath College
Reaseheath, Nantwich, Cheshire, CW5 6DF

Royal Agricultural University
Cirencester, Gloucester, GL7 6JS

Salesian Agricultural College
Pallaskenry, Co Limerick, Ireland

Sparsholt College
Sparsholt, Winchester, SO21 2NF

SRUC – Auchincruive
Auchincruive Estate, Ayr, KA6 5HW

Suffolk New College
Suffolk Rural Campus, Charity Lane, Otley, Suffolk, IP6 9EY

University of Manitoba
Winnipeg, Canada, MB R3T 2N2

Warwickshire College Group
Warwick New Road, Leamington Spa, CV32 5JE

Wiltshire College Lackham
Lacock, Chippenham, Wiltshire, SN15 2NY

Writtle University College
Lordship Road ,Writtle, Chelmsford, Essex, CM1 3RR

Commercial Members

Ace Aquatec Ltd
16B City Quay, Camperdown Street, Dundee, DD1 3JA

Agri-EPI Centre
Easter Bush, Roslin, EH25 9RG

Agricultural Engineers Association (AEA)
Samuelson House, 62 Forder Way, Hampton, Peterborough, PE7 8JB

AGCO Ltd
Stoneleigh, Abbey Park, Kenilworth, Warwickshire, CV8 2TQ

Alvan Blanch Development Co
Chelworth, Malmesbury, Wiltshire, SN16 9SG

Amazone Ltd
Orchard Farm, Hurst Lane, Aukley, Doncaster, South Yorks, DN9 3NW

Autoguide Equipment Ltd
Stockley Road, Hedington, Calne, Wiltshire, SN11 0PS

BAGMA
225 Bristol Road, Birmingham, B5 7UB

Case New Holland
Cranes Farm Road, Basildon, Essex SS14 3AD

City and Guilds
1 Giltspur Street, London, EC1A 9DD

City Farm Systems Ltd
25 Hepplewhite Close, High Wycombe, Bucks, HP13 6BZ

Claas UK Ltd
Saxham, Bury St Edmonds, Suffolk, IP28 6QZ

David Ritchie (Implements) Ltd
Carseview Road, Suttieside, Forfar, Angus, DD8 3EE

Douglas Bomford Trust
The Bullock Building, University Way, Cranfield, Bedford, MK34 0GH

DSL Systems
Adbolton Hall, Adbolton Lane, West Bridgford, Nottingham, NG2 5AS

Fullwood
Grange Road, Ellesmere, Cheshire, SY12 9DF

Household Sprayers
Roughton Moor, Woodhall Spa, Lincs, LN10 6YQ

HSS Hire
Building 2, Think Park, Mosley Road, Manchester M17 1FQ

John Deere Ltd
Harby Road, Langar, Nottinghamshire, NG13 9HT

Knight Farm Machinery
Wireless Hill Industrial Estate, South Luffenham, Rutland, Leicestershire, LE15 8NF

Magna Specialist Confectioners Ltd
Magna House, Stafford Park 3, Telford, Shropshire, TF3 3BH

Marks & Clerk LLP
90 Long Acre, London, WC2E 9RA

Mastenbroek Ltd
83 Swineshead Road, Boston, Lincs, PE21 7JG

Merlo UK Ltd
The Paddocks, Headlands Business Park, Salisbury Road, Ringwood, Hampshire BH24 3PB

National Fluid Power Centre
Turner Road, Worksop, Notts, S81 7AE

NFU Energy Services
Stoneleigh Park, Kenilworth, Warwickshire, CV8 2LS

Nick Young Tractor Parts
Unit 2, The Forge, Moor Road, North Owersby, Market Rasen, Lincolnshire, LN8 3PR

Ploeger UK Ltd
Holt Road, Fakenham, Norfolk, NR21 8JH

Reesink UK Limited
1-3 Station Road, St Neots, Huntingdon, PE19 1QF

Shelbourne Reynolds
Shepherds Grove Ind Estate, Stanton, Bury St Edmunds, Suffolk, IP31 2AR

Spaldings Limited
25-35 Sadler Road, Lincoln, Lincolnshire, LN6 3XJ

Spraying Systems Ltd
Headley House, Headley Road, Hindhead, Surrey, GU26 6UK

Teagle Ltd
Blackwater,Truro, Cornwall, TR4 8HQ

Witham Oil and Paint Ltd
Outer Circle Road, Lincoln, LN10 6YQ

Professional

The Douglas Bomford Trust

Awarding is rewarding…

Secretary Alan Plom reports on recent events supported by the Douglas Bomford Trust:

As indicated elsewhere in this issue of Landwards, we are in 'Presentation Season'. The Douglas Bomford Trust (DBT) sponsors several prizes and scholarships each year, not least those presented at the recent IAgrE Awards Day.

In addition to our long-standing prize for 'Best Paper' in an IAgrE journal - presented this year to Linus Opara for his contribution to a paper published in Biosystems Engineering on "Exploring novel carbon footprints for improved refrigerated containers usage and a more efficient supply chain" - the Trust instigated two new awards to promote 'environmental engineering'.

The inaugural Environmental Engineer Award was presented to Prof Mark Kibblewhite, by Trustee Richard Robinson recognising his "distinguished contribution to environmental professionalism throughout his career". Mark also helped the Trust make effective use of our resources and was a much-valued mentor to those involved in soil and environment-related projects during his six years as a Trustee. The first Environmental Engineer Team Award (for a "substantial contribution to improving any aspect of the environment") was received by the CNH Methane Tractor Team.

Scholarships

The Trust's latest crop of scholarship winners at Harper Adams were also presented with their certificates by Trustee Richard Robinson. Congratulations to Pavel Dundin, Anna Schoemecker, Max Finch and Rhodri Williams

Rhodri - a second-time DBT Scholar who also received a Claas scholarship and placement in Germany in 2020/21 - gave a heartfelt 'Thank You' speech on behalf of all 136 HAU students who received a total of 160 scholarships between them this year.

These included a number of other aspiring agricultural engineers being supported by other organisations, including the David Lawson Trust (awarded to previous DBT Scholar, Eric Murray); JCB (Eric again!), and 'our' Max Finch who also received another scholarship from The Alamo Group.

We enjoyed chatting to several other previous DBT scholars and lecturers, and it is always rewarding to hear their ideas and personal aspirations. The Trust is keen to continue to maintain contact and mentor recipients into their future careers. As Richard said in his presentation speech: "Douglas (Bomford) would have been delighted to meet such an excellent group of students, who will push our trade forwards".

Rhodri has since endorsed this view (in a LinkedIn post): "The support from both these scholarships allows me the opportunities I take every day, and allow me to grow my knowledge and strive for excellence in both personal and educational life. Definitely helping me on my journey to professional and personal development."

'Tis also the time for new Strategies….

The poster behind the HAU Scholars' group photo proclaims: "Together we will make a difference" – the title of the new Strategy for HAU to 2030 and beyond, announced by Vice-Chancellor Prof Ken Sloan, prior to the Scholarship presentations. This was very different to traditional 'launches', with excellent local food served 'al fresco' while guests were 'serenaded' by Harper's resident 'covers' band. [Particularly enjoyed by DBT Secretary 'Al Plom', who plays the drums as well as drumming up support for the Trust!]

Coincidentally, promoting collaboration is a key theme in DBT's new Strategy and stakeholders will be invited to a workshop later this year to discuss how we can encourage working in partnership and information sharing.

Congratulations to Pavel Dundin, Anna Schoemecker, Max Finch and Rhodri Williams, Front L-R with trustees rear L-R Alan Plom, Richard Robinson and David White.

The DOUGLAS BOMFORD Trust
SUPPORTING AGRICULTURAL ENGINEERING

For further information, see the Trust's website:

www.dbt.org.uk

or contact the Secretary Alan Plom via:

enquiries@dbt.org.uk

You can also follow:

@BomfordTrust

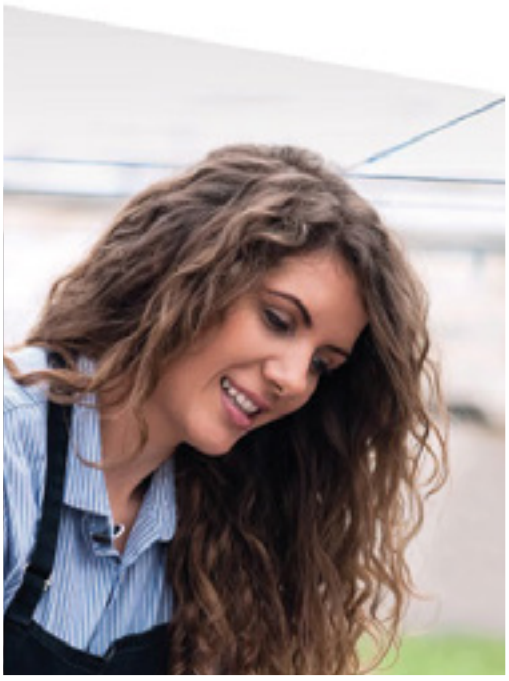
on Twitter and on LinkedIn, for news of interesting events, opportunities, or developments.

The Institution of Agricultural Engineers

Do you employ technicians and engineers?

Have you considered professional membership and registration for your employees?

This not only supports their personal development, but also demonstrates your professionalism as a business.



How do my employees join?

It couldn't be easier, visit **www.iagre.org/why-join-iagre** or contact Alison Chapman at **membership@iagre.org** or call us on**01234 750876** and we'll happily guide you.