

Landwards ^{@IAgrE}

The professional journal for the Institution of Agricultural Engineers

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information



In this issue...

- People: Technicians of the year
- Engineering honey
- So you think you know about trailer braking?
- The future of the internal combustion engine
- Membership matters



AGRICULTURE



HORTICULTURE



FORESTRY



ENVIRONMENT



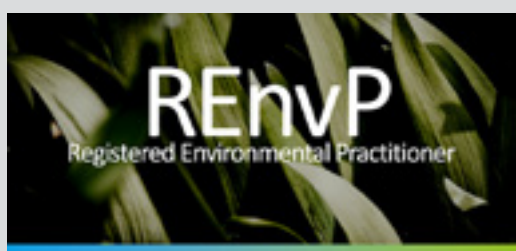
AMENITY

"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

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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).

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w: www.iagre.org

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



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Editor's Welcome



The last quarter has been busy for the Institution, and this edition of Landwards is all the richer as a result.

Let's start with some long overdue celebrations. Like buses, no IAgRE award ceremonies in 2020, and then not one but two award ceremonies on one day at the end of April! Albeit still virtual, but a great opportunity

to recognise some of the unsung talent supporting the profession and the Institution often behind the scenes. It was a lovely way to acknowledge excellence and be a part of the wider agricultural engineering 'family'.

If you have already flicked through this edition and think you have missed the awards write up, it's with the magazine as a standalone Awards Extra publication, as the winners are worth shouting about. Congratulations one and all.

"May you live in interesting times" is an oft-quoted Chinese curse (it's worth googling the origins of the saying, you may be surprised) and we do live in interesting times. Agricultural engineers are adept at rising to challenges and thrive with complex problems, so Alastair Tulloch's discussion piece in Practice p16 on the future of the internal combustion engine is timely, to say the least.

The editor spends too much time contemplating the future/ looking out of the window/procrastinating (delete as appropriate). On the horizon p12 delves a little deeper into some of the more interesting perspectives showing potential directions of travel for agricultural engineering.

Looking ahead, this year's conference promises to be one not to miss. A range of speakers will look at alternative fuels and how agricultural engineering is rising to the challenges of moving away from carbon-based energy. See the back cover for more details and dates.

I wish you well for the summer. I hope that you will find stimulation and food for thought in these pages to help your agricultural engineering journey.

Andy Newbold

Editor
andy@farm-smart.co.uk

Agricultural Engineering Institution (IAgRE) maintains professional status

The Engineering Council (EC) has renewed IAgRE's professional licences for a further five years.

The EC licence is granted to Professional Engineering Institutions to authorise them to assess applicants for inclusion on the Engineering Council's register of professional engineers and technicians. The licence gives IAgRE the authority to assess the competence and commitment of candidates for registration as chartered engineer, incorporated engineer and engineering technicians to qualified members.

The Society for the Environment has also renewed IAgRE's licence for five years.

IAgRE is a founder constituent body of the Society for the Environment (SocEnv), an umbrella body for environmental professionals. It was

formed to provide an internationally recognised professional qualification for environmental practitioners (CEnv) and IAgRE is able to offer the award to suitably qualified and experienced members. The Society also recently launched a new qualification Registered Environmental Practitioner which will provide more individuals with the opportunity to gain professional registration and achieve external verification of their competence.

To qualify for renewal IAgRE was re-assessed by the EC and SocEnv to ensure continuing compliance and that the correct procedures are in place to continually monitor the professional development and conduct of registrants.

From the beginning of this year the IAgRE has experienced a large increase in members applying for professional registration.

"IAgRE offers professional recognition to an extraordinarily wide range of people working in the application of science, engineering and technology to the land, whether it is for food or industrial production, amenity or environmental stewardship," said Charlie Nicklin, IAgRE CEO.



Changes to membership grades

At IAgrE we constantly review our membership procedures and practices to ensure the offering remains relevant and of a high standard. Therefore, we have decided to simplify the process.

Member (MIagrE) grade is for individuals who have developed a level of knowledge, understanding and experience and are an established practitioner with more than five years experience (typically but not exclusively) in agricultural engineering, land-based industries, and associated environmental and science subjects.



Associate Member (AMIAgrE) grade is now only open to those who have recently qualified and are not yet established in their careers. This grade will retain the existing fees scale to reflect the costs involved for those recently qualified. After five years, Associate Members will automatically be upgraded to Member grade.

If you are an existing Associate Member you have the option to upgrade to Member grade providing you have completed five or more years in a relevant career. However, if you prefer, you can remain as an Associate Member for as long as you wish.

With the exception of Honorary Fellow, all grades are open to applicants, and you may want to think about reviewing your current grade of membership against our guidance notes. For example, Members who have considerable and sustained responsibility may wish to apply for Fellow grade.

For more information please see guidance note:

G1 - Guide to IAgrE Membership Grades and Qualifying Criteria - <https://iagre.org/upload/1614857701.pdf> or contact Alison by email membership@iagre.org for more details.

CSCS cards

Members of IAgrE qualify for the Construction Skills Certification Scheme (CSCS) Professionally Qualified Person (PQP) card which certifies that the holder is a qualified member of an approved professional body, and has the skills and knowledge required to work on a construction site without special supervision, even if they are not typically based on the site.

Click here for more info:

<https://iagre.org/cscs-cards>





John Deere to open new apprentice training centre

John Deere and training provider ProVQ have announced plans to open a brand new Apprentice Training Centre this autumn, at a farm site in Upper Saxondale near Bingham in Nottinghamshire. This will mark the 30th anniversary of the company's first Ag Tech apprentice intake, who were enrolled at original partner Brooksby Melton College in 1992.

Designed specifically and solely for John Deere dealer apprentices attending the company's award winning Ag Tech, Turf Tech and Parts Tech training programmes, the first John Deere Apprentice Training Centre was established at Radcliffe-on-Trent five years ago. These premises have now been

outgrown, due to the programmes' success and increasing dealer demand.

The Ag, Turf and Parts Tech apprenticeships focus on developing the knowledge, skills and behaviour required for dealer personnel in the future. Each year group trains at the centre for up to eight weeks a year in four blocks of two weeks. Some of this time is spent at John Deere's Langar HQ when working with the largest equipment and the latest technologies.

Training partnership

John Deere appointed ProVQ Limited in summer 2015 as its new business partner to deliver the apprentice

training programmes on behalf of its dealers in the UK & Ireland. Since that time, the partnership's strength has allowed the programmes to develop and grow to meet the needs and expectations of a modern John Deere dealership. The current full-time ProVQ staff will continue to be managed by James Haslam at the new Apprentice Training Centre from the autumn.

ProVQ started its apprentice training programmes in 2005, and went on to develop a full range of national services including apprentice recruitment, training, vocational assessment and qualifications. Today the company trains over 600 apprentices and many hundreds of adult learners on



technical, parts and customer service programmes.

“We are really looking forward to establishing this new bespoke facility close to our UK headquarters at Langar,” said John Deere Limited training centre manager Allan Cochran. “Our joint investment in the expanded Apprentice Training Centre will be in the region of £1.5 million. This will allow us to continue our growth and achieve our ambition to attract more young talent into

successful careers in land-based engineering through the John Deere agricultural, turf and forestry dealer network.

“As our dealership businesses continue to expand, there is increasing demand for qualified technicians equipped with the correct knowledge and skills to support that growth. We have therefore recognised the need to increase the capacity of our already successful, and industry leading, training programmes even further.

Double capacity

“The new site will feature a purpose-built two-storey unit in addition to refurbished and extended farm buildings, effectively almost doubling our available square footage. The premises will include a bigger workshop space as well as larger classroom and cafeteria facilities.

“Most importantly, this will give us the capability to double our throughput of trained technicians to meet dealer demand. ProVQ will maintain its current staffing levels and continue to provide the full suite of apprentice technician training programmes at the new premises.”

From the CEO's desk ...



Well, summers on its way, I think. It does just feel like spring has only just managed it! A very dry spell followed by a wet, cold one is making things a little difficult for farmers.

Maize is poking out of the ground and there is plenty of grass being cut, so the signs are good. Seeing the maize emerge in perfectly neat rows, with zero headland overlap, really heightens how embedded precision agriculture has become, and will continue to be going forward.

An exciting time

I read with interest that a minority stake in the Dutch ag robot firm AgXeed has been acquired by Claas. This is possibly the first of the large traditional OEM commercial ventures into autonomous broadacre farming, that's going to come to fruition. As outdoor events and exhibitions start to open up it will be interesting to see what's on display from the technology

providers and manufacturers. For young people there couldn't be a more exciting time to get involved in agricultural engineering, interesting times ahead for our future engineers and technicians.

Covid is still well and truly with us, who'd have thought that back in early 2020? The UK is doing well with the vaccine and that seems the main way out for us. It's great to see things opening up. Many colleges and universities have had students back in, at what is a very important time of year for them with exams and assessments. I've continued with presentations to students, it's nice to see classrooms with people in again. Adversely, India is in a terrible state, I have many past colleagues out in Delhi and Pune and I've heard first-hand from them how desperate the situation is and its effect on families.

Institution matters

On an operational level IAgRE held its AGM and caught up the delays from last year. Additionally, it was great to meet up with people at some of the branch AGMs earlier this year. During April we received formal notification from the Engineering Council that we had passed our inspection and our licence has been renewed for another five years to grant professional registration. For those of you that have been thinking about it, now's the time to get yourself registered as a professional engineer.

"We continue to have a full line-up of speakers for our popular Lunchtime Lectures, so please make sure you are receiving our eNews and do follow us on social media to take full advantage of what's on offer."

We at last held our awards evening, albeit by Zoom, which encompassed two years' worth of awards. The evening went really well, it was great to see lots of smiling faces and celebrate the fantastic achievements people have made in our industry. We hope you enjoy the Awards supplement enclosed with this edition of Landwards, which contains many interesting citations of our award winners, highlighting the depth and breadth of our industry.

Some members have taken part in the Royal Academy of Engineering (RAEng) Policy Fellowship discussions, which is a great way to assist those advising government to develop better evidence-based policy going forward. Being part of a professional institution is a key way of getting our industry's voice heard. Through the RAEng National Engineering Policy Centre we are connected to government and its policymakers.

And finally, I thought I had better practice what I preach. I applied for Fellow and was thrilled to be accepted, I guess I should have done this years ago! Additionally, we've had a great take-up from those who have been Associate Members for many years, to upgrade to Member grade. I'm sure plenty of you reading this could do the same. If you know people who are very senior and experienced in their career, give them a nudge to apply. It's a great way to highlight people in the industry as well as the achievements and contributions they continue to make.

Presidents Musings

Paul Hemingway



As I write this in late May the sky seems to be lifting both from the point of view of the weather and the prospects for a return to whatever a 'normal' life may look like going forward.

The farmers will be pleased to see the back of a very dry April and then a very cold and wet May – not great growing conditions for any crops. With the season running probably two to three weeks behind what is normal for this time of year there are very busy times ahead for both dairy and arable sectors.

Award winners

The IAgRE AGM and Awards evening have been successfully held in the 'virtual space' and received wide applause. My thanks go out to the Secretariat team who worked so hard to pull the meetings together and enable them to run so smoothly'. I was very impressed by the coverage that our Awards received on social media following the event. It is clear that this type of recognition is much appreciated by award recipients and my congratulations go out to each and every one of them.

Of course, IAgRE does not have the monopoly of awards in our sector. I was particularly interested to read

recently of the awards made to trainee service technicians by the Land-Based Engineering Training and Education Committee (LE-TEC). This year, of the top three technicians recognised places one and two went to girls working as service technicians for ag machinery dealers: Laura Bassnet from Ernest Doe Ltd and Lauren Savage from Lister Wilder Ltd. What struck me particularly was the fact that neither came from agricultural backgrounds but they both speak positively about the diversity and challenges of their jobs. They are also very complimentary about the support they receive from their employers. Chris Laidler who works in product support for CNH Agriculture was also recognised. All three winners exhibited real enthusiasm for their chosen careers and have recorded short videos which are available to view on the LE-TEC website:

www.landbasedengineering.com

If you know of any young people interested in pursuing this type of

career please point them towards these videos.

Lunchtime lectures

The IAgRE Lunchtime Lecture series is continuing to receive good attendance. Thanks to Craig Grant and Andy Scarlett for their recent talks, video recordings of which are available on the IAgRE website. It is planned to continue these talks on a monthly basis for the foreseeable future.

The machinery trade seems to be pretty buoyant at the moment with manufacturers and dealers having very healthy order books for tractors and other capital equipment. This seems to be proving difficult for some manufacturers to fulfil due to parts supply issues of various sorts. Component sourcing from Asia, particularly India, will be challenging due to the ongoing Covid crisis there. It is a reminder to us all that whilst we are seeing blue sky ahead in the UK much of the rest of the world is very far from this situation.

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 201, January 2021, Pages 11-22

Cooling of ambient-loaded citrus in refrigerated containers: What impacts do packaging and loading temperature have?

T.M.Berry, T.Defraeye, W.Wu, M.G.Sibiya, J.North, P.J.R.Cronje

Citrus Research International, Nelspruit, South Africa

Stellenbosch University, Stellenbosch, South Africa

Swiss Federal Laboratories for Materials Science and Technology, St. Gallen, Switzerland

Tennessee State University, Nashville, TN, USA

Perishable Product Control Board, Durban, South Africa

South Africa is the second-largest exporter of fresh citrus fruit. Rising production quantities and increasingly more stringent phytosanitary requirements have placed considerable pressure on the logistics chain and the availability of precooling facilities. One solution to this challenge has been the application of ambient loading when using high-cube refrigerated containers, whereby fruit are cooled in-transit during shipping, instead of on-site by precooling. This study explored the effect of two package designs and the benefits of first partially

precooling fruit prior to loading in shipping containers. Performance parameters were evaluated based on cooling rate and cooling uniformity of fruit within the spatial domain of the container. Containers loaded with Supervent and Opentop cartons had a mean cooling period (from initial to 4°C) of 2.0 and 1.6 d, respectively. However, the study identified a high variability in cooling rate between and within individual containers. This work highlights the complex thermodynamic processes within fully loaded refrigerated containers, which should be characterised in future research.

Biosystems Engineering

Volume 202, February 2021, Pages 152-164

Wind tunnel investigation of the ability of drift-reducing nozzles to provide mitigation measures for bystander exposure to pesticides

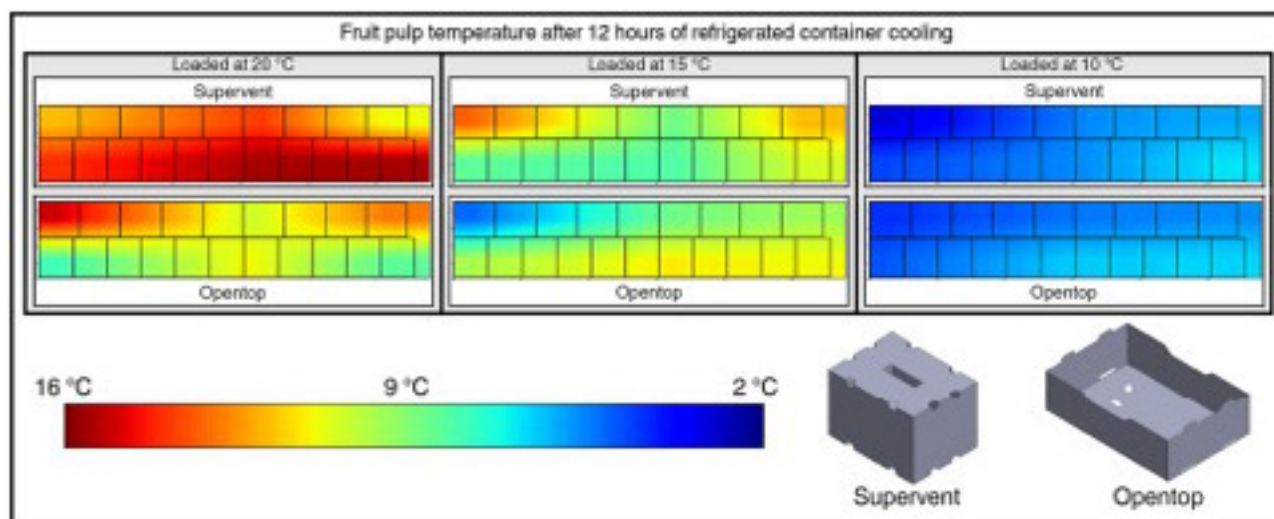
M. Clare Butler Ellis, Andrew G.Lane, Christine M.O'Sullivan, Steven Jones

Silsoe Spray Applications Unit, Wrest Park, Silsoe, Bedford, UK

Syngenta Crop Protection, Bracknell, Berkshire, UK

Models developed for assessing the potential exposure of residents and bystanders to pesticides through spray drift have highlighted the need for mitigation strategies to reduce exposure

of members of the public. Drift-reducing equipment is readily available in many countries and is accepted as mitigation for the exposure of surface water to drifting pesticide sprays but there is concern that the drift-reduction measurement methods used to define the exposure of surface water might not be relevant to bystanders. Airborne spray is an important component in bystander exposure. Two wind tunnel experiments were undertaken to evaluate whether reductions in airborne spray are as great as the reductions in measured spray drift that occur using protocols designed to classify nozzles for protecting surface water. Results, with nozzles and pressures with a range of nominal drift reduction, and three different spray liquid types, suggested very strongly that the nominal drift reduction of a nozzle/pressure combination will give at least the same level of reduction in airborne spray for distances 3–5m downwind. These data should be considered in the context of field data and model simulations in order to establish robust mitigation measures for regulatory exposure assessment.



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

Biosystems Engineering

Volume 203, March 2021, Pages 55-59
Research Note:

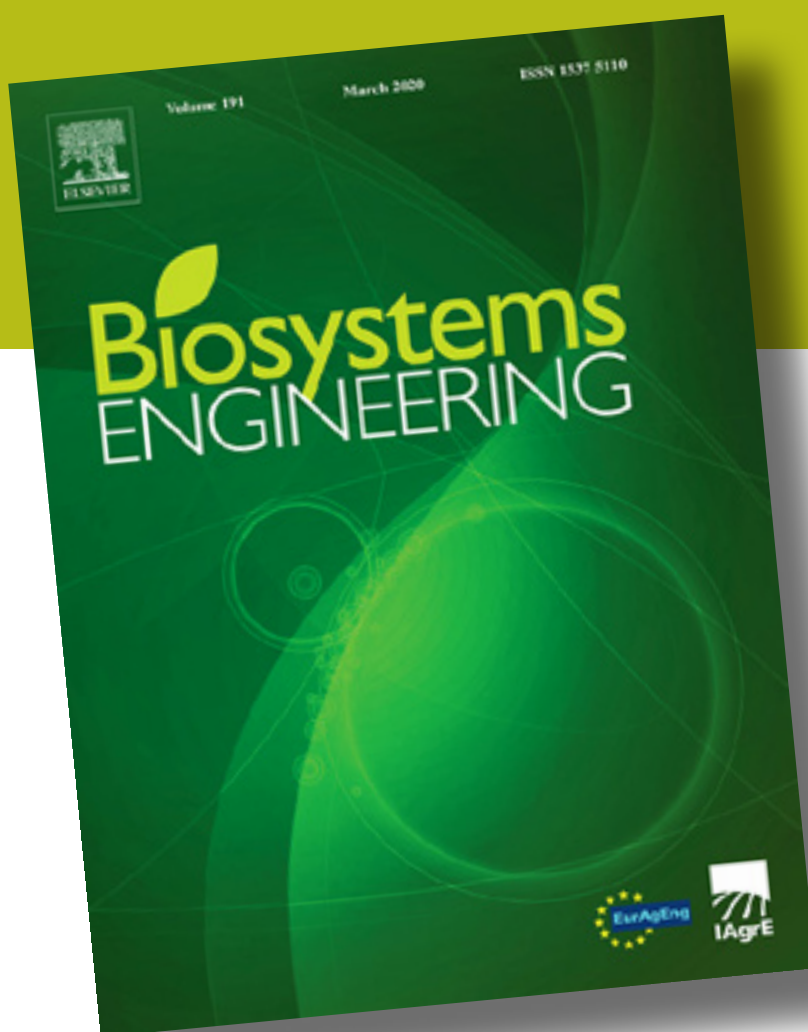
Evaluation of parameters to characterise germination-competent mature somatic embryos of Norway spruce (*Picea abies*)

Kim-Cuong Le, Aruna B. Weerasekara,
Sonali S. Ranade, E-M Ulrika Egertsdotter

Umeå Plant Science Centre (UPSC),
Swedish University of Agricultural
Science, Sweden

School of Mechanical Engineering, Georgia
Institute of Technology, Atlanta, GA, USA

Somatic embryogenesis (SE) is an in vitro clonal propagation method increasingly in use for large scale clonal propagation of conifer plants. However, asynchronous development of immature somatic embryos into mature embryos lowers the yield of plants and limits the benefits for industrial applications. Through the development of an automated harvesting system (SE Fluidics system) for singulation, imaging and selection of mature embryos at the correct developmental stages, yields can be improved. Image analysis software developed for use with the SE Fluidics system has been utilised to characterize and sort mature embryos according to their morphological measurements related to developmental capacity. Here a set of imaging data from the SE Fluidics system has been analysed with the goal of further refining the selection criteria for germination-competent mature embryos.



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 for the latest one click on:

<https://www.buzzsprout.com/1067353/episodes>



The Engineering Horizon



On the horizon

Landwards takes a look at some of the latest technology to meet future sustainability challenges.

Autonomous ag company gets mainstream backer

Claas has entered into a cooperative venture with Dutch start-up AgXeed B.V. and acquired a minority shareholding in the company's international funding round as a mark of its commitment.

The aim is to cooperate on the development and commercialisation of autonomous agricultural machines.

The farming industry must increase productivity in the decades ahead to meet the needs of a growing global population. At the same time, the number of people employed in the

industry, measured in terms of land area, continues to decline, while skilled labour is increasingly difficult to find in some regions and farmers still work longer hours than many other sectors. The agricultural machinery industry has come up with various solutions to address these challenges, ranging from



The aim is for this autonomous field robot with diesel-electric drive, wheels or crawler tracks, up to 156hp and standard three-point linkage to assist farmers with a wide range of tasks in future.

operator assistance and machine optimisation systems to precision farming technologies, and even autonomous machines in different size and performance classes. For Claas, collaborating with and investing in AgXeed marks a logical step towards future-proof technologies.

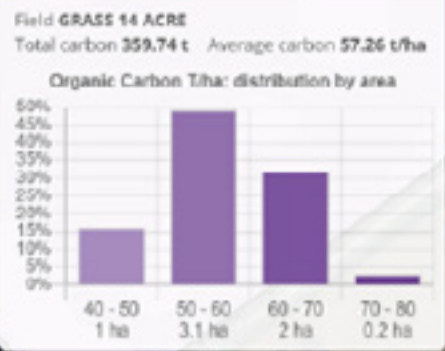
Scalable technology and advanced peripherals

Netherlands-based AgXeed offers a smart, sustainable and fully autonomous system with scalable hardware, virtual planning tools and

extensive data models, making it one of Europe's leading companies in this sector today. To this end, AgXeed will be bringing its autonomous AgBot to fields, pastures and specialty crops alongside a full suite of vehicle peripherals. "Our involvement provides Claas with access to innovative technologies in a familiar market segment and complements our own expertise in autonomy and robotics," explains Thomas Böck, CEO of the Claas Group. "In turn, AgXeed benefits from our extensive expertise and networks in many areas such as data transfer, interfaces and

drivetrain solutions. It's a win-win situation in our view, and one reason why we decided to invest in this start-up company, as well as the fact that the targeted AgXeed technologies are in an advanced state of development. This solution offers farmers and contractors concrete economic added value. What's more, it will soon be available."

The Engineering Horizon





Carbon mapping service launched

Hutchinsons launched Terramap Carbon the first ever carbon mapping service to provide the most accurate baseline measurement of both organic and active carbon in the soil and is now available to UK farmers.

Despite growers coming under increasing pressure to look at their carbon footprint in response to the NFU's commitment for UK farming to achieve carbon net zero by 2040 – until now there has been no accurate means of measuring carbon in the soil. Unless you can measure carbon there is no way it can be managed.

In light of these challenges, Hutchinsons has been investing heavily in developing services and technologies that can be utilised at farm level to allow growers to

work towards these goals. The development of Terramap Carbon is a unique development that reflects this approach.

TerraMap uses gamma-ray detection technology that delivers resolutions of over 800 points/ha and measures naturally emitted isotopes, like caesium and potassium, that are very stable due to long half-lives.

The infield process of collecting the data is carried out in two simple steps; scanning by driving a lightweight all-terrain vehicle fitted with the sensor over a field. Then taking soil samples to allow each scan to be used to create the individual map layers. This means that there are very few limitations to when TerraMap can be used.

Farm invests in UK's first field-scale robot weeder

Suffolk-based Home Farm Nacton has purchased one of the UK's first commercially sold robot tractors, primarily for working in conventional and organic vegetable crops.

A broad range of cropping which includes a large number of row-grown vegetables and roots, plus both organic and conventional production systems, creates a significant need for repetitive inter-row weeding operations and a high demand for labour at Suffolk-based Nacton Farms. With this in mind, the business has purchased one of the UK's first autonomous tractors.

The importer is Autonomous Agri Solutions (AAS), a company formed recently by two Harper Adams engineering graduates, who provide support and back-up. The machine is autonomously controlled with 2.5cm repeatable accuracy by RTK GPS via an onboard computer terminal, to which is sent a pre-programmed planned field route map. Power comes courtesy of two conventional Kubota 75hp diesel engines. Whilst the unit on the left side provides the drive to the hydrostatic wheel motors and powers the hydraulics, the right-hand engine drives the PTO.

With each engine having a 110-litre fuel tank, capacity is claimed to be sufficient for approximately 24 hours of continuous operation.

"It can be in operation day and night without needing a change of driver, or driver fatigue, so it gives us a broader window of opportunity during potentially short windows of weather suited to weeding. By moving surface soil in the early stage of weed growth with guaranteed precision, we catch weeds early before they can affect the crop, making multiple, frequent passes where necessary," said Andrew Williams farm director.

In operation on the farm since mid-April, the Robotti 150D's work to date has centred around inter-row weeding a number of different vegetable crops using a Schmotzer tine weeder.

According to Agointelli, the Danish manufacturers of the Robotti, this is one of 50 robots which will be working in Europe by the end of the year. "As an example of the planning needed for a field task, it took approximately 10 minutes to map a 1.6ha (4ac) field at Home Farm, and a further 10 minutes to log the weeding plan into the system," explains Frederik Rom, Agointelli sales manager.

"Field obstacles such as telegraph poles or trees are logged at the programming stage. Any other obstacles outside of this, including any approaching person, are detected by a laser scanner, whilst impact sensor bars also instantly stop the machine's motion.

The Agointelli website features an online Robotti portal, through which an owner is provided with real-time updates of the machine's progress.

"While we were, naturally, quite cautious at the beginning of our time with the machine, I am now very confident to leave it working in the field," says Mr Williams, farm manager. "It sends SMS text alerts of any issue with operation, and via the portal I can link to the view from its front and rear cameras. That's not only useful from a safety and progress point of view, but it also allows me to assess crop growth progress. "Through the website portal I can check data such as fuel levels, estimated work time based on remaining fuel, and hours of work completed. I can also check and receive an alert when the machine has finished a task and needs to be moved via trailer to the next field, using the manual drive controls."

Practice:

The future of
the IC engine



An exciting time to be a pragmatic engineer

No doubt some readers will have followed the recent virtual conference in early February, entitled 'Sustainable IC engine', organised by UKi Media & Events, associated with the excellent Engine & Powertrain Technology International publication. Alastair Tulloch gives his perspective.

The topic concentrated mainly on the technical issues of current and future transport requirements, but prompted considerations concerning all forms of future power requirements.

In terms of agriculture and agricultural engineering this must surely present exciting opportunities, as there are many challenges to be resolved and no easy or obvious

solutions. There is no doubt that these issues can and will be resolved, but perhaps it needs a more pragmatic approach, together with the need for commercial viability to find the best solutions.

Electrification?

The current desire to electrify everything is understandable, but perhaps the application should

be the prime consideration, as suitability will vary in everything, particularly in agriculture.

Those applications with relatively light power/torque requirements, or intermittent use with relatively short durations clearly lend themselves to electrical power, especially if these are within a restricted location. For field use, these could be met by batteries, but such solutions have



Electrification - The application should be the prime consideration. Its suitability will vary across tasks in agriculture

well-known issues of power density, cost and charging requirements.

Current batteries have a 10:1 power density deficit when compared to liquid fuels, but conventional fuels will become increasingly unpopular in an environmentally sensitive world. However, even if future batteries are twice as good, that still leaves a 5:1 deficit. The other concern is cost. While there is a normal tendency for costs to come down as volume goes up, the increasing demand for the rare earth minerals required will pull in the opposite direction.

For the environmentally-concerned, there is also the issue of pollution in

mining, refining and producing these materials, which tend to be overlooked when out of public view.

While we can expect these difficulties to be partly overcome in time due to the likely demand for battery power, they surely remain a concern, especially when high power/torque applications are considered over long sustained periods of time, in relatively remote locations such as are found in agriculture.

What about hydrogen?

Many will propose hydrogen as a possible solution and it might well be, but it still has to be produced in

industrial quantities and at a viable cost. 'Green' hydrogen from splitting the water molecule with electrolysis, is power hungry and apparently four times the cost of 'grey' hydrogen from natural gas.

There are already test units in place for agricultural vehicles, using hydrogen-based fuel cells to produce electrical power. These are likely to have a future in several applications, but they are complex, expensive, need development and still require batteries

Practice: The future of the IC engine

Dirty old diesel?

In the meantime, we have the good old diesel engine, which is extensively used in agriculture and likely to be for some time to come, even though there is a growing environmentally-focused view against it. The conference shared some interesting and enlightening engineering developments which could mean the internal combustion (IC) engine still has a future and part of that could be in some aspects of agriculture. Apart from the expected improvements in IC thermal efficiency, which could see it passing 50%, there is of course the use of synthetic fuels, which have much lower emissions. These fuels are entering a 'third generation' of development, which makes them more interesting, both as a potential replacement fuel for existing products, and a future one for some applications.

Running an IC engine on hydrogen or methane might also have a future in the short to medium term, since the world has 125 years of experience in building IC engines, making them cheap and reliable. Some might object to the fact that this is not the most efficient use of hydrogen, but it could be a practical one, which is commercially viable, with a short development period.

Crops for fuel?

Most synthetic liquid fuels are based on starch rich plants, so again a potential benefit for agriculture. The use of crops, in conjunction with waste and effluent, is a growing source of biomass-based electrical power generation. That brings up another question however. We only have 3% of the world's surface area on which to grow much of the food



required for a growing population. Should we use that precious resource for food or energy or both? Given the 3% is likely to shrink as there is a demand for other uses, the challenge increases.

The chances are that we might need to grow, harvest and process an increasing volume of crops from a reducing land mass, and find ways of achieving all such requirements at a sustainable cost to make a viable solution. Perhaps the world might have to accept GM crops, but that too, is environmentally sensitive.

Challenges are opportunities

The concerns about our sustainable food supply is not a new one. For the optimistic agricultural engineer however, this is surely another

opportunity. If 'vertical' farming is to increase the supply of certain foods, there will be increasing needs for an efficient production and harvesting process. Likewise, if we are to farm more fish or even grow protein-based meats without animals, the process will require complex automated management systems. Some developments may need time to be adopted, accepted and costed.

It is likely that increasing population demands for fresh water becomes evident before food supplies are threatened, in which case this precious resource will also require 'engineering'. If desalination of sea water is a potential solution, this in turn requires high electrical power consumption, so another increase in demand, all of which will be expected to come from renewable resources alone.



New Holland's methane powered T6 is in action on farms across Europe now and is expected to be commercially available this autumn

There are many who debate these topics with an emotional and ideological agenda, which can be more theoretical than practical. Some dabble in the technology which is probably not their forte. Perhaps it is time for the pragmatic engineers to speak up and show the potential solutions which will undoubtedly evolve, as this is how all development works.

Perhaps the world might have to accept more nuclear power generation. If that were to be nuclear fusion instead of fission, now that would be a breakthrough! Is that one step too far? Maybe not for the optimist, but unlikely to be a part of agricultural engineering!

All good food for thought in considering feeding our population!

About Alastair Tulloch

Alastair graduated from college with two engineering diplomas at the end of the 1960's, which is when he joined the IAgRE.

He worked for all his career with CLAAS UK Ltd. Starting in 1972 as a demonstrator and training instructor, he gradually progressed to acquire all the 'After-Sales' responsibilities and became a director in 2000.

Since retiring in 2017, he retains a continued interest in the industry and has an involvement with the CLAAS International Scholarship Scheme and the LAMMA Innovations Awards. He has also written articles for industry publications.



Practice: Trailer braking



Why are we still talking about trailer braking in the UK?

It's over ten years since the original AEA 'Look Behind You' Guide to tractor-trailer braking highlighted the widespread problem of inadequate agricultural trailer brakes in the UK. Based on the findings of an HSE/DfT/Industry-funded research study undertaken by Scarlett Research Ltd, the original guide sought to inform owners and users of important trailer braking system design features as well as how their correct selection and use could help avoid premature tractor brake failures. Dr Andy Scarlett of Scarlett Research Limited brought us up to speed with a fascinating lunchtime lecture recently.

In November 2020 the AEA launched a new, revised 'Look Behind You' Guide. Much has changed over the past decade. Machines are now larger and can travel faster. Trailer braking systems have evolved and

both UK and EU vehicle legislation has changed. But have the consequences of these changes been appreciated? If not, what are the best ways to get the messages across?

By way of background, the 2010 guide was 20 pages long and the 2020 update has 40. Over 1500 hard copies have been distributed alongside 2000 downloads of the 2020 Look Behind You guide.



Machines are now larger, loads are heavier and are able to travel faster than in times past.

What is different?

The original Look Behind You guide became a useful reference document for dealers, but over the past 10 years much has changed:

- UK farm businesses are changing – fewer, larger tractors travel further on road to perform operations over a greater geographic area
- Majority of on-road ag transport performed by 150-300hp tractors
- More than 80% of new tractors in this power range have high speed capability (ie Vmax greater than 40kph)
- Faster than 40kph tractors have been readily available in UK for

over 15 years. UK market uptake is 2nd only to Germany

- Majority of newer trailers used by UK farmers and contractors are around 16t capacity.

Today, vehicle combinations are larger and faster, with consequent increased braking demands. Tractor trailer braking systems are more complex and the desirable system performance characteristics are not necessarily understood by users or specifiers. Alongside these factors, the system operation and braking requirements are not always recognised or fully understood.

There is increasing need to raise awareness and understanding of

the requirements to achieve safe trailer braking.

Who is the guide for?

It is intended for farmers, farm managers, tractor drivers, farm mechanics and dealership technicians.

It will also help inform anyone who may:

- Purchase a trailer or trailed implement
- Influence a buying decision
- Use the equipment
- Be involved with its maintenance

Practice: Trailer braking

The Look Behind You guide is a concise technical overview, not a comprehensive reference document. It is intended to raise user awareness, explain what is required of a tractor-trailer braking system, both legal minimums and the ideal standard whilst highlighting good practice. The guide helps users make informed purchasing decisions and recognise shortfalls in existing equipment.

The guide is also intended to be an aid to managing risk and improving safety by encouraging correct operation and appropriate maintenance.

How should tractor-trailer braking work?

In an ideal scenario the braking effort is balanced between the tractor and trailer and is distributed in proportion to the loads on the axles. When laden, the trailer actually generates more braking effort than the tractor, and when unladen, the trailer must generate less braking effort (but with the same braking efficiency).

In reality the trailer usually generates insufficient braking effort (ie less than the tractor) which leaves the tractor braking system to make up the shortfall. When braking the trailer pushes the tractor, and the trailer does not adjust its maximum braking effort between laden and unladen. The trailer has poor or no load sensing. Historically load sensing was less of an issue with smaller loads and slower tractors, as the trailer brakes were not that effective anyway. However increasing speed has a much greater effect on braking load than increasing weight.

How heavy can the trailer be?

In the UK, the tractor and trailer maximum gross weight (tractor, trailer plus load) is 31t. However, the maximum gross trailer weight

About the guide

The guide is available in pdf, interactive pdf and ePub versions which can be downloaded from

<https://aea.uk.com/look-behind-you/>

Hard copies can also be ordered from the same site.

The guide has QR codes integrated to enable the reader to access additional content such as video clips and animations on YouTube.

(unhitched trailer and load) is 18.29t. If a typical 14t capacity unladen trailers weight is 5t, this leaves a legal payload in the UK of 18.29t – 5t = 13.29t. If the unladen trailer weight is greater, then the legal payload will be reduced further. It goes to show that larger trailers and tractors do not automatically mean remaining within the law for maximum gross weight when fully loaded.

User and specifiers need to pay attention to this basic requirement.

How fast can I go?

The maximum UK road speed for agricultural tractors has been 40mph (65kph) since 1986, however, unsuspended tractors are not permitted to exceed 25mph (40kph). To travel above 40kph the tractor requires full suspension, better braking and ABS.

Many modern conventional tractors with front suspension are capable of travelling in excess of 30mph (50kph) but are not recognised by current UK road vehicle legislation. It is not illegal to sell a 50kph tractor, but it is illegal to use one at a speed above 25mph (40kph).

In conclusion

This report does not do justice to a fascinating technical summary given by Dr Scarlett. The recording makes for essential viewing for all engineers involved in mobile machinery and provides some thought-provoking discussion at the end. We recommend that you set aside an hour or so and login to

<https://www.youtube.com/watch?v=cEq2fPbpQqA>

for the full presentation.

“All key professional users will be well over speed and well over weight against the regulations requirements, so it’s in their interest to manage their inspections and trailer/tractor maintenance as mitigation.”
Dr Andy Scarlett



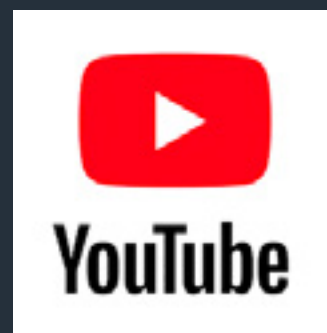
About Dr Andy Scarlett

Dr Andy Scarlett has been engaged in agricultural engineering research since 1985, the past 30 years mainly concerning agricultural vehicles. He spent 16 years at Silsoe Research Institute, latterly responsible for management of tractor and field machinery-related research and testing activities.

Scarlett Research Ltd was formed in 2005, following the closure of Silsoe Research Institute. The company specialises in delivery of engineering-related research & development as well as technical consultancy services focused on agricultural tractors, machinery and self-propelled vehicles to public and private sector customers in land-based industries. When not at his desk, Dr Scarlett farms in Norfolk.



Watch again



Don't forget that the Lunchtime Lectures are available to watch on the IAgRE's youtube channel :

<https://bit.ly/3kpKVF8>

People: Technicians of the Year



The Awards highlight the skills and passion of the sector

LE-TEC announce winners of Technicians of the Year 2021 competition

Designed to celebrate and find the UK's best technicians in the land-based engineering sector, entrants were asked to submit a short video explaining three aspects of themselves: who they were, what inspired them to become a Land-based Technician and why they enjoy their day-to-day job so much.

As an industry collaboration, the LE-TEC Ltd judging panel consisted of the Institution of Agricultural Engineers (IAgrE), British Agricultural and Garden Machinery Association (BAGMA) and the Agricultural Engineers Association (AEA). Aiming to highlight the skills and passion

for the sector, the judges were overwhelmed by some of the superb entries received, and after much deliberation they settled on a top three.

The judges' top three videos consisted of Laura Bassnet in first

place, Lauren Savage in second place and Chris Laidler in third place. All three videos display incredible passion for their work and just how rewarding a career in Land-based Engineering can be.

Winners Videos



1st Place

Laura Bassnet

from Ernest Doe –
Winner of both a Stanley FATMAX
Technicians Suitcase provided by
Toolbank and a multi-day training
course provided by AP Air Ltd

<https://bit.ly/3yZ4ooJ>

2nd Place

Lauren Savage

from Lister Wilder –
Winner of Sealey Tools 100pc
Mechanics Tool Kit kindly donated
by Kubota UK

<https://bit.ly/3vTGklm>

3rd Place

Chris Laidler

from CNH Industrial –
Winner of a Makita Cordless
Impact Drill

<https://bit.ly/34PRICx>

People: Technicians of the Year



The power of professionalism

AEA chief executive Ruth Bailey explains the initiative: “Recruitment for us, as within many industries, has been difficult in recent years. Our industry is an absolute gem but one that is little-known outside of its own circles. These three winners will be fantastic champions for our industry, showcasing the major talent and ambition that is represented throughout the sector. We cannot wait to work with them further.”

Charles Nicklin, CEO of IAGrE continues: “Our industry is such a great place to work. We are surrounded by sophisticated highly productive machinery enabling customers to run operations efficiently. Service backup and product support are essential elements that need top quality professional technicians performing these roles. The top three technicians we have selected are fantastic examples of people working in our exciting industry and I wish them well in their careers.”

Keith Christian, Director of BAGMA said: “with around 48% of dealer staff employed in the technical

side of the industry, the wealth of experience, level of professionalism and technical ability that technicians offer to UK users of equipment in the land-based sector is on a par with all other engineering-based industries in the UK.”

Great stories to tell

Charles Nicklin remarked on Laura’s winning video: “A great example of a professional dynamic person embarking on a career in our industry. Her personable confident approach will be a great asset to her employer in providing professional customer service.”

With Ruth Bailey adding: “All the judges felt that the entrants had a great story to tell and told it with real passion and sincerity. The judges were looking for several things from the video submissions: how someone started their career; what type of equipment they were working with; what excited them about their job and how the candidate had either progressed or could see themselves progressing. Judges were looking for how entrants presented themselves, how they related with the audience and how their style could engage with

an audience that LE-TEC is looking to capture. All three of our winners were able to deliver on this.”

Competition winner Laura states: “I am delighted to have been acknowledged as an upcoming technician in this progressive industry. It just goes to show that with the right leadership and opportunities you can turn your ambitions into a career.”

Keith Christian concludes: “As an industry collaboration, LE-TEC is looking to tackle one of the biggest current issues facing the agricultural and outdoor power equipment sectors – that of skills. The training and recruitment of youngsters for our industry, particularly attracting young talent into our manufacturing and retail base, is ever more critical. As an industry, we face a huge crisis in the skills gap. We must start to look more pragmatically about enticing a new intake of recruits and then genuinely offering them a progressive career path which recognises skills and competence levels within the technicians’ and customer service-related roles.”

About the Land-based Education and Training Committee

The Land-based Training and Education Committee (LE-TEC Ltd), a private company limited by guarantee, is sponsored by three main industry bodies: AEA, BAGMA and the IAgRE. Its aims are to promote training and education for people working with farm and horticultural machinery and associated areas.

LE-TEC

Landbased Engineering Training and Education Committee Limited

The IAgRE Lunchtime Lectures



Autonomous Agri Solutions

13/07/2021 - 1pm-2pm Online Technical Talk

Autonomous Agri Solutions was founded by two Agricultural Engineering graduates Tom Beach & Jack Wyatt; both with a passion to propel the UK into the Fourth Agricultural Revolution.

Tom says "Both of us have grown up on farms and have worked with different agricultural enterprises throughout our careers. I have worked for a handful of the largest fresh produce growers across the UK whilst Jack has more experience in the arable and livestock side of British Agriculture."

We first saw **ROBOTTI** at Agritechnica in 2019 whilst on a study tour to the show. The robot's lightweight design and simplicity is what caught our eye the most. It is built from standard off the shelf components that are used throughout our industry in a wide range of machines."

Activities to Grow Agricultural Engineering to Transform Africa - A Call to Action.

17/08/2021 - 1pm-2pm Online Technical Talk

Alastair Taylor former IAgRE CEO discusses IAgRE and AfroAgEng: Agricultural Engineering in Africa

For more details on these and other future lectures head to the upcoming events page at

<https://iagre.org/events>

Book Club

The wider picture



Farming is relearning what it forgot

The agricultural sector is returning to knowledge from more than a century ago, but with updated science and technology, says a co-author of The Agricultural Notebook.

Readers of a certain age will have fond memories of 'Primrose McConnells Agricultural Notebook', in fact the editor still has the 18th edition on the shelf behind him.

The Notebook, which is widely regarded as 'the Bible' for every agricultural student, farmer and industry professional, was first

published more than 130 years ago. But its current co-author, Richard Soffe, emeritus fellow at Duchy & Bicton Colleges' Rural Business School, says that for the latest 21st edition, he found himself revisiting Notebooks from the 1800s.

"We looked back at old editions and found things that as an industry we'd

forgotten and that are now coming back full circle – it's quite amazing really," says Mr Soffe. "In the 1800s, for example, farmers knew the importance of grasslands being made up of lots of different species; the latest edition reflects the fact that we've started to increase the mixes in grasslands and herbal leys."



Farming is going “back to the future”

More science and tech

Much of this age-old knowledge is combined with modern science and technology – a ‘back to the future’ step, says Mr Soffe. In particular, chapter authors – who were drawn from across Europe – were asked to focus more on environmental challenges; reflecting growing interest in the issue, changes to post-Brexit agricultural policy, and the NFU’s target to reach net zero by 2040.

The chapters on farming and wildlife, and resource management, reflect

this. “While it’s a farmer-friendly book, it pulls no punches in saying that agriculture needs to do more for wildlife,” says Mr Soffe. “But it encourages farmers to look at their farm’s resources as a whole, so that they can manage it more effectively.”

The 21st edition also includes a new chapter on applied nutrition, dealing with ruminant and monogastric nutrition. “Applied nutrition is a lot more scientific than it used to be. For example, now we’re talking about how to use it to control the type of milk produced.”



Richard Soffe

Book Club

The wider picture



Additional science is included in the soil management chapter, as understanding of and interest in soil has continued to develop. And there's greater focus on renewable energy as farmers look to increase non-agricultural income generation.

Beef and dairy must reflect the bigger picture

Readers of the dairying and beef production chapter are encouraged to 'look at the bigger picture', says chapter author Paul Ward who is a research & programme manager at Duchy College's Rural Business School.

"Regarding climate change and emissions, cattle have had a very negative image recently, but we wanted the chapter to encourage people to look at the bigger picture," says Mr Ward. "For example, how can grassland sequester carbon? How else can farmers mitigate and reduce emissions?"

"We've focused a lot on efficiencies in the system and how to reduce the carbon cost of meat and milk. But also how to prevent disease, rather than just treat it. And how to use technology to measure things – and critically – use this data to make better decisions."

Adding value to products is another important topic as producers look for further income streams in the post-Brexit world. "We've included a bigger focus on marketing, branding and story-telling, so farmers can tell people about the positives of cattle, while adding value to their produce," says Mr Ward.

Cropping requires more knowledge today

Growers now need wider knowledge than in the past, and to combine age-old practices with new science, says Louisa Dines, principal lecturer in agronomy at Harper Adams University, and author of the crop production chapter.

"Successful UK crop production increasingly requires an excellent understanding of technology, biological and agronomic principles as well as business and marketing principles," she says. "Legislation, consumer requirements, economics and protection of the environment place an increasing number of constraints on arable crop production in the UK."

"These are demanding the integration of new technologies and products with a return to some of the basic principles of good agricultural practice, such as the maintenance of soil health along with diverse and resilient rotations."

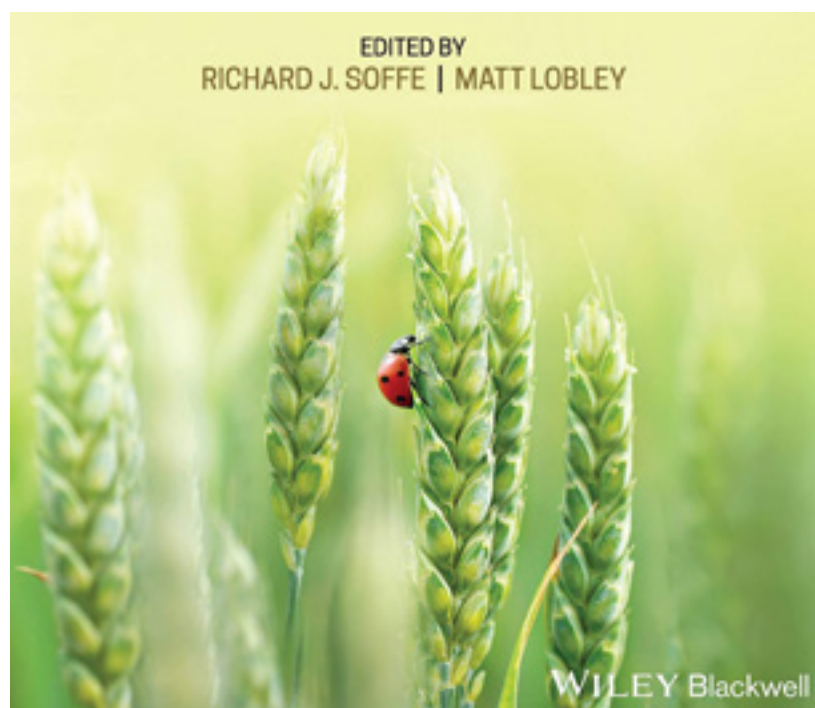
As farming and science continue to develop and become more specialised, The Agricultural Notebook is moving from being a 'bible' to 'the essential reference book', which now includes a large number of suggested further resources, says Mr Soffe.



If you have read (or written) a new or recent book which members will benefit from, please let the editor know.

The Agricultural Notebook

The 21st edition was launched in February and is edited by Richard Soffe and Professor Matt Lobley of Exeter University. It is available from Waterstones, Amazon and Wiley.



Profession: Honey

Honey technology: from bee skep to industrial laboratory

On 21st April, Nicholas Corker tuned into the IAgRE's Food Engineering Group seminar on honey technology with the aim of better understanding the depth and diversity of the honey industry, he was not disappointed.

The seminar, with five presentations, was ably convened by Daniel Hefft with an international attendance of 175 participants, representing the complex value chain associated with that seemingly simple natural food stuff: honey.

Engineering challenges

From a food engineering perspective honey presents a number of

challenges, it is a viscous natural product derived largely from a dispersed yet sophisticated craft industry dependent upon a symbiosis between apiarist, bee and flower. It is traded locally and globally in raw and composite states, transported in bulk and subject to regulation and import tests, variable in quality and value, associated with health and wellbeing and open to adulteration.

Sustainable and traditional methods

The meeting opened with a fascinating talk from St Kliment Ohridski University on traditional and sustainable bee keeping in Macedonia. We learnt of the production process including the manufacture of skeps from hazel and daub and of apitherapy - the value of inhaling the atmosphere created



As a viscous natural product, honey presents a number of challenges



Sustainable and traditional methods

Profession: Honey



Filtration technology in the form of vibrating sieves and self-cleaning filters

by bees within the hive for the treatment of asthma.

In this topographically diverse country, climate change is manifest in unseasonal cold dry winds that inhibit early flowers, thus depriving bee colonies of much needed energy as they emerge from hibernation.

Filtration

Although honey is recognised as a pure substance there is a requirement for industrial filtration for some markets. Russell-Finex Ltd introduced us to the challenges of handling and filtering bulk honey and how filtration technology has been

developed in the form of vibrating sieves and self-cleaning filters. This UK company actively works with producers. A Norwegian case study of an apiarists' co-operative explained how Russell Eco Filter® & Filter Management System™ were installed to handle throughput of 2,000 – 2,4000 kg/hr with much lower pressure whilst removing all unwanted particles.

Honey adulteration

Intertek Food Services detailed the challenges of honey adulteration, commonly by dilution with cheaper alternatives (corn syrup), the laboratory science behind quality

controls and work to understand and counter the natural process of honey crystallisation. Here we learnt of what defines 'honey' as a product, its essential composition methods of analysis and factors governing its quality such as moisture content, electrical conductivity and acidity. The range of monofloral (derived from single flower types) honeys are premium products eg. Manuka and Acacia and often associated with medicinal benefits. The cited statistic that there is more honey traded globally than bees to produce it underlines the importance of this work.



There is more honey traded globally than bees to produce it

The University of Bologna's research deepened our understanding of how crystallisation harnessed through seeding is important to the manufacture of creamed honey. Detailed analysis of the rheological properties was provided indicating how these could be modified thus leading to the specification and development of new processing machinery.

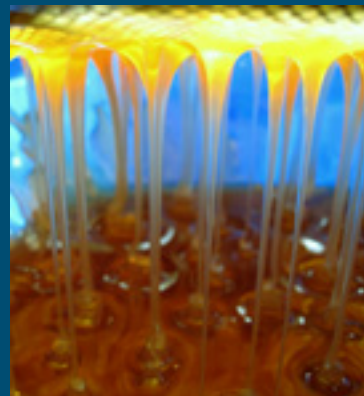
Understanding characteristics

Continuing with rheology the Federal Polytechnic of Nigeria Ado-Akiti showed the potential of understanding viscosity characterisation for the cost-effective detection of honey adulteration. The importance of this work was indicated by an experiment that showed how honey's natural antimicrobial activities were reduced through adulteration with fructose. A reminder of the multi-faceted nature of this remarkable food stuff and that for many honey is not just something to spread on toast.

We would encourage anyone with an interest in bee ecology, honey and food process innovation to view the slides and join the group:

<https://iagre.org/EFDHoneytech2021>

About the author



Nicholas Corker C.Env is the innovation manager at the UK Centre for Ecology & Hydrology where he is promoting a National Honey Monitoring Scheme:

<https://honey-monitoring.ac.uk/>

The Honey Monitoring Scheme is a UKCEH innovation project that utilises molecular techniques to establish the signatures of pollen from honey samples provided by beekeepers from across the UK. The aim being to learn something of the availability of the floral resource over time and to enhance the beekeeper's understanding of their own bees foraging habits and local floral resource.

Profession: Agri-Tech awards



On-farm technology is helping boost sustainability, productivity and profit

Innovative agri-tech companies invited to enter the Agri-Tech Excellence Awards

From yield-boosting robotic milkers to disease-detecting arable drones, the rapid growth of on-farm technology is helping farmers around the world boost their productivity, sustainability and profit.

Engineers include a lot of bright, forward-looking innovative people and those in the IAgRE are of course no exception. In their pursuit of future technological developments, however, how much consideration is given to the plight of the target customer? No doubt the obvious answer would be that is the objective, to improve the future efficiency of agriculture and

horticulture for the benefit of all. How much consideration is given to the business situation of these customers? It could be suggested that there is something of an assumption that future innovation ideas will be accepted with the same enthusiasm as the innovator had with its development. Should this aspect be given more thought? Should the IAgRE give more support?

If we consider the current target market, we obviously have a mixture of type, size, age, wealth and opinion, but perhaps the one aspect which is common is the operational margins of their business. Many growers would accept they have a good lifestyle, but they are also trying to run a business and that is very challenging. It is also important to separate the wealth

of an individual, with the margins generated in the business, because that is what drives the ability to invest in future technological proposals.

Little opportunity, more concern

Agriculture and horticulture have long been struggling with margins, from the downward pressures on farm gate prices, combined with the upward pressures on all inputs, both of which are largely out of their control. Now we have a new Agriculture Bill to contend with and that seems to bring a little in the way of opportunity, but also much in the way of concern.

The accepted current situation is that the UK is only 60% self sufficient and could so easily be at least 75%. Subsidies pay about 50% of agricultural income and 85% of agricultural profit. Many do not like the idea of subsidies, but what do these figures say about the business model without them?

The new Agriculture Bill makes much of the environmental issues and many would say that is absolutely right, but surely its function is to produce food! All growers would support environmental aspects more than many would give them credit for. In celebration of the power of innovation, Agri-EPI Centre is inviting the most forward thinking small to medium-sized agri-tech companies to enter the inaugural **Agri-Tech Excellence Awards**.

Sponsored by Leyton, Kubota, Barclays, Syngenta and Marks & Spencer, the awards will recognise the ground-breaking work of agri-tech SMEs that have had significant impact on sustainable productivity on-farm, in the UK and internationally, between January 2019 and January 2021.

To be eligible for the awards, companies must have taken their innovations beyond the development stage and be supplying their technology commercially on-farm. The award is open to all SMEs (up to 250 employees) from all sectors.

The awards have two categories:

Category 1:

Agri-tech Excellence demonstrated on a UK farm

Category 2:

Agri-tech Excellence demonstrated on an international farm (based outside of the UK)

Entries will be judged against a number of areas: impact on productivity, health and welfare; impact on environmental protection and enhancement; and business efficiencies.

The judging panel will comprise experts in the field of sustainable agri-food and innovation. It will include representatives of the awards sponsors and Charlie Nicklin, chief executive of the Institution of Agricultural Engineers and Andy Newbold, editor of Landwards, with more to be announced.

The winners of each category will be announced during Agri-EPI's national conference on September 30, which is attended by a large audience from companies and organisations involved in sustainable agri-food.

Agri-EPI Centre chief executive Dave Ross said: "The UK has a vibrant and dynamic agri-tech sector. The UK private investment into the agri-food tech sector is also on the march – and we are a European leader in this regard. Agri-EPI is pleased to be involved in catalysing new innovations and our awards seek to celebrate the success that agri-tech companies are achieving in all sectors of farming. We're very excited to have first class sponsors and an expert judging panel supporting the awards. We look forward to receiving what will no doubt be very high-quality entries from a diverse range of companies."

How to enter

- To enter, please complete the online form on the Agri-EPI website. The deadline is Friday 30th July 2021.

- You will be asked to submit evidence for the social, environmental and economic benefits for impact on farm.
- A shortlist of entries will be agreed, and a representative from each shortlisted company will be invited for a short on-line interview with the judging panel on Thursday September 9th 2021.
- For enquiries, please contact awards@agri-epicentre.com

A word from one of the judges



"Engineering and technology applied to agriculture continues to improve the efficiency and productivity of food production. The environmental impact and sustainability of our agricultural and food production systems are more important than ever before. Individuals and businesses working in the agricultural engineering sphere play an immensely important role, and this decade we will see significant advances in technology. I'm delighted to be involved in recognising and celebrating these exciting innovative achievements," Charlie Nicklin C.Eng CEO, Institution of Agricultural Engineers.

Membership Matters



Slurryquip dribble boom at work

Northern Ireland Branch

Slurry equipment in two hemispheres

Report by Terence Chambers

The guest speaker on a recent Zoom meeting of the NI Branch of IAgRE was Richard Fitzpatrick, from Slurryquip, who has now been involved with the manufacture and supply of slurry spreading equipment for 27 years.

The business is based on his family farm at Mountpanther, Clough on the East coast of Co. Down. On leaving Loughry College in 1985 he became involved with running the farm following the death of his father Seamus. He also went out to New South Wales, Australia for some seasonal work experience on a broadacre cotton farm. Once home, he began selling farm machinery as a sideline. By 1993, he commenced the design and manufacture of drag hose umbilical slurry systems with the SlurryKat brand name. This developed to serve customers

in Ireland and Scotland as well as co-operation with a partner in Holland supplying umbilical systems to spread slurry carried in large off-road Terragator vehicles.

Heading to NSW

By 2008 Richard had decided to sell on his established SlurryKat operation, leave Mountpanther and go back to NSW Australia and try broadacre irrigation farming on his own account where his crops included cotton, sorghum, haylage and wheat.

Climatic conditions there were very different to home with the constant strong sunlight and high temperatures taking some getting used to. Drought, floods and high mice population infestations were regular features. Reliable water supply and management was vital to cropping success with excess stored in a large 80-acre storage dam. Typical daily surface evaporation was around 25mm, and substantial additional water supplies were also contracted in. Other farms in the state practised dryland cereal growing. Unlike Co Down soils where

wheat sowing is deferred until after rainfall NSW farmers have to make the most of the available moisture by sowing when the rain is on!

The harsh climatic variations can support some very profitable production years, but others are the opposite with growers often having to endure an anxious wait, of several years, before achieving profitable yields again. The latest news from there is that compared to two previous severe drought years farmers are currently enjoying a relatively good cropping season. Weeds are controlled all year both in the crop and to save water. Crop spraying techniques range from aerial applications to modern precision spot spraying techniques. Genetically modified glyphosate resistant cotton crops are typical with Monsanto issuing licences for the use of its seed varieties.

Slurry spreading equipment for Australia and New Zealand.

As well as farming, Richard was still spending some time in the design and manufacture of slurry equipment. In 2010 he decided to



Slurryquip Cerberus tanker with front boom

sell the NSW farm and move on to the South Island of New Zealand. The climate there and the prevalence of large dairy herds was his incentive to develop, manufacture and supply umbilical systems to farms in the area. The scale of the farms demanded efficient and high output systems. His intended three month stay extended to two years after which local dealerships have continued to supply his Slurryquip branded product, as a market leader, on both North and South Islands. The manufacturing base has since moved back to Northern Ireland but still supplies Australia, New Zealand, Ireland, Norway, Canada, Australia, Spain, Finland and the UK. The priority for his customers in Ireland still tends to be protecting soils in a wet climate compared to speed and low-cost spreading performance for most other world markets.

Back at Mountpanther

Richard, and his son Seamus, now manufacture at the Mountpanther site with 30 people employed there and 20 others at work with associated sub-contractors. The Slurryquip range now includes retro-fit dribble bar booms up to 12m for existing slurry tankers, tractor-mounted umbilical boom

systems up to 15m, and a new range of farm-sized tankers with integrated folding front-mounted dribble bars. All of the systems are available with intelligent application rate tracking management systems. A complete range of remote-control slurry pumps, hose reels, layflat pipe and couplings are also supplied. The market for dribble bars, to retrofit existing tankers, is still significant in the UK and Ireland but for larger livestock units the trend is away from field tankers to high-capacity umbilical systems which can spread at up to 300 cubic metres / hour. The earlier systems delivered through 4.5" layflat hose but Slurryquip now strongly promotes the larger 5" or 6" hose sizes as, with them, much less power and fuel is needed to get the same output in all types of slurry.

The Cerberus tanker system

Although Slurryquip has not been directly involved in manufacturing its own large, trailed slurry tankers, it has identified a niche market (on 80 to 150 cow farms), for a medium size tanker with a front-mounted boom dribble bar system for safer use on sloping land, and ease of manoeuvring in smaller fields, small yards and narrow roads. The Cerberus field tanker is

designed around its front-mounted folding booms to optimise weight distribution, improve traction and minimise the tail-swing compared to an attached rear boom applicator. It is now available in a range of capacities up to 12500 litres (2750 gallons) and boom widths up to 12m. It has a flow control and GPS recording equipment to guide and record accurate application rates. This and other planned new products are now routinely patented to prevent unauthorised copying in some markets.

Other ventures

Mountpanther Farm Park occupies a prominent location, adjacent to the A2 main Mourne coastal tourist route, just 6 miles north of the seaside resort of Newcastle. Part of the farm now has a farm zoo enterprise (in season, employing up to 40 people) and play park where family groups can visit.

Branch Chairman Ken Gardiner, thanking Richard for his most interesting, informative and enjoyable presentation, wished him and his business all success for the future. More detail of all the products and services referred to above can be viewed on the Slurryquip website.

Membership Matters



A purpose built unit for runway clearing built on a Fastrac at Heathrow

Western Branch

AGM and career highlights

Report by Mike Whiting

Following the branch AGM both branch and members from across the regions received a presentation from Paul Hemingway, the IAGrE President, on his career. In this country it is relatively unusual for engineers to move from academic positions to take up management roles in industry.

Following 11 years lecturing in agricultural engineering at Harper Adams (including a year's exchange to Lincoln College, New Zealand) Paul took up a position with the JCB Group as service manager for the

high-speed tractor development project that was to produce the JCB Fastrac. Over the next 10 years or so his responsibility expanded to include product marketing and export sales which involved him in a diverse range of specialist applications for machines, several outside agriculture and significant overseas travel.

A constructive move

He then moved to the construction side of the business working predominantly on the 'outward facing' side. This involved working alongside the JCB dealer network with roles in UK and export service, sales and service training and parts marketing. Paul also took on

a three-year overseas assignment running the service department for JCB India which he described as one of the highlights of his career. His time there saw the introduction to the Indian manufacturing business of several new product lines: telehandlers, skid steer loaders and generator sets as well as the development of the export business shipping machines built in India to other parts of the world.

It was clear that Paul enjoyed a very varied and fulfilling career in Agricultural Engineering and he continues to be involved as a visiting lecturer at Harper Adams and through membership of various other industry committees.



Future branch meetings



Whilst the summer months traditionally have slim pickings for branch meetings the autumn and winter programmes are starting to fill up, head over to:

<https://iagre.org/events>

If you can't wait that long, the IAgRE's youtube channel has recordings of all the previous years branch meetings, alongside lunchtime lectures and some of the specialist groups presentations too.

<https://www.youtube.com/channel/UCCiJwRVjGizSE3EZ-KQ3uVg>



Heading further afield the fastrac at work in Malawi

Membership Matters



Claas Lexion 5000 series combine

Wrekin branch

The Claas Lexion Combine – Adam Hayward, Claas Combine product manager

Report by Bill Basford

Adam painted a picture of his early life through HAU to placement with Claas at Saxham and then further afield in Australia where he worked for three years with the main importer for Claas. Following the opportunity to return to UK he described his position within the company and alongside the construction of the recent new UK HQ there. Presenting to an online audience gave him a unique opportunity to offer a technical rather than sales-oriented angle.

Leading into the Lexion in detail he described the worldwide manufacturing outlets for combines or components in many countries ranging from Germany through Hungary, India, China and the USA. Considering the market in the UK this was split for Claas as 40% straw walker to 60 % rotary (hybrid) moving 500-600 units per year, not necessarily all 'big' ones. He commented that the total metre of header width sold currently was similar to that some 30 years past, though this potential was on fewer machines.

All such facts lead to the Lexion series launched well back with the 480 in 1995 and now represented by the 8000/7000 APS Synflow hybrid (rotary) machines and 6000/5000 APS Synflow walker units.

New idea timelines

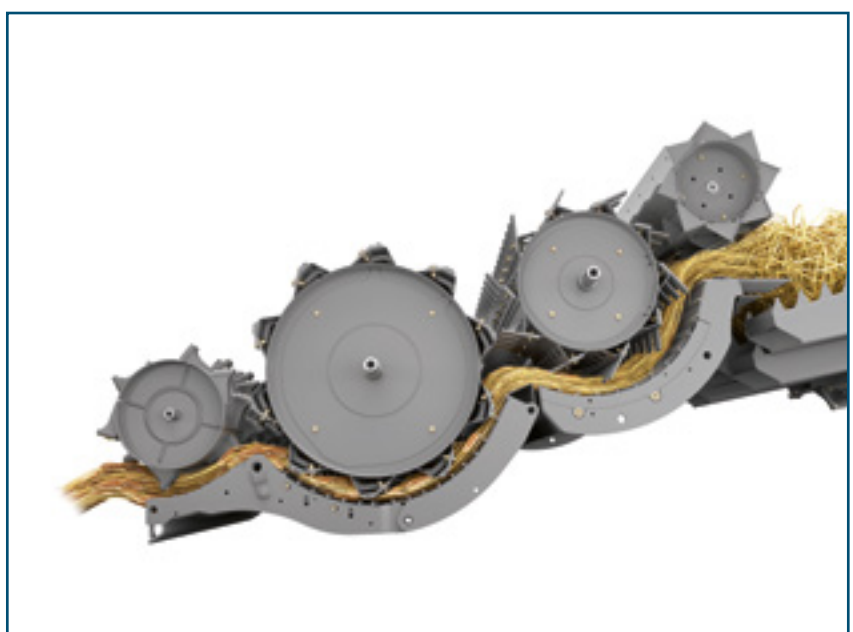
He stressed that between 20-30 years existed within 'new' idea timelines and that concept through field testing to production involved some individual test machines running for 10,000 hours. Several examples of detailed graphics highlighted the difference in design and shots of close coupled re-thresher rigs working in a range of crops were seen. 20-30 crops in Western Europe have led to specific auto settings for threshing and machine management in various harvest conditions. Development of the Lexion had included 90% change in parts from previous machines. Adam described what product launches meant with the company



and dealers including all manuals development, H & S and servicing issues before any product launch to customers. A professionally presented review promoted considerable interest throughout resulting in a stream of questions on chat covering straw value v rotary use, cost of walker v more complex rotary units, power units – future for hydrogen or EV power, smaller machine potential sales, size limits of basic machine size within Europe and the future for smarter automation both in machine management and support considerations.

The presentation was recorded, and you can see it here

<https://www.youtube.com/watch?v=hzwSF89h9OY>



Claas Lexion Synflow Walker

Membership Matters

Closed transfer systems eliminate contamination at the point of filling

Wrekin Branch

Closed circuit transfer of pesticides to sprayers - Richard Garnett, Wisdom Systems and Eziserv Ltd.

Report by Bill Basford

Richard started by recognising that closed transfer development from around 1985 had been quite protracted and that the system had not really been picked up in the UK yet. He explained that in the past studies like the Cherwell project showed considerable contamination to surface waters from pesticide handling at point of filling. Alongside those findings at the time, operator training and container handling was still quite basic and disposal was still a matter of burning within ventilated oil drums leading to considerable atmospheric pollution.

As sprayers now cost somewhere between £20,000 and £250,000, he suggested that handling / transfer of pesticide to such products had not really been addressed beyond induction bowl adoption.

He explained his involvement had started during his time as a college

lecturer at Holme Lacey. Since then, he had spent time within his own company developing the systems which were gradually accepted in Europe and particularly into some of the American states and Australia.

Developments in Europe on very large East German farms around 2008 identified the ability of the system to function with large areas serviced by refillable and reusable containers. The experience there was to increase the use of particular chemicals and by 2014, 25 products representing approximately 80% of application on those East German farms included close transfer systems.

IBC developments

Some developments were known with IBC's, this was followed within Germany and Switzerland. However, the return of these containers for refilling provided very challenging situations and which really led to a lessening of uptake of the system elsewhere. Some South American countries particularly became involved with different containers around 210 litres capacity which were linked particularly to aerial crop spraying of banana crops. The

timeliness of loading an aircraft placed increased acceptance of close transfer systems particularly in close proximity to both loading personnel and aircraft themselves. Systems in Australia were also mentioned where the government has brought pressure on chemical handling safety systems.

RFID

Now 85% of all chemicals in some areas include returnable closed transfer systems, these containers all being RFID chipped. Experience has shown that within 10 minutes sprayers can be filled safely and that the reduction in operator exposure has been considerable. Further developments concerning Isotanks are also known there. These being similar to IBC's but have no lower drain valve only top closed transfer connections, sizes from 300 to 1000 litres.

Catchment sensitive farming

He referred to UK experience where the responsibility for controlling waste was the owner / operator and that through the Catchment Sensitive Farming scheme point source losses have been addressed by the adoption of biobeds and



biofilters. He suggested that the reduction of contamination potential was vastly increased where closed transfer systems were adopted, perhaps lessening the need for, or the capacity of such systems.

Supermarkets

In a radical departure from pesticides, he outlined his experience within supermarkets where refillable packaging has been considered for detergents and laundry care products. In that situation no leakage could of course be accepted within a supermarket floor area. Experience was also described with baby food packaging. He stated that the developments now in the UK are within the Hypro Pentair company and since 2015, 78 colleagues across many countries have been involved with an International Standard for closed transfer systems, Richard himself becoming chair of that standards committee.

The presentation was recorded and is available here

<https://www.youtube.com/watch?v=Qtb35uHPDcw>

Michael C Sheldon - 50 years in the IAgRE



Little did I think after Andy Veitch recruited me as a student member in 1971 that I would still be enjoying the benefits of the Institution 50 years later. I feel privileged to have met a number of the past Presidents, one of whom was instrumental in encouraging me to apply for full member status. I certainly recall meeting John Chambers (and his brother Richard), a number of times. John was chief engineer at Harry Ferguson Limited.

Keeping one updated of developing technologies was indeed paramount and exceedingly crucial to my many years spent in education as a lecturer. The broadening of the engineering aspects, to be inclusive of the environment, made it even more beneficial. Contrast this technology with some of my childhood spare time being spent on a farm in the 1950s which even then was outdated, with just three carthorses, no gas, electricity or telephone, and water obtained from a spring.

What I have valued the most has been the camaraderie of the Institution. The continued friendship and support of Members and the Secretariat, from Penn Place, Wrest Park, Silsoe and Cranfield, has been excellent. Without this, my time as West Midlands branch secretary would have been untenable.

Finally, a great thank you to all those people who have helped and given me good advice throughout my 50 years as an agricultural engineer.

Michael C Sheldon
IEng CEnv FIAgRE

Obituary

John Brian Finney CBE, HonFIAgrE



Brian, who sadly died on the 26th February 2021, the son of a Welsh chauffeur, from a brick making family and a mother from the Isle of Skye, was born in Pool Quay, Powys on 8th March 1933. After attending Welshpool Grammar School, he obtained both a degree in agriculture and a postgraduate Diploma in agriculture (farm mechanisation) from Reading University. Following these, Brian studied at the Imperial College of Tropical Agriculture in Trinidad before joining the Colonial

Service in northern Nigeria in 1955, where he worked as an agricultural adviser. Nigeria made a profound and lifelong impression on Brian. When asked why he chose to go there, he said, "I wanted to make a difference. I wanted to help make the desert bloom". It was in 1955 that he joined the IAgRE as an Associate Member, and while in Nigeria avidly studied the technical material published in 'Journal and Proceedings of the Institution of British Agricultural Engineers' on

tillage and traction principles that helped to shape his future career in extension work in agricultural mechanisation.

Mechanisation adviser

Upon his return from Nigeria in 1963, Brian joined the National Agricultural Advisory Service (now ADAS) where he was first based in Reading, serving as a mechanisation adviser for Oxfordshire, Berkshire and Buckinghamshire. He fostered

close working relationships with many leading farmers who were so beneficial to his early career. He transferred to the Cambridge office in 1968 and went on to lead the mechanisation team in the Eastern Region in 1972, becoming a Member of the IAgRE in 1969. In 1972 the first of many editions of the popular textbook 'Soil Management' that he co-authored with Bryan Davies and David Eagle was published.

A move to Silsoe

Brian moved to Silsoe in 1981 as ADAS's senior mechanisation officer based at Wrest Park before transferring later to the ADAS headquarters management team in London. He believed in combining the expertise of all relevant disciplines and it was fitting that he was responsible at that time for the heads of all the specialists across the advisory service along with the Experimental Husbandry Farms and Horticultural Stations in England and Wales. Brian was a respected adviser amongst farmers and for providing workable solutions for senior colleagues.

Services to agriculture

In 1990 Brian was awarded the CBE for services to agriculture. Following his retirement in 1992 he was made a Fellow of the IAgRE and between 1992-1994 he served as IAgRE President. He also served as secretary to the Douglas Bomford Trust and as an external examiner for Silsoe College for whom he undertook two consultancy visits to Russia. For many years he served as the lead judge on the panel assessing innovation for the Royal Welsh Agricultural Society and as honorary consulting engineer and as a Silver Medal judge for the Royal Agricultural Society of England. He was also a former Fellow of the Council for Awards of Royal Agricultural Societies. In 1998 he was awarded Honorary Fellowship of the IAgRE and was an active attendee at the South East Midlands Branch meetings. Brian was heard to say at the IAgRE 80th Anniversary Conference in 2018 that he was glad to be back at Wrest Park as he considered this to be his professional home.

In all of his many roles Brian was above all a self-effacing but astute 'team player' with the delightful

knack of combining wisdom and wit. Brian's wife Margaret, pre-deceased him in 2017. They first met when travelling by train for their first term at Reading and married when Brian was on leave from Nigeria. Their daughters Elizabeth and Kathleen and their families, to whom we send our condolences, survive him. They report that Brian was always interested in and supportive of whatever they were doing and that he was generous to a fault but also thrifty! Some of his favourite and most-worn clothes included an ancient camel hair coat given to him by someone who had served in the North Africa Medical Corps in WW2 and a milkman's trousers donated when the dairy changed its uniform. The man certainly had style.

"The world lost a real gentleman and scholar" probably best summarises the very many affectionate tributes paid to him from friends and colleagues from around the world.

Elizabeth and Kathleen plan to hold a memorial service to celebrate Brian's life later in 2021.

Update to CPD Requirements

As an active professional member of the IAgRE you will be aware that we expect you to complete CPD in order to maintain your membership and your professional registration and/or standing. Suitable CPD activities include courses, conferences, fieldtrips, online learning, webinars and relevant reading etc.

Of course, in these challenging times and with the current restrictions on commercial and social interaction, many of the events you would usually attend have been cancelled. This may impact the CPD activities you had planned for the year. We have been working with our licensing bodies, the Engineering Council and the Society for the Environment, who have agreed that the current situation will be taken into account when the CPD records are reviewed for 2021.

However, we have been taking steps to ensure that you will still have a variety of online options for CPD available to you. We have created a member page CPD Resources & Ideas <https://iagre.org/cpd-resources-and-ideas> that pulls together a variety of online resources we have made available to members including recordings of the 2019 IAgRE Landwards Conference, webinars from the Society for the Environment as well as training resources generously shared by IMI and IMechE. We are also launching a series of podcasts and intend to host online Branch Meetings and Technical Talks so do look out for eNews and contact us if you are not receiving it.

Landwards, as you are reading, is still in production so do make sure your online details are correct so that our publications reach you even when you are working at home! If you need any support with your CPD please do contact Sarah – secretary@iagre.org – who will be pleased to help and for Membership queries please get in touch with Alison – membership@iagre.org – who is on hand to assist.

Membership Changes

1/02/21 to 30/04/21

Admissions

Fellow

Member

Mr Athanasios Mandis (South Eastern)
Mr John Baines (Wrekin)
Mr John Gadsby (East Anglia)
Mrs Marion Perrett-Pearson (W Midlands)
Dr Natalia Falagan-Sama (S E Midlands)

Associate Member

Associate

Affiliate

Mr Phillip Neal (S E Midlands)

Technician

Mr Daniel Eaves (Wrekin)

Academic & Commercial Members

Students

Hadlow College

Mr Ryan Poliak

Institute of Technology Tralee

Mr Cathall Barrett
Mr Jack Corkery
Mr Jack Daly
Mr Odhran Duffy
Mr Ethan Harte
Mr Shane Harnett
Mr Rory Lynch
Mr Rory McCarthy
Mr Robert Messou
Mr Brendan O'Connell
Mr Terence O'Connor
Mr John O'Neill
Mr Dylan Power
Mr Seamus Stack
Miss Niamh Thornton
Mr Mark Tobin
Mr Shane Warren
Mr David Whelton
Mr Keiran Whyte
Mr Dylan Young

Wiltshire College (Lackham)

Mr Charlie Bath
Mr Sam Brinkhurst
Mr Harry Brookes

Miss Hermione Brooks
Mr Brandon Brownrigg
Mr Ben Coggan
Mr Alexander Cornfield
Mr Hayden Daniell
Miss Rebekah Daniell
Mr Neta Dante
Mr Aiden Dunn
Mr Edward English
Mr Kevin Fitzsimons
Mr Jonny Flower
Mr Conor Hatcher
Mr Rory Hopkins
Mr Michael Hyde
Mr Matthew Jones
Mr George Kelsey
Mr Jamie Lloyd
Mr Ben Middleton
Mr Ben Moore
Mr Lenny Izatt
Mr Edmund Sage
Mr Henry Sheppard
Mr Daniel Sutton
Mr Scott Thomas
Miss Imogen Wakefield
Mr Nathanael Wiltshire
Lee-Bott R

Harper Adams University

Mr Sam Ashing
Mr Sam Atkins
Mr Archie H Bennett
Mr Samuel A Campbell
Mr Joseph A Coxon
Mr William Creed
Mr Harry Crunkhorn
Mr Alfie Drever
Mr Thomas Edwards
Mr Gruffydd H Evans
Mr William Evans
Mr Tawananyasha T Furidze
Mr David I Goodchild
Mr William M Goodman
Mr Gerran K A Hawkey
Miss Imogen S Hill
Mr Shahrukh Hussain
Miss Ellen M Huxley
Mr William Jones
Miss Rachel Kellet
Mr Christian R J Lovett
Mr Mateusz P Ludynia
Mr Alec N Matthews
Mr Thomas Morgan
Mr Maxim Nazaruk
Mr Kamen Pavlov
Mr Benjamin Penter
Mr Issac E Price
Mr Brendan Quinn
Mr Tadas Rimas
Miss Lauren M Roberts
Mr Frederick J A Siebert
Mr Robert J A Siebert
Miss Alice E Unthank
Mr James M W Vernon
Mr Cadour S M Wood

Readmission

Mr Thomas McMullan
(Northern Ireland)

Deaths

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

Mr J B Finney HonFIAGrE –

A Member of the Institution since 1955. Honorary Fellow since 1998 and President 1992 - 1994

Mr J R A Colman IEng MIAgrE –

An Incorporated Engineer and member of the Institution since 1978

Dr David Llewellyn Owen Smith – CEng MIAgrE

A full obituary will appear in the Autumn edition of Landwards.

Transfers

Fellow

Member

Mr Jeremy Green (S E Midlands)
Mr Luke Edwards (Tanzania)
Dr Toby Waine (S E Midlands)
Mr Martin Oldham (S E Midlands)
Mr Peter Verhoeven (Northern Ireland)

Society for the environment

REnvP

Mr Graham Higginson (Wrekin)

Academic Members

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

Coleg Sir Gar

Gelli Aur Campus, Llandeilo,
Carmarthenshire, SA32 8NJ

Cranfield University

Cranfield, Bedfordshire, MK43 0AL

Duchy College

Stoke Climsland, Callington,
Cornwall, PL17 8PB

Easton & Otley College

Easton, Norwich, Norfolk, NR9 5DX

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

Institute of Technology

Tralee Clash, Tralee, Co Kerry, Ireland

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

Myerscough College

Bilsbarrow, Preston, Lancashire, PR3
0RY

Newcastle University

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

Pallaskenry Agricultural College

Co Limerick, Ireland

Plumpton College

Ditchling Road, Lewes, East Sussex,
BN7 3AE

Reaseheath College

Reaseheath, Nantwich, Cheshire,
CW5 6DF

Royal Agricultural University

Cirencester, Gloucester, GL7 6JS

Sparsholt College

Sparsholt, Winchester, SO21 2NF

SRUC – Auchincruive

Auchincruive Estate, Ayr, KA6 5HW

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

Commercial Members

Ace Aquatec Ltd

16B City Quay, Camperdown Street,
Dundee, DD1 3JA

Agri-EPI Centre

1-4 Bush House Cottages, Edinburgh,
Technopole, EH26 0BA

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

Autoguide Equipment Ltd

Stockley Road, Hedington, Calne,
Wiltshire, SN11 0PS

BAGMA

225 Bristol Road, Birmingham,
B5 7UB

Briggs Irrigation

Boyle Road, Corby, Northants,
NN17 5XU

City and Guilds

1 Giltspur Street, London, EC1A 9DD

City Farm Systems Ltd

25 Hepplewhite Close, High
Wycombe, Bucks, HP13 6BZ

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

NFU Energy Services

Stoneleigh Park, Kenilworth,
Warwickshire, CV8 2LS

Fullwood

Grange Road, Ellesmere, Cheshire,
SY12 9DF

Househam Sprayers

Roughton Moor, Woodhall Spa, Lincs,
LN10 6YQ

HSS Hire

25 Willow Lane, Mitcham, London,
CR4 4TS

JCB

Rochester, Staffs, ST14 5JR

John Deere Ltd

Harby Road, Langar,
Nottinghamshire, NG13 9HT

Marks & Clerk LLP

90 Long Acre, London, WC2E 9RA

Mastenbroek Ltd

83 Swineshead Road, Boston, Lincs,
PE21 7JG

National Fluid Power Centre

Carlton Road, Worksop, Notts,
S81 7HP

Orby Engineering

Craigmore Road, Newry, BT35 6JR

Reesink Turfcare UK

1-3 Station Road, St Neots,
Huntingdon, PE19 1QH

PlantTech Research Institute

Bay of Plenty, New Zealand

Shelbourne Reynolds

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

SSAB Swedish Steel Ltd

Narrowboat Way, Hurst Business
Park, Brierley Hill, West Midlands,
DY5 1UF

Teagle Ltd

Blackwater, Truro, Cornwall, TR4 8HQ

TeeJet London Ltd

Headley House, Headley Road,
Hindhead, Surrey, GU26 6UK

Witham Oil and Paint Ltd

Outer Circle Road, Lincoln, LN10 6YQ

Douglas Bomford Trust

Collaboration and seed corn

Trust secretary Alan Plom reports on another quarter of online meetings and events: these included the half-yearly Board meeting in April. Hopefully we will all be able to meet face to face rather than the 'new normal', with our new trustees too, at our next meeting in November.

We were pleased to receive a number of applications for funding, as the number of suitable proposals for PhD research projects has reduced in recent years (a trend observed pre-pandemic). Several sponsored projects have also been completed or are about to be. However, we cannot support every application, as funds are limited, and we have to select projects which meet the core objectives.

Collaboration

The Trust is a member of the AgriFood Charities Partnership (AFCP) and we often refer unsuccessful applicants to their website <https://www.afcp.org.uk/>. This lists well over 100 organisations which together invest around £3.5m/year in new research, skills development and public education for UK Food and Farming. Some co-sponsor projects with our Trust. Individuals or charities can use AFCP's website to find funding opportunities or partners, eg



for research, travel or other CPD opportunities. We are seeking ways to share information between charities speedily to help applicants. In addition to their regular Board business, trustees took the opportunity to 'meet' with the CEO of Agri-EPI Dave Ross, to discuss potential collaboration and our sponsored researchers at universities. Like other charities in the sector, some of our projects complement those being developed and coordinated by Agri-EPI.

IAgrE Student Membership

The Trust sponsors student membership of IAgrE as part of our shared objective to help individuals develop, to encourage them to opt for a career in the sector and enable them to progress within it. We are discussing how we can encourage students to become more actively involved with IAgrE and its Branches, to benefit those individuals who demonstrate commitment to the profession.

Illuminating our 'Alumni'

We virtually 'met' our 2021 HAU Scholars: Robert Bryning, Thomas Bowers, Will Flittner, Alex Williams, and Rhodri Williams, together with additional recipient Mark Sherry, for an hour after their online 'Presentation Ceremony'. Trustee/mentor Paul Miller, ex-trustee David White and I were able to enjoy a wide-ranging hour-long discussion about their projects, their hopes, the future of the industry and career opportunities. We have an open door to our 'alumni' and can be contacted at any time via the email below. We look forward to sieving this year's 'wheat from the chaff' in the Autumn. [nb. This competition is open to students on any relevant course (not just HAU).

Trust seed corn

It is good to hear examples of Trust funding acting as 'seed corn'. Two HAU Graduates Tom Beach and Jack Wyatt featured recently on BBC Radio



4's Farming Today and TV News. The first to import the Agrobot from Denmark, which they saw at Agritechnica in 2019 - a visit part-funded by the Trust.

It was rewarding to see a number of previous HAU Scholarship winners receive prizes at IAgRE's combined 2020 and 2021 Awards event, including:

- **Will Hook** - CNH Industrial Award for his thesis on design and evaluation of seed dispersal units.
- **Andrew Hardy** - Student Project Award: "compact excavator

attachment for lifting trees out of the ground".

- **Huw Gilchrist** - Safety Project Award: "A safe load indicator for a tractor and fore-end loader".

The Trust also sponsors the IAgRE prize awarded to the author(s) of the 'Best Paper' (published in Landwards and/or Biosystems Engineering).

Further details of all the IAgRE award winners are in the Awards Extra with this edition of Landwards.

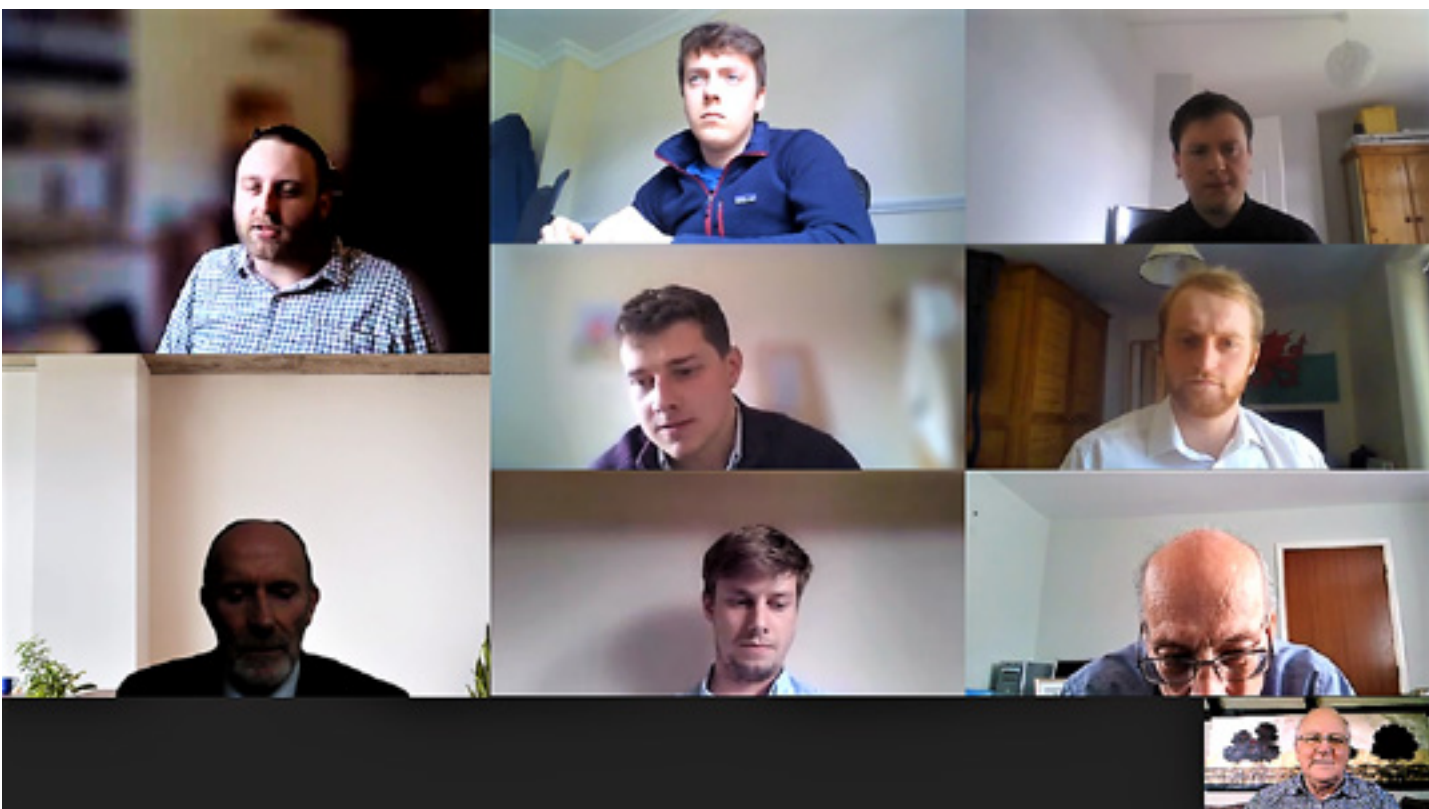
For further information

DOUGLAS BOMFORD TRUST

Contact the Trust via

enquiries@dbt.org.uk, 07951 527051

@BomfordTrust on Twitter or LinkedIn



Landwards
Conference
2021

FUTURE FUELS



We are delighted to announce that the IAgrE will host an annual conference this year. The topic will be the alternatives to existing carbon-based fuels, with expert speakers looking at the options currently available and on the horizon.

With a series of lunchtime presentations in October culminating in live discussion with the speakers on **Wednesday 3rd November**.

Further details will be shared as plans progress.

• www.iagre.org • secretary@iagre.org • 01234 750876

