Landwards

Agriculture • Horticulture • Forestry • Environment • Amenity

IAgrE Professional Journal www.iagre.org Volume 70, Number 4 Winter 2015

INNOVATION IN FOCUS

Agri-Tech advancements were featured in the latest series of Innovation events staged by the Royal Academy of Engineering

In this issue...

Launch of IAFRI

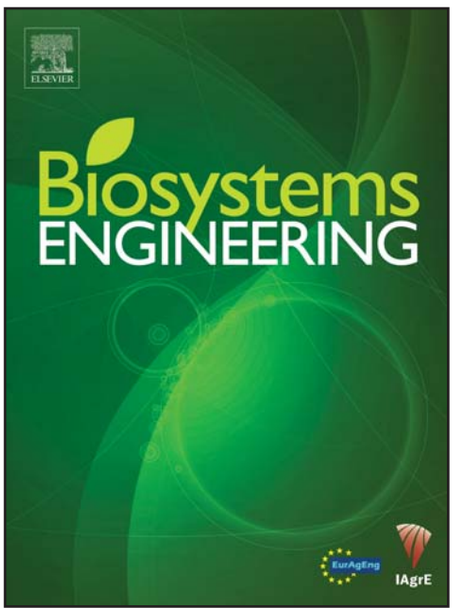
World Agri-Tech Summit

Council at Wessex Grain

Wind energy future

Biosystems Engineering

Biosystems Engineering, owned by IAgrE, and the Official Scientific Journal of EurAgEng, is published monthly with occasional special issues.



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The Managing Editor of ***Biosystems Engineering***, ***Dr Steve Parkin***, has kindly summarised some of the papers published in the last three issues which he thinks may be of interest to IAgrE members

Biosystems Engineering
Volume 136, August 2015, Pages 25-38

Modelling heat and mass transfer of a broiler house using computational fluid dynamics

Fernando Rojano, Pierre-Emmanuel Bournet, Melynda Hassouna, Paul Robin, Murat Kacira, Christopher Y. Choi
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Improvements to the living conditions in semi-enclosed spaces such as broiler houses can be achieved by better control of the heat and mass transport that occur in climate and air quality. A two dimensional CFD model was used to assess the dynamics of a broiler house by investigating sensible and latent heat, as well as mass transport and radiative transfer energy, as these relate to the environment of the broiler house. Validation data related to temperature, absolute humidity and CO2 were collected both inside and outside of a naturally ventilated broiler house. Inside data was logged at various locations to identify the degree of homogeneity throughout space. The CFD model replicated two contrasting cases: an early stage and a late stage of production. The predicted values for temperature, absolute humidity and CO2 were in good agreement with experimental data.

Volume 137, September 2015, Pages 43-54

Comparison of equipment used to measure shear properties in equine arena surfaces

Kate Lewis, Alison J. Northrop, Glen M. Crook, John Mather, Jaime H. Martin, Danielle Holt, Hilary M. Clayton, Lars Roepstorff, Michael L. Peterson, Sarah J. Hobbs

The design of a novel apparatus, the Glen Withy torque tester (GWTT), for measuring horizontal shear properties in equine sport surfaces is described. Previous research has considered the effect of vertical loading on equine performance and injury but only limited discussion has concerned the grip or horizontal motion of the hoof. The horizontal support of the hoof by the surface must be sufficient to avoid excess slip without overloading the limb. The GWTT measures the torque necessary to twist an artificial hoof that is being pushed into the surface under a consistently applied vertical load. Its output was validated using a steel surface, then was used to test two sand and fibre surfaces (waxed and non-waxed) through rotations of 40-140°, and vertical loads of 157-1138 N. The GWTT was able to detect significant differences in shear resistance between the surfaces. Future work should continue to investigate the strain rate and non-linear load response of surfaces used in equestrian sports.

Volume 138, October 2015, Pages 59-64

Special Issue: Innovations in Medicine and Healthcare

Effect of injection pressure and fluid volume and density on the jet dispersion pattern of needle-free injection devices

Tyler M. Grant, Kevin D. Stockwell, Jason B. Morrison, Danny D. Mann
Department of Biosystems Engineering, University of Manitoba, Manitoba, Canada

Needle-free injection devices improve vaccinator safety and optimise vaccine delivery time by eliminating the use of needles. Of significant importance is a full understanding of the relationships that exist between the injection properties and the depth and shape of the injectate dispersion. Work has been done to characterise the distribution of human needle-free injection devices, but little research has been conducted on livestock injections, which operate at much higher pressures and volumes. The aim was to characterise the injection profile of a livestock needle-free injection device while varying the injection pressure and fluid volume and density. Water and porcine circovirus vaccine were injected into ballistic gelatin blocks and the injection mechanism was captured using high-speed photography. It was found that pressure influenced the depth of penetration, but had little effect on the shape of the injection profile. In contrast, the volume and density increased the penetration depth and varied the dispersion pattern. These results can be used to better understand how the injection profile of a needle-free injection device changes given an initial set of parameters. This will be important for developing administration protocols that successfully deliver intradermal, subcutaneous, and intramuscular livestock injections.

The Professional Journal for Engineers, Scientists and Technologists in Agriculture, Horticulture, Forestry, Environment and Amenity

Landwards

EDITORIAL:

Progress and practicalities

CHRIS BIDDLE
Editor
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I recently had the pleasure of hosting farmer and BBC TV *Countryfile* presenter Adam Henson at a conference. Adam is one of the new breed of rural practioners who are ambassadors for their industry, and great communicators.

Countryfile now attracts a greater audience for its Sunday night slot than ITV's X-Factor - and one of this country's leading farm machinery dealers who runs a multi-branch operation said that he had recruited new talent into his company because they liked what they saw on the programme every week.

The key as always is communication. Farming has a monumental challenge in projecting a message that is palatable to consumers, particularly to those who think that meat is produced in plastic wrapping or a burger bun. Food chain processes can be a messy business from birth to the plate, but whilst consumers don't need to know the full details, farming has to be open to scrutiny and full account.

Fortunately at the arable end, big kit, open fields and technology are a much easier sell. But even then the communication between the users and the providers needs to be constantly under review. Adam Henson has joined forces with neighbouring farms to share the best farm machinery they can buy - rather than compromise due to individual budgetary restraints.

But even then, as a user he is concerned that technology might be taking over from practicality. It is one of the challenges that those at the sharp-end of research and development need to be aware. Of course, boundaries always need to be pushed, new windows of technological opportunity opened, but in the progression from laboratory or engineering field test, the end user always has to be kept firmly in mind.

And part of that communication process presented itself to our industry with the splendid Innovation in Agri-Tech event held at the Royal Academy of Engineering, curated skillfully by Professor Dick Godwin HonFIAgrE. It gave our industry a wonderful opportunity to showcase our skills and ingenuity to the wider engineering community.

Much of the talk was of remote cloud-based control and information systems guiding the precision equipment required for optimum production. Heady stuff - until the representative from the NFU reminded us that only 15% of the rural community has a decent Wi-Fi signal.

Once again, progress has to go hand-in-hand with practicalities.

The views expressed in Landwards editorial are those of the Editor, and do not necessarily reflect those of the Institution

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Top UK engineering honour

For JCB's Tim Burnhope

JCB's Chief Innovation and Growth Officer Tim Burnhope has received one of the highest honours for UK engineers.

Tim, who has worked for JCB for 16 years, has been elected as a Fellow of the Royal Academy of Engineering (RAE), which champions the cause of engineering in Britain. He is only the third person in JCB's 70 year history to receive the coveted accolade. Lord Bamford was made an Honorary Fellow of the Academy last year.

Tim said, "I am passionate about engineering and to be recognised in this way is a fantastic honour, not only for me but for the whole engineering team at JCB."

Professor Dame Ann Dowling DBE FREng FRS, President of the Royal Academy of Engineering, said, "The Royal Academy of Engineering is the national academy of engineering of the United Kingdom which, uniquely, brings together the country's most eminent and distinguished engineers of all disciplines."

Last year the Institution of Mechanical Engineers (IMechE) granted Tim Chartered Engineer status and made him a Fellow of the organisation. Tim graduated from college with a BEng Hons degree and later studied for an MBA at Newcastle University Business School. He joined JCB in 1999.

At JCB, Tim has worked in the roles of Engineering Manager and then Managing Director of the Loadall Business Unit eventually becoming Managing Director of both the Loadall and Backhoe Business units. In June 2006 Tim joined JCB Sales as Director of European Sales and in 2008 became Managing Director of JCB Sales Limited. In January 2012 Tim became Chief Innovation & Growth Officer with responsibility for innovation, research, product development and engineering for the JCB Group.

Supported by the Engineering Council

New engineering awards launched

Two prestigious annual engineering awards have launched their 2016 campaigns, supported by the Engineering Council.

Applications are now open for the 2016 Baroness Platt of Writtle Award and for the 2016 Hawley Award, with respective cash prizes of £1,000 and £5,000 for the winners.

The awards are presented by the Worshipful Company of Engineers through their trust fund, 'The Engineers Trust', which supports numerous annual awards and prizes to promote excellence amongst qualified engineers and those working towards registration as an Engineering Technician, Incorporated Engineer or Chartered Engineer. Shortlisted candidates for both awards will be invited to present to an award interview panel.

The Baroness Platt of Writtle IEng Award is in its fourth year in its present format and recognises the achievements of outstanding, newly registered Incorporated Engineers (IEng) across all disciplines.

Candidates must be nominated by their institution, so institutions are being asked put forward their most remarkable new IEng members and give them the opportunity to achieve this accolade and to boost their careers. Institutions can nominate up to five candidates who have achieved IEng status during 2015, and who have displayed outstanding ability to apply engineering knowledge, strength of commitment to the engineering profession, have excellent communication skills and have demonstrated managerial qualities.

The submission deadline for the Platt Award is Monday 4 April, 2016, and shortlisted candidates will be invited to attend an interview at the end of April 2016. Full details about award criteria, eligibility and where to send nominations can be found at ***tinyurl.com/nanq2ar***

Jon Prichard, CEO of the Engineering Council, says, "Incorporated Engineers make an essential contribution to all sectors of the engineering profession. Approximately 1,300 individuals achieve their IEng status every year, and through the Baroness Platt of Writtle Award, the Worshipful Company of Engineers are recognising and rewarding the most outstanding of these newly registered engineers."

The Hawley Award is presented for the most outstanding engineering innovation that delivers demonstrable benefit to the environment.

Individuals can put themselves forward for the award but must have the support of a supervisor. Entries must be based on work undertaken after graduate or post-graduate degree work and must have at least reached a stage where a prototype or a proof of concept has been developed, with the expectation of commercial implementation. Candidates must be members of a professional engineering institution and within 10 years of starting a professional career as an engineer or scientist in either academia or industry. Full details about award criteria, requirements and how to enter can be found at ***tinyurl.com/ogonnwb***

Barry Brooks, Hawley Award Co-ordinator and IET past President, says, "Every year, the interview panel is impressed by the high standard of innovative projects put forward for the Hawley Award. We are looking for original projects that are on their way to becoming commercially viable products or systems, with the potential to improve the environment."

The submission deadline for the Hawley Award is Monday 18 April, 2016. Interviews for shortlisted candidates will be held in early May 2016.

The winners of both awards will be presented with an engraved medal, certificate and cash prize at the Worshipful Company of Engineers Annual Awards Ceremony and Dinner on 19 July, 2016.

New institute offers unique food chain expertise

The Institute for Agri-Food Research and Innovation launched

A newly formed institute that joins up the research expertise of Newcastle University and Fera Sciences Ltd to address real world challenges throughout the entire food production and supply chain has launched.

The Institute for Agri-Food Research and Innovation (IAFRI) is a five-year £9million collaboration, and will work with partners from the agricultural and food industries.

IAFRI will harness the world-leading scientific expertise which exists across both Fera and Newcastle University to drive forward innovation in areas such as food security and crop protection. Joint appointments and new PhD studentships across the two organisations will also help bring a unique breadth of expertise to bear on current concerns around food security.

The new institute will benefit from the unique facilities at Newcastle University's research farms - Cockle Park and Nafferton - as well as state-of-the-art food testing facilities at the University's Human Nutrition Research Centre. Initial priority themes will be:

- Agri-food production and protection, improving the productivity and health of our crops and livestock
- Agri-tech diagnostics and biosecurity, to develop precision approaches and smart surveillance systems help protect agriculture and the natural environment from pests and pathogens
- Food safety and health, ensuring our food and feed is safe and nutritious and that our supply chains are resilient

Cutting across these themes will be an emphasis on sustainability and land use. All research carried out within the institute will be interdisciplinary, involving natural and social scientists working together to identify areas for research and to carry out the work.

Director of IAFRI Professor Rob Edwards said, "This is a truly unique endeavour. IAFRI will bring together academic and research excellence from across Newcastle University, from the School of Agriculture, Food and Rural Development, from Biology, Medicine and Engineering and beyond. It will marry this with the experience that Fera brings both in research and in applying research to real world problems. We will harness this breadth of experience and expertise, in both natural and social sciences, to address issues throughout the length of the food chain.

L-R: Prof Ian Boyd - DEFRA, Hilary Aldridge - CEO Fera Sciences Ltd, Rob Edwards - Director of IAFRI

"An interdisciplinary approach is already a great strength of our research here at Newcastle. Just as importantly, we have well established links with the agricultural and food industries which underpin our activities, provide complementary expertise from a very practical perspective and give a helpful focus to our endeavours.

"Drawing upon all of these assets, IAFRI will be in an unrivalled position to support food security nationally and globally, throwing light upon every aspect, from food production and its environmental consequences, to the implications, both personal and societal, of the choices that consumers make every day as they fill their supermarket trolleys."

Hilary Aldridge, CEO of Fera Science Ltd, said, "We are delighted that the formation of this joint venture delivers a complimentary platform for Fera's unrivalled position as an organisation working with the private and public sectors and the academic and research elements of Newcastle University to develop world-leading translational science.

"I look forward to seeing IAFRI's vision of delivering innovation in research across the agri-food supply chain being achieved as a result of bringing together the best multidisciplinary talent in the social and natural sciences. The output of which will be to drive new solutions, techniques, skills and best practice in the agri food and associated environmental sector to develop innovative solutions that will benefit society as well as driving economic growth for not only the medium but also the long term."

The launch event took place at Newcastle University's London campus and was attended by Professor Ian Boyd, Chief Scientific Adviser to the Department for Food and Rural Affairs, as well as representatives from Research Councils UK, other funders and industry contacts.

> "IAFRI will be in an unrivalled position to support food security nationally and globally"

New idea? Help is at hand

David Shelton, managing director of E. Skinns Ltd and active in the work of the Institution says, "In many businesses ideas abound but relatively few get beyond the back of the envelope stage.

"This is not surprising for when new agricultural machines or equipment are envisaged it initially entails detailed design work

"This is usually followed by Computer Aided Design (CAD) studies and finally by the building of a prototype or prototypes.

"The expertise to undertake this type of work from beginning to end is not readily available.

"Work of this nature is in the DNA of our agricultural engineering business based at Woodhall Spa Lincolnshire. Our expertise has been acknowledged by the winning of several national and international awards including the Lincolnshire Media Creativity Award the citation of which read '*For outstanding success and achievement*'.

"In many cases consideration will need to be given to the protection of intellectual property rights and meeting EC criteria. Here we can provide guidance. Over the years we have helped many businesses and individuals get ideas into production. Perhaps we can help you?"

Visit *www.eskinnsltd.co.uk*

Bill Butterworth

Bill Butterworth was the architect and General Secretary for 25 years of the 'reverse franchised' (farmer-owned) Land Network consortium of farmers who recycle 'wastes' to land.

Having recently emerged from that and his 50 year apprenticeship with the IAgrE he has been appointed The Director of Land Research Ltd which allows him to "keep long term interest in anything to do with the land and soils" but specifically to develop his interest in deep drilling, including shale gas development.

His blog and contact details can be found at *www.landresearchonline.com*

East Midlands Engineering & Science Professionals lecture

At long last the East Midlands Engineering & Science Professionals have re instated their annual lecture.

The next EMESP Prestige Lecture will take place on the evening of March 2rd, 2016, at the Nottingham Albert Hall, with the topic being 'The London Crossrail Link'".

More details, and how to get tickets for this event will follow shortly.

24 new CLAAS apprentices

On Technician and Parts schemes

Barony intake

This autumn has seen 24 new students join the CLAAS Agricultural Apprenticeship scheme, of whom five are training for the new Parts apprenticeship created last year.

Of the 24 students who come from CLAAS dealerships throughout the UK and Ireland, 18 will be conducting their training at Reaseheath in Cheshire, and the remaining six from the North of England, Scotland and Ireland will be studying at SRUC Barony.

The 19 students studying for the CLAAS Agricultural Technician Apprenticeship at Reaseheath and Barony will work towards achieving the Extended Diploma in Landbased Technology over the next three years. This high level vocational qualification is designed to meet the Government's calling for training programmes that meet employer's needs.

CLAAS launched the Parts (Sales and Marketing) Apprenticeship, which is also based at Reaseheath, last year in order to bring into the industry the next generation of young, knowledgeable and experienced parts personnel.

The CLAAS Agricultural Apprenticeship is provided by IMI Awards, who have worked in conjunction with CLAAS. Over the course of their apprenticeship, the Apprentices will be continuously assessed for their competence and skills, using both work-based evidence and e-portfolios.

Both sets of Apprentices may also be selected to visit the CLAAS Group headquarters in Harsewinkel, Germany. They will also spend time training within CLAAS UK headquarters, at Saxham in Suffolk, giving them an insight into the size and scale of CLAAS, a global company employing in excess of 11,000 people.

In their final, fourth year, the Technician Apprentices will also undertake additional advanced technical and industry training, so that by the time they qualify they will be eligible for LTA 2 status.

Reaseheath intake

PANEL DISCUSSION: Capturing Agri-Tech innovations

Professor Simon Blackmore

Dr Helen Ferrier

Dr Robert Merrall

Calum Murray

A panel session followed the main presentations, which comprised:

•Professor Simon Blackmore FIAgrE (Head of Engineering, Harper Adams University) *"We are still limited by the size of railway tunnels in this country, so smarter not bigger machines have to be the answer"*.

•Dr Helen Ferrier (Chief Science and Regulatory Affairs Advisor NFU), "*Farmers are now closer to full productivity than ever before, However, with new innovations, the problem is that only 15% of farmers have reliable wi-fi connectivity, use of 4G is still low, so we have to beware of running before we walk*".

•Dr Robert Merrall (President-Elect IAgrE) "*Agri-Tech can certainly learn from other industries including railway engineering and pharmacueticals, there is so much crazy technical stuff out there to learn from now*".

•Calum Murray (Sustainable Agriculture and Food, Innovate UK) "*The agricultural industry is knowledge-rich and data-poor so collating the information needed for the economic validation of new technology is currently a challenge*".

PICTURED AT THE ROYAL ACADEMY OF ENGINEERING

left: Leon Terry, Elizabeth Stephens, Mark Kibblewhite and Paul Miller. *centre*: Chris Evans (AEA) with Trevor Tyrrell and right Marion King with Sarah McLeod on IAgrE stand.

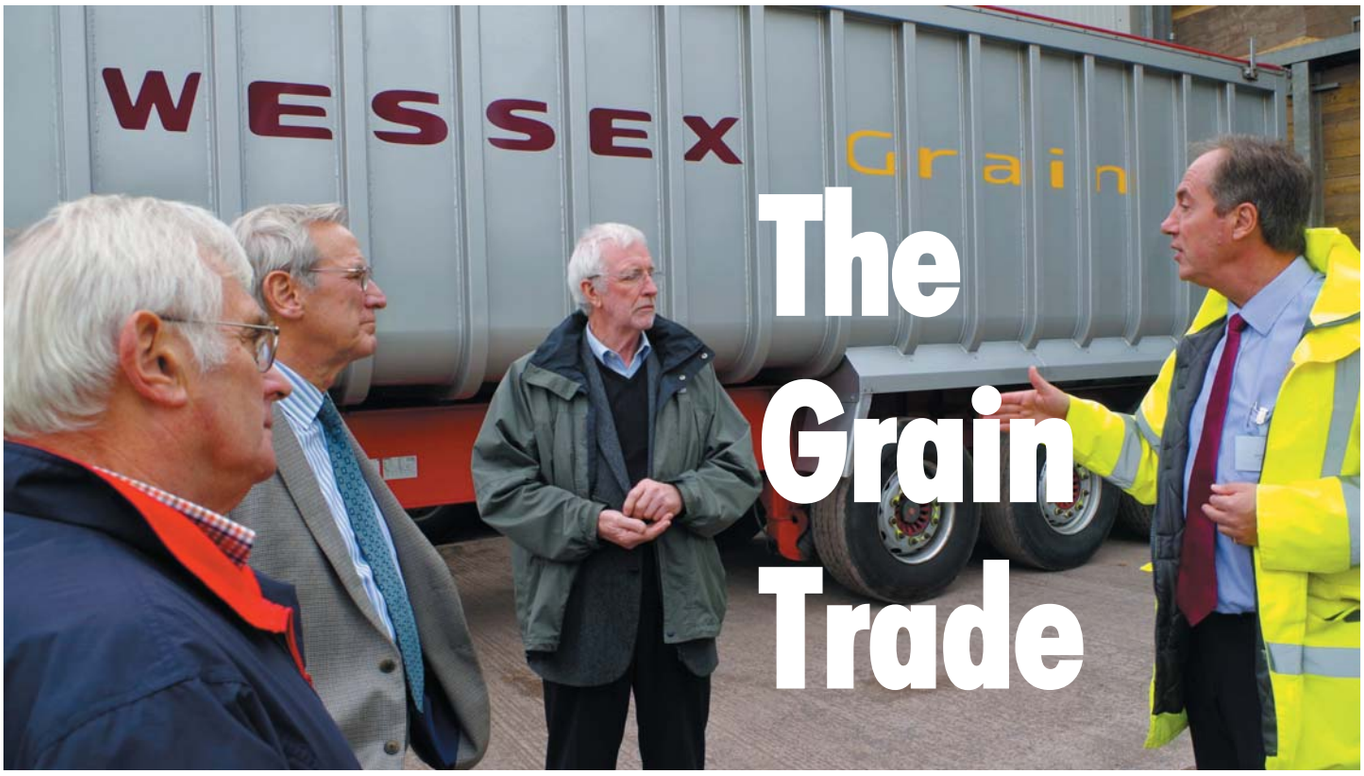
WATCH THE EVENT

The Royal Academy of Engineering film unit recorded the whole of the Innovation in Agri-Tech event on 12 October.

You can watch the various presentations on:

www.raeng.tv/Media/2015/Innovation-in-agri-tech.aspx.

In addition, Professor Dick Godwin contributed a lengthy feature on Precision Farming for the Sept 2015 issue of the Royal Academy's professional journal, INGENIA. You can read the article on the journal's website www.ingenia.org.uk



The Grain Trade

Wessex Grain managing director Simon Wilcox outlines the processes in place to Council members

For its latest on-the-road venue, the IAgrE Council visited the headquarters of Wessex Grain to look at a highly automated operation by one of the UK's leading grain traders.

The IAgrE Council was kindly hosted by Wessex Grain Managing Director and IAgrE Member Simon Wilcox for its meeting on Thursday 22 October 2015.

The linking of council meetings to a technical visit is something which the Institution has been doing for a number of years and the opportunity to explore the complexities of post-harvest technologies was an interesting opportunity for the institution.

Following the business meeting which included a useful discussion on specialist and technical groups, and how these can be refreshed in line with the changing face of the agricultural engineering industry, council members were given a fascinating insight into the operations of Wessex Grain followed by a tour of the grain storage facilities

ABOUT WESSEX GRAIN LTD

Wessex Grain Ltd has grown from a small farmers Co-operative established in 1980. As the business grew it expanded into three companies that operated parallel to each other (Wessex Grain Store Ltd, Wessex Grain Marketing Ltd and Henstridge Grain Services). Henstridge Grain Services changed its name to Wessex Grain Ltd in 1995 and in 2003 merged with the two other companies to form one entity managing all facets of the business.

Wessex Grain Ltd is now one of the top ten grain traders in the UK. It is renowned for providing growers and grain users with a service that is reliable, friendly and efficient.

The company is now the only major grain trading business based solely within the region.

Wessex Grain's state-of-the-art facilities, and the ability to blend grain on-site, equip it with all the necessary tools to maximise the value of members' grain. The store has recently had a £2.5 million expansion and upgrade, partially funded by an RDPE grant which has increased capacity to 70,000

tonnes, including a single 17,000 tonne flat store. The store is registered with LIFFE as a Grain Futures Store, and offers farmers storage space which costs significantly less per tonne than the cost of on-farm drying, cleaning and storing.

Laboratory technician weighs all incoming and outgoing loads before taking samples for testing in laboratory

THE AGRICULTURAL ENGINEERING DIMENSION

Alastair Taylor, IAgrE CEO says, "My first thought was that the storage of grain and the infrastructure required must be relatively simple, but behind the scenes there have been many technological advances which have been introduced in line with the need to ensure clear traceability, sampling, testing and automated movement of products. I was surprised as to how technical things have become."

The start of the process is the weighbridge, sampling arrangements and laboratory. Nothing enters or leaves the facility without being sampled, tested and recorded. A remotely operated spear is used to collect a sample with a range of tests being made to assist managers in making the right decision as to end destination, storage, and drying requirements.

There is a range of storage arrangements in use at Wessex Grain including bins filled and emptied by augers and elevators as well as flat stores filled by elevators and emptied by a telescopic handler with a five tonne bucket. An interested point was the angle of the shed roofs which has been matched to the angle of repose of heaped grain - no waste of space being the plan.

Remote controlled sampling spear

AUTOMATION

In the recent past, Wessex Grain have invested in upgrading the control system for the grain elevators and distribution systems. The original system used a manual control plan to set up the route from the tipping hopper through to the required destination. As this became outdated, the move was to a computer based system operated from a terminal in the grain store manager's office.

Although the process control system is commonplace across many food processing operations, a bespoke solution was designed for Wessex Grain. With five tipping pits for different products, it is possible for simultaneous movement of all of these around the site.

TRANSPORTATION

The company trades around 450,000 tonnes per annum of combinable crops through a variety of pooled and ex-farm contracts.

The ex-farm trading covers an area from Cornwall to Sussex, northwards up to Buckinghamshire and then back across to South Wales. Throughout the country,

Wessex Grain works closely with the major flour and oat millers, maltsters and oil crushers. It also supplies all the animal feed compounders within the South West region. The company also has strong connections and knowledge of the export markets and so is able to move specialist commodities, especially Malting Barley and any local surpluses, through the ports of Poole, Southampton, Avonmouth, Sharpness, Plymouth and Teignmouth.

In addition to its own fleet, Wessex Grain uses a number of owner drivers to move grain across the region. The margins are very tight so every effort is made to ensure that trailers never run empty.

NEXT COUNCIL MEETING

The next Council Meeting is scheduled for Thursday 11 February 2016 to be held at the IAgrE offices, Bullock Building, Cranfield.

It is planned that the meeting be followed by a presentation from research students currently doing their PHD at Cranfield.

CALLING ALL IAgrE 'SNAPPERS'

IAgrE is on the hunt for amateur photography stars to help build an innovative and lively image bank to support the Institution's marketing activities.

Members and their families are invited, to email digital photographs to the Secretariat at **pressroom@iagre.org** by the 25th of each month and the entries will be judged by the secretariat team.

"We need to source new images to support our on-going marketing campaigns such as the website, press releases, *Landwards*, literature etc and it is a great opportunity for budding amateur photographers to get creative recognition," said IAgrE CEO Alastair Taylor.

Entries must be good quality and submitted as jpegs

By submitting a photograph you are confirming you own the copyright to that picture and you grant IAgrE the right to use it in its marketing material.

Entry submitted by David Elder 'Weighing in the rye grass' taken using a camera-fitted drone

World Agri-Tech Investment Summit

FUNDING AND FAST TRACK INNOVATION

IAgrE President-Elect Dr Robert Merrall MIAgrE reports from the global agricultural investment summit held in London in November

DURING November, London saw an influx of agri-tech entrepreneurs and venture capitalists from around the world at the World Agri-Tech Investment Summit. There was strong presence among fund managers from the USA, but also the UK, Canada and Israel. On the business front there were companies attending from across the globe, as the delegate list attests.

George Freeman, Parliamentary Under Secretary of State for Life Sciences, Dept for Business, Innovation & Skills (BIS) held the attention of the room as he cited his farming credentials and championed the cause of instilling a strong work ethic in our young people.

He highlighted the exciting opportunities for industry and research partners in today's Agri-Tech arena, something we all recognise as a blessing after a long 'fallow' period. There would appear to be a level of commitment to continued investment in the technology that ensures we all have enough to eat (although to what extent will be clearer after the Autumn Spending Review on 25th November 2015).

His main message was a clear request to our sector: please keep telling the Treasury about the good stuff you are doing. He clearly needs his colleagues at No11 to appreciate the scope for return on what is (in governmental terms) quite a modest investment. He was also keen to point out the risks of over-regulation European objections to some of the latest genetic techniques.

He spoke in supportive tones about the commitment his department had to the current programme of Agri-Tech investment, but clearly he has to demonstrate impact and needs to feel that industry at large is behind government in this endeavour.

Ian Noble from Pepsico endorsed the Minister's comments (as one might expect…he is after all advising government in this area as a key member of the Agri-Tech Steering Committee).

Ian joined Trish Malarkey (Head of R&D at Syngenta, Switzerland) and Steve Webb (from Dow Agrosciences, USA) in the first global leaders' debate of the day, looking at fast-tracking innovation through partnerships and collaboration.

Some key concerns emerged about the extent to which regulation was stifling innovation. In particular, the opinion seemed to be that the EU could be legislating itself into the genetic innovation 'slow lane'.

Speaking more broadly, Ian Noble talked about using genetic markers to assist conventional Mendelian breeding approaches, perhaps looking at old traits that have been bred out of modern elite lines. The concept of breeding for sustainability was discussed, as was the concept of breeding to cope with soil salinity and the whole idea of leaving more in the soil than has been taken out.

> . . . the biggest brake on innovation is the regulatory burden

There was general discussion between Ian and Trish about smarter pest control, and how collaboration was dependent on getting the approach to intellectual property correct.

The relative merits of patents/trade secrets and non-disclosure agreements were discussed - as Trish said, in Syngenta's business, what's patentable depends on the delivery mechanism employed and the combination of technologies involved in this delivery.

However, the biggest brake on innovation for her is the regulatory burden. The return profile is simply not attractive enough on much agricultural innovation. In the pest and disease control area involving a novel active ingredient, there is always going to be a 7 to 10 year gap before any return on investment is achieved.

It seems to me that this is one reason why mechatronic interventions in the agri-tech sector could become so attractive, provided our legislators can resolve the problem of autonomous vehicles effectively.

Early indications are that the UK wish to

take a leading position in this area, but it remains to be seen how this will be delivered.

SEEKING NOVEL CONCEPTS

The conversation then turned to the relative lack of business incubation facilities in our sector, which is seen as a significant challenge for academics, government and private investors alike. Even relatively well-developed concepts need to be connected with the right investors.

Venture capitalists are not looking for normal, run of the mill solutions. They are seeking out concepts that are novel or perhaps disruptive and they will be taking a bet on someone else's integrity, energy and imagination, and this needs to be kept in mind by start-ups.

The day continued with a good discussion about the Internet of Things (IoT) in farming with CNH's Antonio Marzia explaining the link from machine to farm in today's equipment and the fact that this equipment is almost autonomous now.

His position was that the growth in sensors on machinery would continue, but that it was not the place of machinery manufacturers like CNH to add interpretive value to the data collected.

The role of the local adviser is key in this area, but it was clear from the discussion that work needs to be done on data standards and the creation of local 'data co-ops' who might hire agronomists familiar with local needs.

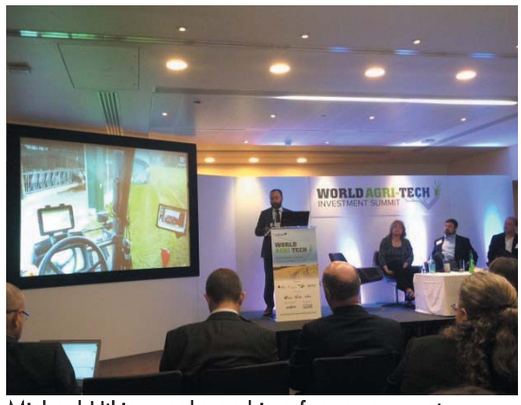
There is a real need for continued software development in the Agri-Tech Internet of Things, focussed on the development of APIs (application-programming interfaces).

Interesting R&D funding opportunities to develop new service businesses were highlighted by Tony Sephton from the European Space Agency (based in Harwell). Essentially, if you have a concept that uses 2 satellite derived functions (eg: GPS positioning together with SMS based telemetry), then there is scope to seek ESA project funding, and there is money available right now.

GOOGLE

Google then took to the stage in the form of Andy Wheeler, managing partner at Google Ventures who talked through some recent investments he had made in start-ups in farm data, but made the point that there is real hard work needed to add value to data.

A recent Google investment called Farmers Business Network has had some recent success in the USA, but this success has been built on hard work from their field staff who were doing a lot of farmer 'hand holding' to the extent that they would meet around the kitchen table to collect SD cards before ingesting and processing the data back in their regional offices.



Michael Utkin speaks on his e-farmer concept

The discussion about data integration continued into the next session, chaired by Simon Blackmore. The use of appropriate interfaces was discussed, the need for improved ISOBUS standards was highlighted, as was the need for integration with external data sources like the weather.

A 'Dragon's Den' session followed, with a series of entrepreneurs presenting a seven minute snapshot of their concepts. Of most interest to IAgrE members would be Northern Ireland based John Arrell's concept from Sixty-5 Technologies, who use android tablets to provide very simple 'light bar' style steering guidance mostly for grassland farmers.

Their innovation is a small wi-fi box that plugs into the tractor ISOBUS and a Trimble gps receiver. That means that a wi-fi tablet can be fixed to the windscreen with a sucker and a power lead and nothing much else, as the connectivity is via the wi-fi interface bolted into the tractor cab and plugged into the ISOBUS.

Another innovation of real interest was Netherlands based Michael Utkin with his eFarmer concept. Once again, an android based concept, this time offering tractor guidance together with a suite of farm management tools with a downloadable app. Their team of 16, based in Noorwijk (Netherlands), Gutersloh (Germany), with developers based in Kiev (Ukraine), seeks to offer mobile farm management tools that offer real management advantage through their web based portal, and presently have more than 50,000 downloads via Google Play.

The Eastern European theme continued into the afternoon, with the significant opportunities in the CIS region being highlighted by Wojtek Boniaszczu, senior banker at ERBD. A series of 5 speakers from the USSR and Ukraine highlighted the clear opportunities for investment in the CIS.

The afternoon continued with Chris Dunkley from Rothamstead's new Centre for Research & Enterprise, explaining more about the home-grown innovation opportunities and challenges facing the (mostly biotech) sector.

. . . team of 16 provide mobile farm management tools with over 50,000 downloads via Google Play

Day two continued in a similar vein, with investment opportunities highlighted in the UAE, Turkey and Tunisia. There was much discussion about plant breeding innovation and biotech, with the session chaired by NIAB's CEO, Tina Barsby. More Dragon's Den sessions followed with biotech startups (including a French company developing insect protein sources for livestock feed).

Later in the day, the challenges (including more regulatory impacts) of getting biological products to market were explored in a discussion session, which was followed by speakers highlighting the opportunities in both China and India (which seems appropriate given the recent high level visits to the UK from both country's premiers).

The final session of the day was aimed squarely at later stage entrepreneurs seeking exit, with an impressive array of investors speculating about the next likely strategic opportunities.

The next event in the series is in San Francisco, March 16-17 2016 and it is likely that the event will be repeated next year in the UK in November 2016.

Technical & Special Interest groups

by Alastair Taylor, IAgrE CEO

The Institution has a wide range of Technical & Specialist Interest Groups set up to provide a forum for technical updates and networking within the industry.

They aim to keep members informed of the various disciplines within IAgrE.

At present we have eleven groups:

- **Amenity/Sports**
- **Food Engineering**
- **Forestry Engineering**
- **Health & Safety**
- **Horticultural Engineering**
- **Livestock Engineering**
- **Overseas**
- **Pioneering Technology**
- **Power & Machinery**
- **Renewable Energy**
- **Soil & Water**

Technical and Specialist Interest groups are very important to the Institution, but several of them are less active and are perhaps in need of a new injection of enthusiasm.

Many of our members have worked hard to make a success of the groups but perhaps some are no longer of interest? Perhaps new Groups should be formed that are more relevant? We welcome your views.

Council had a discussion at the October meeting around this subject, where we asked them:

- **Is the range of specialist 'technical' groups relevant?**
- **Should we 'cull' the inactive groups?**
- **Should we have new groups and if so, how can we make these flourish using electronic media, etc. Do we have any champions we need to be approaching?**

Several points were made but no particular conclusions were drawn.

In summary:

- **There was general agreement that all the current groups remain relevant and for the most part, the titles and themes remain relevant.**
- **For any group to thrive it must have a real issue to address and someone must be willing to take that issue forward and drive the group forward. Unfortunately several of our current groups do not have a leader to take things forward.**
- **Successful groups connect people who are interested in the same topics and provide excellent CPD opportunities. Going forwards, videoing Branch Meetings may help to provide a resource for Technical and Specialist Interest Groups. Social media such as LinkedIn, Facebook and Twitter have an important role to play.**

It was agreed that some new Technical and Specialist Interest Groups could be established.

- **Once the new Agri-Tech Innovation Centres are up and running there is scope for a new group to disseminate information related to this.**
- **A forum for those involved in Landbased Technician Accreditation (LTA) was suggested although it was felt this might be better taken forward via Facebook or LinkedIn.**

YOUR OPPORTUNITY TO CONTRIBUTE

Our questions for you are the same but we also ask for volunteers who would like to manage our existing groups and take them forward.

We do not have a preference about how these groups are run or how they exist. The Institution provides a web page (or pages) that may be managed by the group's contact or the Secretariat if you prefer. They just need 'feeding' with the latest news and views from the areas they represent.

Occasional meetings and events may be run and the Secretariat would support you in this. Perhaps videos could be made and disseminated through eNews? The choice is yours.

Please contact Sarah (*secretary@iagre.org*) if you have any ideas or would like to get involved in one of our existing groups or would like to set up a new group.

Several groups are less active and are perhaps in need of a new injection of enthusiasm

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Secretary: Paul Miller Administrator: Elizabeth Stephens

Activities of the DOUGLAS BOMFORD TRUST

An update

The Annual General Meeting and General Management Board meetings held in November

The Annual General Meeting of The Douglas Bomford Trust was held on 10th November 2015 at Cranfield and was attended by eight trustees and two administrative staff.

At this meeting:

- **Antony Burgess stood down as a trustee: Antony has been an active trustee and has contributed much to the work of The Trust over the past six years.**
- **Nick August was appointed as a trustee to succeed Antony: Nick is a farmer from the Cotswolds with 500 hectares of arable land on the Oxfordshire/Gloucestershire border where he also operates a contracting business. He has a strong interest in precision farming and plays an active role in projects conducted on his own land.**
- **The Annual Report and accounts for the financial year ending 31st March 2015 were accepted and signed: these will be submitted to The Charities Commission and made available via The Trust's web site.**

A meeting of the new Board of Trustees was held following the AGM.

At this meeting the Trustees:

- **Reviewed the administration of The Trust;**
- **Received a report concerning the financial management of The Trust's assets - Jonathan Bomford, Anthony Burgess, Elizabeth Stephens and Paul Miller had met with the three fund managers who handle Trust funds in October and were able to update Trustees on issues relating to these funds;**
- **Reviewed the progress of activities that are funded by The Trust;**
- **Examined new proposals for funding and made recommendations as to which of these proposals should be funded: at this time much of the Trust's income has been allocated to on-going projects and no new major projects could be started in the coming six months.**

The Trust continues to support the Arkwright Scholarship scheme

In September 2014, The Trust agreed to support The Arkwright Scholarship Scheme by sponsoring two students - Mark Holliday and Oliver Rees - working towards their 'A' Levels and with an interest in agricultural engineering as a possible future career - *see Winter 2014 Landwards*.

We have maintained contact with the students during the year and offered to arrange some work placement during the summer although ultimately both found activities nearer to their home address. These students will be supported for a further year running up to their 'A' level examinations.

The Trust has extended its involvement with the Arkwright Scheme by sponsoring a further two students - Andrew Knight and Alex Williams - for the next two years. Andrew and Alex were presented with their scholarships at a prestigious ceremony held at the Mermaid Theatre in London attended by both sets of parents as their guests.

Arkwright scholars Andrew Knight (left) and Alex Williams (centre) with Douglas Bomford secretary Paul Miller having received their scholarships at the 2015 presentation event

Studentships & Prizes

STUDENTSHIPS

More than twenty applications were received for DBT studentships for the 2015/16 academic year. These awards typically provide successful undergraduate students with up to £1,500 to support their studies during the year.

Eight students were interviewed at Harper Adams University on 18th November and the results of the selection process are currently being finalised.

PRIZES

The Trust awards prizes to students at Cranfield, The Royal Agricultural and Harper Adams Universities on an annual basis -see Autumn 2015 Landwards for details of presentations at Cranfield and The Royal Agricultural University.

This year The Douglas Bomford Trust prize 'For the best FdSc Agricultural Engineering student' at Harper Adams University was awarded to James Tyler. The award, comprising a scroll and a cheque, was presented to James by Paul Miller, secretary to The Trust, at the Harper Adams University Graduation day on 25th September 2015. James, who comes from a local farming family, will be returning to Harper Adams University for the 2015/16 academic year so as to top up his qualification to a BSc (Hons) degree.

James Tyler with Paul Miller

The Trust is represented at a reception for Harper Adams University donors

Jonathan Bomford (trustee) and Paul Miller (Trust secretary) attended a reception at Rabobank in London that was organised to thank organisations that had encouraged Harper Adams University in its work through the provision of student scholarships and capital development funding.

The reception was attended by the Chancellor of the University, HRH The Princess Royal and she spent time talking directly to all of the organisations represented at the event.

Jonathan Bomford (trustee) describing aspects of The Trust's work to The Princess Royal at the Harper Adams University reception

PROJECT REPORT

DBT funded PhD student, Alex Cooke, holds soil erosion research demonstration event

Alex Cooke of Cranfield University held a day long event demonstrating her PhD research on the 25th September in Herefordshire.

Her work evaluates the use and adoption of filter socks for the control of soil erosion, runoff and nutrient losses from agricultural lands under current and extreme rainfall events. Filter socks are currently widely used in the US for sediment control on construction sites and her research aims to make them applicable to UK agricultural land. In addition to DBT support, the research is also part funded by the Environment Agency (EA).

The demonstration event was attended by DBT trustee, Peter Redman, along with other delegates from a wide range of backgrounds. The day involved presentations from Andrew Osbaldiston (EA) on the issues of water quality in the Wye catchment; Dr Robert Simmons (Cranfield University) on the principles and mechanisms of soil erosion; and Dr Britt Faucette (Filtrexx International) on filter socks and their current US applications.

Following lunch there were field demonstrations from Mick Boyle (Scotbark UK) on the installation and application of filter socks in the UK; and Alex Cooke (Cranfield University) presented the field trials and instrumentation used to monitor the effectiveness of different filter socks in controlling losses of runoff, soil and nutrients.

LEFT & RIGHT: The demo day in Herefordshire
BELOW LEFT: The plots
BELOW: A Tank

Spreading the dirt: IYS 2015 at Cranfield

Oliver Pritchard, Alexandra Cooke and Jacqueline Hannam
Cranfield Soil and Agrifood Institute, School of Energy, Environment and Agrifood, Cranfield University

If you weren't already aware, 2015 is the United Nations Food and Agricultural Organisation's International Year of Soils (IYS).

The aim of IYS is to encourage further awareness and understanding of soil for food security and ecosystem functions. However, soil supports much more than this, including the management of flood risk, supporting our infrastructure as well as providing a climate buffer. As soil-science PhD researchers and academics at Cranfield University's Soil and Agrifood Institute, we have been doing our bit for the IYS.

We are acutely aware of the benefits of social media for immediately outreaching to large numbers of people. As such we have been using this medium to actively engage with the scientific, farming, and environmental communities, as well as the general public through both a student-led blog, The Dirt Doctors (*www.thedirtdoctors.com*) and Twitter (*@DirtDocs*).

Since the blog's conception earlier this year, it has had thousands of views spanning almost one hundred countries. But the really fun and engaging part has been the several outreach activities with local schools and the general public. In the remainder of this article, we provide you with a flavour regarding some of the activities that we have been involved with.

Alex Cooke explaining hand texturing of soil

SOAPBOX SCIENCE

Cranfield University soil science academic, Dr Jacqueline [Jack] Hannam, has participated in several Soapbox Science events.

Soapbox Science being a platform for women scientists, spanning a range of disciplines, to stand on their Soapbox (literally a box) and explain what they do in their day-to-day research to a general public audience. Having presented at events in London and Manchester, and drawing many crowds, Jack is helping dish the dirt about soil.

Over the course of an hour or so, she explains what soils are, how they are mapped/monitored, their importance to society and what the future potentially holds. The event also spawned the creation of the now prolific, 'soil megamap' which shows the distribution of Great Britain's soils. The megamap has proven to be a great tool for soils outreach, prompting many interesting questions whilst engaging the public's understanding of the soils in relation to where they live.

STONY STRATFORD PRIMARY SCHOOL

Due to Jack's success, we got the bug for getting involved in soils outreach, with the aim to help inspire people to potentially pursue a career in soil science.

To this end, earlier this year we visited a school in Stony Stratford near Milton Keynes, where primary school children aged 5-11 were given a brief taste of the different specialisms within soil science, forming part of their annual 'science week'.

Despite being greeted by the head-teacher with the line "*you know that being soil scientists is a bit weird, right?*", our enthusiasm wasn't put down. The day's activities involved hand texturing; microscopy of soil particles and biological constituents as well as understanding the distribution of soils using the megamap. The kids left with muddy hands and a soil bug, courtesy of the British Society of Soil Science.

3D scanning of soil monolith

ASPIRE STEM EVENT

Recently, Cranfield University hosted an Aspire STEM (Science, Technology, Engineering and Mathematics) event for girls aged between 13-15; those either just embarking or half way through their GCSEs, and so beginning to think about possible future careers in STEM.

As the audience was a bit older, our activities changed to allow them to understand the different scales and technologies involved in collecting and using soils data. This included use of the 3D scanner (for scanning soil surfaces) alongside 3D visualisation of terrain and soil data for Great Britain.

This not only allowed the girls to use some cutting-edge technology, but also understand how landscape affects different soil types, along with giving an insight into the uses of soil data in the agricultural and industrial sectors.

SUMMARY

What we've learnt is that outreach is valuable for both us as academics and the students we are engaging with.

For us it provides insights into how our research can benefit non-academic communities. For the students, it gives them an understanding of different subjects, and consequently the practical opportunities and the careers they will consider in the future.

In our case, it exposes students to two career paths they may not have considered and which are suffering from a decrease in workforce; soil science and engineering.

Outreach is hugely rewarding and our advice to anyone is that if you can spare some time, get involved!

What does future hold for wind energy industry?

Uncertainty over Government subsidies and planning and financing constraints risk putting the brakes on the small-scale wind sector. **OLIVIA MIDGLEY** gauges opinion from a selection of the industry's leading experts.

This article was the runner-up in the Guild Of Agricultural Journalist awards and first appeared in Farmers Guardian

Progression in the UK farm-scale wind market has led it to be one of the strongest and most active in Europe.

Worth more than £100 million to the rural economy, the market's status is supported not only by its activity, but also by its maturity, with consolidated players operating at all levels of the value chain.

But market growth continues to be threatened by a variety of hurdles, which will need to be surmounted if distributed wind generation is to fulfill its enormous potential in the UK.

These range from the ongoing impact of tariff degression and financing difficulties, to planning challenges and technological concerns such as how to address grid connection and long-term maintenance.

While landowners across the country continue to enjoy the financial benefits of becoming independent power producers, it is vital each of these areas is addressed in order to guarantee the sustained viability of farmscale wind as a practical and profitable investment.

Ivo Arnus, director of UK business development at Norvento, says: "As a Feed-in Tariff [FiT] supported sector, the success of farm-scale wind has always been tied in to the status of external Governmental mechanisms.

The UK's farm-scale wind market growth continues to be threatened by a variety of hurdles

RATE OF GROWTH

"While the development of the sector to date has been fuelled by favourable subsidy regimes, ongoing tariff degression as small and medium wind installations proliferate is, in turn, starting to slow down the rate of growth."

The recent degression this October (a 10 per cent cut across all tariff bands) is set to be followed by another (possible 10 per cent) in April 2015, which will, in practice, come into effect this December as developers and landowners look to meet Ofgem's pre-registration deadline.

"While the positive reading is this has prevented a potential industry 'bubble', many will inevitably interpret this rapid tariff reduction as something of a death spiral," adds Mr Arnus.

"At the current tariff level, the industry is still able to offer an attractive product to investors and landowners. Further cuts, however, may prove hard to swallow and it is likely some consolidation will be necessary and we may see a process of natural selection, whereby only the strongest companies with the most efficient product will survive in the long run."

UK managing director of Endurance Wind Power Dave Rankin agrees farmers will still be able to see decent returns from more efficient turbines such as the firm's new 85kW E4660 wind turbine.

This new turbine generates 35 per cent more electricity than the original model, which means a lower cost of energy and an excellent return on investment (ROI) even at modest wind sites, effectively turning back the clock on the UK FiTs to 2012 levels.

FINANCING

Given the impact of tariff degression on the market, the matter of how new installations are financed is important. With many banks unwilling to lend on small-scale proj-

ects, farmers are looking at more innovative solutions, for example joint ventures between landowners and developers.

For Arwyn and Cerian Ellis, hosting a 50kW wind turbine on their farm has given them the ideal opportunity to diversify their upland livestock business.

The couple farm 110 hectares (270 acres) of upland grazing and hill ground at Ty Isa, near Llanfihangel Glyn Myfyr, Conwy County. They are the family's fourth generation to farm the land and currently run 45 beef suckler cows and 850 breeding ewes.

SECOND TURBINE

With one turbine successfully installed and generating a guaranteed rental income, a second turbine will soon be constructed on a newly purchased 10ha (27-acre) plot, through a land rental partnership with Endurance.

Mrs Ellis says: "With meat prices constantly fluctuating and farm support payments set to diminish, we have made a conscious decision to ensure we have not got all our eggs in one basket."

Across the UK, the well-publicised interventions of the Secretary of State for Communities and Local Government Eric Pickles and changes to planning rules have presented another hurdle for would-be independent power producers.

These changes have ultimately slowed down the decision-making process of local councils as a growing number of studies and consultations are required in the early phases.

"Often the process becomes so protracted developers are driven to file appeals for non-determination," says Mr Arnus.

"These appeals, in turn, take a long time to resolve with the local planning authority and frequently result in refusals which have a considerable impact on the bottom line."

Many refusals for farm-scale developments hinge on the visual impact caused by the turbine.

"In order to minimise the likelihood of refusals of this nature, Norvento always commissions experts to assess the potential impact of each prospective site on the landscape and will never proceed with an application if this impact is found to be significant.

"Likewise, many of the most sophisticated modern turbines are designed and painted with the specific goal of reducing noise and visual impacts."

'Visual impact' is the reason why an application by Ellesmere beef farmer Robert Williams for a 500kW turbine was turned down.

Mr Williams, who finishes beef cattle for ABP/Sainsbury's says he has spent £22,000 in the planning process.

"I am trying to diversify my business and make sure the farm is viable for my two children," says Mr Williams.

"It seems disheartening the council will not give permission for the wind turbine when Government policy says we need wind energy. I have been accused of being selfish and greedy by objectors.

It has been a horrible experience."

Mr Williams is in the process of appealing the decision.

Experts think wind energy presents a viable opportunity for farmers

GRID CONNECTION

The suitability of a site for a medium-scale wind turbine is determined not only by its prospective impacts on the local environment but also the impact the turbine will have on the local grid. Grid constraints have posed a significant hurdle in areas of the UK market such as Northern Ireland, the South West and Scotland and are starting to pose a problem in some parts of Wales.

The Ellis family have installed a 50kW wind turbine on their 110-hectare (270-acre) upland farm

"The challenge lies not only in bringing grid connections to remote locations at some distance from the nearest grid infrastructure, but also in the capacity of the grid to accept input from distributed sources," says Mr Arnus.

"In Northern Ireland in particular, a surge in the popularity of farm-scale generation, combined with outdated infrastructure has led to considerable grid congestion which has thwarted many new developments."

Despite the constraints, experts believe wind energy presents a viable opportunity for farmers.

However, certain issues must be ironed out if the industry is to thrive.

Mr Arnus says: "The UK farmscale wind industry as a whole needs to work in unison to foster best practice to address longterm financial and regulatory hurdles, ensure it retains its leading status in Europe and remains a viable investment proposition for lenders and landowners alike."

Ongoing tariff degression as small and medium wind installations proliferate is, in turn, starting to slow down the rate of growth

Ivo Arnus, director of UK business development at Norvento

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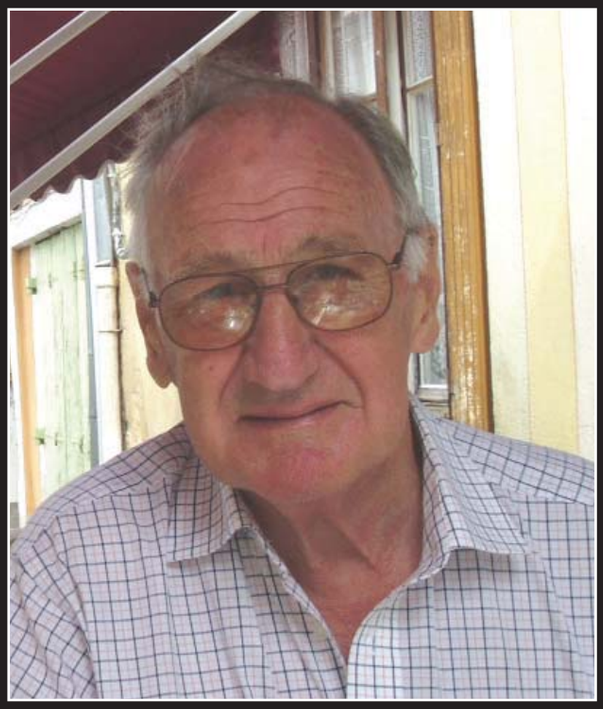
MEMBERSHIP MATTERS

OBITUARY

Hamish Shiach



Former head of the engineering division of the old North of Scotland College of Agriculture (now subsumed into SRUC) and a past president of the Institution of Agricultural Engineers (IAgrE), Hamish Shiach, has died at the age of 90.

Mr Shiach was a pioneering and highly respected figure in agricultural engineering and a source of sound advice to generations of students and farmers in the North-east of Scotland and further afield.

He is credited with broadening advisory work from its wartime function of machinery instruction for operators with the introduction of an inter-disciplinary approach to the development of agricultural mechanisation systems, working in co-operation with soil, crops, animal and veterinary scientists and building and drainage specialists.

He drew heavily on his own hands-on experience as a farmer in the practical approach he adopted towards his machinery development, advisory and lecturing roles and was way ahead of his time in areas which are now commonplace, such as renewable energy, anaerobic digestion, straw burning, wholecrop harvesting, slurry aeration, grass utilisation and the use of methane to generate electricity.

The son of a bank manager, Mr Shiach initially wanted to be a farmer but lack of funds precluded this option at the outset of his career. He graduated in both agriculture and engineering from Aberdeen University and joined the teaching staff on a part-time basis in 1952 as the university's first lecturer in agricultural engineering. He had earlier interrupted his studies toward the end of World War II to join the Royal Navy and was on his way to the Far East when the war ended.

But only a year later, he grasped the opportunity to buy the farm of North Faddonhill, Millbrex,where he established a piggery as well as starting to teach on a part-time basis. Six years later he was offered the tenancy of the 86ha farm of Sunnyside of Folla, Rothienorman, where he farmed initially dairy and then beef and arable in partnership with his wife, Doreen, a former primary education adviser with the old Grampian Regional Council.

Following a revamp of the engineering division of the college in 1969, he was appointed head of the division on a full-time basis and chaired the engineering and farm buildings group within the Aberdeen School of Agriculture. A measure of his success and influence is that his initial team of four was expanded to more than 20 during his 19 years at the helm to cover the division's extensive teaching, advisory and research remit.

He was very much responsible for raising the status of agricultural and forestry engineering, working closely with colleagues in other disciplines to implement his systems approach. Close links were developed with the other two colleges in Scotland (East and West), Aberdeen University (where he continued to lecture), the Rowett Research Institute, the then Department of Agriculture and the IAgrE at Silsoe, Bedfordshire, where he became the first president to serve a two-year term.

He also started what became very popular and successful study tours to France for BSc students, returning with a hold full of bulk wine (on which he always paid the duty!). He later had a small heavy duty trailer made specifically for the year's supply of wine collected during annual family holidays to their gite in France. Even at the age of 86, four years ago and in ill-health, he insisted on driving to France to pick up his wine - and celebrate his 60th wedding anniversary.

Day-to-day management of his farming enterprise was left in the hands of his grieve to enable him to concentrate on his full-time job with most of the field work being carried out by contractors. However, he greatly enjoyed his direct involvement in farming, which he felt was beneficial to his job, and served as a branch chairman of the National Farmers Union of Scotland. He was also an assessor for the Scottish Association of Young Farmers' proficiency tests programme which did so much to teach young farmers and farm workers the practical skills involved in farming.

Following his retirement in 1988, he was a key member of the Aberdeen University Agricultural Graduates Association, serving as treasurer for 15 years and made Honourary President in 2012. Until 2012, he also ran the 'Grazers', an informal organisation for retired employees of the college.

Mr Shiach is survived by his wife, Doreen, two sons, Donald and Alasdair, two daughters, Caroline and Morag, five grandchildren and two great-grandchildren.His funeral took place at Aberdeen Crematorium on Thursday October 22.

OBITUARY

Doug Walker

Douglas M Walker, Past President of IAgrE and John Deere UK's longest serving managing director from 1968 to 1993, has died at the age of 87, on Sunday 8 November. The funeral was held in Nottinghamshire on Wednesday 18 November at Bramcote Crematorium.

A graduate of the Edinburgh School of Agriculture, Doug Walker was a key figure in John Deere Limited's establishment and growth in the UK and Ireland after the company started trading from its present day headquarters at Langar, near Nottingham, in January 1966. The 25 years under his leadership saw the development of a strong, dedicated dealer organisation and prominent market position for the business.

He became John Deere Limited's first employee as territory manager for Scotland and after three months became the company's first sales manager. He was appointed managing director in October 1968, a position he held until his retirement 25 years later on 4 February 1993, after 27 years of service with the company. During that period the business grew from a turnover of £3 million to £120 million and the agricultural dealer organisation expanded from 11 to 132 outlets.

Doug Walker also oversaw the introduction of high horsepower tractors into the UK market in the late 1960s, when the average farm tractor was in the 50hp class; the John Deere product range in 1966 included the classic 91hp 4020, the first tractor to appear on the UK market with a powershift transmission. In recognition of this contribution to increased farm efficiency and lower costs, he was appointed an associate of the Royal Agricultural Societies in 1992.

Among a host of industry achievements and trade related posts held at various times during his career, Doug Walker was a past president of IAgrE, served twice as president of the Agricultural Engineers Association (AEA) in the 1970s and 1980s, was chairman of the Royal Smithfield Show Joint Committee and president of the Motor and Allied Trades Benevolent Fund (BEN), the charity for those who work in the automotive and related industries.

Born on 4 February 1928 in Edinburgh, Doug Walker was educated at the George Heriot School in Edinburgh before gaining his NDA at the Edinburgh School of Agriculture. He originally wanted to be either a vet or a farmer, but ended up developing an interest in agricultural machinery. For a short while after graduating he lectured in the subject at the then Lancashire Farm Institute, where he set up the machinery department.

Two years later, on getting married (to Helen) on 18 August 1951, he moved to the relatively new Shuttleworth College in Bedfordshire, again as its first agricultural engineering lecturer in the new department that he also established. Three years later he moved to David Brown Tractors, initially as chief instructor. After seven years of moving through many departments, including sales promotion, he finished as assistant export sales manager before taking up his first appointment at John Deere Limited.

"I had the privilege to work with Doug Walker in various roles from 1975 until his retirement in 1993, reporting directly to him for much of that time," says current John Deere Limited managing director Antony Scott. "He was a strong business leader, with the skill and determination to take John Deere from the position of a new market entrant to market leadership during his tenure as managing director.

"He was highly respected in the industry, taught me a great deal over the years and will leave a strong and lasting legacy. He will be sadly missed by family, friends and former colleagues alike."

BRANCH REPORTS

EAST MIDLANDS BRANCH

LINCOLNSHIRE AVIATION HERITAGE CENTRE

The first of the East Midlands Branch six-monthly meetings for the Winter 2015 / Spring 2016 season got off to a flying start on Tuesday 14 October when 24 members, friends and students paid an evening visit to the fantastic Lincolnshire Aviation Heritage Centre and the Lincolnshire Memorial to Bomber Command, RAF East Kirby 1943-45.

Based at East Kirby, Spalding, Lincs, it's probably best known for being the home of 'Just Jane' a nearly-flying Avro Lancaster bomber. This heritage centre was established by the Panton brothers in memory of their brother who was killed flying a Lancaster during the war.

Obviously, the magnificent Lancaster bomber housed in the main hangar dominates the scene, but there is so much to take in and see as one walks around the whole site. We started in the main hangar where we had a chance to see their techni-

cian changing the Lancaster's spark plugs on an engine still warm from taxiing down

continues over

Just Jane

the runway earlier in the day.

This main hangar is the heart of the centre containing many displays including a Dakota, which is capable of flying. Also here are many displays of many aircraft crashes in Lincolnshire during the war as well as several vehicles and bombs used by the RAF during the war including the famous Barnes Wallis bouncing bomb.

Walking around outside we came across the briefing hut, the control tower, the memorial chapel, billet hut, a home front exhibition and workshop. All were extremely well laid out and presented with each one containing stories, photographs and many film shows of the time. Just a fantastic visit and we can't thank the Heritage Centre enough for hosting us.

SEVERN TRENT ENERGY CENTRE

The second event of this session for the East Midlands Branch took place on Tuesday November 10th, when some 28 members and friends enjoyed a superb, and informative visit to the Severn Trent Energy Centre, at the Severn Trent Sewage Treatment Works, Burton Joyce, Nottingham.

The visit included a very informative, illustrated talk by their very knowledgeable, and enthusiastic Farms & Energy Crop Manager, John Jackson, who explained in detail the history, current situation and workings of the Centre, and its future. This was followed by a tractor and trailer ride down to the main site to view in detail the workings of this very high tech centre.

It was very pleasing to see a lot of new, younger faces at this meeting, and it is fair to say we were all very impressed at the technology involved at this Centre, and the fantastic job that it is doing.

Forthcoming events: We do so hope to see you at our forthcoming meetings (on the second Tuesday of the month - all events are as per programme), but please let me know as early as possible if you are planning to attend.

We are always asked by our host 'how many should we expect?' and I would out of courtesy like to be able to tell them (most put on some light refreshments for us and obviously need to know how many to cater for. So please email me if you intend to come.

Richard Trevarthen
(richard.trevarthen@gmail.com)

WEST MIDLANDS BRANCH

THE FASCINATING WORLD OF LAND DRAINAGE

It is always a delight to listen to an enthusiast and certainly that is what Rob Burtonshaw of Farm Services Ltd is.

They are a well-established Midlands drainage firm. As he said, his grandfather drained Warwickshire, his father the Midlands and him England and Wales.

The company has two branches one specialising in sports fields and the other in agricultural work although this extends beyond field draining into cross country pipelines and around the runways of Birmingham airport.

He said it is a sad fact that his work is a vital part of getting a good harvest and yet all the capital investment is completely hidden from sight and yet will last for years.

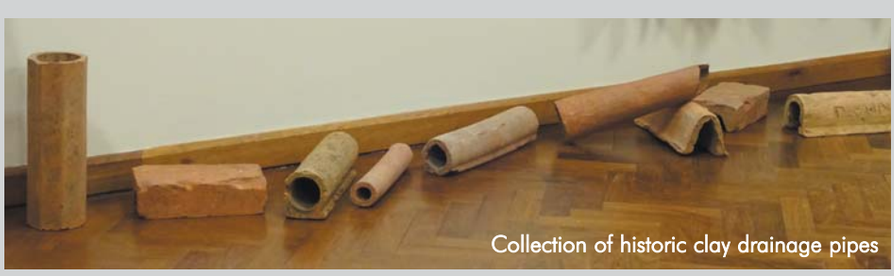
We were given an introduction to the history of drainage illustrated by samples from his collection of early handmade pipes, how from when in the 1850s the first clay pipe machines were developed up to when with the removal of drainage grant the annual drained acreage diminished. The graph he showed also illustrated how continuous plastic pipe made the work easier and quicker.

Rob Burtonshaw illustrating some some large scale drainage equipment

Rob also told us about his travels and observations when travelling on his Nuffield Scholarship to North America and northern Europe. Yes it is true that in the USA they have some very big machinery and laying lengths of drains that are incredibly long. A single run may use the same length of pipe that he uses to drain a whole field!

He also told us how they manage field drains in Holland where the water level in the dykes may be higher than the drain pipes that are put in (they put in intercepting drains). To combat sedimentation they regularly jet the drains clear.

As he demonstrated with a wet sponge you can never over drain land all you are doing is removing excess water down to field capacity.


Collection of historic clay drainage pipes

William Waddilove

SOUTH EAST MIDLANDS BRANCH

THE ENGINEERING CHALLENGES OF WEED CONTROL

Dr Paul Miller from Silsoe Spray Applications Unit kicked off South East Midlands Branch season of technical meetings with an excellent tour-de-force presentation in October on *'The Engineering Challenges of Weed Control'*.

Paul reviewed the significant developments in weed control techniques and equipment but highlighted the related problems of resistance, reduction in available herbicides and the pressure to minimise pesticide use for environmental and human safety reasons as the major challenges, which mean that the control of weeds in both arable and horticultural crops is now particularly difficult. Paul described some of the engineering options that are being developed to help address these problems. However, this will require a multi-disciplinary approach to be successful.

Weeds reduce yield by competing for nutrients, light and moisture and can also affect quality of the crop through contamination, cause harvesting difficulties, e.g. by increasing mass/bulk and moisture in the crop canopy, and can provide a disease 'bridge'. He pointed to the significant areas of crop being destroyed locally in an attempt to control blackgrass, a consequence of control with pre-emergence herbicides being reduced from 98% to 25% effectiveness under minimum and other tillage regimes.

Good weed control requires high levels of weed reduction (98%+) with minimum adverse effect on crop plants, high work rate and timely implementation, i.e when weeds are sensitive to the control option and the crop is robust. The treatment method also needs to be safe (considering human and environmental safety), and cost effective, of course.

Research by Paul and others has demonstrated the benefits of patch spraying, e.g for controlling black-grass in winter wheat, based on mapped weed distribution. For patch spraying herbicides, weed patch detection is crucial. Whilst manual mapping is costly, time consuming and can lack accuracy, in the future sensors will detect and predict weed distributions automatically.

The key will be future developments in sensors and interfaces with decision support tools, particularly relating to weed detection, disease prediction and crop development.

Weed identification by image analysis and pattern recognition, e.g of black-grass in a wheat crop, for detection (of control failure) in one season, for treatment in a subsequent season, will also be enabled by the development of boom-mounted cameras.

Current studies are also looking at detection of individual weeds by image analysis - particularly for specific applications, e.g volunteer potatoes in vegetable crops.

Paul described how targeting the inter-row gap in arable crops requires row-following guidance systems, eg using GPS and/or vision systems, combined with targeted treatment methods and improved nozzles, delivery and pesticide containment systems to prevent drift and environmental contamination.

Paul reflected on the significant and widely used developments in safe chemical loading and closed transfer systems, improvements in spray drift control, active and auto boom levelling, etc. Current commercial developments include automated boom cleaning systems, wider precision band sprayers, dual tank systems and multiple spray-lines. Also available are automatic nozzle clusters for simultaneous application of different chemicals, and the use of oscillating liquid streams from different designs of nozzle to improve targeting and reduce chemical usage.

Developments on the horizon include improved tank fill calculators and monitoring, targeted application by machine vision, automatic chemical application recording, and operations using field robots.

New chemical products and formulations will also have implications in developing refillable packs with integrated electronic tag labels and connectors for closed chemical transfer systems.

Engineering has clearly played a key role relating to current herbicide use and Paul thought that herbicides will remain the mainstay of weed control programmes for at least the next decade.

However, we will be faced with increased pressure relating to human and environmental safety and niche applications using different methods will be necessary in some circumstances.

It must be remembered that effective weed control is also important in amenity areas, such as maintaining pavements, parks and golf courses, as well as in the construction industry - particularly with the increase in difficult to control invasive weed species such as Japanese Knotweed.

In addition to describing the evolving chemical and mechanical methods of weed control (including from manual hoeing to faster and wider automated systems such as the Garford Robocrop covered in a recent Branch meeting), Paul outlined the pros and cons of the alternatives.

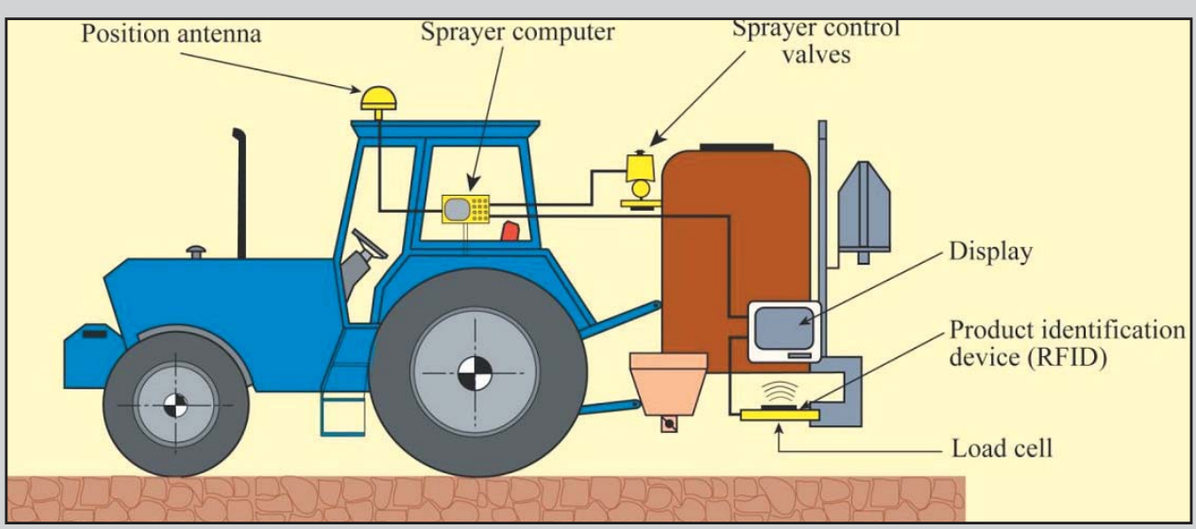
These mainly include the application of heat, i.e flame weeding, hot water/foam and electrical methods (contact and non-contact) - even lasers. Some of these methods are being used and trialled for application in non-agricultural sectors, where they may find a role as current pesticide products are withdrawn.

Paul's comprehensive and thought-provoking lecture reminded us of the vital contribution agricultural engineers have made in controlling weeds so far, and the key role they will necessarily continue to play, if we are to meet these challenges.

Inevitably, a strong engineering component will be required as part of developing weed control systems in the future and engineers will necessarily need to work with others.

Paul's audience all agreed that exciting times and opportunities lie ahead.

Alan Plom



SOUTHERN BRANCH

DAY OUT IN HAMPSHIRE

Denis Welstead (with input from Alan Plom) reports on the 2015 Southern Branch Summer Visit to Sparsholt College and Otterborne Waterworks, near Winchester, on 2 September.

Local members, guests and visitors from other Branches were given a guided tour of Sparsholt College's impressive new engineering facilities and then moved on to their expanding (and most profitable) small animal husbandry/vet school.

Unfortunately, the fascinating collection of unexpected creatures - from venomous spiders to reptiles, birds and large mammals (used for training RSPCA and other organisation's staff) held the attention of our party for too long. This meant that we didn't get to see the many other departments of interest to the engineers amongst us, such as the dairy, arable, equine and deer units as well as fish rearing, but a further visit will be popular and at least there will be plenty more to see when we visit again.

Our afternoon visit to Southern Water's Otterborne Water Treatment Works was also less comprehensive than anticipated, due to ongoing construction works restricting access to those wearing adequate PPE (personal protective equipment). Unfortunately, our hosts were unable to provide sufficient hard hats and hi-vis jackets for everyone, so only a limited number were able to tour this interesting facility. Southern Water have since apologised for being unable to accommodate all of our party and have offered us the opportunity to revisit and tour the plant.

Local members kindly gave up their opportunity to tour the plant so that our visitors' longer-distance journeys were not wasted. For their benefit, the plant uses some complex (and expensive) processes to filter and purify water extracted from local boreholes and rivers to produce safe drinking water. This explained where a significant proportion of their water rates are being spent!

Maintaining Drinking Water Quality

Southern Water provide water to 2 million customers and wastewater services to more than 4 million in their area.

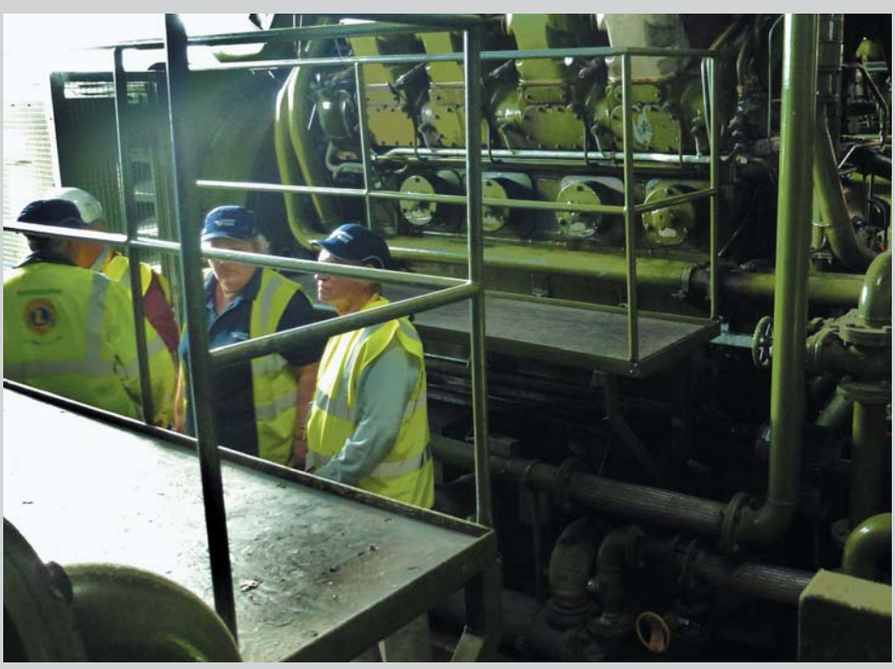
Generally water from aquifers is already of high quality because it has been filtered through many layers of chalk or sand and needs only disinfection with chlorine, but water from rivers and reservoirs contain a range of substances which need to be removed to meet the strict standards enforced by the Drinking Water Inspectorate (met in 99.94% of cases in 2013).

Water is tested regularly for more than 100 substances at householder's taps and at the company's 90 water treatment works and 204 service reservoirs.

23% of their supply comes from groundwater, with the majority (70%) predominantly from the chalk aquifer which is widespread across the region and the remaining 7% from surface water reservoirs owned by the company.

To achieve this high standard and remove the chemical impurities and micro-organisms poses a significant engineering challenge. Cyptosporidia is a major focus, being safety-critical for consumers, as a recent outbreak in the north-west highlighted. To avoid cross-contamination, water and waste treatment are not carried out on the same site.

At Otterborne, long-surviving and chemical-resistant cryptosporidium oocysts are removed using banks of micro-filters. These filters are automatically back-flushed, cleaned and disinfected regularly using a sequence of chemicals to maintain pH and quality. However, filtration is just one of the mid-stages in the process of water purification, which also includes screening, pre-ozonation, coagulation/flocculation, clarification, pesticide removal, pH correction, phosphate dosing, chlorination, and in some cases, ultraviolet treatment.



Reliance on automatic remote monitoring and control of the processing systems means that the plant is now run with a minimal labour force. However samples are still taken frequently by hand and screened in the laboratory for over 100 substances and potential contaminants - including many pesticide products, of course.

As well as the surprisingly complex process plant and its many miles of pipework, our visitors were also impressed by the 3 large English Electric stand-by generators to keep the plant running in the event of power failure.

These marine engines are kept heated 24/7 ready for start-up and are fitted with Alfa Laval oil filter systems - a name more familiar to many of us in milking parlours of course. These engines burn 700 litres of fuel/hour, so together with all the investment to improve quality and reliability of the water supplied, plus the time-consuming maintenance procedures required (at this and the company's 90 other treatment works) explains why this is not a drop in the ocean, cost-wise!

Denis Welstead & Alan Plom

WESTERN BRANCH

'MY LIFE AND TIMES AT RDS TECHNOLOGY LTD'.

Wiltshire College Lackham was the venue for a recent meeting of the IAgrE Western Branch where Richard Danby BSc FIAgrE was the guest speaker, delivering a presentation to assembled members and guests present entitled 'My Life and Times at RDS Technology Ltd'.

Richard began by detailing his early years as a farm mechanic studying for an OND at Hereford Technical College. He explained that his early farming experiences instilled a work ethic within him - a trait that seems to be common to people who have been brought up 'on the farm'. After his OND, Richard went onto NCAE Silsoe and after graduating from there he contacted RDS in 1974. Back then RDS was very much a small sales company known for distributing grain loss monitors. Richard was interviewed by company founder, Jim Brown, and began working in Technical Support looking after the early Grain Loss Monitors which had been recently launched. At this stage the Company's client base for the Grain Loss Monitor was mainly farmers and machinery dealers.

In 1977 the company moved to Nailsworth to a 7,500sq-ft facility and began product development and manufacturing a few years later. Richard was promoted to Technical Manager and was later created Technical Director, joining the board, in 1982.

1986 saw Richard move to the OEM sales organisation of RDS, becoming OEM Sales Director with Peter Nelson (another Silsoe graduate) taking over as Engineering Director. In the early 90s, Richard was involved in a management buy-out and became Managing Director, with Jim Brown retained as Chairman. Richard retired from the Company in 2013. Today, the Company employs 95 staff and has a 25,000sq-ft custom designed facility and is a division of Topcon, a Japanese-American company with interests in precision farming.

The early 1980s saw RDS develop automatic sprayer control which measured speed and pressure to control application rate. The system was branded 'Rate Governor 80' and was the first microprocessor agricultural control system. RDS also developed seed drill application systems which were utilised by the like of Massey Ferguson on its MF30 drill.

During this period, the Company developed its weighing instrumentation technology and introduced the 'Weigh log'. The Weigh log is a derivative of the UDM - later to become the Wizard series - a series that has sold over 300,000 units.

The 2000s saw further development of weighing equipment and sprayer/drill application control, and the company added bale wrapper control systems to its portfolio. The next decade saw CanBUS technology and all the features and benefits that this offers such as touch screen technology, USB interface and SD cards and Ethernet connections.

At the end of the presentation, Richard took questions from the audience before receiving a vote of thanks from Branch Chairman, Rupert Caplat.

Eur Ing N J Handy CEng MIAgrE

RDS' First Instrument 1972

2015 instruments

Membership changes

Admissions

A warm welcome to the following new members:

Member

Alsop MJW (East Midlands)
Burtonshaw RJ (West Midlands)
Holmes D (East Midlands)
Parsons MA (South East Midlands)
Scott A (East Midlands)
R Willey (East Midlands)

Associate Member

Abbott AP (Herts & Essex)
Brewer YT (S Eastern)
Court A (Wrekin)
Dale SE (Western)
Dawe MG (Southern)
Drury JC (East Midlands)
Horne RJ (Western)
Maynard J (South East Midlands)
Sharp J (Yorkshire)
Street A (East Midlands)
Targett C (Southern)

Associate

Jures E P (Scotland)
Evans I L (Wrekin)
Watson S (Yorkshire)

Student

Bicton College

Beviss H
Dare Turner C
Dart L
Greenhalf H
Habberfield B
Hall R
Hounsell O
Smaldon D
Smith H
Toogood H
Wassell G

Cranfield University

Afriyie E
Darmovzalova J
Golicz KK

Easton & Otley College

Bates J
Bowell A
Bull L
Ferris T
Fish M
Galley SD
Garrod B
Hancock JPC
Jaggard L
Key HJ
King A
Lock S
Lummis G
Mackay JP
McDaid LP
Newson B
Spencer R
Smith M
Taylor A
Ward CJ
Warnes W
Williams J
Wood J

Harper Adams University

Boubou Y

Greenmount College

Clarkin J
Cousins B
Doherty D
Doherty G
Dunne R
Farry R
Grant R
Gribbin J
Hamilton AJ
Lafferty J
Lee A
Magennis C
Mayers GD
McCarney PP
McFetridge CN
McGarry F
McGovern M
McKendry M
Millar AJ
Moley C
Nelson M
Park J
Travers C

SW College (Omagh)

Baird H
Beattie G
Blair M
Clements M
Dolan C
Dolan F
Donnelly C
Gilfedder P
Gilmour N
Holmes P
Kerrigan J
Keys A
Keyes T
Loughran L
Lyttle A
McAleer K
McConnell A
McCulla A
McDaid D
McElroy R
McGrath C
McKane W
McKinley C J
Moore M
Peace J
Quinn D
Rafferty M
Rogers PM
Sloan J
Stewart M

Institute of Technology, Tralee

Carroll B
Cardiff O
Foott K

Royal Agricultural University

Haylesden-Ashby CV

Re-admission

Associate Member

Moore R A (W Midlands)

Deaths

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

Mr David W Ross MIAgrE, (Scottish Branch) a Member since 2002 (Scottish)

Mr James George (Hamish) Shiach, HonFIAgrE (Scottish Branch) a member since 1970, Past President 1982-4

Transfers

Member

Thomas S A from AMIAgrE to MIAgrE

Associate Member

Verhoeven P - from PreProf to AMIAgrE

Associate Member

Hopkins D - from PreProf to AIAgrE

Engineering Council

Congratulations to the following members who have qualified as Chartered Engineers and Engineering Technicians entitling them to use the designatory letters CEng and EngTech after their name.

Registrations

CEng

Stacey T I (Wrekin)

EngTech

Abbott AP (Herts & Essex)
Dale SE (Western)
Dawe MG (Southern)
Drury JC (East Midlands)
Horne RJ (Western)
Maynard J (South East Midlands)
Targett C (Southern)
Sharp J (Yorkshire)
Stevens PJ (Southern)

Soc ENV Registrations

Davies H A L (Wrekin)

Long service certificates

Name	*Grade*	*Date of anniversay*
60 years		
Peter David **Russell**	IEng MIAgrE	13/12/2015
50 years		
Giles Anthony Nicholas **Harty**	IEng MIAgrE	26/10/2015
William Richard **Butterworth**	FIAgrE	26/10/2015
Roger John Owen **Thomas**	FIAgrE	26/10/2015
Thomas **Waugh**	IEng MIAgrE	26/10/2015
35 years		
Richard Gareth **Ellis**	CEng MIAgrE	24/11/2015
John Richard **Pedley**	IEng FIAgrE	01/12/2015
Graham Reid **Tyrie**	FIAgrE	04/12/2015
25 years		
Peter Watkin **Jones**	MIAgrE	09/10/2015
Julian Mark **Sparrey**	CEng MIAgrE	03/12/2015
Matthew Thomas **Payne**	IEng MIAgrE	18/12/2015

Academic members

Babcock Training Ltd
Babcock
Ruddington Fields Business Park
Ruddington
Nottingham
NG11 6JZ

Bicton College
East Budleigh
Budleigh Salterton
Devon
EX9 7BY

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

Easton & Otley College
Easton
Norwich
Norfolk, NR9 5DX

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

Harper Adams University
Newport
Shropshire
TF10 8NB

Institute of Technology
Tralee
Clash, Tralee
Co Kerry, Ireland

Myercsough 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

Wiltshire College - Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

Commercial members

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
Heddington
Calne, Wiltshire,
SN11 0PS

BAGMA
Middleton House,
2 Main Road,
Middleton Cheney,
Banbury, Oxon, OX17 2TN

Bomford Turner Limited
Salford Priors
Evesham, Worcestershire
WR11 5SW

David Ritchie (Implements) Ltd
Carseview Road
Suttieside, Forfar,
Angus, DD8 3EE
Douglas Bomford Trust
The Bullock Building
University Way,
Cranfield
Bedford,
MK43 0GH

FEC Services
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2LS

Fullwood
Grange Road
Ellesmere
Cheshire SY12 9DF

Huntaway Consulting
Ivy Cottage
Torlundy
Fort William
Inverness-shire
PH33 6SW

John Deere Ltd
Harby Road
Langar
Nottinghamshire
NG13 9HT

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

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

SSAB Swedish Steel Ltd
Narrowboat Way
Hurst Business Park
Brierley Hill
West Midlands
DY5 1UF

TeeJet London Ltd
Headley House,
Headly Road,
Hindhead, Grayshott
Surrey, GU26 6UK

EVENTS

IAgrE Branch Meetings and Events

South East Midlands Branch
Monday 11 January 2016, 19.30
TALK - SUBJECT TBC
Speaker: Alistair Leake, Allerton Project
Venue: Maulden Church Hall, Church Road, Maulden, MK45 2AU
Contact Branch Secretary John Stafford for more information
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk
Web: www.gwct.org.uk/allerton/

East Midlands Branch
Tuesday 12 January 2016, 19.00 for 19.30
VISIT TO MARSH OF SLEAFORD
Venue: Marsh of Sleaford, Condon Road, Sleaford, Lincs, NG34 8NX
Marsh of Sleaford are one of the leading Claas Dealerships in the UK, and a very interesting evening is promised
Tel: 01509 215109
Email: richard.trevarthen@gmail.com

Wrekin Branch
Monday 18 January 2016, 19.30
CONSTRUCTION MACHINERY DESIGN PROCESS - FURTHER DETAILS & SPEAKER TO BE CONFIRMED
Venue: Agricultural Engineering Innovation Centre at Harper Adams University
Tea & Coffee are served from 19.00 Please contact Branch Secretary David Clare for more information
Email: dclare@harper-adams.ac.uk

Western Branch
Wednesday 27 January 2016, 14.00
VISIT TO ANDOVER TRAILERS
Venue: Andover Trailers, 75 Columbus Way Walworth Industrial Estate Andover Hampshire SP10 5NP
Places are limited so please contact Branch Secretary Glen Craig glencraig@btinternet.com to secure your place.
Tel: 07985 756001
Email: glencraig@btinternet.com
Web: www.andovertrailers.co.uk/

South East Midlands Branch
Monday 8 February 2016, 19.00
STUDENT MEETING/AGM
Venue: Maulden Church Hall, Church Road, Maulden, MK45 2AU
Contact John Stafford, Branch Secretary for more information
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk

East Midlands Branch
Tuesday 9 February 2016
THE LATEST INNOVATIONS IN PRECISION FARMING
Speaker: James Szabo, Trimble UK
Venue: Brooksby Melton College, Brooksby Campus, Melton Mowbury LE14 2LJ
Tel: 01509 215109
Email: richard.trevarthen@gmail.com

Wrekin Branch
Monday 15 February 2016, 19.30
POSSIBLE VISIT TO LOCAL DEALER - TBC
Tea & Coffee are served from 19.00 Please contact Branch Secretary David Clare for more information
Email: dclare@harper-adams.ac.uk

Western Branch
Wednesday 17 February 2016, 14.00
VISIT TO WADWORTH & CO LTD, BREWERY
Venue: Wadworth & Co Ltd, Northgate Brewery, Devizes, Wiltshire, SN10 1JW
For more information please contact Branch Secretary, Glen Craig
Tel: 07985 756001
Email: glencraig@btinternet.com
Web: wadworth.co.uk/home

East Midlands Branch
Tuesday 8 March 2016, 19.00 for 19.30
VISIT TO BAILEY TRAILERS LTD
Venue: Bailey Trailers Ltd, Pride Parkway, Sleaford, Lincs NG34 8GL
Tel: 01509 215109
Email: richard.trevarthen@gmail.com

Western Branch
Wednesday 9 March 2016, 18.30
WESTERN BRANCH AGM FOLLOWED BY MICROLISE TELEMETRY TALK
Speaker: TBC
Venue: Wiltshire College Lackham, Lacock, Chippenham SN15 2NY
Microlise supply remote telemetry systems for manufacturers such as MAN Truck & Bus and JCB.
For more information please contact Branch Secretary Glen Craig
Tel: 07985 756001
Email: glencraig@btinternet.com
Web: www.microlise.com/

Wrekin Branch
Monday 14 March 2016, 18.30
WREKIN BRANCH AGM, 18.30 FOLLOWED BY ROBOTIC MILKING EQUIPMENT TALK 19.30
Speaker: John Baines from Fullwood
Venue: Agricultural Engineering Innovation Centre at Harper Adams University
Wrekin Branch AGM, 1830 followed by Robotic Milking Equipment talk, 1930 -
Contact Branch Secretary David Clare for more information
Email: dclare@harper-adams.ac.uk

East Midlands Branch
Tuesday 15 March 2016, 19.00 for 19.30
EAST MIDLANDS BRANCH ANNUAL DINNER & AGM - TBC
Details to follow
Tel: 01509 215109
Email: richard.trevarthen@gmail.com

West Midlands Branch
Tuesday 15 March 2016, 19.00 for 19.15
WEST MIDLANDS BRANCH AGM
Venue: Friends Meeting House, Stratford upon Avon, CV37 6XT
Please contact Branch Secretary Mike Sheldon for more information
Tel: 01926 498900
Email: michael-c-sheldon-iagre@outlook.com

South East Midlands Branch
Wednesday 23 March 2016, 19.30
ADVANCES IN FIELD SPECTROSCOPY APPLICATIONS
Speaker: Abdul Mouazen
Venue: Cranfield University
Field spectroscopy in the visible and near infrared range has gained considerable interest from scientists working in precision agriculture. This talk will shed the light on fundamentals and problems encountered and propose practical solutions for the implementation of field

spectroscopy. Case studies on variable rate fertilisations including nitrogen and phosphorus will be discussed and concluded.
Contact John Stafford, Branch Secretary, for more information
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk

West Midlands Branch
Spring 2016 - date to be confirmed
VISIT TO BIO DIGESTER - BY KIND INVITATION OF FRED WALTER & SONS
Venue: Fred Walter & Sons, Retford, Nottinghamshire
For more information please contact Branch Secretary Mike Sheldon
This event will be open to ALL members nationally
Tel: 01926 498900
Email: michael-c-sheldon-iagre@outlook.com

South East Midlands Branch
Thursday 14 April 2016, 19.30
NAT SPRAYER TEST SCHEME
Speaker: Duncan Russell, AEA
Venue: St Neots
Details to follow
For further information contact John Stafford, Branch Secretary
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk

Wrekin Branch
Monday 9 May 2016, 19.30
LATEST DEVELOPMENTS IN ENGINE AFTER TREATMENT - TOPIC & SPEAKER TO BE CONFIRMED
Venue: Agricultural Engineering Innovation Centre at Harper Adams University
Tea & Coffee will be served from 1900. Contact Branch Secretary David Clare for more information
Email: dclare@harper-adams.ac.uk

Other Events:

Tuesday 19th January 2016
Westminster Energy, Environment & Transport Forum
WESTMINSTER ENERGY, ENVIRONMENT & TRANSPORT FORUM KEYNOTE SEMINAR
Venue: Central London
Policy priorities for waste management in England: innovation, best practice and developing the circular economy, including keynote addresses from Dr Liz Goodwin, Chief Executive Officer, WRAP and Richard Pullen, Head of Waste Policy and Regulation, Defra.
With the reintroduction of the European Commission's package of circular economy policy initiatives due in late 2015, this seminar will be a timely opportunity to assess progress and next steps toward the ambition of a zero waste economy, and putting the circular economy into action - examining progress across the UK and international examples of best practice.
Web: tinyurl.com/nqmllua

Wednesday 2 March 2016
EMESP
EAST MIDLANDS ENGINEERING & SCIENCE PROFESSIONALS PRESTIGE LECTURE
Venue: Nottingham Albert Hall
Lecture Title: The London Crossrail Link
Please contact Richard Trevarthen if you have any questions
More details will follow.
Email: richard.trevarthen@gmail.com
Web: www.emesp.org.uk

Full details of forthcoming events can be found on www.iagre.org/events

EVENTS OF INTEREST

JANUARY 2016

5-7	Oxford Farming Conference *www.ofc.org.uk*
19-21	BTME 2016, Harrogate International Centre *www.btme.org.uk*
20-21	LAMMA 2016, East of England Showground *www.lammashow.co.uk*

FEBRUARY 2015

2-4	Doe Show 2016, Ulting *www.ernestdoe.com*
9-11	World Ag Expo, Tulare, California *www.worldagexpo.com*
10-11	Executive Hire Show, Ricoh Arena, Coventry *www.executivehireshow.co.uk*
16-17	Totally Tools, Rioch Arena, Coventry *www.totallydiy.co.uk/content*
16-18	Salon du Végétal, Angers, France *www.salonduvegetal.com*

MARCH 2016

18-03/4	Ideal Home Exhibition, Earls Court, London *www.idealhomeshow.co.uk*
19-20	West County Game Fair, Shepton Mallet *www.westcountrygamefair.co.uk*
31	CountryTastic, Three Counties Showground, Malvern *www.threecounties.co.uk/countrytastic*

APRIL 2016

16-17	BASC Gamekeepers Fair *www.bascgamekeepersfair.co.uk*
26-28	The Commercial Vehicle Show, Birmingham NEC *www.cvshow.com*
21-24	Harrogate Spring Flower Show *www.flowershow.org.uk/spring-show-2015*

MAY 2016

2	North Somerset Show *www.nsas.org.uk*
14-15	Nottinghamshire County Show *www.nottinghamshirecountyshow.com/*
11-13	Balmoral Show, Belfast *www.balmoralshow.co.uk*
19-21	Devon County Show *http://devoncountyshow.co.uk*
21	Fife Show *http://www.fifeshow.com/*
21-22	Royal Welsh Spring Festival *www.rwas.co.uk/spring-festival/*
24-28	Chelsea Flower Show *www.rhs.org.uk/shows-events*
28	Shropshire County Show *www.shropshirecountyshow.com*
28-29	Herts County Show *www.hertsshow.com*
30	Surrey County Show *www.surreycountyshow.co.uk*

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Why your organisation should join IAgrE

IAgrE is a registered charity working for the public benefit through bringing together academics, practitioners and industry to share knowledge and promote professionalism in the advancement and application of technology in the landbased sector.

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Talk to us about how you can become an IAgrE partner

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- Free copy of Landwards, our quarterly journal with advertising opportunities
- Advertising of jobs on the IAgrE website
- Priority places and early bird discount at our annual conference
- Table space at our conference and other events
- Access to branch, technical meetings & hubs
- Product promotion and opportunities for guest speakers
- Sponsorship opportunities
- Access to CPD and training
- Online presence on our website and social media with your logo
- Fulfils your corporate social responsibility and shows your support of the industry
- Access to the latest e-news and business news
- Use of IAgrE CPD recording system
- Access to the latest developments within the industry
- Opportunities to reach your target customers
- Access to IAgrE archives
- Professional development and CPD recording

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Contact Sally Wood, **IAgrE Secretariat**, 01234 750876
projects@iagre.org for full details

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