Landwards

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WORLDWIDE OPPORTUNITIES FOR ENGINEERING IN AGRICULTURE

Special forum scheduled for new Douglas Bomford Lecture Theatre at Harper Adams University in November

VARIABLE WEATHER IN THE UK IS HERE TO STAY

So what can farmers do about it?

NEW IAGRE CEO APPOINTED

Alastair Taylor to succeed Chris Whetnall in October

IAgrE Professional Journal www.iagre.org Volume 68, Number 3 Autumn 2013

Biosystems Engineering

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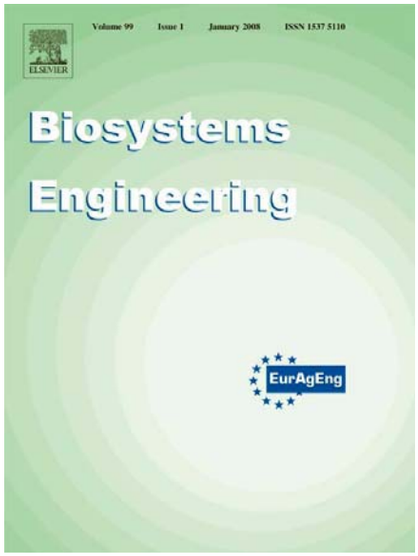

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The Managing Editor of ***Biosystems Engineering***, ***Dr Steve Parkin***, has kindly summarised some of the papers published in the last three issues which he thinks may be of interest to IAgrE members

Biosystems Engineering
Volume 115, Issue 1, May 2013, Pages 66-81

Soil organic matter sensing with an on-the-go optical sensor

Giyoung Kweon, Chase Maxton
Gyeongsang National University, Jinju, Republic of Korea
Veris Technologies, Inc., Salina, KS, USA

This research was conducted to develop an inexpensive on-the-go optical sensor for soil organic matter sensing. Diffuse reflectance for 86 soil samples from Kansas and Illinois was measured by a spectrometer in a laboratory. Stepwise multiple linear regression and B-matrix in partial least squares were used to determine important wavelengths for soil organic matter measurement. The wavelengths of 660 and 940 nm were used for an optical sensor. The developed optical sensor with dual wavelength was evaluated with dry and wet soils in the lab and the relationship between reflectance and organic matter showed a coefficient of determination (R2) as high as 0.91. Gaps between soil and the sensor window reduced the ability to estimate soil organic matter, thus the sensor window should press firmly against soil. Further field tests need to be implemented to evaluate the soil organic matter estimation with the sensor over different types of soils in a wider set of locations.

Volume 115, Issue 2, June 2013, Pages 211-219

Airflow measurements in and around scale-model cattle barns in a wind tunnel: Effect of wind incidence angle

Merlijn De Paepe, Jan G. Pieters, Wim M. Cornelis, Donald Gabriels, Bart Merci, Peter Demeyer
Institute for Agricultural and Fisheries Research (ILVO), Merelbeke, Belgium
Faculty of Bioscience Engineering, Ghent University, Coupure, Gent, Belgium
Ghent University, Sint-Pietersnieuwstraat, Gent, Belgium

Indoor air quality in animal houses can be accomplished through natural ventilation, as often implemented in cattle barns. Besides wind speed, the largest contributor to efficient natural ventilation is the building orientation, since the angle of wind incidence strongly affects the pressure distribution around it. To acquire a better understanding of this process, air velocity measurements were carried out in two 1:60 scale models of a dairy cattle house placed in a wind tunnel, using a reference air velocity of 3.5 m s-1. Five different wind incidence angles were simulated using a turntable, in order to quantify their effect on indoor air velocities. The responses in local air velocities could largely be attributed to the relative position of the end walls of the scale models orientated towards the wind. This crucial position allows the measured air velocity trends to be explained. The estimated airflow rates gradually decreased for larger wind incidence angles. Expressions that relate air velocity to wind incidence angle (for angles = 45°) are presented through linear regression. Additionally, the experimental model provides useful data for evaluating and possibly improving computational fluid dynamics (CFD) models.

Volume 115, Issue 3, July 2013, Pages 230-243

Chemical methods for the remediation of ammonia in poultry rearing facilities: A review

Dorin Bejan, Thomas Graham, Nigel J. Bunce
University of Guelph, Guelph, Ontario, Canada

Possible chemical methods for the treatment of ammonia in the air of livestock holding facilities, with particular focus on poultry production, are reviewed in the context of eliminating ammonia by oxidation to elemental nitrogen. Gas phase catalytic oxidation processes are incompatible with the needs of the poultry industry on grounds of both capital cost and energy intensiveness. Most chemical oxidants convert ammonia principally to nitrate rather than N2. So-called advanced oxidation processes are unsuited to ammonia oxidation because the hydroxyl radicals that characterize these oxidations react poorly with both NH3 and NH4+. One promising option is electrochemical oxidation, which does not require the purchase of stoichiometric amounts of chemical oxidants. Among possible electrochemical methods, we favour electrochemical hypochlorination, whereby the denitrification of ammonia to elemental nitrogen is mediated by hypochlorous acid, which is formed reversibly from chloride ion. This technique is compatible with currently available scrubbing technology, with the modification of using acidic brine as the scrubbing solution. Because electrochemical hypochlorination can be applied without costly and complicated pH adjustment of the scrubbed solution with chemical additives, it constitutes an example of best available technology.

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Harper Adams University students Kit Franklin and James Thomas, who have both gained Masters Degrees in Agricultural Engineering, pictured with the robotic orchard tractor developed in collaboration with international partners.

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EDITORIAL

We must 'use it or lose it' . . . .

FOR some while, there has been a widely expressed view that the agricultural engineering sector has flown under the radar when it came to major policy decisions. Hopefully not ignored, but perhaps taken for granted.

First, there was the 'Foresight oversight' which was quickly corrected with a well-reasoned addendum prepared by the Institution, identifying the vital role that engineers and engineering science must play in future food production.

Perhaps one of the problems is that we do not explain ourselves well enough. I still hear our front-line troops, the dealer network, referring to 'fitters' and 'mechanics' rather than technicians.

Even the word 'dealer' has unfortunate connotations. - and there can be few outside our immediate world who really know what the 'land-based sector' or 'land-based engineering' really stands for.

Gradually though our terminology is changing, and I do believe for the better.

Talk about Engineering for Agriculture, or Agri-Tech solutions and we are starting to explain our role more succinctly.

It may be a co-incidence, but this issue of *Landwards* is filled with forward-looking initiatives.

The Government's £160 million Agri-Tech strategy (still only worth two or three Premiership footballers) has brought reasoned comment and observation from industry leaders: a £13m grant from the Technology Strategy Board (TSB) to fund engineering solutions across the agri-food chain; the forthcoming recruitment forum at Harper Adams and IAgrE's support of the World Agri-Tech Investment Summit in London.

All will place the engineering sector into the limelight, into the mix and into the consciousness of those in power - and that is what we have to keep on doing.

Of course, having raised the awareness, raised the stakes, then when funding opportunities come along, as in the case of the TSB investment, then we must ensure that the industry takes up the challenge.

The phrase 'Use it or lose it' can never have been more apt!

Ave atque vale, there I knew my Latin would come in useful one day. Hail and farewell, first to Alastair Taylor as he takes over as the new IAgrE chief executive in October at a time of exciting challenges for our industry - and farewell and thanks (once more) to Chris Whetnall for his stewardship over the years. We wish he and Rosemary a very happy retirement.

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

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IAgrE celebrate 75th with sci-fi publication

TO celebrate this significant milestone IAgrE in partnership with Newcon Press, publishers of science fiction, fantasy, dark fiction and horror stories, has sponsored a science fiction, short story competition which has culminated in a book called '*Looking Landwards*', an anthology of original science fiction.

"*Looking Landwards* is NewCon Press's first ever open submissions anthology," said Ian Whates, owner of NewCon Press. "We have been overwhelmed by the response, receiving submissions not only from within the UK but also from the USA, Australia, mainland Europe, Africa and Asia, from professional writers and would-be writers, from scientists and engineers who are actively involved in dealing with the book's themes to people who have simply been inspired by them. *Looking Landwards* features the very best of these stories."

The book contains twenty-three works of science fiction and speculation as to what the future may hold for farming and agricultural engineering.

To be published in the autumn, this exciting publication will be available in both hardback (£29.99) and paperback (£11.99). The hardback edition will be a collectors' item limited edition signed by all the contributing authors.

Anyone wishing to secure a copy can take advantage of the pre-publication discounted price of £24.99 and order on line at *www.iagre.org/shop*.

The winning entry, '*Wheat*' by Kevin Burke, can be found in this issue of *Landwards* on page 17

Alastair Taylor to take post in October

IAgrE appoints new CEO

IAgrE has appointed Alastair Taylor as its new Chief Executive to succeed Chris Whetnall on 1st October.

His appointment follows the resignation of Ian Adams, who had been appointed Chief Executive Designate in the Spring, but who had to resign the post after a few months for family reasons.

Alastair is an Incorporated Engineer, a Chartered Environmentalist, and a member of the Institute of Agricultural Engineers.

He has served the Institution as chair of the Education and Training Committee, and more recently as the independent chair of the Land-based Engineering Training and Education Committee (LE-TEC).

Commenting on his appointment, Alastair said, "I know that Chris Whetnall will be a hard act to follow, but I am looking forward to working with the Council and the Cranfield based team to take the Institution forward.

"I am not sure that there has ever been a time as exciting as this to be involved in Agricultural Engineering."

Chris Whetnall (left) welcomes Alastair Taylor as the new IAgrE chief executive

JCB chairman, Sir Anthony Bamford, to enter House of Lords

Peerage for IAgrE fellow

IAgrE Fellow and JCB chairman, Sir Anthony Bamford, is set to become a Conservative peer in a list of 30 new appointments announced by Downing Street.

He was nominated by the Conservative Party having given £2.5 million to the party since 2002.

A JCB spokesman said, "Sir Anthony feels honoured to have been invited to serve in the House of Lords as a working peer. He is looking forward to making a positive contribution on key business and industry issues, particularly in relation to manufacturing, engineering and exporting."

He became Chairman and Managing Director of JCB at the end of 1975, succeeding his father, the late Joseph Cyril Bamford CBE, who founded the company nearly 61 years ago. His career began with a two year apprenticeship at Massey Ferguson in France before he started at the Rocester headquarters in 1964.

Under Sir Anthony's leadership, JCB has grown to become one of the world's largest and most successful construction equipment manufacturers. JCB has won more than 50 premier awards for exports, marketing, design, technology and for its care for the environment, among them 18 Queen's Awards for Technological and Export achievement.

Sir Anthony was knighted in 1990 was a former High Sheriff and is a Deputy Lord Lieutenant of Staffordshire.

In December 2004, after 29 years as both Chairman and Managing Director of JCB, Sir Anthony announced that, while he would continue as Chairman, he would relinquish the role of MD.


Sir Anthony Bamford

Michael Bealing

Death of former President of the AEA

MICHAEL Bealing, the former MD of Vicon UK and a former President of the AEA, died on 25 July at the age of 81.

The AEA Director General at the time, Jake Vowles, remembers the role that Michael Bealing took in shaping the Royal Smithfield Show and also with negotiations over Europe. "Michael was a great help to myself and the AEA in developing the Association during the 1980s and in particular whilst we were in the midst of the EC legal process which coincided with the time that Egbert Hartmann, the Vicon Group Chairman was also President of CEMA (European Farm Machinery Manufacturers Association)," he says.

Following his retirement from Vicon (now part of Kverneland), Michael became chairman of precision drill manufacturer Stanhay, and was also Chairman of the Ipswich Port Authority and of waste compator company, Thetford.

Graduation day celebrations for New Holland apprentices

IT was recently the turn of a fresh cohort of apprentices to celebrate their graduation this year from New Holland's specialist training course.

26 graduates will return to their New Holland dealerships with a BTEC Extended National Diploma in Land-based Technology after completing the three-year course at Reaseheath College in Cheshire.

They were awarded their certificates at a ceremony at the college attended by Mark Barnes, the UK and Republic of Ireland's Technical Training Manager for CNH.

Students come from dealerships around the country for the specialist, semi-residential course which is partly funded and run by New Holland, and involves an extra five modules specific to its machines and equipment.

Since 2002, experienced New Holland trainers come in to teach the apprentices about the latest innovations for engines, hydraulics, electrics, electronic service tools, and powertrain technology.

Each graduate is also qualified to apply for LTA status (Land-based Technician Accreditation) at Level 2, which is a professionally recognised scheme run by the IAgrE in conjunction with major agricultural equipment manufacturers.

Mark Barnes said, "Congratulations to all the trainees who have worked so hard to complete this challenging course. It's great to see them ready to go back to their dealerships and use the skills they have learned."

FEEDBACK

Dear Chris

Having just read the article in *Landwards* about the Soil and Water Centre at Harper, I was surprised and dismayed that so little credit had been given to the industry partners, without whom the Centre would not have come into being.

The sentence, "The Centre was established by Harper Adams University in conjunction with … etc." suggests it was an initiative by Harper with token support from the industry partners. This is very far from the case. It was the industry partners who approached Harper and it is they who are putting in around 75% of the cost of the Centre in the first three years.

Although this article is welcome in highlighting the setting up and existence of the Centre, it is disingenuous in attributing the credit for its coming into being. I hope this fact can be highlighted in the next issue of *Landwards*.

Kind regards

Tim Chamen
Controlled Traffic Farming (CTF Europe) Ltd

IAgrE Guild of Agricultural Journalists Award

AN article on the benefits of varying cereal and oilseed rape seed rate within fields and the equipment needed for GPS seed drill control was selected for the first IAgrE journalism award.

The Institution offered a £1000 prize fund for the best article or broadcast on the application of engineering within the land based sector as part of its 75th anniversary, to celebrate and reward articles that highlight the vital role of engineering in meeting the requirements of modern food and energy production

The article, published in *Crops* and written by machinery freelance Peter Hill described research into the technique and gave guidance on the control software and equipment growers need.

"This was a well written article providing a wealth of technical detail, giving a clear view of the issue and supported by facts and quotes from a range of sources," said the judges.

The panel comprised Clare Butler-Ellis, head of NIAB-TAG's spray applications unit, Silsoe; Paul Miller, NIAB-TAG and Douglas Bomford Trust; Mark Kibblewhite of Cranfield University; Peter Leech, former area training manager for Europe at John Deere; and Tim Price, NFU Mutual communications executive, representing the Guild.

The runner-up award went to *Farmers Weekly* machinery reporter Oli Mark for a feature describing a robotic milking system. The judges considered it a very readable and clear account of one manufacturer's system, including farm experience.

Read Peter's winning article at **tinyurl.com/lmjsyn6**, and Oli's at **tinyurl.com/lhkssll** (page 1) and **tinyurl.com/mechuru** (page 2).

Peter Hill (left) and Oli Mark (right) both received their awards from Paul Miller who was part of the judging panel

Farm safety open meeting

THE IOSH Rural Industries Group, on behalf of the Farm Safety Partnership (FSP), are organising an Open Meeting to discuss farm safety current issues and priorities at the NFU Headquarters, Stoneleigh, Warwickshire on 1 October 2013.

Agriculture continues to have the highest fatal incidence rate, with injuries and ill health also causing concern. The underlying aim of the event is to share information and also to expand interest, involvement and support for the FSP. As such, this Workshop will be an open meeting, not just for FSP members. IOSH members and any others from the industry who can play their part will be welcome.

The Workshop is intended to:

- *Provide the latest analysis of the main causes of fatalities, injuries and ill health in agriculture*
- *Update delegates on emerging issues and the latest developments in relevant legislation, standards, technology and good practice*
- *Identify priorities for the FSP's Machinery Safety sub-Group*
- *Encourage joint working and production of further guidance, information and initiatives*

Anyone within the industry who feels they can play a part and contribute to the meeting is welcome to attend.

The event will also be very relevant to those responsible for managing health and safety in land-based industries, consultants/advisers, lecturers, instructors and training organisers - anyone willing and able to provide a wider perspective and identify means to deliver sound practical advice in the field - literally!

The event is free to attend, including refreshments and lunch but places are limited and will need to be booked.

For details visit *www.iosh.co.uk* or contact Ruth Atterbury, IOSH Events Assistant Coordinator via email on *ruth.atterbury@iosh.co.uk*

Woodland Carbon Code celebrates

Second year of achievement

THE Woodland Carbon Code, a voluntary UK standard which ensures that 'carbon forestry' projects really do achieve the carbon benefits they claim, has passed its second anniversary with an impressive number of achievements.

Increasing numbers of people and organisations are seeking opportunities to invest in tree and woodland planting to help tackle climate change and compensate for their unavoidable carbon emissions to the atmosphere.

Validation of such tree-planting projects under the Code ensures that they meet stringent requirements for sustainable woodland management and carbon accounting, and provides an assurance to investors.

Achievements during the Code's first two year of operation include:

- A total of 133 projects covering 14,200 hectares (35,000 acres) have been registered under the Code. (Registration is a notice of intention to seek validation);
- The amount of carbon dioxide predicted to be removed from the atmosphere by registered projects has passed 5 million tonnes;
- 42 of the 133 registered projects have completed audits and been independently validated as conforming to the standards of the Code, meaning that the carbon sequestration claims and other aspects of the project have been checked and confirmed;
- A scheme to allow groups of woodland projects to come together for validation has been successfully piloted and is now open to applicants, making the process more cost effective for smaller projects;
- The Code was recently launched on the Markit Environmental Registry, bringing enhanced accountability and transparency to the developing forest carbon market in the UK; and,
- An updated version of the Code has been published, addressing lessons learned from practical experience since the Code was launched in 2011.

Dr Pat Snowdon, Head of the Economics and Climate Change Unit at the Forestry Commission, which administers the Code, said, "It's been another strong year of growth and achievement for the Woodland Carbon Code. It continues to offer credible assurance to investors that the woodlands they invest in will deliver the carbon dioxide emissions abatement ascribed to them, while also providing other environmental and social benefits.

"Investing in woodland creation provides companies and individuals with a tangible means of demonstrating how they are reducing their carbon footprint. From October this year UK-quoted companies will be required to report their gross carbon dioxide emissions. The Government's Environmental Reporting Guidelines also enable any company to report the benefits of its investment in carbon sequestration through Woodland Carbon Code-validated projects."

Professorship for Dr Bryan Griffiths

In recognition of contribution to soil biology research

Dr Bryan Griffiths has been awarded a Personal Professorship at SRUC's graduation ceremony, held at the Bute Hall, University of Glasgow on 5th July.

Bryan has been designated 'Professor of Soil Ecology' in recognition of his contribution to soil biology research.

Bryan is a soil ecologist, with considerable experience in studying a wide range of interactions between soils, plants, microbes and fauna.

Speaking of Bryan's expertise, SRUC's Vice Principal Research, Professor Geoff Simm, said, "Bryan's work has helped to create the understanding which will ultimately contribute to the development of sustainable soil management practices for agriculture and horticulture. Another of his strengths is his wealth of experience in developing and building international partnerships which is helping to consolidate SRUC's international reputation."

Bryan has played a major role in the design and management of a number of EU projects which focus on improved understanding of soil biology and function. He was also involved in the SEPA State of Scotland's Soils report and the Scottish Government's Scottish Soil Framework.

He was part of an expert panel workshop organised by the National Institute for Public Health and the Environment (RIVM) in the Netherlands, the role of which was to make recommendations for the surveil-

Top SRUC award for Drew Easton

Receives the 2013 Inverarity Award for business development

Drew Easton receives his award from Sandy Inverarity CBE

WELL respected agricultural engineer, Drew Easton, Head of Engineering at the Barony campus of Scotland's Rural College, has been presented with the 2013 Inverarity Award.

The award, named after college former Chairman Sandy Inverarity CBE, recognises a special contribution to innovation and development within the SRUC business. Drew received his award at the Royal Highland Show from Sandy Inverarity himself.

Announcing the award SRUC Principal and Chief Executive Professor Bob Webb said the nomination provides all the key elements for the Inverarity prize.

"Drew's work is founded in business development and transforming a good business relationship into the provision of sector-leading training and skills. The award winning engineering department at Barony has developed new programmes that have changed the face of agricultural engineering and given Scotland's Rural College in a new leading role."

Professor Webb focussed on the innovative business Drew has established with the global agricultural engineering company CLASS. It began eight years ago, after winning a contract to train apprentices from the company's dealership network in N. England, Scotland and Ireland. The latest new contract involves training not only technicians, but parts, sales and management staff. The existing network supports around 1000 trainees but this is forecast to grow to some 15,000 within the next 7 years. CLAAS senior management recently visited SRUC in Edinburgh to discuss further developments.

Speaking after Drew received his award Russell Clarke, Regional Sales Manager for CLAAS in the north of Scotland said, "Partnerships like this are more important than they have ever been for the industry. We now have engineers coming into our business who have been trained to our standards and which meet our needs. Drew has helped develop a shared vision for the future."

The Barony team's reputation is also demonstrated by the progress of the Land-based Technician Accreditation (LTA) schemes. Backed by manufacturers of agricultural, forestry, ground care and milking equipment LTA is a way of benchmarking, monitoring and assessing technician competence and helps give them a clear career structure and an incentive to continue regular training.

SRUC's Barony campus is a UK pilot centre for LTA and has developed on-line teaching material in a number of areas. Currently 2807 people are registered on the LTA schemes but over 10,400 people work in the land-based engineering sector UK wide. In addition the Barony team are developing material for independent, non franchised dealerships.

Recently the team won the International category at the Scotland's Colleges Annual Awards for a new, online training programme 'Hydraulics and Fluid Power', developed with Australian company CDX. It has widespread applications from offshore platforms, remote mining areas and agriculture to construction, forestry and aerospace. Already it has been bought by a major international airline.

Drew Easton was surprised, honoured and delighted to receive his award, "I am thrilled at the success of what we have achieved with CLAAS in the last eight years, helping them achieve their vision for the apprenticeship programme. The LTA scheme is a cross industry initiative and we look forward to working with other industry partners in the future."

"The revival of agricultural engineering is a key aim within the new UK agri-tech strategy", ended Bob Webb. "The work by Drew and his team creates a focus of attention on SRUC and the Barony campus."

lance of GM effects on the soil ecosystem. During five years with Teagasc, the agriculture and food development authority in Ireland, Bryan was closely involved with the Irish Agricultural Research Forum exploring ways that emerging technologies in soil science could be applied to practical agricultural issues.

Before joining SRUC in 2012, Bryan held a Science Foundation Ireland Stokes Professorship in Soil Science.


Dr Bryan Griffiths being presented with his Professorship of Soil Ecology at SRUC

•EAST Malling Research opened its doors to the public for the first time in a decade on 14 September. The Open Day, at the world-renowned home of fruit research, provided a fascinating insight to plant sciences.

East Malling has been responsible for many changes in the way fruit is gown around the world - changes that have also shaped the Kent countryside and altered the way we all, as consumers, buy fresh produce.

The day included features such as:

- *A visit to East Malling's root laboratory.*
- *A Plant Clinic which allowed visitors to bring along their pest-infected or diseased parts of their fruit plants to be expertly identified by their skilled team of scientists.*
- *Demonstrations of how to extract plant DNA.*
- *A replica of a lab set in 1913 - the year East Malling was founded.*

Tractor tours, self-guided walking tours and escorted laboratory tours also took place throughout the day.

MARKET REPORT

Agricultural Machinery in first six months of 2013

BRITISH farmers are estimated to have spent in the order of £0.9 billion on farm equipment in the first 6 months of the year, a drop of more than 10% on a year earlier, *says Chris Evans, economist of the AEA*.

Tractors are generally the best indicator of activity and 6,677 units of over 50hp were registered between January and June, a decrease of 19.7% on the previous year. The average power has continued to move up, to 147.6hp this year.

The next major sub-sector of the market is the combine harvester; sales have been at a much lower level in this seasonal year (September to August) and are projected to reach 760 units, down almost a third. This drop must be placed in the context of the preceding season being artificially high, driven by elevated grain prices plus tax incentives for major investments.

Another major sector in terms of machine value is the self-propelled forage harvester, sales of which are expected to reach 160 units; the poor early grass season has recovered a little with recent rains relieving a hot, dry stretch whilst cattle and sheep prices have been supportive, if volatile.

Many other machine types saw a, smaller, decline in deliveries as the first half progressed although a few categories such as ploughs, tined seeders, pasture toppers and bale wrappers were still showing a slight year-on-year increase by the end of June. Deliveries of small drills have also remained on a par with last year, although numbers of trailed units are well down, and round balers are only showing a marginal fall.

The first half year has been challenging both for farmers and their suppliers, with cash flows being critical. In contrast to some previous seasons, grain prices, whilst remaining high, have been insufficient to offset a lower output. The planted area, particularly of wheat, was badly affected by last autumn's adverse conditions. The dairy and livestock side of farming suffered a large increase in their cost base over the difficult winter which generated caution but there has been some reporting from recent trade shows of an improving mood.

At first sight the performance of the agricultural machinery market looks disappointing but this is in relation to several very strong preceding years and some would argue that the current volumes are now at a more normal level. In 2012 the real strength of the market was in the early months with a more subdued second period and so the trade is not expecting to see a significant percentage decrease in the second half of this year compared to the same period last year, although 2013 as a whole will probably display a double digit percentage drop on 2012.

CEO VIEW New boy, start of term

HAVING spent much of my life involved in education of one sort or another, I tend to make my new year's resolutions at the start of the academic year, which is around September.

So here we go then, new term, new job, new aspirations, and new resolutions. I have given up on the resolutions around taking more exercise and eating less . . .

Agricultural Engineering has played a significant part of my career and as I reflect on my new role as Chief Executive of the Institution, I also reflect upon what we all mean by Agricultural Engineering and how we can open the eyes of the broader population as to how vital an industry it is to our future prosperity of the world - as well as keeping us fed and watered.

Mark Kibblewhite made some important points in his article around Engineering Leadership for Agricultural Innovation in the summer 2013 edition of *Landwards* and I think it is in all our interests to re-read his article as well as the *Future of Food and Farming Foresight Report*. I feel sure that this development will form an important plank of the Institutions future work.

I am sure that you would not be reading this if you were not committed to Agricultural Engineering and the work of the Institution so in many ways I am speaking to the converted.

But we all have a duty to think about how we can take our industry forward and without wanting to be a hostage to fortune, my new resolution is to work with Institution members, our President and the Council to take forward the challenges of raising the profile of our vital industry and promoting professionalism to new audiences.

I am sure that I have your support with this.

Agricultural Engineering - a diverse subject

MY wife and I disagree over very little but recently I was accused of being a hoarder and asked why I was keeping all of my college notes dating back to 1976. Reluctantly, I decided that perhaps it was time to sort these out (hoping that my wife wouldn't have a look in the cupboard in the garage to see what hoarding truly looks like!).

As I sifted through my old college notes I was struck by a number of things. Firstly how neat my writing was but more importantly, what a diverse subject agricultural engineering is.

From fuel injection systems to field engineering, mowers to milking machines, irrigation to surveying, potato harvesters to ploughs, soils to soldering, the range of topics we covered was vast.

The other striking fact was the depth of mathematics and physics although I can't recall when I last used the Bernoulli differential equation!

I was left wondering how much of this is covered in modern day training and education. The thing which interested me most is how our industry has changed.

> ❝ I can't recall when I last used the Bernoulli differential equation! ❞

Back then, we had training from a skilled blacksmith, we needed to know how to set the timing on a spark ignition engine, we learnt how to calibrate an in-line fuel pump and 'pop test' injectors. At the time, laptops, common rail injection systems and yield mapping were a figment of the imagination. The term 'mechatronics', although invented in 1969, was not a big part of our vocabulary. What will it all look like in another 30 years I wonder?

Alastair Taylor

It is only when you reflect upon these things that you realise that by some form of osmosis, we continue to develop our knowledge and understanding. We never stop learning and as new technologies come along we seem to absorb these without really thinking about how we gain the new knowledge.

Were we to log this development in some sort of CPD record, I am convinced this would make for a comprehensive illustration of our on-going development.

So now for the 'word from the sponsors' bit as they say on the BBC! Do remember that it is important to maintain a record of CPD. As member of the Institution, you can use My Career Path to record your ongoing development. You need to visit the IAgrE Website *www.iagre.org/membership/cpd* to access this.

Engineering for Agriculture - a new term on the block

ELSWHERE in this issue of Landwards you will read about the event sponsored by The Douglas Bomford Trust '*Worldwide Opportunities in Engineering for Agriculture*' to be held at Harper Adams University on 7th November.

This event is designed to promote careers in our industry and to showcase what a diverse industry ours is together with the opportunities available. The programme should be both interesting and informative. Do please promote this event within your communication circles.

I hope to be there and I certainly look forward to meeting you.

MEET YOUR NEW CEO

Alastair Taylor, who will take on the CEO role on 1st October, has agriculture and agricultural engineering running through his veins.

Raised on a mixed farm on the Lincolnshire cost, he attended Caythorpe College of Agriculture where he gained the City and Guilds Technicians Certificate in Agricultural Engineering.

"At that time, the choice was between Rycotewood, Lackham and Caythorpe and the main Universities at Silsoe and Newcastle - so I stayed close to home."

After graduating, Alastair took up a position as a technician and demonstrator in the Agricultural Engineering Department at Harper Adams. "Those were exciting days, working with the likes of the late Geoffrey Wakeham and Paul Hemingway, now of JCB."

1983, a big year for Alastair, as well as getting married to Linda, then a soil technician, he moved to Reaseheath College as a lecturer specialising in a range of subjects, and at the same time gaining a Certificate in Education and a First Degree in Education Management.

In 2000, Alastair joined the government inspectorate responsible for monitoring the quality of education and training in college and apprenticeships in land-based colleges.

In 2006, he moved back into mainstream education, firstly working in a business development role for a consortium of five colleges and latterly as Vice Principal at Hartpury College in Gloucestershire.

Since 2010, Alastair has been running his own consultancy offering a range of services to colleges, private companies and recently, the railway sector.

Alastair lives in Shropshire and in his spare time enjoys his Victorian cottage and garden, photography and the outdoor life.

Need to widen the gateways into skilled work

University should not be default gateway say CBI

THE UK risks failing to close its 'chronic skills gaps' by continuing to focus teenagers on the university 'default route' and more young people should take shorter or part-time degrees and advanced apprenticeships, says a report from the CBI which argues that a growing demand for degree-level technical skills will not be met by traditional university courses alone.

The report, *Tomorrow's Growth*, predicts that by 2020 nearly half of all employment will be in 'highly-skilled roles'. Meeting this challenge "rests on the extent to which we can widen gateways into skilled work and promote routes to higher skills that appeal to individuals for whom a degree may not be the best option", it argues.

In particular the authors say more young people should be encouraged to take technical and vocational courses which they say have long been undersold and should have parity of esteem with academic routes. The report calls for better careers advice from an early age, and an end to the "information asymmetry" which "blights the system".

"What is now seen as the 'default route' of an undergraduate degree is not suitable for all, young people have different talents and learn in different ways," the report argues.

"To become informed consumers, young people need access to better work inspiration from primary school on. We should aim to inspire but also be realistic, setting out the costs and likely return on the options open to young people, including the vocational options that have long been undersold."

The authors call for "a vocational UCAS system" with similar prominence and standing to the university entrance system.

This would provide "information on the full range of programmes available" and "improve visibility of these routes to young people".

They recommend more partnerships between colleges, universities and business to provide vocational training, with businesses expanding their commitment to high-quality training schemes such as apprenticeships, work-based training and fast-track schemes for school-leavers.

They urge universities to provide more 'learn as you earn' education alongside traditional degrees. This would include employer-backed sandwich courses and more flexible degrees, especially part-time ones.

The CBI's policy director Katja Hall said, "The UK needs to vastly increase the stock of workers with higher-level skills to drive long-term growth and stop us falling behind our competitors. Changes to the university finance system in England have meant that young people, facing tuition debts of £27,000 for a three-year course, are already becoming savvier in shopping around for routes to give them the competitive edge in a tighter job market".

"Universities must be much more innovative to take advantage of the change in students' approach. And we need businesses to roll up their sleeves and expand high-quality alternative routes."

> **The UK needs to vastly increase the stock of workers with higher-level skills to drive long-term growth and stop us falling behind our competitors**
>
> Katja Hall, CBI Policy Director

Fall in agricultural machinery thefts

THE cost of countryside crime fell by almost 20% last year, according to the latest figures released by rural insurer NFU Mutual. Rural theft cost an estimated £42.3m during 2012 across the UK - an annual fall of 19.7% in 'agri-crime' year-on-year, said the company.

Driving this reduction was a significant fall in claim costs for tractor and quad bike thefts, which fell by 32% and 17% respectively. Tractors and quad bikes accounted for more than one-third of the cost of all theft claims.

In contrast, 2012 saw a slight increase in NFU Mutual claim levels for livestock theft - but nothing like the three-fold increase experienced the previous year. The figures, based on claims data, have been released to coincide with the publication of the annual NFU Mutual Rural Crime Survey, a nationwide survey of 220 of its rural branch offices.

The trend for items most commonly targeted by rural thieves remains largely unchanged with tools, quad bikes and oil/diesel again topping the list.

Unlike other crime reports, NFU Mutual's study includes claims for crimes against rural homes, farms, commercial premises and vehicles.

While agencies suggest tractors and metal are less commonly targeted than last year, garden equipment makes a debut in the annual top ten list of targeted items, at number five.

"The fall is a vindication of the tremendous efforts made by country people, police, NFU Mutual and agriculture vehicle manufacturers to improve security and beat crime." says NFU Mutual's chief claims manager Matthew Scott.

But country people should not become complacent, said Mr Scott. Rural residents should continue to make security a priority on their farms, businesses and homes, he said. "Rural crime is still taking place at significant levels. In 2013, while numbers of thefts are slowly declining, we have seen some worrying spikes in high value tractor thefts - and a recent spate of tractor GPS guidance system thefts showing that thieves will steal anything of value from farms."

All change, business as usual . .

IAgrE President, ANDY NEWBOLD, sees first hand how skilled agricultural engineers are meeting the market's demands and visits the FEG Symposium

IN my small backwater of the world there's a phrase which goes "*there's many a slip 'twixt cup & lip*", however after several application processes, and a false start here we are with a new CEO, so welcome to Alastair Taylor.

We look forward to the next chapter for the Institution with Alastair at the helm. Once again though I would like to take this opportunity to thank Chris Whetnall for his service, professionalism and friendship (not to mention the odd frank exchange!) as CEO and wish him a happy and well deserved retirement.

I RECENTLY had the pleasure of attending the John Deere Leaping Ahead event in Berlin, which was the press launch for over 25 new agricultural products.

When the reasoning for the new products was discussed with Markwart Von Pentz, John Deere's president for Agriculture & Turf, it became clear that emissions standards were the main driver, alongside the desire to show innovation in new products. The delegates got a real insight into John Deere's thinking regarding how they see European and world agriculture developing.

Irrespective of the level of technology currently in use in a given region, John Deere are striving to offer solutions to help those businesses go forwards. In the case of the BRIC countries (Brazil, Russia, India and China) the requirement for simple reliable technology remains at the core. Whilst at the other end of the spectrum, the demands of a highly mechanised, tech savvy western European operator are for more accurate, repeatable machine control, and monitoring, with advanced Precision Farming and operational analysis.

In fact over 5000 European farmers and contractors have been surveyed by John Deere in 2012 and their key criteria in priority order from their technology was 1) uptime, 2) performance and 3) cost of operation. Uptime (i.e reliability) is at #1, and we should be mindful of this as irrespective of the colour of the product we have a responsibility to strive towards this goal.

The point I would like to make is that at the very centre of meeting the market's demands, anywhere on this global spectrum, is the need for versatile creative, innovative engineers. Although we have taken John Deere as the context here, the same applies across the breadth of agricultural engineering and it is very exciting to be a part of this.

ONE of the pleasures of being president is that I occasionally succumb to kind invitations on behalf of the Institution. One such was the annual Forestry Engineering Group's (FEG) Symposium in early September.

Of course I forgot that I would have to sing for my supper by summing up the day at the end of proceedings. This means no dozing at any point, rapt attention throughout and frantic note scribbling to ensure I had something (worthwhile) to say at the end.

I was not disappointed, by way of forest road design, low ground pressure haulage systems to protect fragile load bearing surfaces, carbon footprinting, biosecurity, the Forest Industry Safety Accord, innovative uses for waste products and encouraging youngsters into the industry (any of this sound familiar to the ag specialists?). The organisers are to be congratulated on a relevant, practical day focussing on engineering into action!

PRESIDENTS reading: **tinyurl.com/l2s9nyk** - all I will say is that an engineer and a plant breeder set out to change the game. Read this and see what you think - it encouraged me . .

Remember, please do be in touch, I am here to represent your interests.

> "**. . The organisers are to be congratulated on a relevant, practical day, focussing on engineering into action!**"

PROFILE: Julie A McMorran

MSc, BSc(Hons), CEng. MIAgrE

FORESTRY ENGINEERING GROUP

Julie has been a FEG committee member since 2010 and is currently their Chairperson. During her time there she has made a very positive impact on the Group. The following profile by Jim Christie, FEG Event, Press and Media Rep, explains why.

BETWEEN 2005 and 2012 Julie achieved an Honors degree in Civil Engineering, and MSc in Timber Engineering Studies, as well as various vocational qualifications such as City & Guilds 4351 AutoCAD R2000, NVQ3 Shot firing and Blasting, CITB Site Safety Managers Course and SVQ 3 Occupational Work Supervision now currently completing SHE Dip 6 Quarry management.

The contribution Julie made to the Industry when acquiring her education did not go unrecognised. The Scottish Timber Trade Association awarded her for her work on the 'Properties and Use of Structural Timber' and for the best timber-related Honors dissertation project.

Between 1996 and 2001 she was a full-time mother coupled with various part-time jobs. In 2003 she set up her own company offering AutoCAD design Services. She joined the Forestry Commission Civil Engineering design office in 2005 and since then various promotions have taken her to being the Area Engineer for the Central Operations Area for FC Scotland.

Within the Commission's operations Julie is responsible for the delivery of the Civil Engineering program for Central Operations Area. This Role carries with it the usual portfolio of non-technical responsibilities for finance and budgeting, staff performance and training, health and safety, compliance with legislation and the responsibility for a wide range of agency work for outside bodies, frequently for the construction of roads and bridges.

Julie has also had responsibility for what must be a totally unique structure - a new monkey research enclosure for Edinburgh Zoo. After the structure concept had been agreed and the design calculations done, the client's vision was further clarified thus totally changing the concept of what was required. Apparently information had come to light that monkeys had a preference for dead trees and so these had to become a feature of the finished enclosure. Ironically this resulted in the dead trees supplied for the project, generating the highest income per tree in the history of the Forest District that supplied them.

"... Women are increasingly making a significant contribution to the specialties within the engineering profession"

Julie is also very much aware of the importance of professional membership and as well as being a member of our esteemed Institution and its Council, she is currently Chair of the Forest Engineering Group, is Registered with the Engineering Council UK, is a member of the Women in Engineering Society.

Her record of CPD points is exemplary as is her list of presentations delivered to a wide range of audiences including in-house Commission training sessions and Timber Trade Association AGMs, including topics ranging from '*Women and girls in Forestry and Construction*' to '*Quarries*'.

Currently Julie is very much one of the few female members of the Institution who has Committee and Council responsibilities and I would suggest that this is a situation which needs to be addressed. Women are increasingly making a significant contribution to the specialties within the engineering profession and this needs to be recognised and reflected in the structure of the Institution.

As an Institution we must do more to engage with this potential membership resource.

Inspiring future engineers

Pictured:

HELPING VINEYARDS

HARPER Adams University has joined a consortium to develop an innovative irrigation solution for orchards and vineyards.

The USER-PA project brings together precision agriculture experts from eight ICT-AGRI member countries – Israel, Denmark, Germany, Greece, Italy, Switzerland, Turkey and the United Kingdom.

Scientists have been sourced from universities, research institutions and industry thanks to their expertise in the fields of robotics and automation, sensor technology, spatial decision support systems, irrigation, and plant physiology.

Harper Adams University's role in the consortium is to build an autonomous orchard tractor that can carry the instruments built by the other partners.

Head of Engineering at Harper Adams, Professor Simon Blackmore, (pictured above) said: "Harper Adams University is uniquely positioned in the fact that it is home of the National Centre for Precision Farming (NCPF).

"This centre of excellence promotes and evaluates the use of technology as a vital aspect of precision agriculture, building upon the university's reputation as an innovator in the field of engineering."

INSPIRING young people to choose agricultural engineering is the theme of a free careers forum to be held at Harper Adams University in November.

'Worldwide opportunities in engineering for agriculture' is being organised by Harper Adams in conjunction with the Douglas Bomford Trust and the Institution of Agricultural Engineers (IAgrE).

The event, scheduled for November 7, is designed to inspire and encourage the next generation of engineers to play a key role in agriculture and food production.

Among the speakers will be former Chief Scientist, Sir John Beddington, who commissioned the Foresight Report 'Global Food and Farming Futures'.

The Forum will be led by Mark Moore (AGCO Corporation), and include contributions for leading speakers such as Clive Blacker (Precision Decisions Ltd), David Yiend (CEO, AB Agri) and Debbie Beaton (Farmers Weekly).

Head of Engineering at Harper Adams University, Professor Simon Blackmore, said: "Harper Adams is the only higher education institution in the UK to offer agricultural engineering at degree level.

"Therefore we are delighted to be working with the Douglas Bomford Trust and the Institution of Agricultural Engineers to showcase what the industry has to offer in terms of careers and prospects."

Sir John Beddington

During the event, presentations will be given by representatives from companies such as AGCO, and academics from Cranfield University, Harper Adams and the South China Agricultural University.

Technical demonstrations of robotics and autonomous vehicles; high-speed tractor design; and precision agriculture and livestock management, have also been scheduled.

KEY employers from the sector such as John Deere, JCB, ACGO and others will attend the event and there will be interactive debate and discussion encouraged, to illustrate why agricultural engineering can prove an exciting career choice.

Professor Paul Miller, secretary of the Douglas Bomford Trust, said: "In the UK, engineering and agriculture have been under-played and, together, are not seen as attractive or of sufficient value to received adequate investment.

"This event aims to present the opportunities, challenges and rewards that will attract, motivate and inspire the future generation of agricultural engineering professionals."

The Douglas Bomford Lecture Theatre, which is part of a new £2.93m Agricultural Engineering Innovation Centre at Harper Adams University, will also be formally named at the event.

The facility will supplement existing academic resources and provide a physical base around which university/industry collaboration can take place.

For more details on the Forum which will run from 10.00 am to 4.00pm on 7 November, and details on how to sign up please go to **www.dbt.org.uk/dbtforum**

Variable weather in the UK is here to stay

So what can farmers do about it?

Last year's summer and autumn weather confirmed just how vulnerable farmers and growers can be. Will they continue to be victims of the weather or are there actions that can minimise the impact of the UK's unseasonable weather?

Earlier this summer the Institution of Agricultural Engineers convened a special meeting to examine some of the key issues. Presentations were given by three leading experts in their fields.

Increased diversity and management flexibility is needed

WILL FOSS

FARMERS who struggled to establish crops on saturated soils last autumn have been told that variable weather in the UK is here to stay. With many farmers locked into specialised systems, or even a single cultivation/management approach, there clearly needs to be more diversity and management flexibility, said **Agrii agronomist Will Foss**.

Building greater resilience into soils is also extremely important. Are farmers becoming too complacent about field drainage, he asks. "Attention to detail is so important, especially when it comes to maintaining your drainage systems."

Many farmers experienced failure of dated drainage systems last year. As water was locked into the land, unable to drain away, they were prevented from getting onto land to carry out routine arable operations, including fertiliser and spray applications.

Autumn soils were so wet it was very difficult to rectify damage. With turnaround times severely compromised, land was turned straight back into rape in many cases; arguably a lot later than rape should be drilled.

"Another issue was the relatively cold conditions in September and on into the winter. A lot of oilseed rape was drilled into September and it's really noticeable that crops drilled in August tended to do much better and what has been grown after this date did not do very well."

Farmers ended up in the late autumn with a thin backward oilseed rape crop and slug damage in spite of pellet applications.

One lesson learned from the past season was don't give up on winter oilseed rape too early in the spring. Take account of weed as well as crop status in decision-making and think about what is going on below the ground as much as what can be seen above it, he noted.

Wheat is more adaptable than oilseed rape and even in extreme conditions many farmers persevered and drilled. But putting seed into wet conditions meant it was destined to struggle, with further bad news that black-grass grew where wheat could not.

At Agrii's primary black-grass management site at Stow Longa near Huntingdon

trials have taken place on the same fields for more than 10 years and major differences in weed control have been obtained from different combinations of cultivation regime, wheat variety, seed rate and drilling date, as well as herbicide programmes.

Mr Foss said Agrii's cultivation systems work clearly shows ploughing and delaying drilling are the best cultural techniques for reducing black-grass in a single season. But with the right tillage programme, some reduced tillage and direct drilling regimes can be almost as effective in controlling black-grass, deliver similar yields and generate higher margins over establishment and chemical costs.

"The extent to which ploughing for a second season in a row brings up black-grass seed buried the previous year has also become very obvious. In contrast ploughing after direct drilling and most min-till regimes resulted in far fewer black-grass plants."

Parallel trials at Stow Longa have shown the value of a two pass min-till system in encouraging large amounts of black-grass to germinate early, even in a dry autumn and where the seed is considered relatively dormant.

Spring cropping has shown consistent results in reducing black-grass, with an 88% mean reduction in the crop when compared with September sown wheat. Most of the population appears in the autumn, with very little appearing in the spring.

When the autumn is wetter the benefit in terms of reduced black-grass pressure from delayed drilling is more significant than when rainfall is low. Wheat and oilseed rape are more lucrative than lower yielding spring wheat, linseed and winter barley, which still need black-grass control.

Even crops which were not hindered by the weather remained one to seven weeks behind their normal development stages, flag leaves emerging from 30th May and on into June for late crops. That could well cause problems in terms of a reduced turnaround time before the next crop, with little time to rectify soil structure issues, even if conditions are suitable.

A final issue is seed quality. Mr Foss urged farmers to do germination and vigour tests before drilling seed saved from the current crop.

. . . ploughing after direct and most min-til regimes resulted in far fewer black-grass plants

Time for a closer look at field drains

PAULA MISIEWICZ

LAST autumn and winter's awful weather sent shock waves through the farming industry, as farmers and contractors alike struggled to establish winter crops. As the 2013 establishment season approaches it may pay to reconsider drainage systems.

Good land drainage not only improves yield potential, especially in poorly drained areas prone to water-logging, but also helps machinery travel across land, improving timliness of operations and reducing compaction and rutting, said **Paula Misiewicz, a researcher and lecturer at Harper Adams University**.

Indeed, increasing the depth of the water table through drainage increases soil strength and trafficability, lessens compaction, and eases subsequent field operations, increasing the number of available work days, so improving overall timeliness and crop establishment. Indeed, better drainage can improve the timeliness of all arable operations, which is critical when considering harvest and spray/fertiliser application windows.

A drainage system that has been in place for decades may need reviewing and replacing in certain areas. "But where to start," she asked. "Check, maintain and improve drainage infrastructure and reduce traffic intensity and contact pressure. It is so important to regularly inspect old drainage systems. Restoring an old system is much cheaper than creating a new one."

She referred to two types of drainage issue. One is surface water control, especially where clay soils are close to the surface so water cannot infiltrate. Secondly, more permeable soils with the water table close to the surface require piped drainage and moling.

Preventing mechanical compaction is also important. It maintains lower soil strength, improves freedom for root and shoot growth, allows infiltration of water and aeration, and can lead to yield increases of up to 15%.

One approach is controlled traffic farming, whereby wheelings are restricted to long-term tramlines. Where soil is not trafficked water is better able to infiltrate, reducing water run-off and erosion, and improving fertiliser use efficiency. It can also mean less overall compaction, better yield thanks to improved conditions for plant growth, more uniform grain, less overlap, lower input costs and greater placement accuracy.

Even before taking crop yield into account operating profit can be up 8% (£75/ha).

Lowering ground pressure is a simple and cheap way to reduce soil damage, leading to extended working time, improved fuel economy and better trafficability and manoeuvrability. Extra costs using a tractor of around 280hp with ultraflex tyres can be equivalent to £1/ha and £0.50/ha for a combine. But those cost are offset by fuel savings, improved trafficability and narrower operating widths.

In the short term Ms Misiewicz urges

continues over

farmers to study old drainage plans and walk ditch drains when they should be flowing. Check that tile drains, plastic pipes and mole drains are flowing, clean blocked ditch and open drains, flush pipe drains, ensure outfalls are functioning and map damaged areas for repair.

In the medium term mole drain clay soils with perched water tables, to connect with gravel backfill of existing tile/plastic drains. Sub-soil damaged areas after the next harvest and improve existing drainage.

Longer term look to install pipe/ditch drains, mole drain clay soils with perched water tables to connect with gravel backfill. Install grass waterways, grade low spots in flat lands, improve existing drainage systems, reduce surface compaction by reducing traffic density and intensity and improve soil organic matter content.

Predicting soil workability

MARK KIBBLEWHITE

PART of the problem with last autumn and winter's awful weather was the uncertainty about how long it would last and how severely it would affect different soils. Better information could have saved some of the headaches.

Some of the key issues emerging from the atrocious conditions included the scope for improved forecasting to aid on-farm decisions about machinery operations.

Lost timeliness stemming from weather extremes is the main source of the annual variation in total costs of cereal production, amounting to anything from £0/ha to £120/ha, suggested **Professor Mark Kibblewhite of Cranfield University**.

"You have the risks of no crop establishment or poor yield from late sowing and the cost of soil damage from traffic or tillage when the soil is to wet."

Trafficability of soils is a key issue, he stressed. "Poor trafficability and workability of soils leads to late or abandoned drilling, damage to soils and higher establishment costs. We need to be able to make better decisions about where and when operations are done to maximise good use of windows of opportunity."

Farmers need real-time information on the suitability of specific operations before deploying kit, to avoid the cost of wasted journeys or to support decisions to proceed anyway and cause damage.

"Using higher work rate kit you are able to cover more ground during the 'windows of opportunity', but you need to be aware that a combination of weight and power is likely to increase the risk of damage," noted Prof Kibblewhite..

"Rainfall affects workability, with variations over short distances and hour by hour, making soil status variable from day to day. Daily updates on current and forecast workability are needed."

Studies to predict the number of machinery work-days (total days when soil is workable) from soil and climate information can aid strategic planning, such as choice of farm system and crops. But it can't help operational decisions within each year.

For that farmers need extra data. Soil properties, including texture and real time soil moisture, plus local rainfall and temperature from an automated met station, plus a five day forecast from the local meteorology station, could be delivered remotely to the farm office to help compute short term predictions of trafficability and workability, he suggested. Available work days for sowing and crop maintenance could then be predicted far more accurately.

Better forecasts of soil status would allow optimal timing of crop establishment for the season, reducing the risk of no or late sowing and reducing the risk of soil damage.

"We definitely have the ability technically to build a prediction system," Prof Kibblewhite concluded.

These articles orginally appeared in Tillage magazine, and have been reprinted here with their kind permission.

Read Professor Jane Rickson's overview of the IAgrE Council meeting where these presentations were delivered on page 28 of this issue.

Looking Landwards

COMMEMORATING IAgrE's 75th Anniversary, the *Looking Landwards* sci-fi short story competition, held in association with NewCon Press, continues this issue with the winning entry.

Wheat

by Kevin Burke

It was her hair that he remembered most. Not her eyes, warm and beguiling though they undoubtedly were; nor her smile; nor the ease with which she would break into sudden, infectious laughter. It wasn't even the feline movement of her body as she crossed the room. It was her hair, flowing like honey, gently undulating in the soft summer breeze.

He traced its movement with his finger, as though this simple action would lend substance to the memory. In his mind's eye he watched it brush against her cheeks, then cascade across her shoulders like a golden waterfall. Finally, reaching the farthest point of its journey, the saffron river ran in to tiny tributaries that lost themselves in the folds of her gown: slender wisps of ochre lost in a sea of green.

From his seat in the window, he looked at the awards that hung on the opposite wall. He was pleased that his work had been recognised, that these plaques of glass and metal reflected the success he had achieved; but ultimately they meant little. It was the smallest of the collection, the one that was engraved with Martha's name, which held his gaze.

Thirty-five years ago, when they had first posited the idea, their focus had been entirely on off-world cultivation, but when the change in the climate had begun to accelerate at a speed that not even the doom-mongers could have foreseen, it was all hands to the wheel. 'Desert creep' had turned into something more akin to 'desert stampede', and parts of Europe had become a dustbowl. In North Africa, nothing could survive. In Britain, drought conditions in summer, along with extreme flash flooding hurricane level winds and the fact that much of the east of the country was under water, meant that traditional arable farming methods had all but been abandoned. It was a crisis from which no country on Earth was immune.

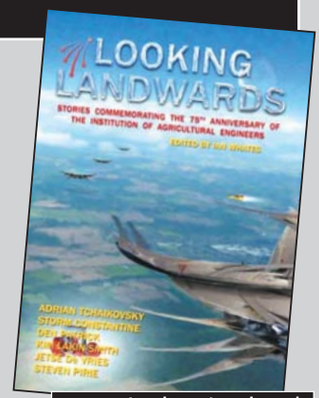
Martha had been the first to see the potential. A form of capillary matting, thin as paper, rolled out from huge bobbins over the arid soil. The 'food carpet', as it had immediately been dubbed by the press, contained everything necessary for life . . . and then some.

The idea had been that the cocktail of chemicals in the underside of the matting would mineralise and enrich whatever surface it came into contact with, creating a growing culture through which the embedded seeds could send roots, enabling the emerging plants to lock into the newly created compost. At the same time, the capillaries within the carpet's fibres would carry fluid to the seedlings in the same way that the veins and arteries of a human body carry nutrition to the cells.

He looked again at the awards. There had been many who were working on the project, but it was Martha who had made the concept work. His own recognition had come from the creation of the solar powered devices that encouraged the fertiliser mix to combine with whatever moisture source might be available, and then to expand throughout the capillary system. No mean feat, but it was Martha's genius that had developed the matting itself.

The surface of the carpet was completely impervious to hostile elements, while remaining permeable to moisture and life-giving sunlight. Tied up in the strongest of patents, the nanotechnology involved was mind-boggling, yet it remained financially within the grasp of even the most cash-strapped of governments. That was the real genius, the holy grail of technological advance. It was never going to be enough simply to build a better mousetrap; you had to bring it in at a price that everyone could afford.

The 'food carpet', as it had been dubbed by the press, contained everything necessary for life . . . and then some



Looking Landwards anthology publication to be released by NewCon Press this autumn

So it had been the cruellest of blows when the accident happened. A tiny nick in a safety glove, and it was all over. The chemical combination held in the lowest layer of the mat had been created to seek out the most infinitesimal of water molecules. Within the matting it remained inert, until brought to life by the workings of the capillary system, but, in those early days in the laboratory, it was savage. In the pores of Martha's fingertip it found a perfect source of water, and the concoction set about the work that she had created it to do. In less than five minutes the mineralisation process had spread through her cellular structure. Within ten she was dead.

He turned in his chair and looked out of the window. Populations need to be fed, wherever in the Universe they may be. They had tried fungi, lichen and plankton, but they had never taken off, despite a gargantuan effort on the part of the marketing men. The debate over genetically modified crops had long since been won, as people realised that, without a little help, much of their food simply couldn't grow in the new, harsher conditions of our brave new world. So now they had cultivatable grains and grasses that would grow anywhere, and which, thanks to Martha's expertise, could be rolled out over everything from ice cap to desert.

It was a fitting epitaph. Wherever there were people, on Earth and beyond, the legacy of her work would keep them fed. As he looked out over the acres of golden wheat, waving sinuously in the late afternoon breeze, he was, as always, reminded of Martha.

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UPDATE

AUTUMN 2013

LATEST NEWS AND INFORMATION ON THE LAND BASED TECHNICIAN ACCREDITATION SCHEME (LTA)

Time to stop this social injustice

DAVID KIRSCHNER asks who is going to inform society just how highly skilled and professional land-based engineering technicians, parts operatives and their management teams can be?

PROFESSIONALISM deserves respect, reward and acknowledgement but for some reason this is not fully appreciated when applied to the land-based engineering industry.

We should be shouting from the rooftops about the professionalism of our industry and its staff, promoting the challenging roles, careers and opportunities to work at the cutting edge of advancing technology whilst gaining professional recognition. However, unfortunately to date only limited success has been achieved in changing the perception of the industry and those working within it. What can be done to change this?

There is some light at the end of the tunnel, credit must be given to the industry for taking proactive steps to address the situation by introducing a suite of LTA career paths that benchmark and recognise the expertise of aftermarket managers, technicians and parts department operatives. LTA is not about qualifications it's about recognising the proven ability to fulfil a job role. If only other professions would follow suit!

Let me offer an analogy for you to consider: who is perceived to hold a higher social standing and be viewed as a professional (a) general practitioner in your local health centre or (b) a land-based engineering technician? My guess would be the general public would choose the doctor, am I right!

Having served in the provision of after sales support for over 40 years and now being the guardian of a heart that technically falls into the 'Friday Nighter' category due to hereditary manufacturing defects I think I am well qualified to comment. My views are based on experience gained from visiting most doctors in the local practice as I can't seem to get my medical emergencies to fit in with the 3-5 days notice period required to see my own doctor.

As a patient I can apply logic, explain the symptoms exactly, show where it hurts, express how I feel, discuss what has changed and even offer solutions, these are diagnostic luxuries not offered to our technicians. The doctor can carry out hydraulic tests (blood pressure test) perform an electronic diagnostic test (ECG) order an oil analysis (blood tests) and recommend a course of action. Simples I think. How wrong could I be! In more cases than I now care to recall it appears that unless you have a visible defect, cut finger, boil on your bum etc there is as much chance of an accurate diagnosis as there is of Santa's reindeer 'pooing' on your rhubarb.

The General Practitioner will refer patients particularly those who make the most noise (a speciality of mine) to a consultant, now we are talking expertise on a parallel with our LTA professionals. So why is the perception of the land-based engineering industry and its practicing professionals so low?

> "LTA is not about qualifications, it's about recognising the proven ability to fulfil a job role"

As an industry we have the choice of doing nothing and complaining about our lot or investing in and promoting the true assets of the industry and its workforce. In my opinion until we recognise and value the expertise of the staff within the industry there is little hope of influencing the perception of people outside of the industry.

Now I must remember to find out how many doctors surgeries are on the circulation list of publications which may carry this article!

To learn more about LTA and its benefits, or if interested in becoming an LTA Accredited Training Provider, contact David Kirschner: *mrdkirschner@btinternet.com*

Forestry Engineering embraces LTA

Russell McGhan

RUSSELL MCGHAN, who is the workshop foreman for John Deere Forestry, will be the first forestry engineer in the UK to embrace LTA.

The company which is based at Carlisle Airport industrial estate provides sales and service support for John Deere Forestry equipment throughout the UK and although part of the John Deere family runs as a separate operation.

Russell is committed to training and recognises the value of LTA to the technician as well as the customer. "It is great to have the LTA benchmark to highlight what the technician has achieved and also that they are committed to CPD," he said.

"This is essential as supporting the machines is likely to become more demanding in the future due to ever increasing levels of complexity. The ability to understand and use the technology to good effect will be the hallmark of tomorrow's technicians."

Russell is currently accredited to LTA 2 and will undertake progression to LTA 3 as his workload allows. The professional registration with IAgrE associated with LTA 3 will provide comfort to customers. When one considers the value of some of the equipment used in Forestry it really is a job for the 'top gun' technician!

Other technicians employed by John Deere Forestry lare ikely to follow Russell's trail-blazing lead.

Government unveils £160m Agri-Tech strategy

On 22 July, the government unveiled its £160m strategy to boost farming technology, a move it says will turn the UK into a world leader in agricultural science. Industry is also expected to invest heavily in the project, with the aim to transform farming in the UK, using the latest technologies to produce more, while affecting the environment less.

AGRI-TECH STRATEGY SUMMARY ISSUED BY UK GOVERNMENT

"This is the first time the UK government, science base and food and farming industry have come together to identify and develop the opportunities and strengths of the UK agricultural technologies (agri-tech) sector.

Led by the Agri-Tech Leadership Council, this strategy is the outcome of consultation and partnership with the agri-tech communities to agree a set of actions to deliver our vision:

> *We want the UK to become a world leader in agricultural technology, innovation and sustainability; exploit opportunities to develop and adopt new and existing technologies, products and services to increase productivity; and contribute to global food security and international development*

Agricultural science and technology is rapidly becoming one of the world's fastest growing and exciting markets. It is driven by global changes: a rising population, rapid development of emerging economies with western lifestyle aspirations and growing geopolitical instability around shortages of land, water and energy.

A technology revolution is also taking place. Breakthroughs in nutrition, genetics, informatics, satellite imaging, remote sensing, meteorology, precision farming and low impact agriculture mean agri-tech has huge potential for development.

Agri-tech is a well-established and important UK sector. The entire agri-food supply chain, from agriculture to final retailing and catering, is estimated to contribute £96 billion or 7% of gross value added. The UK exported £18 billion of food, feed and drink in 2012 and is one of the top 12 food and drink exporters. Employment for the whole food supply chain that includes agriculture and fishing is 3.8 million.

UK STRENGTHS

UK has strengths in all the three elements that are vital to support the growth of the sector:

- we have institutes and university departments at the forefront of areas of scientific research vital to agriculture and related technologies
- we have innovative and dynamic farmers, food manufacturers and retailers
- we are well positioned to make an impact on global markets through exports of products, science and farming practices

This strategy is about better integrating the UK's progressive food and farming businesses, and world class science base. The aim is to help unlock a new phase of global leadership in agricultural innovation.

OUR PLAN

The strategy sets out a range of actions for the Agri-tech Leadership Council, industry, government and the science base to deliver our vision for the agri-tech sector. The actions will:

- Improve the translation of research into practice through a £70 million government investment in an Agri-Tech Catalyst which will provide a single fund for projects, all the way from the laboratory to market; this will include £10 million to deliver international development objectives.
- Increase support to develop, adopt and exploit new technologies and processes through £90 million of government funding for Centres for Agricultural Innovation.
- Help the UK exploit the potential of big data and informatics and become a global centre of excellence by establishing a Centre for Agricultural Informatics and Metrics of Sustainability
- Provide stronger leadership for the sector; the Agri-tech Leadership Council gives industry a stronger and more cohesive voice with government and the science base.
- Build a stronger skills base through industry-led actions to attract and retain a workforce that is expert in developing and applying technologies from the laboratory to the farm.
- Increase alignment of industry research funding with public sector spend by increasing understanding of what is being spent and where.
- Increase UK export and inward investment performance through targeted sector support.

The newly-established Agri-tech Leadership Council will oversee the delivery of the actions in this strategy. The council will help to prioritise and focus activities, reduce duplication by the Technology Strategy Board (TSB) and other funding bodies, and facilitate integration.

The success of the strategy will depend on the whole agri-tech sector leading, participating and co-investing. The potential rewards are increased productivity, reduced costs, growth, new investment and jobs and tackling the challenges of sustainable intensification and global food security.

The UK has a science and research base that is world class across a number of agricultural technology disciplines. Government spent £450 million on research and development in agriculture and food in 2011 to 2012, including substantial capital expenditure supporting research institutes and cam-

puses.

Conservative estimates of private sector investment in agricultural research and development in the sector suggest it is at least £100 million a year. However, this underestimates the true activity as farming makes up only one part of the agri-tech sector.

The research landscape is complex, involving many different institutions from agricultural colleges, universities and institutes as well as private organisations; research takes place across the UK.

INCREASED INVESTMENT

We want to increase investment across a range of disciplines, some of which are:

- crop and livestock genomics
- agri-engineering (sensors, autonomous vehicles, robotics, precision agriculture)
- genetics
- nutrition
- food science
- health in crops and livestock
- plant breeding
- environmental sciences
- human nutrition
- functional foods
- nutraceuticals
- clean technology and energy generation from waste
- industrial and synthetic biology

Much high quality and useful research is taking place. However it is fragmented, with too few commonly agreed priorities. Not enough research is commercialised, so farmers and food manufacturers are unable to take advantage of the opportunities and productivity improvements that new technology and innovation provides.

To resolve this confusion, the Leadership Council, working alongside others, will conduct a comprehensive mapping and evaluation of private and government funding available for research, translation and innovation. The Leadership Council will use this as a basis to better prioritise and coordinate research.

Building on existing reports, the Leadership Council will work with the research councils to identify the skills needed to support the agri-tech research base.
TO specifically address the need to commercialise more agricultural technologies in the UK, the government will:

- Invest £60 million through the TSB to establish an Agri-Tech Catalyst to support the 'proof of concept' development of near-market agricultural innovations.
- Contribute an additional £10 million through DfID to the Catalyst to support the transfer of technology and new products to developing countries.
- Invest £90 million over 5 years to establish a small number of Centres for Agricultural Innovation to support advances in sustainable intensification.

We want to see more private sector investment. The Catalyst fund and the Centres for Agricultural Innovation will be developed and co-funded with industry either in cash, or in kind.

The first Centre for Agricultural Innovation will focus on big data, and establish the UK as a world class centre in agricultural informatics: the metrics and performance indicators needed at field, farm and landscape level to improve productivity and ensure a balance between efficiency and resource impact.❞

INDUSTRY RESPONSE

Strategy does not go far enough say IAgrE

A step in the right direction, but still work to be done

IAgrE fully supports the government's new £160m Agri-Tech strategy but believes there is still some way to go before engineering for agriculture is properly recognised in the UK as a critical component in the quest to deliver sustainable and affordable food.

Mark Kibblewhite, President Elect of the Institution, says, "This is a step in the right direction but the urgent strategic technological challenge is to translate existing and emergent science in to practical tools and processes for farmers. This is primarily a task for engineers and technologists.

"The balance of the strategy appears too weighted to supporting new science rather than its technological translation and this is disappointing.

"It should be doing even more to increase the opportunities for engineers working outside the agriculture sector to bring their knowledge and skills to engineering for agriculture and bring this strategic sector in

to the 'mainstream' of UK engineering, while recognising the distinct and specialist role of the agricultural engineering discipline itself.

"Over many years there has been a general decline in investment for research and education infrastructure for agricultural engineering.

❝ . . . The balance of the strategy appears too weighted to supporting new science ❞

"We hope the strategy represents a fresh start. It offers useful funding to help businesses and researchers to work together so that new, innovative ideas for tools and processes reach the ready-for-implementation stage.

"We are pleased that the Government is considering establishing a Centre for Agricultural Engineering and we look forward to assisting its early development," he added.

A key challenge is to develop opportunities for education, research and training in engineering for agriculture.

The Institution is optimistic that the strategy can encourage better appreciation of the exciting and cutting-edge career opportunities in engineering for agriculture and it looks forward to contributing to this objective in its role as the professional institution of choice for engineers in the land-based industry sector.

AEA describes report as 'very disappointing'

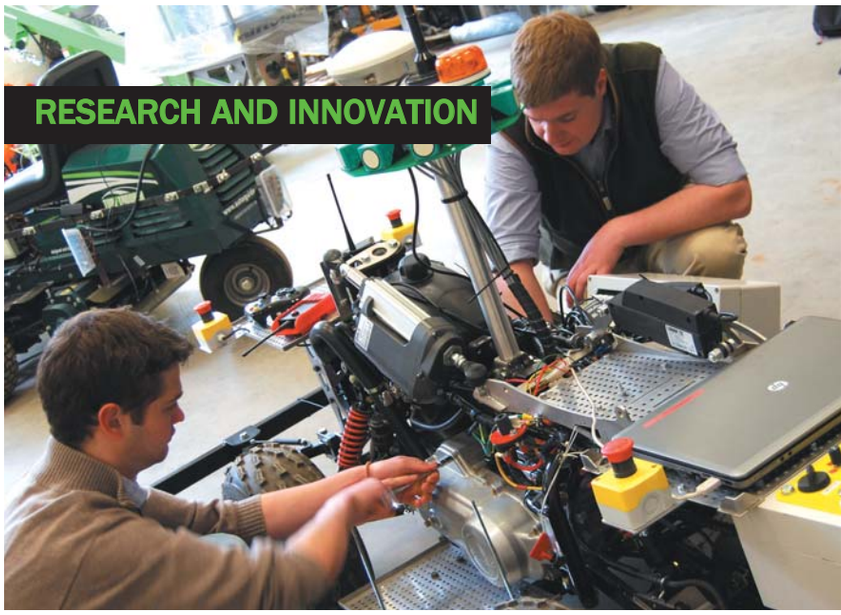
The Agricultural Engineers Association (AEA) described the government's £160m investment strategy for developing agricultural technology "very disappointing".

Roger Lane-Nott, the director general of both the AEA and Milking Equipment Association, made the comments after the agri-tech strategy to invest more money in science and technology was launched.

"The fact that farm equipment was given a couple of small paragraphs was verging on insulting to an industry that has a turnover of nearly £4bn in the UK and is a fundamental part of agricultural production," said Lane-Nott.

"There was no sign of any commitment to improving either farm equipment R&D or applied research, and milking equipment was ignored altogether. What's more, the leadership council does not have anyone from the farm equipment sector on it," he added.

£13 million grant aid for engineering solutions to enhance agri-food production *see next page*



£13m grant to aid engineering solutions to enhance agri-food production

The Technology Strategy Board (TSB) Sustainable Agriculture & Food Innovation Platform has just announced the 5th in a series of calls for collaborative Research and Development.

Following on from calls on New Approaches to Crop Protection, Sustainable Protein Production, Food Processing and Manufacturing Efficiency and Measurement Technology, the TSB and their funding partners are offering £13m for collaborative projects on engineering solutions to develop agri-food solutions across the supply chain.

This competition will draw on all facets of engineering science to advance the sustainable intensification of primary agriculture, and raise product quality and process efficiency in food manufacturing.

The TSB is particularly keen to encourage engagement with sectors such as space, ICT and electronics sensors & photonics.

BUSINESS LED

Project proposals must be business-led and collaborative.

The TSB are primarily seeking to fund industrial research, with a business partner attracting 50% public funding for their project costs (60% for SMEs).

They expect most projects to range in size from £500k to £1.5m, with the maximum total project size being around £2m but may consider larger project (applicants should discuss these with TSB) before making an application.

THE CHALLENGE

Achieving the sustainable intensification of agriculture - increasing yields without adversely affecting the environment or having to cultivate more land - represents a cross-disciplinary challenge.

Precision agriculture provides opportunities to increase agricultural productivity through more accurate and efficient crop and livestock production systems.

Employing engineering solutions to increase precision and efficiency in the food processing and retail environment can also help to improve the economic and environmental sustainability of food production.

Much of the UK engineering base for agriculture has become fragmented over past decades, with engineering businesses importing technologies rather than maximising the UK's R&D and manufacturing capabilities.

Applying technologies such as satellite positioning systems and remote sensing devices can enhance decision-making in the field to increase yields and improve precision and efficiency in crop and livestock systems.

With real-time monitoring, these technologies can optimise the delivery of inputs such as fertilisers, crop protection products and irrigation.

In this context, the TSB is particularly keen to help companies in the space, ICT and electronics, sensors & photonics sectors establish new collaborations with the agricultural community.

Engineering technologies such as automation or robotics can also increase product quality, enhance manufacturing efficiency and reduce waste in the food sector.

SCOPE

THE scope of this competition includes the application of engineering solutions from primary production to the food processing and manufacturing environment.

Proposals can include software engineering and information technologies, where they represent an essential component of an engineering project.

Projects that address non-food crops or the engineering of biological systems are out of scope.

INDUSTRY OPPORTUNITY

"EVEN at this early stage, Harper Adams are reporting good levels of interest in collaborative projects," says IAgrE Vice President Dr Robert Merrall.

"Whilst it is not a pre-requisite to have an academic partner in a bidding consortium, doing so can really enhance a project. The National Centre for Precision Farming at Harper Adams has done very well at attracting government funding so far, and is actively seeking stronger industrial collaboration as part of its ambitious delivery programme.

"They report representation from most of the engineering disciplines with (so far) the possible exception of agricultural building design.

"However, many small companies perceive the administrative burden of these projects to be excessive. It is certainly the case that these projects demand strong leadership and accounting for in a way which passes an audit, but with careful resource allocation by the consortium, these projects really can stimulate collaboration between partners and deliver very tangible results for small companies.

"This funding is designed to bridge the gap between a good idea and its commercial exploitation.

> ❝ . . . funding is designed to bridge the gap between a good idea and its commercial exploitation ❞

"As a sector, agricultural engineering any government funding has been hard-won, and one of TSB's concerns from the outset has been whether there would be sufficient numbers of highly motivated businesses in our sector to take up the funding.

"We need to demonstrate that this is the case.

"Any member seeking further advice on potential projects could contact the IAgrE Secretariat in the first instance - they will be able to signpost members to the most appropriate resources and individuals to help. In any event, we need to seize the moment . . . let's show government how innovative our sector can be!"

Investment of up to £13m for businesses to develop engineering solutions across the agri-food supply chain.
Award: Up to £13m
Opens: 23 Sep 2013 :
Registration closes: 30 Oct 2013
Closes: 06 Nov 2013
Further details: Technology Strategy Board ***http://tiny.cc/5u032w***

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Secretary: **Paul Miller** Administrator: **Elizabeth Stephens**

An update

Support for Undergraduate Students -

Studentships, prizes and travel awards

WHILE a substantial proportion of the financial support given by The Trust to students goes towards those involved with research projects leading to a PhD thesis, support for those studying agricultural engineering and related disciplines with courses up to the undergraduate level are also regarded as important by trustees.

Plans are currently being made for the allocation of studentships to those on appropriate courses during the 2013/14 session. These studentships provide funding, typically up to £1,500 allocated during one academic year, to enable recipients to purchase items or engage in activities that will maximise the benefit that they can gain from their course.

Applicants must be student members of The Institution and the selection process is based on a brief written case, a submitted CV and, where possible, an interview with the student. Students at Harper Adams University can apply through a system operated on the campus by The Harper Adams University Development Trust whereas students at other universities and colleges can apply directly to The Douglas Bomford Trust or through a representative at their college/university.

The Trust awards prizes to students at Cranfield, Harper Adams and The Royal Agricultural Universities on an annual basis. This year "*The Douglas Bomford Trust Award for the best student on the Land Reclamation and Restoration option of The Land Management Course*" at Cranfield University was awarded to Oliver Edmonds.

The award, comprising a plaque and a cheque, was presented to Oliver by Paul Miller, secretary to The Trust, at the Cranfield University Graduation day on 6th June 2013 (see photograph).

At the same event, Zaka Quraishi received the Shepperson Memorial Prize for the best thesis applying engineering to agriculture that is awarded by the South East Midlands branch of The Institution (see photograph).

Zaka was a Douglas Bomford Trust sponsored EngD student at Cranfield University and the title of his project was "*The evaluation of field soil compaction for optimal mechanisation systems in controlled and non-controlled traffic systems*".

Oliver Edmonds being presented with *The Douglas Bomford Trust Award for the best student on the Land Reclamation and Restoration option of the Land Management Course* at Cranfield University by Paul Miller

Zaka Quraishi receiving the Shepperson Memorial Prize for the best thesis applying engineering to agriculture from Paul Miller

French exhibition trip for Riseholme students

RISEHOLME College engineering students travelled to Paris in late February 2013 to attend the SIMA show with sponsorship from The Douglas Bomford Trust.

This provided some of the students with their first experience of travelling abroad and the opportunity to visit a large agricultural show over a period of two days.

Many of the students wrote letters to The Trust thanking trustees for their financial support and reporting their reactions on visiting the show. These indicated that the students were impressed by the scale of the event and the details of individual items of machinery that they were able to inspect at first hand and close up.

The group travelled by train and in addition to attending the show, were also able to do some sight-seeing in Paris. Many of the students reported that the whole visit was " . . an unforgettable experience" with both technical and social components.

Engineering students from Riseholme College assemble for their visit to the SIMA show in February 2013

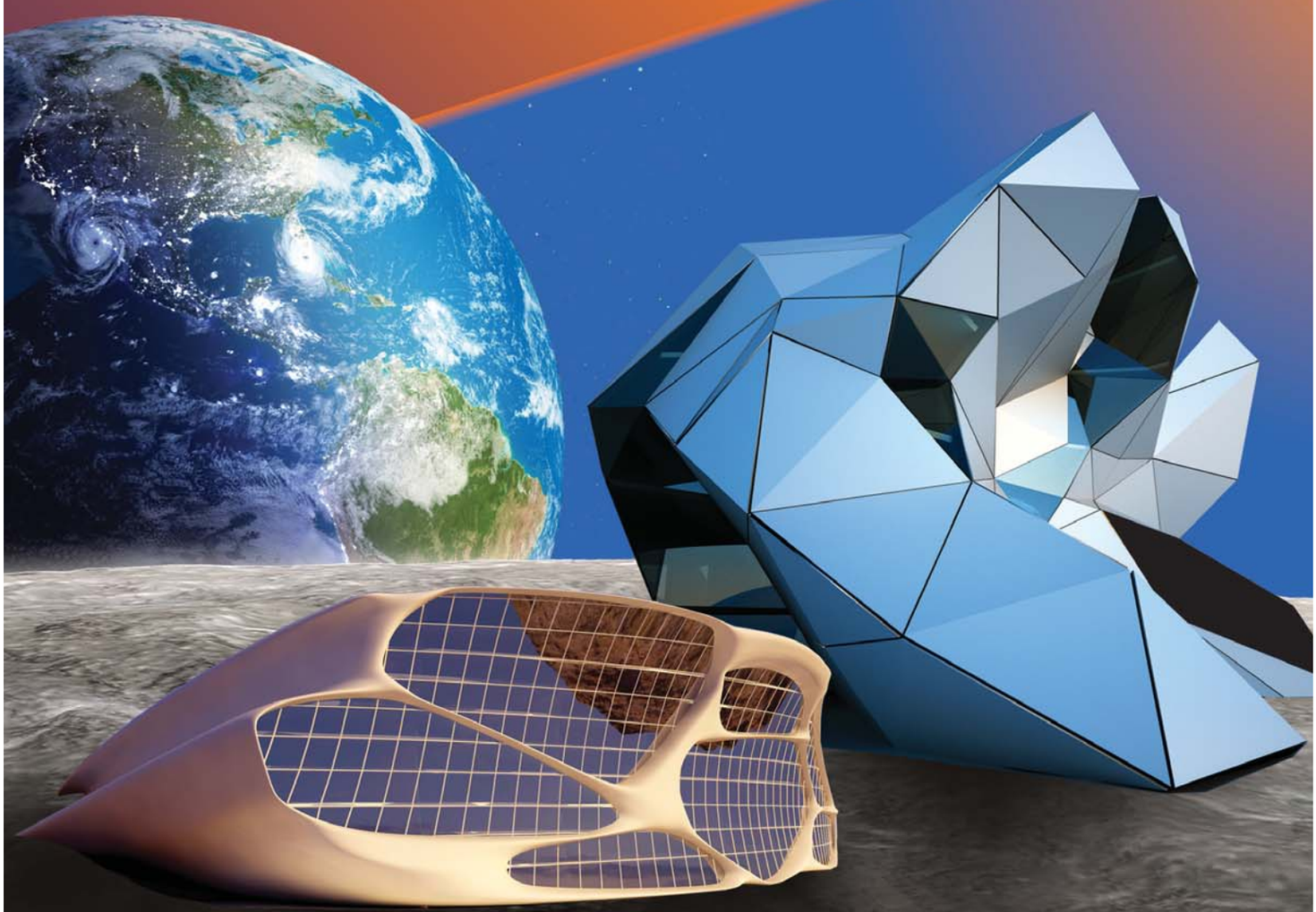
National Apprenticeship Competition

Cranfield UNIVERSITY

Manufacturing on the Moon

20th May 2014

Apprentices from all years are invited to work in teams from their institution and build models to demonstrate their imagination and present at the competition site at Cranfield. A team of national judges will select the winner.



For more information and
to register your interest go to:
www.national-apprenticeship-competition.org.uk

THE Manufacturer

Prime Minister launches joint initiative by three of the major engineering institutions

100,000 more EngTechs in five years

THE Prime Minister has launched a scheme to increase the number of registered engineering technicians in the UK eightfold by 2018.

Architects of the scheme, which aims to register 100,000 extra people with the protected title "engineering technician" (EngTech) in the next five years, hope it will increase skill levels and raise the status of technicians, in order to recruit more people to the profession and help meet anticipated demand.

The scheme will involve marketing the benefits of registration based on new research and will particularly target apprentices. Registering every new engineering technician expected to complete their apprenticeship in the next five years would meet the 100,000 target.

In March 2012 The Technician Council reported that the UK will need an estimated 450,000 new or replacement professional STEM technician roles by 2020.

Technicians make up over half of the nation's professional engineering population and are an essential component of the capability the profession provides to UK plc.

All engineers will know full well that without the practical skills and technical competence of engineering technicians, new technologies would never get beyond the drawing board; buildings and plant would never be constructed to enduring high standards and the safety and environmental integrity of any equipment in operation could never be assured.

Yet despite this, whilst the professionalism of over a third of those who have graduated in engineering is publicly recognised through the achievement of Incorporated or Chartered status - entitling them to the post-nominals 'IEng' or 'CEng' and full membership of their institution - the equivalent professional recognition which is available to technicians - 'EngTech' - has been taken up by less than 1% of the potential population. As a consequence the registered membership of the Professional Engineering Institutions (PEIs) does not mirror the profession they represent.

If it were to do so, there would be almost 300,000 rather than 17,000 EngTech registered members!

Although there have been recent improvements in the number of individuals becoming EngTech registered, with an average increase of about 15% per annum - an 800% increase in new registrants, which is then maintained for 8 years without loss, would be required simply to capture a nominal 10% of the current 'market' and result in 100,000 registrants.

. . . the registered members of the PEIs does not mirror the profession they represent

Also requiring attention is the effective length of time that technicians remain registered, which is currently under half that of Incorporated and Chartered Engineers - with a significant proportion leaving the register before they reach the age of 40.

Engineering UK's latest annual report found that 30 per cent of firms already report difficulties in recruiting technicians.

According to Kevin Dinnage, who heads the Engineering Council's technician registration and membership project, there are currently around 14,000 technicians with EngTech status in the UK but around 1m who are eligible to register.

"Every year about 20,000 people come through with apprenticeships and that will probably increase," he says. "If we can have more apprentice schemes that are accredited as leading to EngTech then you can bring whole cohorts across."

The Engineering Council commissioned a project in May 2012, sponsored by the Gatsby Charitable Foundation, with the following aim: "*To create and launch a revised registration product that is valued by employers and is embraced by technicians*".

The project has completed its research phase and issued a report which provides a number of new perspectives; confirms with concrete evidence the need for action and prioritises the importance of many anecdotal insights which will be familiar to those who have been concerned about this issue over the years.

Whilst the report highlights a number of challenges and barriers that need to be tackled, it does provide some positive messages and some clear guidance and focus to help maximise the effectiveness and impact of the next phase of work, which will be focussed on delivering a step change increase in the number of EngTech registrants.

Ultimately, success will be dependent on the membership of the professional bodies accepting and embracing significant change in their membership profile says the report.

IAgrE has been supporting the initiatives to increase the number of EngTech registrations since the scheme started but recognise the need to do more in line with the Engineering Council's proposals.

REPORT

Modelling spray drift from ground-based applications

A very successful workshop was held at Cranfield in June, which attracted delegates from a wide range of international organisations involved in sprayer technology.

The presentations triggered some lively and informative discussions.

There were also demonstrations from Malvern Instruments and Oxford Lasers.

Presented here is brief report on the workshop written by the Convenor, **Professor Paul Miller**, and copies of the presentations are available on the IAgrE website.

OBJECTIVES OF THE WORKSHOP

The objectives of the workshop were to discuss and explore the use of spray drift modelling in achieving the following:

- **Gaining regulatory approval for new agrochemical products, and keeping existing products on the market by recognising 'real world' scenarios;**
- **Gaining recognition for the role engineering developments are playing in reducing environmental impact;**
- **Ensuring there is a strong pull for new techniques and equipment that improve the sustainability of pesticide usage, and eliminating the restrictive effect of a rigid regulatory system.**

ELEMENTS FROM PRESENTATIONS AND DISCUSSION

Presentations relating to the use of CFD demonstrated that considerable progress had been made enabling such approaches to be used to predict air and droplet movements at relatively short downwind distances from application machinery.

These approaches now provided a useful tool for examining different machine configurations including interactions with a crop canopy particularly in the case of air-assisted machines for use in bush and tree crops. Such methods were very demanding of computing resources and the results obtained less applicable to predicting drift at larger downwind distances.

Work to develop existing models was continuing at a number of centres, with work that included:

- **Accounting for landscape effects and multiple applications;**
- **Examining the description of air flows within models including those relating to atmospheric turbulence, movements through crops and air entrained within a spray;**
- **To enable calibration with different datasets.**

The implication from work at a number of centres was that the wake generated by both the sprayer and

the spraying vehicle was important when aiming to predict the risk of drift from boom sprayers and that this was not adequately accounted for in existing models. Some experimental work had been undertaken but more was required particularly to examine incorporating such effects into existing models.

Methods of defining drift reducing capabilities of applications systems were now important with implications for regulatory approaches in many countries/states. The use of simulation models was already relevant to such definitions in some cases, there was scope to use models in some other schemes and modelling was likely to have a role in relating results from different schemes and so could be part of work to harmonise definitions of drift reducing capabilities.

The concept of using models to predict drift risk as a component of a real-time sprayer control system was outlined in two presentations and was well recognised in a lively discussion. As such systems are developed commercially, it will be important to build confidence in the use of the systems, to demonstrate the levels of off-target contamination associated with these control strategies and for regulatory organisations to accept the outcomes from the successful implementation of them.

CONCLUDING DISCUSSION AND OUTCOMES

It was recognised that many individuals and organisations that were involved with examining risks associated with spray drift and evaluating methods of spray drift reduction were used to handling experimental data and making decisions based on that data.

Experimental data was variable and obtaining good quality field data relating to spray drift was costly. However, once an experimental dataset had been credibly established, it tended to be used widely in drift risk assessments.

Work was required to build the same level of confidence in model predictions that currently related to experimental datasets. This could involve:

a) *Establishing a reference dataset, representative of current commercial spraying practice, that could be used to validate the output from existing models and demonstrate modelling capabilities: it was recognised that making a completely new set of field measurements would be expensive and that an alternative approach may be to combine existing datasets in a way that would give a robust and widely accepted reference;*

b) *Comparing the outputs from existing models: this could identify areas that lead to differences in model predictions and enable these to be examined in any further work: linkage to a reference experimental dataset would also strengthen the acceptance of model predictions.*

Funding was identified as an issue limiting the development of models and the obtaining of both input and validation data

It was recognised that an action relating to (b) above does require models to be accessible to others. This raises issues of technical support, reliability and documentation that require resource. Funding was also identified as an issue limiting the development of models and the obtaining of both input and validation data.

The workshop had mainly been concerned with mechanistic models to predict spray drift and the discussion confirmed that there was an important future role for such approaches. Models that were based on a fit to experimental data had value and the ability to 'tune' mechanistic approaches based on well established data was also recognised as valuable.

It was likely that models had an important role in higher tier risk assessment, as an aid to the design of improved application equipment and in defining the performance of drift reducing systems. Models were getting better and there was now a case for making more use of existing models.

There was value in using a combination of model outputs and experimental data particularly when estimating the quantities of drifting spray at the larger downwind distances where measurements are difficult and associated with high levels of uncertainty.

AGREED ACTIONS

It was agreed that:

1) Research teams should seek ways to work together in the future to progress the development of spray drift models. This could involve seeking to:

a) Establish a collaborative project with either European or other funding organisation relevant to international cooperation;

b) Obtain resources that would enable a robust dataset of experimental data to be established/collated and that could be used for future model validation.

2) All would seek to promote the use and acceptance of modelling approaches when possible and relevant. It was noted that:

a) Models were being used is some countries as part of drift risk assessments particularly for aerial applications and that there was considerable scope to extend the approach to applications from boom sprayers in particular;

b) There was substantial industry interest in the development and use of drift modelling approaches - this needed to be promoted and extended where possible.

MEMBERSHIP ENQUIRIES
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MEMBERSHIP MATTERS

COUNCIL MEETING

Report on the Institution of Agricultural Engineers 2013 Annual General Meeting

THE IAgrE's 2013 AGM recently took place in Sleaford, Lincolnshire, kindly hosted by Great Plains Simba.

As well as the business of the AGM and IAgrE Council meeting, a technical session was organised on the theme of '*Soil and water management in response to extreme weather*'. **Will Foss**, Agrii regional technical advisor, spoke of the impact of the wet and cold weather conditions in 2012/13 on the UK arable sector.

These included difficulties in harvesting in the wet autumn of 2012 and subsequent delayed crop establishment. The wet conditions also aggravated pest problems such as slugs and poor seed germination in wet, cold seedbeds (although ironically persistent weeds such as black grass weren't so badly affected). In places, Will estimated that 40% of the winter wheat crop and 100% of oil seed rape have been lost because of the weather. A third of the autumn crops could not be drilled in time, and a quarter has now been written off altogether.

There will be knock-on consequences for the harvest of 2013 and subsequent late cultivations for the 2013/14 season. Will presented the costs to farmers associated with these extreme weather conditions, and worryingly, it is expected that we will have to get used to these conditions as the 'new normal'.

Great Plains Simba, in Sleaford, Lincolnshire played host to IAgrE's 2013 AGM

Will Foss, Regional Technical Advisor, Agrii

Dr Paula Misiewicz (Harper Adams University) followed by presenting soil management options that could minimise some of these impacts, including tillage and drainage which could lead to better soil trafficability and workability. Paula presented the impacts on crop yields from waterlogged soil, not least from the compaction associated with trafficking wet soil. This is aggravated by the number of field passes needed in some farming operations, although these can be reduced by the introduction of controlled traffic farming and use of low pressure tyres or tracks. The role of organic matter content was highlighted as improving soil structure to both drain excess water during wet conditions and to retain limited water during droughts. Organic matter is also linked to trafficability as it helps keep soils in a friable, rather than plastic state for longer in wet conditions.

The final presentation in the technical session was presented by **Professor Mark Kibblewhite** (Cranfield University). His presentation asked the question: *What existing and new technologies do we have (or need) to allow better remote assessment and prediction of soil workability and trafficability?*

Mark argued that timeliness of operations is paramount and can be the main source of annual variation in farm costs. He also pointed out that farm units are growing in size, making operational decisions difficult, given spatial variations in rainfall, soil, topography etc., greater distances between fields and limited windows of opportunity for operations such as cultivation, drilling, spraying and harvesting.

New technologies such as sensors to monitor soil moisture content will provide farmers with valuable information on the state of their soils and whether they can be trafficked and worked without damage. These systems will also help in irrigation scheduling as they will flag up when soil water may be limiting to crop growth. Managing the data generated will be important and user-friendly information systems should be developed to support this.

The technical session was followed by a presentation by Great Plains Simba Sales Director, **David Holmes** on the background to the company, current activities and future developments.

The acquisition of Simba in 2010 by Great Plains Manufacturing Inc. (based in Salina, Kansas, USA) brought together two of the world's leading brands in tillage and drilling equipment. Significant investment has transformed the Sleaford site into the Great Plains headquarters in Western European. Recent developments at Simba Great Plains include the introduction of telematics equipment that senses changing hopper weights on seed drills, the use of precision farming for nutrient management and disc angle design to reduce smearing in

wet conditions - very relevant given the issues raised in the technical session.

David explained that modifications of equipment were needed for the different markets such as the need to introduce folding systems to reduce the width of machines so they can travel on UK roads (3m), as opposed to much larger widths permissible in the US.

Attendees were then taken on a tour of the factory, extending to over 3,000 square metres. Here, a wide variety of product lines are manufactured, including cultivators, seeders and planters primarily aimed at the European market including the UK, Bulgaria, Russia and the Ukraine. The factory produces several existing Simba-badged products as well as other Great Plains land-based equipment.

The manufacturing plant at Sleaford is also home to one of the most important and innovative new products in the company's history - the new Centurion cultivator drill. One of the company's slogans is '*The harvest starts here*', demonstrating the importance of soil management right at the start of each cropping season.

More details of Simba Great Plains can be found at *www.greatplainsmfg.co.uk*.

David Holmes, Sales Director, Great Plains

The IAgrE would like to thank David and his colleagues at Simba Great Plains for hosting the 2013 AGM and giving an excellent insight into how agricultural machinery and engineering can meet the current challenges surrounding sustainable soil management.

Prof Jane Rickson, CEnv, FIAgrE

BRANCH REPORTS

PIONEERING TECHNOLOGY SPECIALIST GROUP

Summer meeting

FINE weather supported the Pioneering Technology Specialist Group summer outing.

There were two places of interest planned during the day. The morning was to Swalecliffe Barn. This is a 15th century stone built Cruck barn built by New College Oxford and now housing the collection of farm wagons owned by Oxford Museum service.

We were met by Michael Jones one of the museum conservation staff who told us about the construction and restoration of the barn and the collection, how they obtained the wagons and were looking after them. Among the farm vehicles was a very rare horse drawn prize bull transporter.

The barn also houses a historical display established by The Swalecliffe Society showing the development of the area from iron-age times and the collection of artefacts from the local Roman villas. The Society now hosts the public open days and the chairman welcomed us to the barn.

After a lunch in the historic Sun Inn we had a guided tour of the Hook Norton Brewery. The brewery is one of the few surviving Victorian built tower breweries.

Water 'liquor' is pumped up to tanks at the top of the tower and flows using gravity through the various floors and processes ending in casks on the ground floor. All the machinery is still worked through the original line shaft drive and this proved fascinating to members of the group who were not familiar with this system.

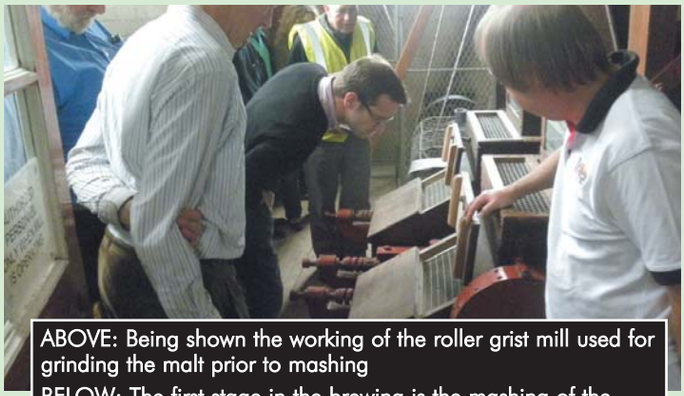
Although it can be driven by the original horizontal engine it is now usually by electric motor as the fuel oil makes it expensive to run. Even the traditional sack lift will still only work when the system is running.

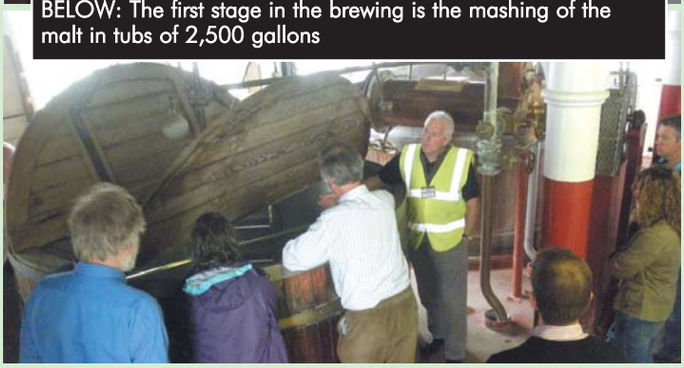
And yes we did have an introduction to the products that are produced but with a better understanding of the many types of malt and hops and yeast used to give the different brews.

William Waddilove and Stuart Martin


ABOVE: Michael Jones, right, describing details of the collection


BELOW: The horizontal engine that still has the potential of driving the mill 'line-shaft' driven tower brewery


ABOVE: Being shown the working of the roller grist mill used for grinding the malt prior to mashing


BELOW: The first stage in the brewing is the mashing of the malt in tubs of 2,500 gallons

WREKIN BRANCH

Supercat and RNLI - Submersible launch machine for life boats

ANYONE who has an engineering interest and who has visited one of the many RNLI stations around our coast cannot fail to be impressed with the standard of both lifeboat manufacture and maintenance.

That impression was seriously reinforced at a recent Branch meeting when and Steve Austen, Head of engineering support at RNLI and Simon Turner, Senior Project Engineer at Supacat joined forces to describe the fascinating new launch vehicle for beach launched lifeboats.

Steve first gave an overview of the RNLI function with various statistics, one of which that the totally voluntarily supported RNLI saves around 300 lives each year and that this figure is decreasing as more rescues result in fewer losses. This decrease is actually being achieved by more rapid responses, better equipment, planning and training.

Alongside this success the engineering challenges have included obtaining more from less within a recessionary period. Further the engineering involved includes a sustainable operation within a seriously challenging environment. The in-house engineering has developed particularly as proprietary equipment often has not provided reliable in service. When the range of boats includes 8-25 knot vessels with the latter possibly facing 16m waves and 60 knots of wind members used to agricultural environments being harsh had to re adjust their horizons.

Within reviews undertaken by RNLI the need for updating launching equipment which had possibly been based on developed ex military equipment, Simon stressed that the right time for new equipment aligned with the need of a new vessel, e.g. The Shannon Class replacing the Mersey class.

Getting more from less was linked with the development of the Shannon Class which Lean methods within planning as well as CAD and block representation of designs. Lean is a production practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination. It was stressed that within some RNLI engineering practices improvements had been made finding 33-80% savings in project times particularly. Further reviews and practice revisions have lead to moving direct from prototypes to production units, a major saving in a vessels development.

One aspect of RNLI design was that the design life projected is being moved from 25 to 50 years, thus at the end of a composite material vessels life it may have had the internals changed several times. Design features to meet this extended life included vastly improved access for efficient maintenance protocols.

Development lifeboat and Supercat LRCS on Dungenss beach - *pics RNLI*

Discussion highlighted the low utilisation time of RNLI vessels and equipment within such an extended life and whether perhaps as little as 30-50 hours per year, albeit critical running time, caused any detrimental effects.

Simon Turner then took on the description of a stimulating project, the Supacat Launch and recovery system, (L&RS) being made for RNLI. Again the presentation included operation in the mind blowing earlier specifications as well as wading to 2.4 m including bow first launch and recovery thus requiring 3600 rotation of the vessel on the carriage. Additionally the whole L&RS to be able to be left submerged to a depth of 9 metres dealing with the possibility of having to leave the system between tides and be recovered later.

He described that they developed a 4 track drive system from a basis of military/agricultural type tracks those these include a complete marinisation for use in the L&RS. Oil filled wheel hubs were discarded in favour of grease filled units with special wheel rims developed to replace the original steel units. The carriage also includes a 'kneeling' system which allows for the vessel to be lowered whilst on the carriage thus allowing access and use of existing life boat houses to be used.

Systems for indexing of the lifeboat onto the carriage and bow retention have been developed into a coxswain release action rather than the tractor driver's action with old systems where visibility from the tractor was also questionable at times. All controls being effected by the operator through twin joystick controls from the power unit cab with specifically developed software development.

In addition the power unit includes changing from air to water cooling regimes as the vehicle enters the sea. 'Beach' launching includes both essentially flat shallow estuary locations as well as steep shelving shingle beaches such as Dungeness. The ability of the 4 track system to manage the latter was effectively demonstrated by an excellent video which also included the rotation of the lifeboat on the carriage as well as one for the boys-a fairly high speed run of the lifeboat onto the shingle to then be recovered by the L&RS later.

In all for members as engineers used to thinking of agriculture creating challenging environments the bar was raised high for vessels and L&RS use.

Considering the highly professional approaches to the engineering involved all present were impressed as to all the principles and practices described. A worthy reminder to all and perhaps a spur to digging deeper when next asked for a donation!

For further information see *www.rnli.org* and *www.supacat.com* both worthy of a few minutes time for excellent images and descriptions.

Bill Basford

SOUTH EAST MIDLANDS BRANCH

Latest developments in mowers for grounds maintenance

The remote control Spider mower being demonstrated

SOUTH East Midlands Branch held a very interesting and successful meeting at their local Cricket Club, back in April.

This was the first time this venue had been used and it was chosen not for its flat pitch, but for the steep grassed slopes that surround it. The meeting notably attracted numerous non-members (half the audience). These included managers and operators from local authorities and grounds-maintenance contractors, after some 'direct marketing' to these organisations and local golf clubs, dealers, etc.

Antony Alexander (Product Support Manager with Ransomes Jacobsen) reviewed and demonstrated the latest developments in mower design and improvements in control systems to increase productivity, ease of use and ensure safe operation, particularly on slopes. There have been several fatalities (~ 1/year) as well as serious injuries and many (unreported) 'near-misses' involving mowers overturning on slopes.

Antony emphasised the importance of improving safety by design and clearly explained and demonstrated how the innovative 'Tilt Sensor Technology' (TST™) fitted to Ransomes' 'Highway 3' ride-on mowers uses 'spare' computer capacity and improvements in electro-hydraulic systems to control the machine and prevent operators from getting into potentially dangerous situations on slopes.

Unfortunately, many mower operators are still tempted to push the envelope to get a job done, but this is prevented on the Highway 3 (the only mower on the market with active stabilisation technology). This is achieved in incremental steps.

Initially, at 15deg, the operator is given an audible and visual early warning that the machine is approaching its 'safe working limit'. If this is exceeded, then at 18deg the deck is automatically 'locked down' to lower the centre of gravity and maintain stability. If the operator still persists, then at 22deg, the mowers disengage to stop mowing until the machine returns to a safe operating slope.

The risk of injury (eg from direct contact with moving parts or thrown objects) and ill health (eg from noise and hand-arm vibration) to persons using alternatives such as pedestrian mowers or strimmers on slopes were also highlighted.

These risks can be removed altogether by using remote radio-controlled mowers, and the company's 'Spider' machine and the new 'Spider Mini' were also demonstrated on the steeper slopes. The cost of purchasing and using such machines was discussed, but the outputs and benefits are compelling, particularly in areas where access is difficult.

Antony works closely with the dealer network and was ably supported by Ransomes' demonstrator Rob Hayward. They were both able to share the previous experiences in the industry, in this country and abroad, making for a very interesting meeting.

Our thanks to Ransomes for providing their 'Men and Machines'.

Alan Plom

ABOVE: The Ransomes Highway 3 mower and

BELOW: The audience examining its TST control system

We want to hear from members

Send branch reports or correspondence to:

The Editor, Chris Biddle

Email: *chris.biddle@btinternet.com*

Or the IAgrE Communications Officer, Marion King on

pressroom@iagre.org

Membership changes

Admissions

A warm welcome to the following new members:

Member

Barnes M (Essex)
Fowler J S (Essex)
Morrissey W A (Ireland)

Associate Member

Bragger N C (E.Sussex)
Davis G J (Hampshire)
Ferns S (Ireland)
Killick J C (Kent)
McWhirter J D (Scotland)
Slaughter J P (E.Sussex)

Associate

Boggis J (Hampshire)
Nicholson E A (Warwickshire)
Rogers D M (Canada)
Shamwarira R T (Zimbabwe)

Student

Cranfield University

Whattoff D

Greenmount College

Bingham K
Clyde J G
Cochrane C
Craig M D
Dugan M A
Eakin R W J
Harte G
Irvine C
James A
King J
Lynch C J
Maguire C
McAlonan S
McConalogue S
McConalogue Lee J
McCotter E
McCreesh S
McDermott A
McGarel G
McGilligan J F
McGoldrick R
McGowan N
McGrath N
McIlvar T J
McLaughlin C J
McManus L
Moley B
Morrow S
Robinson A
Salt C A
Stewart C
Stewart J
Stokes D
Welsh R T
Young N

Pallaskenny College

Battles K
Bergin K
Costigan J
Crowley C
Dowling J R
Downes J
Farrell M
Galligan E
Garfield M
Hannon E D
Hannon M
Healy D
Hennessy M
Hynes J
Keane M
Kehoe M
Kelly A
Kennedy K
Leahy B
Magner K
McCann C
Nolan J
O'Brien D
O'Driscoll D
Power D J
Roche P J
Ryan D
Whelan J

Readmissions

Associate Member

Kaptoge LK (Kenya
Karani J M (Kenya)

Transfers

Fellow

Davies G (Shropshire)

Member

Barrowcliff K (Derby)
Kaptoge LK (Kenya)
Kotschoubey B (Belgium)

Associate

Child J (Yorkshire)
King R (Dorset)
Meredith J R (Somerset)

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 names.

Registrations

CEng

Jackson B J (Ireland)

EngTech

Band R J (Perthshire)
Barnes M R (Essex)
Bragger N C (East Sussex)
Davis G J (Hampshire)
Emslie K C (Aberdeenshire)
Ferns S (Ireland)
Fowler J S (Essex)
Harley A T (Fife)
Killick J C (Kent)
McIlroy B A (Northern Ireland)
McWhirter J D (Scotland)
Naylor A (Aberdeenshire)
O'Brien K (Ireland)
Scott G A (Perthshire)
Slaughter J P (East Sussex)
Starkie L (Lancashire)

Society for the Environment

Registrations

CEnv

Turrion-Gomez J L (Scotland

Deaths

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

Mr Norman Frank Ley (CEng FIAgrE)(Wiltshire) - a member since 1985

Mr David Fleetwood Ellam (CEnv FIAgrE) (Jersey) - a member since 1966

Mr William John Foxwell (FIAgrE) (USA) - a member since 1960

Long service certificates

Name	*Grade*	*Date of anniversay*
35 years		
Robert John **Phillimore**	EngTech, MIAgrE	03 Jul 2013
Michael Dawes **Lea**	AIAgrE	25 Jul 2013
Gordon Clare **Day**	EngTech, MIAgrE	11 Aug 2013
John Lawrence **Defty**	AMIAgrE	11 Aug 2013
25 years		
Andrew Charles **Poole**	IEng MIAgrE	28 Jul 2013
Richard William **Ford**	AMIAgrE	18 Aug 2013

Academic members

Askham Bryan College
Askham Bryan
York
YO23 3FR

SRUC- Barony Campus
Parkgate
Dumfries, DG1 3NE

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
Pibwrlwyd Campus
Pibwrlwyd
Carmarthen
SA31 2NH

Cranfield University
Cranfield
Bedfordshire
MK43 0AL

Easton 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

Myerscough College
Myerscough Hall
Bilsborrow
Preston
Lancashire PR7 0RY

SRUC - Oatridge Campus
Ecclesmachan
Broxburn
West Lothian
EH52 6NH

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

Riseholme College
Riseholme Park
Lincoln
LN2 2LG

SRUC - Auchincruive
Auchincruive Estate
Ayr
KA6 5HW

Sparsholt College
Sparsholt
Winchester
Hampshire
SO21 2NF

Willowdene Training Ltd
Chorley
Bridgnorth
Shropshire
WV16 6PP

Wiltshire College - Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

Commercial members

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

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

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

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

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

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

Garford Farm Machinery Ltd
Hards Lane
Frognall
Deeping St James
Peterborough
PE6 8RR

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

John Deere Ltd
Harby Road
Langar
Nottinghamshire
NG13 9HT

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

White Horse Contractors Ltd
Lodge Hill
Abingdon
Oxfordshire,
OX14 2JD

EVENTS

IAgrE Branch Meetings and Events

East Midlands Branch
October - date tbc
PERKINS ENGINES - TBC
Details to be confirmed.
For further information please contact either the Secretary or Nigel Penlington on nigel.penlington@talktalk.net
Tel: 07977 521231
Email: sandytd2000@tiscali.co.uk
Web: www.perkins.com/

Wrekin Branch
October - date tbc
EDBASTON CRICKET GROUND
Venue: Edbaston Cricket Ground
Afternoon visit to Edgbaston Cricket Ground. A tour of the grounds and a presentation on turf management by Allett Mowers.
Numbers will be limited so please book your place early.
For futher information and to register your interest please contact the Branch Secretary: David Clare
Tel: 01952 815087
Email: dclare@harper-adams.ac.uk

West Midlands Branch
Tuesday 8 October 2013, 19:15hrs
CONTROLLING SOIL EROSION AND RUNOFF IN ROW CROPS
Speaker: Joanna Niziolomski
Venue: Stoneleigh Village Hall, Hall Close, Birmingham Road, Stoneleigh, Warwickshire CV8 3DG
Joanna is a Researcher in the National Soil Resources Institute, School of Applied Sciences, Cranfield University. The project has been part-funded by the Douglas Bomford Trust, EPSRC and Cobrey Farms. Joanna's presentation will look into the development of a cost-effective and adoptable runoff and erosion management system for asparagus production.
For more information contact the Branch Secretary: Michael Sheldon
Tel: 01926 498900
Email: michaelcsheldon@yahoo.com

Western Branch
Wednesday 9 October 2013, 19:00
FORESTRY
Speaker: Jim Christie, Forestry Engineering Group
Venue: Lackham College
For further details contact the Branch Secretary: Rupert Caplat
Tel: 01235 522828
Email: rupert.caplat@lindehydraulics.co.uk

South East Midlands Branch
Tuesday 15 October 2013, 19:00
THE DEVELOPMENT OF A LIFEBOAT LAUNCH & RECOVERY SYSTEM FOR THE RNLI
Speaker: Simon Turner and Steve Austen (Supacat, RNLI)
Venue: Gold Lecture Theatre, Whittle Building, Cranfield University, Cranfield, Bedford MK43 0AL
Launching an 18-tonne lifeboat in minutes and be fully submersed under 9m of water was always going to be a challenge. But Supacat has done that for the RNLI.
For further information please contact the Branch Secetary: John Stafford
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk

Wrekin Branch
Monday 21 October 2013, 19:30
WREKIN BRANCH YOUNG ENGINEERS COMPETITION
Venue: Temperton Room, Harper Adams University, Newport, Shropshire TF10 8NB
Come and test your engineering knowledge in this 'pub quiz' style competition. All welcome young or old to encourage a bit of inter-generation competition!
For futher information and to register your interest please contact the Branch Secretary: David Clare
Tel: 01952 815087
Email: dclare@harper-adams.ac.uk

East Midlands Branch
Tuesday 29 October 2013, 6pm
LARRINGTON TRAILERS
Speaker: Richard Larrington
Venue: Larrington Trailers, Great Fen Road, Boston, Lincs PE21 7PB
This visit will include a tour of factory facilities.
It will conclude with refreshments so numbers are needed. Please contact Sandy Donald if you are planning to attend.
Tel: 07977 521231
Email: sandytd2000@tiscali.co.uk
Web: www.larringtontrailers.com/

Wrekin Branch
Monday 04 November 2013, 19:30
TOOL MAKING AND PRECISION ENGINEERING
Speaker: Chris Sharratt (Lodent Precision Ltd)
Venue: Engineering Innovation Centre Lecture Theatre, Harper Adams University, Newport, Shropshire TF10 8NB
Lodent Precision Ltd of Browhills design and manufacture press, mould and pressure die cast tooling.
Tel: 01952 815087
Email: dclare@harper-adams.ac.uk

West Midlands Branch
Tuesday 5 November 2013, 19:15hrs
“HS2”
Speaker: Dr Dan Mitchell
Venue: Stoneleigh Village Hall, Hall Close, Birmingham Road, Stoneleigh, Warwickshire CV8 3DG
An in-depth look at the possible effects of this planned high speed rail line, currently planned to pass by the former National Agricultural Centre and close to Stoneleigh Village.
For more information contact the Branch Secretary: Michael Sheldon
Tel: 01926 498900
Email: michaelcsheldon@yahoo.com

South East Midlands Branch
Monday 11 November 2013, 19:30
WEATHER
Speaker: Jim Bacon
Venue: Maulden Church Hall, Maulden, Beds MK45 2AU
For further information please contact the Branch Secetary: John Stafford
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk

Western Branch
Wednesday 20 November 2013, 19:00 - tbc
JOHN DEERE - TBC
Venue: Royal Agricultural University
For further details contact the Branch Secretary: Rupert Caplat
Tel: 01235 522828
Email: rupert.caplat@lindehydraulics.co.uk

South East Midlands Branch
Monday 02 December 2013, 19:30
ROBOTICS AND AUTOMATION IN LIVESTOCK AND TURFCARE - TBC
Venue: Maulden Church Hall, Maulden, Beds MK45 2AU
For further information please contact the Branch Secetary: John Stafford
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk

Wrekin Branch
Monday 02 December 2013, 19:30
SIMBA GREAT PLAINS
Speaker: James Kissocks (Simba Great Plains)
Venue: Engineering Innovation Centre Lecture Theatre, Harper Adams University, Newport, Shropshire TF10 8NB
For further information please contact the Branch Secretary: David Clare
Tel: 01952 815087 Email: dclare@harper-adams.ac.uk

West Midlands Branch
Tuesday 3 December 2013, 19:15hrs
THE EVOLUTION OF ROADSIDE BARRIER DESIGN USING COMPUTER SIMULATION
Speaker: Steven Sirman, Tata Steel
Venue: Stoneleigh Village Hall, Hall Close, Birmingham Road, Stoneleigh, Warwickshire CV8 3DG
A look at highway safety products, such as safety fences, bridge parapets, crash barriers and the simulation systems used to develop and create new acceptable products.
For more information contact the Branch Secretary: Michael Sheldon
Tel: 01926 498900
Email: michaelcsheldon@yahoo.com

Other Events:

Thursday/Friday 26/27 September 2013
Advanced Training Partnership (ATP)
SUSTAINABLE AGRICULTURE WORKSHOP
Venue: Aberystwyth
One of four Workshops: 3-4 Sept (Leicester); 9-10 Sept (Winchester); 26-27 Sept(Aberystwyth); 19-20 Nov (location tbc.
12 week Distant Learning Courses: Improved Feed and Forage: starts August 13; Soil Management: starts 30 Sept 2013; Improving Ruminant Production: starts 30 Oct 2013; Silage Science: starts 8 Jan 2014.
Tel: 01970 823224
Email: atp-enquiries@aber.ac.uk Web: www.atp-pasture.org.uk/en
Web2:
www.iagre.org/sites/iagre.org/files/eventdownloads/ATPSoilManagementPostcard.pdf

1-2 October 2013
WORLD AGRI-TECH INVESTMENT SUMMIT
Venue: 200 Aldersgate, London EC1A 4HD
A 20% discount is available to IAgrE members. Please contact the IAgrE Secretariat for the discount code.
Web: worldagritech.rethinkevents.com/

Tuesday 1 October 2013, 09:00
IOSH, FSP
MACHINERY SAFETY - WHAT DO WE DO NOW?
Venue: Stoneleigh Park, Warwickshire, CV8 2TZ
Tel: +44 (0)116 257 3197 Email: bookings@iosh.co.uk
Web:
www.iosh.co.uk/groups/rural_industries_group/group_events/machinery_safety_-_what_do_we.aspx

Monday 7 October 2013, 19:30
Engineering Society/UEA - joint event as part of UEA50
IMPROVING HUMAN WELL-BEING ON A RESOURCE-LIMITED PLANET - CAN WE DO IT?
Speaker: Sir David King, University of Cambridge
Venue: Thomas Paine Lecture Theatre, UEA, Norwich, Norfolk
Web: www.engineeringsociety.co.uk/events.php

Wednesday 16 October 2013, 6pm
Royal Agricultural University
"BEYOND BOUTFLOUR: TOWARDS THE 20000 LITRE AVERAGE COW" - INAUGURAL LECTURE
Speaker: Prof Toby Mottram, Douglas Bomford Chair of Agricultural Mechanisation
Venue: Royal Academy of Engineering, London
Email: mottram.lecture@rau.ac.uk
Web: www.rau.ac.uk/news/rau-news/professor-mottrams-inaugural-lecture. (Also being held on 23 October at the RAU)

Thursday 31 October 2013,
Royal Agricultural University
"SCIENCE, TECHNOLOGY AND AGRICULTURE" - BLEDISLOE LECTURE
Speaker: The Rt. Hon David Willetts MP (Minister of State for Universities and Science)
Venue: Royal Agricultural University
The Bledisloe Memorial Lecture is a free public lecture. Those interested should contact the Vice-Principal's Secretary at the RAU to reserve a place. Tel: 01285 652531 Email: vpsec@rau.ac.uk
Web: www.rau.ac.uk/news/rau-news/science-technology-and-agriculture-bledisloe-lecture-focus-by-minister

Thursday 7th November 2013
DOUGLAS BOMFORD TRUST FORUM 'WORLDWIDE OPPORTUNITIES FOR ENGINEERING IN AGRICULTURE'
Venue: Douglas Bomford Trust Auditorium, Harper Adams University, Shropshire TF10 8NB
Farmers, practitioners and young agricultural engineers will talk about their careers, the challenges and opportunities faced and how they see their careers developing. It will be interactive and inspirational and not death by Powerpoint. We want you to get involved and discover the range of interesting opportunities for those involved in engineering for agriculture.
There will be demonstrations, a hog roast, plenty of opportunities for you to chat with the speakers and prospective employers plus an interactive discussion with an expert panel.
The event is free, so come along and learn more and be inspired by what an attractive and valuable profession agricultural engineering is. Email: enquiries@dbt.org.uk Web: www.dbt.org.uk/dbtforum

Thursday 7 November 2013
IMechE
HEALTHCARE VENTILATION 2013 SEMINAR
Venue: Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London SW1H 9JJ
Web: www.imeche.org/events/s1799

Friday 8 - Saturday 9 November 2013
VDI-MEG and EurAgEng
LAND TECHNIK - AG ENG 2013
The 71st Conference LAND TECHNIK - AgEng 2013 is arranged prior to the world's leading fair on agricultural machinery, the AGRITECHNICA in Hannover, which will start on November 10.
Web: www.vdi-wissensforum.de/en/nc/german-events/detailseite/event/12TA001013/

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

“Worldwide opportunities in engineering for agriculture”

Do you want an exciting and varied career solving real problems and helping to feed the world...?

then think agricultural engineering

If you want to know about this exciting and rewarding career come along to a free Forum at

Harper Adams University, Shropshire, TF10 8NB
7 November 2013

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The event is sponsored by the Douglas Bomford Trust, Harper Adams University and forms part of the Institution of Agricultural Engineers 75th anniversary celebrations

For more information and registration go to **www.dbt.org.uk**