AGRICULTURE ▪ HORTICULTURE ▪ FORESTRY ▪ ENVIRONMENT ▪ AMENITY

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Landwards

WORLD CLASS MANUFACTURING

New Holland tractor plant setting new standards

In this issue

- *Ethical Engineering*
- *LAMMA Report*
- *IAgrE Awards*
- *Silsoe spray applications unit*
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- *East Malling joins NIAB*

IAgrE

Biosystems Engineering

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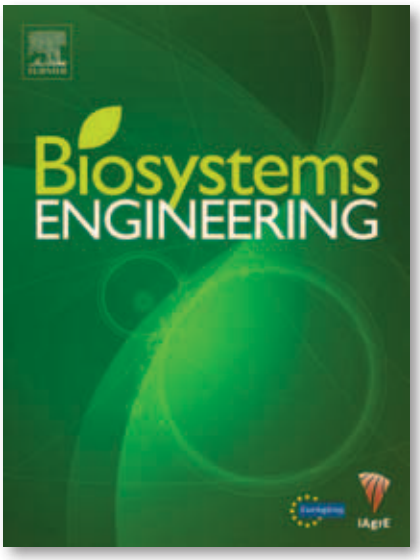

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The Managing Editor of Biosystems Engineering, Dr Steve Parkin, has kindly summarised some of the papers published in the last three issues which he thinks may be of interest to IAgrE members

Biosystems Engineering

Volume 141, January 2016, Pages 1–11

Effect of light microclimate on the quality of 'd'Anjou' pears in mature open-centre tree architecture

Jingjin Zhang, Sara Serra, Rachel S. Leisso, Stefano Musacchi

Shanghai Jiaotong University, Shanghai, 200240, China
Washington State University, Wenatchee, WA, 98801, USA
Washington State University, Pullman, WA, 99164, USA
Agricultural Research Service, U.S. Department of Agriculture, Wenatchee, WA, 98801, USA

Light availability within trees is an important factor for canopy and fruit development as light drives photosynthetic processes. The effect of pre-harvest light microclimate on 'd'Anjou' pear fruit quality from harvest through to cold storage and ripening on fruit grown in open vase pear tree canopy was investigated. Light penetration was used to determine the light availability at different positions within the tree canopy. Five light penetration levels were predefined and 60 fruits were selected from each level for quality assessment during three-month cold storage and postharvest ripening period. At harvest, upper canopy portions had a greater number of fruit than lower portions, but average single fruit mass was similar. During the cold storage and ripening period, the IAD index, a measure of chlorophyll degreening indicating fruit maturity, decreased. Fruit soluble solids increased with light penetration while firmness exhibited an inverse relationship with light penetration level. This study indicated that light microclimate had consequential effects on 'd'Anjou' pear fruit quality, and effects of light penetration on quality were most pronounced in extreme light conditions, which are suggested to be the focus of further research.

Biosystems Engineering

Volume 140, December 2015, Pages 48–58

Classification of nest-building behaviour in non-crated farrowing sows on the basis of accelerometer data

Maciej Oczak, Kristina Maschat, Daniel Berckmans, Erik Vranken, Johannes Baumgartner

University of Veterinary Medicine Vienna, A-1210 Vienna, Austria
Katholieke Universiteit Leuven, B-3001 Leuven, Belgium

The effectiveness of classification, on the basis of accelerometer data, of nest-building behaviour in farrowing sows that are not confined in crates was tested. Using a herd of 120 Edelschwein sows, data were collected from 9 sows housed in farrowing pens. The behaviour was video recorded and labelled for a period of 24 h before farrowing, with focus on nest-building activities. Each sow had a specific ear tag with an 3 axis accelerometer sensor mounted on the ear. Out of nine sows under observation, six were assigned to the training set and three as a test set. Classification of nest-building events in the test set using accelerometer data with the generalised linear model indicated sensitivity of 87%, specificity of 85% and accuracy of 86%. The developed technique can be used as part of a precision livestock farming (PLF) automatic monitoring system, where PLF can be defined as management of livestock production using the principles and technology of process engineering. On-farm application of the system would give the possibility to keep sows unconfined until the end of nest-building period. Thus, crating of individual sows could be limited to the first few days after farrowing when the risk of piglet crushing is high. This would improve welfare of sows, without an increase in piglet mortality and without extra labour demand for observation.

Biosystems Engineering

Volume 139, November 2015, Pages 76–86

Smooth turning path generation for agricultural vehicles in headlands

Juha Backman, Pyry Piirainen, Timo Oksanen

Natural Resources Institute Finland, Production and Information Technologies, Finland Aalto University, Finland

Headland manoeuvring of agricultural vehicles is crucial when it comes to operational efficiency. Automatic guidance systems are usually able to parallel track but headland manoeuvring is not commonly included. Path tracking systems assume a feasible reference path can be followed but in some cases it is not trivial to generate such a path automatically. The Dubins Curves method is the traditional approach to generate the path, but this does not take into account parameters such as maximum steering rate. An algorithm is presented to generate a smooth path for headland manoeuvring where curvature and speed are continuous. Both the maximum steering rate and the maximum acceleration of the vehicle are taken into account. It is possible to define a target speed profile, either to increase or decrease the speed during the turn. The results present the functionality of the algorithm: two of the tests varied the ending pose and two others varied the parameters. The algorithm utilises numerical integration methods in one phase of the calculation, but it still generated paths in short computational time. The algorithm was found to be suitable both for use in real-time and in simulations since an average computational time of 0.36 s was achieved.

EDITORIAL: New look and features

***CHRIS BIDDLE** Editor*
chris.biddle@btinternet.com

Landwards is published quarterly by:
IAgrE The Bullock Building, University Way, Cranfield, Bedford MK43 0GH Telephone: + 44 (0) 1234 750876 Fax: + 44 (0) 1234 751319 E-mail: secretary@iagre.org

President **Mark Kibblewhite** CEnv FIAgrE
Chief Executive and Secretary
Alastair Taylor IEng CEnv MIAgrE

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IT is appropriate that for this first issue of 2016, our Spring edition, that we should give Landwards a 'spring-clean' by introducing a new look to the magazine. One of the reasons is that my colleague, Steve Gibbs, who has been involved in the production for the past 8 years, has gone onto new responsibilities as Editor of Service Dealer magazine, and I am pleased to welcome Martin Hebditch as the new designer of Landwards.

There is a secondary reason. I'm sure you will have noticed that IAgrE has been refreshing its own corporate look over the past few months with a new logo and consistent style working across all of its promotional and information materials. Landwards will also reflect this fresh new, modern look.

The re-design also provides us an opportunity to introduce new features into Landwards - whilst retaining those that we believe are the 'bed-rock' of the magazine. A new regular feature, **Sharp End**, will talk to those at the 'coal-face' of agricultural engineering, education and research starting this month with Bob Shirley who is the Plant Manager at the Basildon factory of CNH Industrial, a recent recipient of the Manufacturer of the Year Award and a beacon of volume tractor manufacturing in the UK.

Many readers will fondly recall the entertaining and often provocative writing of Geoffrey Wakeham in his Landwards column, Wakeham's World. We will never replace Geoffrey's pithy contributions, but from this issue we are introducing the **Last Word**. Contributions to the Last Word can be cloaked under the name of The Engineer, or indeed can be attributable to the originating author.

We hope that if you have opinions and views about the state of agricultural engineering, today or in the future – and would like to get it off your chest - then here's your opportunity! Send your contribution to me and we'll consider for publication (*needs to be around 600 words*)

Meanwhile, hope you like the new-look. I would be delighted to receive your comments and indeed suggestions for items in future issues.

Chris Biddle
Editor
chris.biddle@btinternet.com

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LANDWARDS PRODUCTION TEAM
EDITOR: Chris Biddle Tel: 44 (0) 7785 295625 chris.biddle@btinternet.com
DESIGN AND PRODUCTION: Martin Hebditch
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EAST MALLING RESEARCH JOINS FORCES WITH NIAB

East Malling Research (EMR) has become part of the NIAB (National Institute of Agricultural Botany) group. The alliance, which brings together expertise in crop genetics, agronomy, environmental and data science, is "intended to strengthen NIAB's ambition to lead the UK in crop innovation" according to a statement released by the group.

EMR brings research skills in top fruit and soft fruit research, alongside NIAB's scientific expertise in arable crops, potatoes and ornamentals.

There had been fears recently for the financial future of EMR which was reported to have made losses of more than £1.5 million last year. Directors of EMR had expressed concerns that unless a partnership could be established "the likely outcome would be that ERM could be placed in administration".

The bodies say the partnership "will strengthen the UK's crop science infrastructure and capabilities, with the pooling of complementary research expertise, and a shared commitment to the translation and application of science to support crop production in the UK and internationally".

In research terms, the integration will align EMR's capabilities in horticultural and environmental science, including expertise in plant breeding, soil science, water use and biological pest control, alongside NIAB's existing strengths in genetics and pre-breeding, variety evaluation, agronomy research, precision farming and informatics.

The combined organisation, employing more than 300 staff and with a turnover of £22 million, will "provide long-term stability, scale and capacity for investment in crop science", say the two bodies. NIAB EMR will be established as a wholly owned subsidiary of NIAB, and will continue to operate from its existing site at East Malling in Kent.

Chief executive officer of the combined organisation Dr Tina Barsby said: "This is a vitally important time for crop innovation, with a rapidly advancing knowledge base and renewed interest in productive, efficient agriculture, driven by the challenges of global food security, climate change and resource conservation"

NEW SCIENCE FUNDING PLEDGE

The UK's universities and science minister, Jo Johnson, has announced new science funding from the government which he claims will help make the UK the 'best place in the world to do science'.

Speaking at a lecture organised by the Campaign for Science and Engineering(CaSE) in London, Johnson said the government would double the Newton Fund for international science – which supports collaborations between UK researchers and those in developing countries – to £150 million per year by 2021.

During the speech the minister said that UK research offered an excellent 'return on investment', but stressed the need for efficiency savings as part of the government's austerity drive. He spoke briefly about the upcoming changes to research councils and said they would receive individual budgets by mid-February. He also mentioned the current importance of EU science funding, but stopped short of taking a stance on whether the UK should leave the EU.

AGRICULTURE POSTGRADUATE POPULARITY

Agriculture and related subjects saw by far the largest growth in postgraduate enrolments at UK teaching institutions last year with a 29 per cent rise, according to the Higher Education Statistics Agency.

Enrolments to undergraduate agriculture courses also rose 4 per cent between academic years 2013/14 and 2014/15, equal only to courses in the "creative arts & design" category. This contrasted with a 2 per cent decline in overall numbers enrolling onto undergraduate courses, the third year of decline in succession. Total postgraduate enrolments held level.

Harper Adams University postgraduate marketing manager Alex Hardie said: "Harper Adams has been bucking the trend in reporting a rise in postgraduate numbers. Our undergraduate numbers are growing too, with more than 700 first degree students having started this year."

He added: "Masters-level study has just become achievable for more people, with the introduction of postgraduate loans by the Government. Anyone up to the age of 60 can get a £10,000 loan, repayable on similar terms to undergraduate degree loans, to pay for their tuition."

LELY UK ADOPTS LTA TRAINING PATHWAY FOR DEALERS

Company awarded assessment centre status

Lely UK has announced the introduction of a Master Service Technician programme, which will be introduced this year. The programme provides a strategic career pathway for those who work for dealers and service centres which are part of Lely's Service Level Agreement (SLA), launched in 2015.

Lely's turfcare division has recently been renamed Turf Technologies Ltd, and managing director David Cole, says. "Just as the SLA benefits the end user by providing a strong standard of service commitment, we wanted to develop a career continuation pathway to benefit the technicians within the dealer network, who will deliver on those commitments.

"We have been working with third party training providers designing modules for our Master Service Technician programme to provide a seamless career path that follows on from level three of the LTA training pathway. Now we can offer a robust career path with Lely acting as a base for all training and assessment."

This announcement coincides with the news that the company has been awarded LTA training to level two and three for five years, which says Neil Adams, Lely's head of turfcare training, is a "fine achievement" by the Lely training team. "Lely previously represented the scheme as a participating dealer," he says. "Now, because of the recognition of our training and standards by the Institution of Agricultural Engineers who support the accredited LTA scheme, we have been awarded assessment centre status."

"By ensuring that staff are appropriately registered demonstrates to the customer the honesty and integrity of our service network technicians and promotes professionalism of the individual and the dealer itself. It's a win/win situation."

Mike Taylor Machinery (MTM) adopted the Lely SLA and has a promising technician in Lucy Naylor who joined the company in September 2014 and is studying Land Based Service Engineering at South Worcestershire College. MTM's Will Stops says: "Lucy is an outstanding student and employee and we have high hopes for her. She is just about to complete her first year at college and the plan is for her to move through the LTA pathway and onto the Master Service Technician programme at Lely when she finishes. We're delighted to be supporting, through Lucy, the next generation of technicians and to be able to now, thanks to Lely, integrate Lucy's future training so it incorporates Toro, which will have a positive impact on our business."

Another business that has quickly adopted the SLA, Cheshire Turf Machinery, has surpassed all sales targets for the last two years. Managing director, Steve Halley, says that embracing the principles of SLA has helped the company's after sales activity keep pace with this growth. "Our commitment to the programme will ensure that we continue to meet or exceed the service levels expected by our customers and the manufacturer.

"In return for our investment, we benefit in areas such as improved recovery on warranty and personal development, which are key to us driving the business forward. The training and education elements of SLA are good for morale, making staff feel more valued and giving them an easily accessible career pathway, leading to the Master Service Technician programme."

BELOW: Mike Taylor Machinery technician Lucy Naylor plans to move on to the Master Service Technician programme when she finishes college.

LELY SPLIT AG AND TURFCARE

Lely's Agricultural and Turfcare businesses has split and a new trading company, Turfcare Technologies Limited has been formed.

David Cole, managing director of Turfcare Technologies, says the rationale behind the business separation was to create two independent businesses, each having the freedom to develop their own strategies and able to focus on growth in their own and respective markets.

"The planning and implementation for Turfcare Technologies had started during the middle of 2015, but formally came into effect at 1 January 2016" he says.

It was during this period when an approach was received from Netherlands-based, Royal Reesink N.V. for Turfcare Technologies. The proposal is that the new company become part of the Royal Reesink holding company, which specialises in the distribution and sale of capital equipment and allied support services. There are 19 companies in the Reesink group, including Jean Heybroek and Belgium based Packo N.V, Toro and TYM tractor distributors in the Benelux region of Europe.

Lely and Reesink has signed a Letter of Intent for Reesink to acquire the Lely Turf business. The 'agreement of intent' with Reesink will move to the final stages of a due diligence and is expected to be completed during the summer.

JOHN DEERE'S *AWARD WINNING TECHNICIANS*

A record total of 35 young service technicians have graduated from the latest John Deere Ag Tech, Parts Tech and Turf Tech advanced apprenticeship programmes, newly run by national training provider ProVQ.

Charlie Phipps from dealer Farol at Milton Common in Oxfordshire was named ag & turf apprentice of the year for 2015, while parts apprentice of the year is Grant Stearman of Ben Burgess Beeston in Norfolk. Charlie Phipps also won a Service Technician Apprentice of the Year Award earlier in the year from John Deere's previous training provider Babcock, in a national competition designed to identify the best and brightest apprentices across industry.

The group of third year students received their certificates at the John Deere Forum visitor centre in Mannheim, Germany during the annual graduation visit to the company's tractor and cab factories and European Parts Distribution Centre (EPDC) in December. The presentations were made by Deere & Company's Region 2 marketing director Helmut Korthoeber and John Deere Limited training centre manager Richard Halsall.

Charlie Phipps received a crystal plaque, a certificate and vouchers for workshop tools worth £250. His ProVQ regional assessor Roger Hawlor and technical trainer Richard Jenkins said: "Charlie has been a first class student since the beginning of his apprenticeship. His application, effort and motivation throughout have been outstanding, and he has been an excellent ambassador for both the apprenticeship programme and the Farol dealership."

Grant Stearman received a certificate and shopping vouchers worth £250. "Grant has worked very hard throughout his apprenticeship and thoroughly deserves this recognition for his efforts," said his ProVQ assessor Amanda White. Ben Burgess & Co service director Jimmy Lockhart added: "This is an excellent achievement and it's great to see all of Grant's hard work pay off. Grant is an important member of our parts team at Beeston and we look forward to helping him continue to develop in his role"

The John Deere three-year apprenticeships currently lead to the BAGMA/City & Guilds of London Institute 4025 agricultural/groundcare service engineers NVQ Level 2 & 3 certificates and Level 3 IMI Diploma in vehicle parts competence. All future Ag and Turf Tech apprentices will qualify with the IMI Level 2 & 3 Diploma in Landbased Engineering.

Apprentices can also choose to complete their education for a fourth year to gain the John Deere Diploma and register at LTA2 level in the industry's Landbased Technician Accreditation scheme, while starting their adult training within the John Deere University.

Now in its 24th year, Ag Tech was the first such scheme to be introduced in the UK and won a National Training Award at the end of 1997, the only one ever made to an agricultural machinery apprenticeship programme. Since the first programme started in 1992, more than 600 apprentices have graduated through all three John Deere schemes (Ag Tech, Parts Tech and Turf Tech) and are now working in the company's nationwide dealer network. A new Customer Service Tech training programme was also introduced in 2013.

ABOVE: John Deere's 2015 Ag Tech, Parts Tech and Turf Tech third year graduates with (far left) Helmut Korthoeber, Richard Halsall and (far right) ProVQ operations director Carla Tudbury-Jones, ProVQ regional assessor Roger Hawlor and John Deere training centre administrator Toni Aplin.

ABOVE: Charlie Phipps with John Deere's Richard Halsall.

ABOVE: Grant Stearman with Richard Halsall.

FIRST FULLY ROBOTIC FARM PLANNED

A Japanese company is to open the world's first "robot farm". Vegetable producer, Spread, said industrial robots would carry out all but one of the tasks needed to grow the tens of thousands of lettuces it produces each day at its vast indoor farm in Kameoka, Kyoto prefecture, starting from mid-2017.

The robots will do everything from re-planting young seedlings to watering, trimming and harvesting crops.

The innovation will boost production from 21,000 lettuces a day to 50,000 a day, the firm said, adding that it planned to raise that figure to half a million lettuces daily within five years.

"The seeds will still be planted by humans, but every other step, from the transplanting of young seedlings to larger spaces as they grow to harvesting the lettuces, will be done automatically," said JJ Price, Spread's global marketing manager.

The new farm will improve efficiency and reduce labour costs by about half. The use of LED lighting means energy costs will be slashed by almost a third, and about 98% of the water needed to grow the crops will be recycled.

The farm, measuring about 4,400 sq metres, will have floor-to-ceiling shelves where the produce is grown.

The pesticide-free lettuces will contain more beta-carotene – an antioxidant – than other farm-grown lettuce, the company said.

It plans to build more robotic plant factories elsewhere in Japan, and eventually, overseas.

IN BRIEF

Tractor sales in the UK during 2015 totalled 10,598, a drop of 14.8% on 2014, the lowest total for over 10 years. Average horsepower for each unit sold rose by 1.3% to 157.1hp

Agricultural machinery manufacturer, Latham Engineering has gone into liquidation. The Shropshire-based company was founded around 30 years ago, employed 10 people and manufactured slurry tankers, sweepers and yard scrapers.

Broadcaster and former politician Michael Portillo will be guest speaker at the Agricultural Engineers Association (AEA) Conference in London on 12 April. Other speakers include NFU Vice-President Guy Smith and economist Sean Rickard

The NFU is urging the DfT to set the fairest cap possible on crops produced for biofuels under the new Indirect Land Use Change regulation from Europe. Several member states intend to set the cap at 7 per cent putting UK farmers at a competitive disadvantage if the cap was set any lower than this.

The Institution of Engineering and Technology (IET) has re-opened its flagship London headquarters at Savoy Place following a two-year, £30m redevelopment. The venue will act as an engineering hub in London for the Institution's members and features exhibitions and venues for events.

Reuters reports that Germany's anti-trust regulator said it was investigating a possible cartel of companies making agricultural machinery, particularly tractors. It did not name any targets of the probe. German agricultural trading group Baywa confirmed that the cartel office had searched its headquarters on suspicion that some of its employees were involved in anti-competitive agreements.

CEO

Reflections on a changing world

CHALLENGES AND OBLIGATIONS

Meeting radically the different expectations and influence of our members

Alastair Taylor
IEng CEnv MIAgrE

Life in the IAgrE Secretariat is never boring! From time to time things come along that test the mind and demand a good deal of consideration.

We are a Learned Society, a Professional Engineering Institution (PEI), a limited company and a charity. We have to be all things to all people and at times that is a difficult balancing act. Recently, there have been two particularly interesting subjects which have exercised our minds. Both go to the core of why we exist, and whether we are truly meeting our obligations.

A startling figure is a decline in the number of registered engineers

In the latter part of 2015, Engineering Council circulated a discussion paper "The role of the Professional Institutions in 2025". This is an interesting read and offers a range of scenarios we need to consider if we are to move engineering forward as one of a collective of 35 PEI's.

A startling figure is a decline in the number of registered engineers from 265,000 in 2004 to 230,000 in 2014 – although the rate of decline has flattened out since 2010. The paper makes the point that whilst engineering is as vital as ever, there are very real threats to PEI's. The millennial generation (a term I hadn't heard) does not think in the same way as the baby boomers - their values and reward mechanisms are different. A range of challenges are noted:

- Time: people are busier;
- Value expectations: People question fees in a way they didn't before;
- Market structure: it has consolidated and specialized at the same time;
- Generational differences: there are a multitude of groups but all are our members, and all have radically different expectations and influence;
- Competition: there are lots of others out there, nothing is a given;
- Technology: it is very different, changing faster than ever, and we find it hard to keep up.

I would acknowledge all of these challenges. The paper goes on to suggest various options – some quite radical and other more evolutionary. Without wanting to go into the detail, the lasting impression is one of "doing nothing is not an option". We watch this space …

The same paper reminds us of our six core duties as a PEI. These are around public safety and a duty to protect; society and a duty to inform and represent; learned societies and a duty to disseminate; a duty to attract the next generation; the future and a duty to research; and finally a duty to be resource efficient. My own analysis is that IAgrE and its member's do all of these relatively well but it is helpful to be reminded of our duties and have the opportunity to reflect.

All of this is relevant if we consider our obligations as a charity. It will not be lost on Landwards readers that some charities are under the spotlight on account of their inappropriate antics, I certainly would not include IAgrE (or any other PEI for that matter) as operating outside of its charitable remit but it is right that we ask ourselves the question from time to time.

It is helpful to be reminded of our duties

The Engineering Council have reminded us of the need to remember our charitable aims and objectives and members should be assured that the IAgrE Executive and Council frequently assess the extent to which we meet our obligations. In our annual report, we note that the prime remit of the Institution is to:

- Promote agricultural engineering as a profession.
- Direct and apply the sources of energy in Nature for the sustainable use and convenience of man in the adaptation and application of materials and mechanical methods for the best development of land use for agriculture, forestry and other purposes.
- Promote good practice in all applications of technology across the land based sector.

If a charity is defined as "an institution, organisation, or fund established to help the needy"; or "benevolence or generosity toward others or toward humanity", then few would argue that the prime remit of IAgrE is failing to meet its charitable obligations. Who would argue that developing technology that helps to feed a hungry world is not about benevolence towards humanity? I wouldn't!

IAgrE

COMMITTEE FOCUS
MEMBERSHIP COMMITTEE

The IAgrE Membership Committee is one of the most important committees of the IAgrE. Chaired by Dr Steve Parkin Hon FIAgrE, it meets six times a year to consider membership applications and to conduct Engineering Council and Society for the Environment assessments.

In addition, this committee develops and approves policies and procedures as they relate to membership and registration. When it comes to the IAgrE licences, it is this committee that takes responsibility.

Alastair Taylor, IAgrE CEO commented. "The membership committee performs a crucial role for IAgrE and certainly introduces a good degree of challenge and questioning to me as CEO. It is a vital role and I have to say that I truly respect the judgment of these volunteers. I am also impressed with the way in which Steve makes the meetings an enjoyable and fun experience for those involved"

ABOVE: *(left to right)* ***Keith Hawken, John German, Richard Langley. Steve Parkin, Richard Trevarthen, Chris Watts, Chris Whetnall and Malcolm Carr-West***

ABOVE: Richard Brown is welcomed to the IAGRE membership committee by Steve Parkin

At the January meeting IAgrE welcomed Richard Brown as the new Engineering Council liaison officer. Richard represents the Institute of Cast Metal Engineers (ICME) on the Engineering Council, he was Head of Metallurgy and Material at Bradford College for over 25 years.

Alastair added "I welcome the involvement of others in scrutinising our work in registering engineers. In the same way, one of our own members sits on the membership committee of another engineering institution. It is only by sharing intelligence that we get better"

NOTICE

New IAgrE Specialist Interest Group (SIG) Internet of Things SIG

Call for Interest Inaugural meeting early May 2016

IoT is a buzz word for the world of connected devices using Internet Protocols. With estimates of many billions of device nodes servicing existing roles in the biosphere, the devices and data enable new "unthought-of" solutions, products and services. Many descriptions of variants of this web 3.0 application include: the **SemanticWeb, Machine2Machine, Connected World** and a myriad of other terms, defining rhetoric as well as routed in reality.

We, as Agricultural Engineers, have always been "agile" to embrace promising innovative technologies and it would be useful for our membership to engage in SmartAgEng, enabled by IoT.

We would welcome suggestions or volunteers to present at an inaugural meeting of the IoT, SIG, possibly in Cambridge early May 2016, and also possible attendance at the event.

IAgrE member Tim Reynolds has offered to lead the SIG in the first instance please contact him through Sarah McLeod at secretry@iagre.org

CENTRES FOR AGRICULTURAL INVESTMENT

Government announces £68m investment

The Chancellor announced in his Autumn Statement that the Government is to invest £68 million in three new Centres for Agricultural Innovation.

As well as creating capacity in the UK to translate agricultural innovation into commercial opportunities for UK businesses, the three new centres will stimulate inward investment and help to revolutionise farming practices in the future. The Government's investment will finance world-class laboratory equipment, IT hardware and software, and facilities to test and develop new agricultural technology and products.

The three centres are

- **Centre for Crop Health and Protection (CHAP)** - £21.3 million government investment to revolutionise how farmers manage crop threats including pests and disease
- **Centre for Innovation Excellence in Livestock (CIEL)** - £29.1 million government investment to create new livestock technology and products to boost the profitability and productivity of livestock farming.
- **Agricultural Engineering Precision Innovation Centre (Agri-EPI)** - £17.7 million government investment in the new, fast-moving market of precision agriculture to help the UK's agri-food sector develop advanced technologies that will increase productivity and sustainability in UK agriculture. The Centre will have hubs in Edinburgh, Harper Adams University and Cranfield University.

The first Centre for Agricultural Innovation focussing on Agrimetrics was launched in October 2015 and these new Centres will collaborate with Agrimetrics on many projects.

Legal agreements and contracts are being finalised and the plan is to formally launch each Centre in May or June.

Agritech strategy spokesman said" We believe the Centres really are our chance to deliver long lasting game changing innovation in the agriculture sector. They will tackle the issues that no one part of the sector can address alone and establish new networks, perhaps even with 'competitors' working together, to address the grand challenges we face.

A GLOBAL OPPORTUNITY

IAgrE has the strength and influence to make a difference in developing countries

President's Musings

IAgrE President,
PROFESSOR
MARK KIBBLEWHITE
CEnv FIAgrE

"***The food and agriculture sector offers key solutions for development and is central for hunger and poverty eradication.*" Not my words but a headline statement under "*End hunger, achieve food security and improved nutrition and promote sustainable agriculture*" which is the second of the 17 new United Nations Sustainable Development Goals. I guess we can all agree with these aspirational statements. The question is how to turn these fine words in to effective action. And, for us, the issue is "How can agricultural engineering contribute?"**

A striking fact is that some 500 million small farms worldwide, mostly still rain fed, provide up to 80 per cent of the food consumed in a large part of the developing world, even after a century or more of global agri-business development. Food produced in larger scale intensive agriculture underpins food security for growing urban populations. It also supplies the troubled World Food Programme. Nonetheless, small farms play the main part in securing sustainable food security for the rural poor and also many in the margins of towns and cities.

My sense, however, is that most of our attention in IAgrE is on improving the performance of larger scale, capital intensive agriculture via larger machines with higher work rates operating with greater precision. My proposal is we should balance this by strengthening our focus on accelerating the productivity of small farmers who have limited capital.

It is not surprising that large-scale agri-business suppliers are a strong pull for agricultural engineers. In the main, we are professionals who work for investors' companies either directly as salaried employees or via contracts for services that support these companies. Economies of scale and scope in production and global distribution support high returns. It is a business model that needs and can support a lot of engineers, many well-paid. Large-scale agri-businesses have the deep pockets needed to finance great life styles alongside interesting careers and projects. And, of course, their success is a good thing because increasing the productivity of 'mainstream' commercial agriculture is essential to match the future demand for food for the whole World population.

Accelerating the productivity of small farmers who have limited capital.

The facts remain, however, that one in nine people in the world today (795 million) are undernourished and the vast majority of the world's hungry people live in developing countries where their food depends on small scale production. The challenge for us is about "What can we do as professionals to help these undernourished citizens feed themselves and their children?"

Moreover, it is not just about food; agriculture is the largest source of the income poor rural households need to buy basic resources and support their children's education.

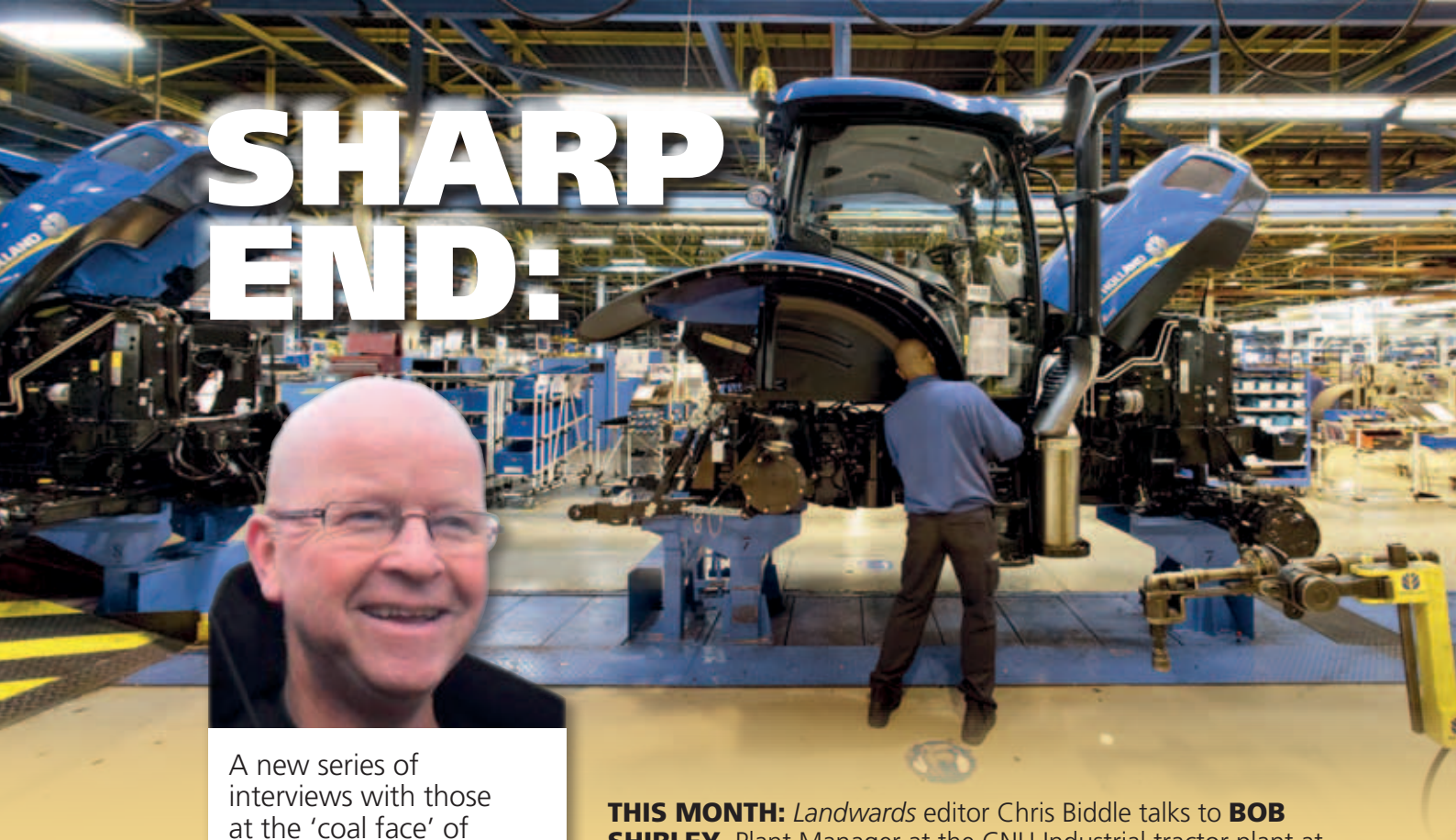
I think IAgrE can make important contributions. Not just in the technical aspects but also in institutional development. Increasingly, there is a realization that the old three-legged stool of sustainable development via economic, social and environmental development needs a fourth leg of better governance and institutions. We know something about the latter.

We have considerable strengths to build on.

Some members are already working in developing countries. We have excellent connections to relevant organisations, including major global companies as well as UK agencies. I think our key objective should be to establish partnerships with sister institutions in developing countries, specifically aimed at helping them to support small farmers. As well as our own resources and that of member volunteers, we can surely use our established good relationships with public and private organisations to get funding for in-country workshops with partners, second members to work with them and finance elective projects for UK students.

Our contribution will help grow a stronger cadre of engineers to support especially small farmers to increase their productivity. It can make a difference. Let's get talking about this together and agree a plan of action.

SHARP END:



A new series of interviews with those at the 'coal face' of agricultural engineering, research and education in the UK.

THIS MONTH: *Landwards* editor Chris Biddle talks to **BOB SHIRLEY**, Plant Manager at the CNH Industrial tractor plant at Basildon, a recent winner of Manufacturer of the Year title.

DRIVING FORCE

Tractor manufacturing, like farming, retains close-knit ties with its roots. So it is no surprise to hear Bob Shirley, Plant Manager at the CNH tractor in Basildon, describe the Essex manufacturing centre as a 'family firm'.

No matter that here is the sole volume tractor maker remaining in the UK. A plant with global reach and reputation. A manufacturing operation that today consistently demonstrates a level of sophistication and excellence that stands comparison with any of the current successful crop of UK based car production plants.

"Of the more than 500 people that work in production, we have a number of fathers and sons, the average age is 45 and the average length of service is 18 years" says Bob. "So we definitely regard ourselves as a family team".

Bob himself has worked at Basildon for 28 years. He trained as an HGV technician before joining the then Ford Tractor plant working in prototype engineering during the development of the 40 Series. "The testing processes for new models and updates was a continual challenge, but you felt that you were really involved in the front-line 'nuts and bolts' of engineering" he says.

After 14 years, Bob moved into the heart of the Basildon plant as a manufacturing engineer, where he was to spend another three years. "It was quite a culture shock" he says "and highlighted for me the difference between engineering and manufacturing. Engineering is all about seeking perfection, whilst manufacturing requires precise disciplines"

Bob then spent a further three years from 2007 to 2010 as the Quality Engineering manager at the plant before moving to responsibility for Manufacturing Quality across the EMEA region for 5 years where he was to have exposure and involvement with other divisions of the Fiat industrial group including Iveco truck and Fiat Powertrain Technologies (FPT) divisions.

In March 2015, Bob was appointed Plant Manager at Basildon succeeding Colin Larkin who had held the post since 2011 and who had moved to another group role in South Africa.

FIAT AND CNH

Ford had purchased New Holland in 1985, but was soon looking for a way out of the tractor business. In 1991, Ford-New Holland was sold to Fiat – and a massive and significant change in manufacturing cultures began.

In 1999, CNH was established

"Our aim for at least an 8% year-on-year saving on manufacturing costs is something that we have consistently achieved"

through the merger of New Holland N.V. and Case Corporation which had been acquired by Fiat who then merged Case into New Holland. Fiat Industrial had begun operations on 1 January 2011, following the demerger of the activities of Iveco, CNH and FPT Industrial from Fiat S.p.A.

CNH Industrial was incorporated in November 2012 and became operational in September 2013 as a result of the mergers of Fiat Industrial S.p.A. and CNH Global N.V.

Today, the Basildon plant is an important cog in the giant CNH Industrial Group which recorded sales in excess of $25 billion last year, and has around 69,000 employees

The manufacturing process is markedly different to those early days. Since the factory had been built in 1964, over 3 million engines had been produced at Basildon, but Fiat was already working on meeting engine emissions and had its own engine making facilities in Turin and engine manufacturing ceased at Basildon in 2008.

The 40-hectare site is a key assembly plant for tractors ranging from just over 100hp up to the newly introduced New Holland T7 Heavy Duty series which tops out at over 300hp. Annual production numbers fluctuate, in an average year the plant produces around 23,000 tractors, the majority of which are exported. Such are the vagaries of the tractor market however, that flexibility is the key as worldwide demand fluctuates. Full production capacity of the plant is around 30,000 tractors a year.

The Basildon plant has proved a beacon of manufacturing success in the UK, recognised by business leaders and by the Prime Minster who has used the plant for important policy announcements. But the company has to have its finger on the pulse of the market, and over the years the plant has introduced manufacturing disciplines to reinforce its long term efficiency, flexibility and viability to meet market changes.

PILLARS

An early adopter of the World Class Manufacturing (WCM) set of performance criteria, Fiat first introduced the 10-pillar strategy in 2006, and it was taken up by Basildon in 2008.

"Each world class manufacturing pillar touches every aspect of our process," says Bob Shirley.

"It should come as no surprise" says Bob "that SAFETY is number one on the list, and importance to the plant. The objective is to have no snags, no-hold-ups and no unforeseen episodes"

All pillars are treated with equal importance, even reverence.

Training (People Development) has been scrutinised and new standards implemented. "In the past" says Bob "a new staff member would have received a short induction course, and put straight to work on the production line" New staff now take a one-week training programme including a full briefing on a tractor's operation. "We also demonstrate the importance of the worker's role to the end product, the customer and to the business" he says.

But the training does not stop when the operator is competent with his specific role. "We have an aim for every operator that they should know three separate job functions. Every operator should know three jobs and every job should know three people so as to cover holidays, sick days and other eventualities".

In a plant where nothing is manufactured, every component, part and accessory is out-sourced, the name of the game is seamless logistics. From the straight-line design of the assembly line where corners and bends can add seconds, to the bare minimal stock-holding of parts at each stage of production and the elimination of unnecessary physical effort by the operator – all are monitored to the Nth degree to fit the WCM criteria.

To the outsider, WCM might seem like the impossible dream – and to some extent it is. But the results are tangible and measurable. In the first three years of its introduction, the company made savings of more than £4 million. "Our aim for at least an 8% year-on-year saving on manufacturing costs is something that we have consistently achieved" says Bob, "But as you can imagine the first 5% or so can be relatively straightforward, but the rest can be more of a challenge".

As with any structured manufacturing programme, success only comes when employees buy-in to the philosophy. Basildon

THE PILLARS ARE

1. SAFETY ensures the operations are as safe as possible to protect staff and prevent loss time accidents.

2. COST DEPLOYMENT investigates the losses in the plant and looks at each of the micro processes and the related costs. It assists to foster an understanding of where the greatest losses occur.

3. FOCUSSED IMPROVEMENT helps to ensure that when applying the remaining pillars that the correct tools are being utilised to tackle the issue in question.

4. AUTONOMOUS ACTIVITIES
(a) Autonomous maintenance works towards the goal of the workers maintaining their own equipment using correct techniques and standards
(b) Workplace organisation aims to organise the plant to operate in the most efficient manner possible while reducing non-value-add activity.

5. PROFESSIONAL MAINTENANCE relates to the maintenance of equipment to tackle the biggest losses that exist in breakdowns, moving from being reactive to proactive.

6. QUALITY CONTROL using data from all sources including warranty and internal to determine what defects are causing the most problems.

7. LOGISTICS/CUSTOMER SERVICE examines workplace organisation to ensure that an operator receives the part in the most efficient and user friendly way possible.

8. EARLY PRODUCT/EQUIPMENT MANAGEMENT relates to the launching of new products, the purchasing requirements and the team learns the full production process before a product is launched onto the production line.

9. PEOPLE DEVELOPMENT relates to the training needed to support the other activities.

10. ENVIRONMENT/ENERGY investigates environmental initiatives for waste reduction and improved environmental efficiency.

has developed its own people development programme. "We report to people on the savings they implement and there is a bonus scheme linked to savings achieved," says Bob "Communication is the key, we want motivated people and this incentive provides a practical clarity on the meaning of WCM".

COMMUNICATION

Like the oft-used phrase "Ours is policy of continual improvement", full implementation of WCM is a distant goal. Bob Shirley says that the Basildon plant is a steady improver within the CNH Industrial group having just achieved Bronze status – and is now heading for Silver. "Step by step we are getting there, but still have some way to go to implement all the pillar principles at each and every stage of production".

Notwithstanding that, the Basildon plant was voted Manufacturer of the Year in 2012, having been runner-up the previous year.

For Bob Shirley, much of his role revolves around communication, listening and learning. Each day, he will set off into the plant and spend as much time as needed on a single station. "It is incredible the amount of valuable feedback I get that translates into further efficiencies and cost-savings".

"I also find that when we introduce a new change or process, it is essential to explain the rationale behind any change. Once someone knows the thinking behind it, it is so much easier to move forward"

"Ultimately, we are one team at Basildon. From sales, to admin, to R&D, to production, we have a single aim to be the best we can at our job, to produce the best tractors, efficiently and profitably".

"I think we have turned the corner in the perception of engineering amongst young people, there are so many branches that are exciting and provide terrific opportunities that we need to get out there and spread the message".

For many years, CNH Industrial had no formal apprenticeship programme, today it has a regular intake in association with Semta and a local college. The company also takes on a rolling block of 8 interns every year to work across the departments, all are paid and many stay on to take a permanent role.

Bob Shirley has seen considerable change during his near 30 years at the Basildon plant. It was the vision of Fiat Group CEO, Sergio Marchionne, to adopt World Class Manufacturing in 2006 and to bring disciplines of the likes of Toyota and BMW into the field of heavy machinery. Today WCM is the driving force required to keep plants such as Basildon at the cutting edge of efficiency and competitiveness in an uncertain and often unstable world.

Basildon adds something else to cutting edge manufacturing techniques – heritage. Farmers appreciate heritage – and although the names and the ownership has changed, they associate Basildon, and Dagenham, before it as a still important part of British tractor making.

CNH Industrial are rightly proud of their present day plant which definitely induces the 'wow-factor' when you walk through the doors. Why, at a recent launch of the New Holland T7 Heavy Duty series, dinner for the dealers, farmers and guests was served up on the production line, cleared specially and back in action few hours later.

Pride in the job can be an over-used phrase, but for Bob Shirley it is rightly justified. Day-to-day challenges are constantly at his door, the evolution of manufacturing practices a constant companion. But as he contemplates the 'family-firm' in which he plays such a key role during those moments away from the plant, enjoying his love of fishing or watching his beloved West Ham United, he must exude pride.

"I couldn't have a more enjoyable or varied role where every single day is different, but where ultimately teamwork makes the difference" he says. ■

SECURED FUTURE FOR SILSOE SPRAY UNIT

Independent research team established by owner of Househam Sprayers

Report by Clare Butler Ellis and Professor Paul Miller

Robert Willey

On 1st January 2016, the spray applications unit based at Wrest Park, Silsoe, became an independent company, Silsoe Spray Applications Unit Ltd. The new owner of the business, Robert Willey, the owner and MD of Househam Sprayers, acquired the team, facilities and portfolio of projects in order to ensure that this important UK capability was not lost.
The new business unit will remain separate and independent. 'British agriculture leads the world' says Robert Willey. 'The UK needs successful independent science and technology organisations, especially in machinery and engineering, to remain competitive'

The research team is led by Clare Butler Ellis, and includes four scientists (Christine O'Sullivan, Andy Lane, Clive Tuck and Rafael Alanis) and a part-time assistant (Rachel Miles). Paul Miller is a director of the new business, and will also provide technical consultancy.

LONG HISTORY

The origins of research into spray technology and pesticide application at Wrest Park go back to the days of the National Institute of Agricultural Engineering (NIAE). Paul Miller became head of the Chemical Application Group in 1984. The research programme at this time had strong components relating to the design and evaluation of electrostatic spraying systems, the testing and design of boom suspensions and the optimisation of field spraying operations.

The following years saw an increasing emphasis relating to the environmental footprint of farming, particularly of arable systems, with collaborative programmes of work examining the balance between spray efficacy and drift with ADAS, Long Ashton Research Station and the Applications Hazards Unit at Harpenden, among others.

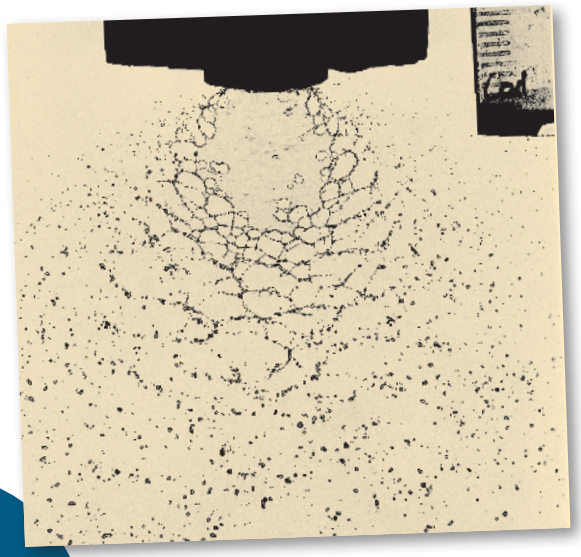
The work on spray drift led to the

Spray drift testing

Prototype patch sprayer

development of predictive computer simulation models, field and wind tunnel techniques to quantify factors influencing drift. Grants from BBSRC led to basic research programmes with the Department of Applied Mathematics and Theoretical Physics at Cambridge University that in turn enabled the facilities at Silsoe for characterising sprays to be upgraded and a new purpose-designed wind tunnel to be commissioned in 1997.

Spray formation from a hydraulic nozzle spraying an emulsion



Working jointly with Rothamsted, in a series of projects, a prototype patch spraying system was developed that incorporated an injection metering system, also developed at the Institute. Patch spraying of grass weeds in cereal crops was successfully demonstrated in farm-scale trials and in 1992 the patch sprayer won the SKF Archimedes Award for Excellence in Engineering, presented to the research team by Cliff Michelmore at a prestigious national event in Birmingham.

Further prototypes were developed based on the multiple switching of nozzles and the patch spraying technology was licenced to Micron Sprayers in the mid 1990's.

Clare Butler Ellis joined the team in 1994, by which time the NIAE had become Silsoe Research Institute (SRI), and a further 10 years of research ensued. Examples include investigating the interaction between nozzle and spray liquid, where the effect of emulsions on spray breakup was identified; and optimising the performance of air induction nozzles, which directly led to the development of the Amistar nozzle with Syngenta and Hypro.

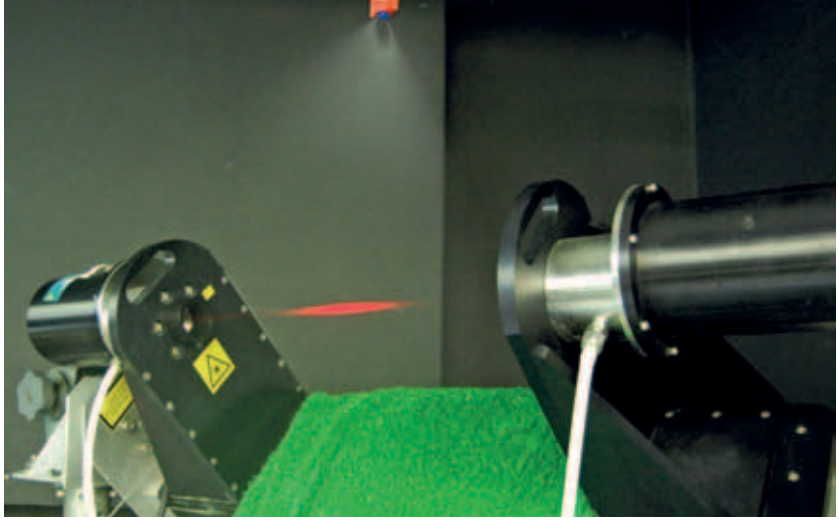
Another project looking at low spray application volumes was crucial in supporting the trend towards reducing water volumes which can give significant benefits in efficiency and efficacy to growers. The expertise in application technology was used to create the first HGCA nozzle chart, which has had several updates and remains one of the best sources of guidance for selecting nozzles for use in cereals and oilseeds.

By the end of 2004, the future of SRI was in doubt, and discussions between The Arable Group (TAG) and SRI ultimately led to a new spray applications unit being created at TAG, remaining on the Silsoe site, with a smaller core group of scientists led by Paul Miller.

One of the key projects that the unit began under TAG was the BREAM project, which developed a new model of exposure of bystanders and residents to pesticides used in agriculture. This model was based on the original spray drift model published in 1989, but re-written and updated. The team's modelling capability is one of the most important factors in their recent success. The BREAM project led onto a wider, EU project called BROWSE, which further developed bystander and resident exposure modelling, so that the Unit is now one of the foremost research teams across Europe with expertise in predicting and measuring resident and bystander exposure to spray and vapour drift.

The loss of active pesticide ingredients in the early 2000's was an important trigger for the development of a spot sprayer for operation principally in horticultural crops and aimed initially at the control of volunteer potatoes.

Working with Tillett and Hague Technology Ltd in an HDC-funded LINK project a prototype 6.0 m wide unit was developed and trialled that used computer vision to both guide the machine and identify weeds to be treated. Special nozzles were developed in conjunction with Hypro EU Ltd that minimised the contamination of crop plants and non-target areas.



Characterising sprays with the Malvern SprayTec

Field performance assessments showed that the machine could achieve levels of weed control of typically 95% with levels of crop damage at least comparable with any other control technique and herbicide usage of less than 5.0% of that of conventional spraying. This concept has now been developed commercially by Garford Farm Machinery Ltd.

FUTURE – AND FUNDING

Around 75% of the unit's income now comes directly from industry and is commercially confidential. For the first time, they have no funding from Defra. It is hoped that this is only a temporary situation, but recent changes in public funding for agricultural science have not benefited application technology and some funding streams are difficult for private research organisations to access.

The three main aims of the unit's work have remained unchanged for many years: optimising the performance of chemical applications; minimising the non-target impacts; and supporting the regulatory process. Knowledge transfer also remains important, and the team at Silsoe can deliver training courses in spray application to growers, spray operators, agronomists and others within the industry, with an emphasis on bespoke courses for small groups.

Standard tests such as nozzle classification and LERAP testing continue to be valuable, but the team has a reputation for developing new laboratory tests that can help the understanding of the performance of plant protection products without requiring expensive (and sometimes unreliable) field trials.

The facilities, while developed to meet the needs of agriculture, are now also being used in other sectors, notably in defence. The Ministry of Defence does not have the facilities or expertise available at Silsoe, and so a useful partnership has developed between SSAU and the Defence Science and Technology Laboratory at Porton Down to address defence problems relating to airborne aerosols and the treatment with chemicals of biologically-active materials.

The biggest challenge for the new business is its small size. Clare Butler Ellis has led the team since 2010 when Paul Miller took semi-retirement. There are currently plenty of opportunities for the Unit, and while in principle the team can expand, there isn't the existing expertise out there to recruit. The Unit looks secure for the next 10 years, but succession planning will be key to keeping the UK at the forefront of agricultural spray technology, and the ongoing support of both industry and government will be essential.

Tracing spray on plant surfaces using fluorescence

FACILITIES

The facilities at the Silsoe Unit are unique world-wide and the team has been responsible for the development of many important techniques for investigating spray behaviour.

A spray physics laboratory can characterise the spray from any nozzle or spray generation system, by flow rate, liquid flux distribution, fan angle, droplet size and velocity.

The equipment comprises two laser-based instruments, the SprayTec (Malvern Instruments Ltd) and the Visisizer (Oxford Lasers Ltd), combined with a computer-controlled transporter for locating and traversing the nozzle and a liquid-handling system to allow active ingredients to be used. Bespoke software uses raw data from the instruments to conduct analyses necessary for agricultural applications.

The wind tunnel has a working section of 2 m x 3 m x 10 m, generates wind speeds up to 10 m/s and can operate with sprays containing tracers or active ingredients. This can be used to measure spray drift to a standard protocol in order to compare equipment and/or formulations. It can also be used as a controlled environment chamber, with a track sprayer that can operate at speeds up to 14 km/h, allowing field conditions to be simulated. The floor can be removed and trays of plants inserted to mimic both crop and downwind vegetation.

An analytical laboratory has instrumentation for quantifying sprays deposited on a wide range of targets, from passive drift collectors such as paper strips or plastic lines, suction samplers, clothing, and plants, as well as target crop or weeds.

Photography also plays an important part in quantifying spray behaviour, with a range of techniques available to visualise the coverage of a target by a spray, or the behaviour of an individual droplet on a surface.

For absolute measurement of environmental exposures, it is essential to conduct field trials. The team have many years' experience of field trials, measuring airborne and sedimenting spray and deposits on real and surrogate non-target organisms as well as vapour emissions.

The Silsoe Spray Drift Model for boom sprayers is also available for investigating in a cost-effective way the potential effects of various parameters on exposures as part of a risk assessment:

Nozzle design, and spray characteristics;

Environmental parameters, such as wind speed;

Sprayer operating conditions, such as boom height and forward speed.

The model can be adapted to simulate other similar situations, and has been used to simulate dust release, knapsack spraying and high-speed railway spraying.

ETHICAL ENGINEERING

COULD THE VW SCANDAL HAPPEN AT A BRITISH COMPANY, AND WHAT WOULD BE THE CONSEQUENCES?

The VW scandal has brought our profession into disrepute says **Malcolm Carr-West CEng** and urges IAgrE members to keep the Institution's Code of Conduct constantly in mind

The recent news regarding Volkswagen diesel engines must be of more than passing interest to agricultural engineers. Most of us would consider that the diesel engine is the prime power unit for agricultural engineering. So it should obviously concern us all, that one major manufacturer has done much to damage not only its own reputation but also the reputation of diesel engines.

Once we have overcome the initial and inevitable schadenfreude, (It would be easy to shrug our shoulders and think, German engineering is not as good as we have always thought it to be) we need to consider our own position. I have spoken to a number of people whose distrust of engineering in particular and science in general has been strengthened by the VW scandal. To put it succinctly, the VW scandal has bought our profession into disrepute.

The exact nature of what happened at VW is still far from clear and it is not possible to state with any certainty if VW's sufferings were caused by a lone engineer acting on their own initiative or by a team within the company trying to fulfil their obligations to the company. Indeed, it is too early yet to be clear if anyone at VW was involved in setting up the 'cheat device'. It should go without saying that no one would approve of breaking the law or of technical fixes that cover up law breaking. How then should we react to the VW scandal? If this had happened in a British based company what should be our reaction?

The VW scandal has brought our profession into disrepute says Malcolm Carr-West CEng FIAgrE and urges IAgrE members to keep the Institution's Code of Conduct constantly in mind.

STANDARDS

We can start by looking at the ethical standards we in Britain apply as engineers.

As professional engineers we commit ourselves to following a code of ethics. In principle this calls for us to be honest and truthful. As members of the IAgrE we have signed up to the Institutions Code of Conduct. This document can be viewed on our web site at http://www.iagre.org/codcon. If, in addition, we are registered with Engineering Council, then we are also required to obey the Engineering Council's Statement of Ethical Principles.

Firstly, it is important to bear in mind that our Institution's Code of Conduct is the minimum standard that is expected of us. It also makes it clear that the interest of the public is always paramount. In effect any work that we carry out as engineers should be in the interest of the public regardless of the country in which we are operating.

Similarly, any system that we are responsible for, should operate in the interest of the public in the country in which the system is working. No doubt it could be argued that in some cases the law and public interest are not the same. However, it is difficult to see how flouting emissions regulations could be in the public interest. There are then a number of clauses within the Code of Conduct that lay out specific requirements that members need to follow. Clause 1 reads as follows.

Members shall at all times and in all respect:
(a) take all reasonable care to avoid creating any danger of death, injury or ill-health to any person or of damage to property by any act or omission whilst carrying out their work or as a result or consequence of their work, save to the extent that the creation of such danger is lawfully authorised;
(b) take all reasonable care to protect the working and living environments of themselves and others and to ensure the efficient use of materials and resources;
(c) conduct themselves so as to safeguard the public interest in matters of safety and health and in a manner consistent with the dignity and reputation of the profession as relevant to the Institution; and
(d) notwithstanding the provisions of any of the other Rules or Codes of Professional Practice, comply with all laws and regulations applicable to their professional work.

CHEAT DEVICES

It is quite clear that anyone working on a 'cheat device' designed to ensure compliance only under test conditions failed to observe (a). By allowing cars on to the road that did not meet emissions limits they were clearly not showing a concern about the health of those breathing in emissions. While the emissions from engines are clearly injurious to a person's health, as

Any system that we are responsible for, should operate in the interest of the public in the country in which the system is working.

engineers we may not be the expert as to the acceptable limits. It is clear that whoever was responsible for the 'cheat device' also ignored section (d) as they clearly acted in such a way as to circumvent the law.

If, as an engineer, we are registered with Engineering Council, we need also to comply with the Engineering Council's Statement of Ethical Principles. This code of ethics does not excuse us from not applying our Code of Conduct rather it supplements it.

It is quite clear that those working on the 'cheat device' failed to comply with the clause which says . . . *professional engineers and technicians should avoid deceptive acts, take steps to prevent corrupt practice or professional misconduct, and declare conflicts of interest.* They clearly designed a system that would deceive those lawfully charged with testing the vehicles.

To return to our own Code of Conduct (para 3.3) it says *Members shall not be connected with or carry out any occupation or business in any way which would reflect adversely upon their professional status or the dignity and reputation of the profession.*

There can be very little argument that the 'cheat device' has bought engineering into disrepute. It is abundantly clear that fitting a 'cheat device' contravenes the Code of Conduct of both our Institution and that of the Engineering Council.

It is also obvious that there was the intention to disguise the normal running emissions levels from the inspectors. This is a polite way of saying that they had in fact set out to break the law.

CONSEQUENCES

So it would appear that if any person or persons were responsible for the 'cheat device' and were members of our institution, then, based on our Code of Conduct, there would be a compelling argument for bringing a disciplinary action against them.

Whilst it is impossible to prejudge such a hearing, the likely result would be their being removed from the Engineering Register and so stop them being a Chartered Engineer, an Incorporated Engineer or an Engineering Technician.

So in Britain, there is a clear process that would remove anyone known to have been involved with designing and installing a 'cheat device' from the profession. However, before this can happen, someone needs to identify that they are doing this. How would this come about? Well in the case of VW it has apparently been as a result of rigorous testing in California, although if individuals were involved their names may never be known.

WHISTLEBLOWING

This is covered in the whistleblowing guidance that is currently being developed by Engineering Institutions. As yet we do not have our own guidance in place, so we need to fall back on the Engineering Council's guidance.

This guidance uses the UK Whistleblowing Commission definition of whistleblowing as:

'the raising of a concern, either within the workplace or externally, about a danger, risk, malpractice or wrongdoing which affects others'.

So if there were people in VW that were aware of, but not directly involved in the 'cheat device' it is clear that under this code they would have been obliged to raise their concerns with someone.

Whistleblowing law varies from country to country but many industrial nations have some form of whistleblowing legislation. In the UK the law is on the whistleblowers side.

So to come back to the VW scandal, could it have happened in the UK? The answer is probably yes. Are there measures in place to regulate our profession from such activity? Again, definitely YES. So whilst we cannot rest on our laurels we can at least be aware that it is against the Code of Conduct in our institution and almost certainly in all other engineering institutions.

EUROPEAN CODE

It is worth noting that Germany has similar practices in the regulation of engineers to the UK, although in Germany only those with the correct qualifications can call themselves engineers. There is an overarching engineering organisation for engineering in Germany, the Association of Engineers or VDI. In March 2002 they published Fundamentals of Engineering Ethics which essentially commits their engineers to the same obligations as Engineering Council UK expects of British registrants.

Finally, it should be noted that the European Federation of National Engineering Associations (FEANI) which represents engineering across Europe and beyond has reviewed codes of ethics for engineers across their membership. FEANI's Position Paper on Code of Conduct entitled Ethics and Conduct of Professional Engineers, received approval by FEANI's General Assembly on 29 September 2006.

So we can conclude that both nationally and internationally there are clear codes of conduct to which we are expected to follow. That this has not always done may be unfortunate, and might imply that we need to do more to enforce these codes, but we must remember that they are not voluntary, they are codes that we accept when we sign up to membership.

We need to tell anyone who will listen that our Code of Conduct would not condone this type of activity.

References:
IAGRE: www.iagre.org/codcon
Engineering Council: www.engc.org.uk/professional-ethics
FEANI: www.feani.org

FINE WEATHER AND HUGE CROWDS

Chris Biddle reports on the growing success of LAMMA which mixes tradition and innovation

LAMMA is a remarkable show by any standards. By 9am on the first day, a reported 5000 cars had parked up, with many of the occupants enjoying a special value Early Bird breakfast. The show still has many of the elements of the no-frills "let's put the show on right here" approach adopted by the original organisers. Free entry, free parking, low(ish) cost stand space with 'everyone-who-is-anyone' in the farm equipment market represented – and no side-shows or unrelated stands included to fill space.

Since the show was acquired by Briefing Media (publishers of Farmers Guardian), there have been significant improvements. First the move from the Lincolnshire Showground at Newark to the Peterborough venue of the East of England show with its much better facilities. But even that move nearly got derailed when the show ground was virtually submerged during 2014.

However, 2016 was just perfect weather-wise. Cold and crisp mornings, delightful winter sunshine during most of the daytime. An outdoor show in January is always going to be at the mercy of the weather, either for the showground itself or for the effects on transport.

The most visible evolution at LAMMA is that much more is now under cover. Many of the major tractor suppliers had built their own covered arenas. You could now visit the AGCO hall, the CNH hall, the John Deere hall, and they were joined by Kubota with a compact covered stand. Added to which the vast Peterborough Arena was supplemented by 8 more indoor

***ABOVE:** Indoor Arena for John Deere*
***BELOW:** LAMMA 2016*

halls, providing the show with much more covered display space than ever before.

At the end of the first day, the organisers presented the LAMMA 16 Innovation Awards at a complimentary supper, sponsored by steel company SSAB, and well attended by exhibitors. It was another step up in modernising an event that has become the flagship UK farm equipment show, and which may yet rival the likes of Agritechnica as the premier European event.

Free entry is an obvious draw (but how long will the organisers resist counting and badging visitors)? Cars are only indicator of visitor numbers, but that said, the numbers (an estimated 40,000) are impressive, and crucially the exhibitors recognise the quality and the profile of those who attend the show.

ABOVE: Sarah McLeod and Sally Wood manning the IAgrE stand

IAGRE AWARDS AT LAMMA

IAGRE IVEL AWARD

(New Product or Innovation which has most impact on the environment)

WINNER

POCLAIN HYDRAULICS

The company's new MHP20 and MHP27 hydraulic motors. With their new rotating group arrangement and hydraulic distribution design, these units can operate at unprecedented performance compared with conventional cam-lobe motors and are an ideal solution for hydrostatic transmission on machines such as self-propelled

Poclain's Neal Armiger receives IAGRE Ivel Award with IAGRE CEO Alastair Taylor (left) and Neil Thackray of Briefing Media (r)

IAGRE SSAB SAFETY AWARD

WINNER

TRAKJAK

By PAURIC FAY ENTERPRISES

Designed primarily as a safer way to jack up and support the rear of a tractor, particularly with its wheels off, Trakjak is the brainchild of Irish contractor Pauric Fay.

Born out of the export industry, where there is a constant need to take back wheels off for thorough cleaning and shipping preparation, the device makes use of the tractor's rear linkage to safely lift its own rear-end off the ground.

To work, the rear linkage is connected to a frame which runs under the rear of the tractor. When the frame is lifted via the linkage, it essentially 'levers' the tractor up in the air.

Once raised, the tractor is supported on Trakjak's solid wheels, and can even be driven around the yard with the tractor's rear wheels removed (with four-wheel drive engaged). This means the wheels can be safely removed in the workshop then the tractor is taken out for a wash, for example. Trakjak is certified to a 12-tonne lifting capacity

Pauric Fay receives IAGRE SSAB Safety Award

IAGRE STUDENT AWARD

Cennydd Hughes

IAGRE Student Award winner Cennydd Hughes

The IAgrE Student award was won by former agricultural engineering student, Cennydd Hughes from Llangennech. At college, Cennydd completed a brief to design and manufacturer or modify a piece of agricultural machinery.

His lecturer at Coleg Sir Gar who nominated him said "Cennydd designed and manufactured a multi-purpose machine able to carry out a number of tasks including log splitter and grab which can pull out wood from a stack. The machine could also be used as a tyre bead breaker which splits the tyre from the rim"

Whilst at Coleg Sir Gar, Cennydd who now works at the Narberth branch of the Tallis Amos Group, won the Gwili Jones commercial award during his college course.

INNOVATION WINNERS AT LAMMA

The overall winner of the LAMMA 2016 Innovation Award, sponsored by SSAB was **Target Set Technology** for its Side Ridge injection system that injects liquid products directly into the root zone when the crop is growing. Other winners were the **Kverneland 2500** Isobus reversible plough which allows for plough setting to be made from the tractor cab; the **Vicon Fastbale** non-stop round baler and wrapper combination and the Bryce Suma Post Driver incorporating the **Rockspike** Engagement system

Target Set Technology

Kverneland 2500-I reversible plough

Vicon Round Baler

DOUGLAS BOMFORD TRUST

The Douglas Bomford Trust,
The Bullock Building, University Way, Cranfield,
Bedford MK43 0GH
Telephone: +44 (0)1234 750876
www.dbt.org.uk enquiries@dbt.org.uk
Secretary: Paul Miller
Administrator: Elizabeth Stephens

NEWS

Research Projects/PhD's

Four of the PhD students that are partially funded by The Trust were scheduled to give presentations of their work at the South East Midland Branch AGM on 8th November as follows:

Alexandra Cooke (Cranfield University) on "Filter socks as an effective end-of-pipe solution"

Iain Dummett (Cranfield University) on "Strip tillage and soil health, comparing within and between rows"

Agnese Mancini (Cranfield University) on "Optimising soil erosion control and runoff management in forage maize"

Anthony Millington (Harper Adams University) on "An investigation into the effects of soil compaction and tillage on plant growth and yield of winter barley".

Unfortunately, Anthony was ill and could not take part. The other three students gave impressive accounts of their work with Iain being awarded the prize for the best presentation.

ABOVE: Douglas Bomford Trust students (left to right), Agnese Mancini, Iain Dummett and Alexandra Cooke

Studentships

A total of twenty applications for Douglas Bomford Trust scholarships were received from students at Harper Adams University and shortlisted candidates were interviewed by a panel comprising Antony Burgess and David White as trustees and the secretary Paul Miller on 18th November 2015. A separate application was received from an MEng student studying mechanical engineering at Cambridge University and the student, Martina Cheadle, was interviewed by Peter Redman and Paul Miller on 20th January 2016. The standard of the written applications and presentations at the interviews was very high – two of the students from Harper Adams University made applications detailing a project that they wished to undertake and the panel decided that these should be supported as small projects outside of the studentship scheme. Two grants have now been made to:

Thomas James for a final year project entitled "An investigation into improving hydraulic component efficiency through the use of additive manufacturing processes"; and

Tom Spinney for a project concerned with developing a control system for a flail hedge trimmer.

As a result of the selection process, five studentship awards were made to students at Harper Adams and these will be presented at a special event on 17th February 2016. An award was also made to Martina Cheadle at Cambridge University. We wish our students well and look forward to hearing of their progress.

Travel Awards

The Trust, together with AGCO/ Massey Ferguson, contributed towards a group of thirteen students from Harper Adams University visiting the Agritechnica exhibition in Hanover, Germany in November 2015. The students travelled from Manchester airport on the Thursday evening and spent two days (Friday and Saturday) at the exhibition. The Group prepared a comprehensive report of their visit that was submitted to The Trust and showed that they were all impressed by the scale of the exhibition and the machinery on show. Different individuals highlighted the exhibits that they had found of particular interest and aspects of the show that was relevant to their interests and future aspirations. Further details of the visit can be obtained from The Trust's office.

Interested in working with the Douglas Bomford Trust?
The current Secretary of The Trust has indicated to The Board of Trustees that he wishes to reduce his work for The Trust over the next twelve months. If you are interested in working with The Trust in this capacity, please contact the Douglas Bomford Trust office. Tel: 01234 750876 or enquiries@dbt.org.uk

ABOVE: Group of Harper Adams University students on the AGCO/Massey Ferguson stand at Agritechnica in November 2015.

TIME TO BE DISRUPTIVE

DISRUPTIVE technology? The phrase was used by Professor Simon Blackmore from Harper Adams University on a recent BBC Radio 4 Farming Programme. He was talking about the development of drones, autonomous vehicles, and other technologies which he described as "disruptive". It's a term commonly used across the UK University and research base.

So what is a disruptive technology? According to Clayton M. Christensen, a Harvard Business School professor, a disruptive technology is *a new emerging technology that unexpectedly displaces an established one*. In this respect, the things that Simon talks about broadly meet the definition of "disruptive".

It is not difficult to think of a number of developments that would fall under this definition; mobile internet, cloud storage, autonomous vehicles, the internet of things, 3D printing, renewable energy all come to mind. Some are born out of necessity whilst most would appear to fall into place and become the norm.

Take the Apple iPhone. Less than ten years ago touch screen technology did not exist but with over 700 million units sold it is now part of our daily lives. Take a look at most modern tractors cabs and they are smothered with this technology. Who would have thought this possible just ten years ago? How will it evolve over the next ten years?

In the agriculture world, a very interesting article by Jim McClelland for the content marketing agency Raconteur cites; data preserved in soil through mapping; aquaponics that bring together fish and plant farming; and harvesting solar energy to desalinate sea water as disruptive technologies relevant to the agricultural industry.

Whilst these sound exciting and innovative, it could be argued that many of the developments in farm mechanisation, the work of our agricultural engineering forefathers is nothing more than evolutionary.

The move from the horse as the primary source of draft to the tractor is hardly disruptive. Fundamentally, the oil fuelled engine replaces the heart and muscles, and the wheel engages with the soil to achieve forward traction in a similar way to the hoof. What is the difference? Was it that disruptive?

However, as machines get heavier, soils become more damaged, the climate changes, and the world population expands, are we now at a tipping point where something new, something truly disruptive is needed?

THE recent LAMMA show should present a great opportunity to view a few disruptive technologies. There were many new product launches and a fantastic array of tractors machines and attachments. Innovation is celebrated and prizes awarded.

But was there anything truly disruptive? Equipment that was bigger, heavier, more complex, sometimes less complex, definitely more controllable with higher levels of adaptability. There was integration with precision farming methodologies, often more environmentally friendly, using new materials, plastics, ceramics, with elegant design. LAMMA was a technologists dream, the enthusiastic show visitors were eager to understand how it might all might impact on their business. Great testimony to the engineers and technologies working hard behind the scenes

The technology on show at LAMMA was impressive by any measure and shows how the agricultural engineering industry has innovated to produce farm machinery and equipment that our elders could only dream about. There were examples of innovations that build on systems and technologies developed across wider engineering and science, and applied to the process of mechanised food production. Materials used and engineering production unheard of a generation ago.

Impressive yes. But a question remains.

Was there anything truly disruptive? Was there anything to suggest that things will be different in ten years' time as a result of that technology? Was there a product or method that would leave industry commentators buzzing with enthusiasm? Was there anything which met Clayton Christensen's original definition of a new emerging technology that unexpectedly displaces an established one?

I'm not sure there was

So . . . how long do we have to wait to see something which stops us in our tracks? Something that leaves us saying "wow"? Something akin the music of David Bowie back in the seventies where we look back and say "that was a defining moment, and I was there!"

A vertical farming system perhaps, a growing method that uses no soil and leaves no significant carbon footprint, a primary source of power that leaves a much lighter physical impact on or precious soil, a cultivation system that somehow leaves the soil structure intact.

Some come on you engineers. It is time to be disruptive!

NEW FEATURE

Contributions are invited for this new feature in Landwards. The aim is to present original, perhaps contentious or provocative opinion by IAgrE members on an industry related topic. Authorship will be credited if requested or appear under the nom-de-plume of ***The Engineer****. Copy for consideration should be around 750 words and be sent to the Editor (chris.biddle@btinternet.com)*

MEMBERSHIP ENQUIRIES
IAgrE The Bullock Building, University Way, Cranfield, Bedford MK43 0GH
Telephone 44 (0) 1234 750876 Fax: 44 (0) 1234 751319
e-mail: secretary@iagre.org www.iagre.org

COUNCIL MEETING 11 FEBRUARY 2016

INVESTMENT IN AGRI-FOOD RESEARCH AT CRANFIELD UNIVERSITY

Soil lane at Cranfield facility

Professor Leon Terry

Cranfield University played host to the February council meeting and created a very interesting afternoon programme that included an introduction to Agri-Food, presentations by PhD students and a tour of the Agri-Food facilities.

Welcoming council, Professor Leon Terry talked about the work and investment that has recently taken place at Cranfield to ensure it remains one of the largest and best equipped groups involved in research, consultancy and education in postharvest science.

Leon talked about the many changes and investment that have taken place since Professor Sir Peter Gregson took the helm. For example, Environment and Agri-Food is joining together to create a super theme and grants have been received to create two new Agri-tech centres.

He also spoke about the creation of four new academic posts in soils and Agri-Engineering, the plans to increase the number of PhD students to 100 by 2019 and the intention to maintain and build collaborative partnerships with multi-national food companies in the fields of technology and management.

Leon has also written a policy document presented to BBSRC that discusses the importance of integration between biology and agricultural engineering.

The first PhD student to present was Becky Whetton whose research is looking at particle approach to in-situ wheat crop canopies. Becky's project uses hyperspectral imaging of wheat canopies, a break-through technology that gives consistent and highly accurate results.

Iain Dummett's research looks at strip tillage and soil health. Iain is investigating the trade-off between optimising crop establishment and minimising the costs associated with tillage. By keeping crop residue on the soil surface, conservation tillage practices have been shown to reduce soil erosion.

Next to present was Angela Navarro who is looking at the early detection of latent fungal infections in soft fruits. The project aims to develop a new form of non-invasive, quality control system to improve production efficiency in agri-food industries. The intention is to develop a new type of optical based analyser to differentiate between healthy fruit and fruit with rot or latent infection.

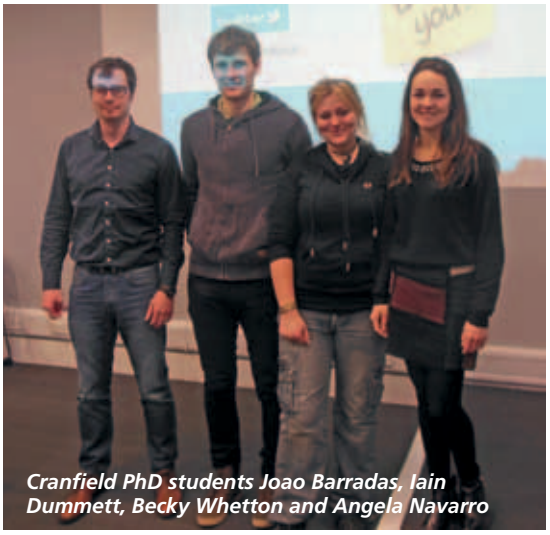
Finally Joao Barradas, a research associate at Cranfield, talked about optimising big data to drive sustainable intensification. This three year project is one of 15 agri-tech projects which was awarded funding

Professor Jane Rickson led tour of facilities

to allow for low and high speed testing. It can also be used to establish draught and vertical force requirements and tillage efficiency.

The erosion laboratory was fascinating and included a selection of pressurised and gravity fed rainfall simulators that can simulate any rainstorm at all. It allows the accurate simulation of temperature and tropical rainfall, drop size, intensities and kinetic energy conditions over a range of storm events.

As well as looking at erosion processes the laboratory can also evaluate the erodibility of slope forming materials, including soil, waste-rock and ores and test a comprehensive range of erosion control technologies.



Cranfield PhD students Joao Barradas, Iain Dummett, Becky Whetton and Angela Navarro

as part of the government's Agri-Tech strategy. The team is looking at an in-depth analysis of Big Data providing scientific evidence to support sustainable intensification and maintenance of soil health at a field, farm and enterprise scale. It is hoped that the findings will act as a catalyst for a step change in the way that Big Data currently generated is used.

SOIL AND WATER FACILITY

Professor Jane Rickson then led the group on a tour of the Soil and Water Management facility, a purpose built, state of the art resource for the advancement of soil dynamics, soil management and soil conversation techniques.

The group saw the soil lane, which is a 45m long, 5m wide and 2m deep and designed for whole vehicle testing. The 20m long soil bin can be prepared in layers to create a number of controlled and repeatable test profile conditions. It has instrument mounting points for the resting of cultivation equipment, tyres and sensors and a variable drive system

Testing equipment at Soil and Water Facility

Dr Robert Merrall, Andy Newbold and Alastair Taylor

The visit ended with a tour of the off-road vehicle testing lab, renowned internationally for its work in off-road vehicle dynamics. The centre was developed to look at machine and soil interaction.

It is equipped with a whole vehicle controlled moisture soil lane consisting of a large open top tank built into the structure of the building which provides a trough into which soil can be placed in a highly controlled manner. The water level in the bin is controlled to simulate a variety of conditions such as hard compact dirt roads and airstrips. Simulating extreme off-road environments helps to evaluate machines that interact with soil from rally cars and agricultural machines to tillage trains and tyres.

WREKIN BRANCH

Tracks on military vehicles, past, present, future
Mention tracks, off Highway or BAE and engineers begin to buzz. That's what happened at the first Wrekin Branch meeting of the winter season. **Dr Marcus Potter, Head of Mobility at BAE Systems** addressed a full house mix of members and students outlining vehicle and power systems development on *12 October 2015*
His career had included Airbus, fuel cell developments for the military especially tank developments. He seamlessly slid through many engineering principles from drag coefficients to hybrid engines, energy sources and the like on such vehicles ensuring the audience were both entertained and informed. Who would have really acknowledged drag coefficients of a tank were vital alongside routine transportation needs to the battleground, operational fuel requirements and tactical demands.
The needs of future fighting vehicles in support of battle needs further suggested possible unmanned units, lightweight with a low signature for operations. Implications of secrecy in designs were alluded to which suggested intrigue for listeners though all were able to leave the room afterwards.

Efficient Water use and irrigation system developments
Without irrigation water much crop production in the UK would be seriously challenged or be unsustainable. The evening (*9 November 2015*) spent considering what reserves are held and licensing needs alongside equipment developments was highly topical. **Dr Jane Whiteman of the Environment Agency** succinctly outlined the licensing procedures for the UK and in particular the local area of Shropshire, Hereford, Worcester and Gloucestershire.
The need for water security both for on farm and other users was highlighted at various levels of critical flow in the relevant rivers with the EA looking to have a light touch low risk approach on water management. She highlighted that actually UK may have less water available per unit area than some Mediterranean countries.

Anthony Hopkins of Wroot Water Systems, Chairman of the United Kingdom Irrigation Association then took over emphasising efficiency being linked to a number of factors not the least of which was applying water to match the infiltration capacity of the soil in question. He outlined systems available in the UK to suit crop use which ranged from the 'standard' now of hosereel / raingun use to booms, linear move, sprinkler and drip irrigation, a speciality of Wroot Water.
Emphasising system planning to optimise both water and energy demands across all systems he suggested savings in time, energy, cost and water all were possible.

Designed for the job
Richard Smalley, one of Wrekin branch committee members provided members with a challenging meeting (*7 December 2015*) by presenting a stimulating review of his engineering life and developments. By introduction to the subject he described and showed the very first ditch cleaner he designed and built which sold for £67 10s in 1967. His wife, present in the audience, affirmed that her efforts as a salesperson ensured her first washing machine purchase! He reminded members that he was the first (or very close to that) to introduce the independent mini excavator, powered by a Lister SR1 air cooled engine powering the hydraulics. Such a compact and manoeuvrable unit allowing access to confined spaces and self-loading onto transport between sites questioned the need for a spade on many construction sites. 100 machines were sold to Japan in 1967, a significant and worthy order at the time. His long and enthusiastic career was highlighted by the many variations on a theme pressing small tracked digging vehicles into grave digging, canal dredging, Channel tunnel access tunnels, forestry and timber work. Equipment described included an intriguing development of an automatic locking track oscillating system (ALTOS) providing a self-levelling operation on steep angles. Bringing his presentation bang up to date he challenged listeners to comment on his latest plans for a combined self-propelled timber billet producer and transport system for the energy market.
Bill Basford

Smalley canal dredger

EAST MIDLANDS

Visit to Grimme UK Ltd
A very impressive turnout of 24 members including a few new to evening meetings were given a warm welcome to Grimme's UK headquarters near Boston on 8 December 2015.
The UK and Irish potato crop is approximately 135,000 hectares which in an average year equates to over 6 million tons of potatoes, this has remained fairly static for many years although consumption habits have changed remarkably to much more processed rather than peel and cook your own. The other big change in the market over recent times has been the swing from many thousands of small acreage growers to an increasingly smaller number of much larger professional growers, the total number of which is estimated to be less than 3000 today.
Grimme UK competes in this market for all of the equipment a potato grower needs from de-stoners, to bed formers, planters and of course harvesters, they are now also big into sugar beet harvesting and through a specialist sister company called ASA Lift also compete in most other types of root vegetable harvesting.
The company started like so many successful agricultural engineering businesses from an entrepreneurial local blacksmith who saw a need for a specialist piece of equipment and started making it, in Herr Grimme's case a simple horse drawn potato spinner. That was back in 1861 and the company has grown through many innovations and technical leadership such as the first tractor drawn potato harvester in 1936 to be the world leader in potato harvesting technology today. They have factories and distribution wherever potatoes are grown and are present in 120 countries around the world.
In the UK they started their fully owned distribution company in 1993 building the first phase of the impressive premises back then and recently opened the second expansion phase. In the UK they sell and support their products through a dedicated and highly specialised dealer network with 18 dealers covering 30 outlets, 5 of which are fully owned by Grimme, these being at Glenrothes, Shrewsbury, Swineshead, York & Dublin. The premises at Swineshead houses both Grimme UK and the Grimme retail dealership.
We were treated to a fascinating talk about the market, the company and the technology involved in the products by a very enthusiastic team of Grimme Sales and Service members including Russell Button, Sean Garrard, Stuart Smith and Dan Griffiths this was followed by a tour of all the facilities and a good look of some very impressive machinery. If you think combine harvesters are big and high tech then take a close look at a Grimme self-propelled potato or beet harvester and you find bigger, more technology and a price tag of up to half a million pounds. This is a very specialised business and Grimme as market leader are leading it in a very modern and professional way. The East Midlands group much appreciated a fascinating evening.
Peter Leech

NORTHERN IRELAND BRANCH

Training and technology for a modern agricultural machinery dealership
The IAgrE Northern Ireland Branch's November technical meeting was a visit to **Erwin Agri-Care, Antrim** to learn about how technicians are trained to maintain and service CLAAS products and the diagnostic tools they now use in the job. Erwin Agri-Care are CLAAS dealers in Northern Ireland and Donegal with bases at both Antrim and Limavady.
This presentation was given by Mark Wilson, CLAAS Regional After Sales Manager. In his introduction he described his own start in his agricultural engineering career, as a student at Ballymena Training Centre and Ballymena Technical College during the 1990s. He is now a CLAAS Regional After Sales Manager supporting dealerships throughout the northern half of Ireland.
The presentation described how technician skills have developed along with the evolution of machine design and service requirements. Technicians in the 1950s worked on basic hydraulic and electrical systems. The latest machines now have closed centre constant 210 bar pressure

hydraulic systems with electronic controls and sensors. Electronic diagnostics now have a vital role in checking performance of components and tracing faults.
A digital laptop installed with the CLAAS Diagnostic System (CDS) can be connected by plug in cable to the CAN bus system. This is a specialised twisted 2-wire based low interference internal communication network in a vehicle to allow communication between components (ECU's). The latest version of CDS can be connected to the machine via wireless connection either by Wi-Fi or remote telemetry where the same information can be transmitted without the cable connection. CLAAS telematics has the ability for remote diagnostic service via the internet for use by the dealership (or an appropriate specialist anywhere in the world) to solve problems.
Whilst an experienced fitter may recognise some diagnostic repairs from previous involvement with a specific machine, the ability to view the performance of individual components is a great time saver compared with the old alternative of swapping individual parts, demonstrated on a CLAAS Jaguar 960 self-propelled forage harvester by Master Technician (James Boyle)
At this stage, individual manufacturers tend to use their own developed systems, but the trend is to seek more standardisation across the agricultural machinery industry.

Human factor
The technical features of modern machinery are impressive but the human factor to use and maintain them is still all important so it is vital to recruit the best people to work in the dealerships. David Graham (Service Manager at Erwin Agri-Care) described the selection, training and ongoing evaluation process for their technicians.
CLAAS supports the LTA scheme, administered by I AgrE and complies with the training standards set by LANTRA (The National Training Association for the Land Based Industries). It is supported by the trade organisations in UK and Ireland including AEA (The Agricultural Engineers Association), BAGMA (British Agricultural and Garden Machinery Association) and FTMTA (Farm Tractor and Machinery Trade Association).
The LTA scheme has 4 levels: LTA 1 right through to LTA4. Those able to demonstrate exceptional diagnostic / technical ability in Year 4 can achieve LTA 4 and Master Technician status. This involves more training at CLAAS UK's Saxham HQ on specific product technical topics but also people skills including first aid, health and safety requirements, mentoring and customer liaison techniques. This year, Erwin Agri-Care has 5 people (4 based at Antrim and 1 at Limavady) due to complete their training.
Master Technicians are expected to keep themselves up-to-date with the wide range of CLAAS products and the latest developments like remote diagnostics. They need to be competent with the engines in CLAAS machines and this now includes Mercedes, MTU, Caterpillar, Deutz, DPS and FPT. I Agr E visitors were able to ask questions relating to recruitment process for trainee technicians and the use of diagnostic software. The chairman thanked all at Erwin Agri-Care for providing such an informative and enjoyable evening and especially to Mark Wilson, David Graham and James Boyle

Social evening at private museum
Northern Branch's I Agr E members and guests enjoyed their annual social evening during a visit to a County Down private museum on the farm of **Mr Norman Kerr**. His collection is based around engineering aspects of agriculture, related industries and rural life.
The range of items demonstrates how practical aspects of life have developed for rural families in the area.
The Kerr farm is located in the river Bann valley which was once a popular area for flax growing and the associated

linen processing industry. There were once 25 processing plants along the river, where water power was used to drive the machinery, until competition from cotton and synthetic fibres caused its decline. Flax was used in a wide range of both industrial and fashion applications. There is now only 1 working linen processing plant in the area.

Mr Kerr described with reference to display items, including some working 3 dimensional models, how the flax crop was grown, harvested and processed to extract the linen fibre. It was pulled, rather than mown, in the field to maximise fibre length and yield. The common method of exposing the central fibre was to submerse the plants in stagnant water until bacterial action (a process known as "retting") broke down the outer cortex.

The traditional terms for the steps in the subsequent process methods probably go back to when each was carried out using hand tools.

The collection also contains a display of the machinery and methods used in the subsequent process of colour printing onto the linen fabric,

Other features on display included early horse-drawn single row implements including a turnip seed barrow and an inter-row weeder; hand tools used in agriculture, tilting rake as used by a person seated on on a horse-drawn reaper; hand operated milk separators and the tools used in butter making, apple corers and peelers, and computer equipment used, during the last 30 years on the Kerr farm, to record dairy herd management data.

WEST MIDLANDS

Conservation work at Spencer's Farm

I had visited the farm of Jenny and Robert Spencer with another group a few years ago and had been impressed by the conservation work that had been done and the way it had been fully integrated into a mixed farm enterprise, being two farms worked together in separate units three quarters of a mile apart.

What also stood out was the way that they were working hard to make best uses of their facilities. This included mixing their own feed, using their best land to create race horse quality hay and even a small caravan club site.

In the low lying parts we were shown the 'scrapes', shallow water areas to encourage wading and birds and with the grass around able to be grazed. The pond had been made bigger with a large predator safe island and planting around it.

Being enterprising is a phrase that comes to mind. The main grain store and barn which also houses some of his machinery and the workshop had been given a few years ago. Yes, given if he removed it - however it was in Devon. His new almost completed cattle building with drive through feed passage was made from reclaimed steel work and corrugated panels. Robert did all the prefabrication himself with a 30 metre extension cable for his 415 volt welder. Hole drilling was done with his portable magnetic drilling machine. The building erectors said that his building went together with more accurate hole drilling than many commercial buildings. It all looked new as everything was properly repainted. By the time we got back to the farm house for tea and home-made cake it was dark so we were unable to fully see their front garden which won a 'Rugby in Bloom' award this year.

We were all impressed by the work being done and we all showed understanding by the tractor restoration project that had not progressed much!

William Waddilove

Jenny Spencer

Fascinating World of Land Drainage

It is always a delight to listen to an enthusiast and certainly that is what Rob Burtonshaw of **Farm Services Ltd** is when he spoke to our meeting on 3 November. They are a well-established midlands drainage firm. As he said, his grandfather drained Warwickshire, his father the Midlands and him England and Wales.

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

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

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

Rob also told us about his travels and observations when travelling on his Nuffield Scholarship to North America and northern Europe. Yes it is true that in the USA they have some very big machinery and laying lengths of drains that are incredibly long. A single run may use the same length of pipe that he uses to drain a whole field! He also told us how they manage field drains in Holland where the water level in the dykes may be higher than the drain pipes that are put in! (They put in intercepting drains) To combat sedimentation they regularly jet the drains clear. As he demonstrated with a wet sponge you can never over drain land all you are doing is removing excess water down to field capacity.

Thinking on our feet!

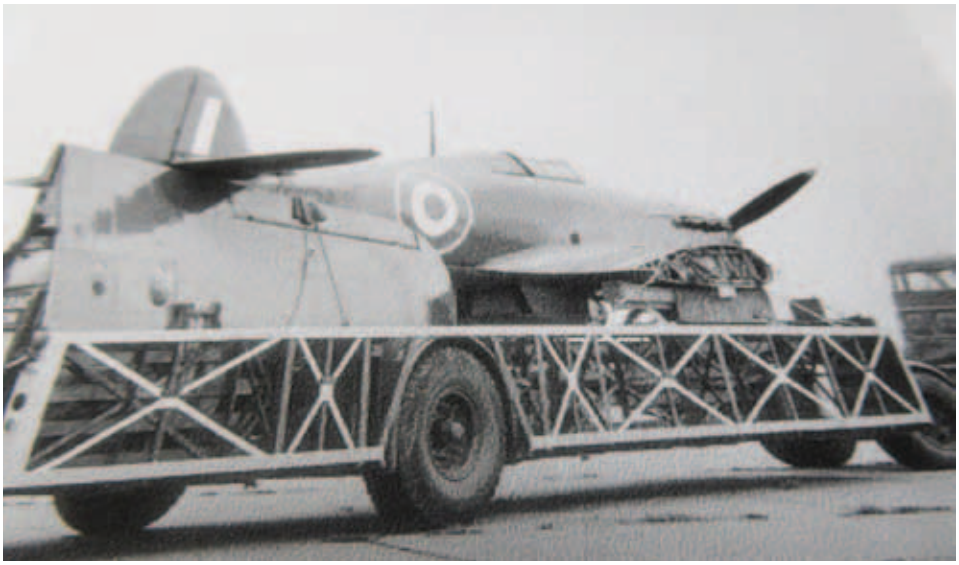
There is a saying in some engineering circles 'That we don't deal in problems, we only deal in solutions', well so it was for our meeting on 1 December

Two days before the meeting, the speaker phoned in sick. So what an interesting meeting we had. We saw Mike Sheldon's holiday pictures, well all the interesting ones about his visiting various tractor rallys and agricultural museums in Germany. They do have a very wide range of tractors only a very few of which we see in the UK. Plus a film about very heavy duty trailer hitches - a design by an Austrian company using an 80mm diameter ball hitch and a film on drain jetting machinery using a clever very high pressure water recycling system.

Ian Moore is professionally involved in the design of slurry tankers and related equipment both trailed and truck mounted. All this lead to some interesting discussions about their various merits (all without using any of my films because I had not had time to look at any emails to see the arrangements coming together!) The only problem of the evening we had was too many festive mince pies!

William Waddilove

Rob Burtonshaw



WESTERN BRANCH

Visit to Andover Trailers

A fascinating visit to the manufacturing plant **of Andover Trailers** for Western branch members on 27 January, one of the country's leading manufacturers of low-profile semi-trailers. The company blends heritage and tradition with some the highest quality bespoke trailers on the market today. During the visit, hosted by Andover Trailers Technical Director, Leonard Fuller, IAGRE members learned how the company design, build and supply transport solutions to move everything from huge radar equipment, nuclear waste containers to locomotives and boats. Virtually all the units leaving the factory are fully customised to the customer's exact requirements.

The origins of Andover Trailers are rooted in another former Andover-based engineering company, Taskers. Well-known in the agricultural sector for its farm trailers and implements, Taskers was founded by blacksmith Robert Tasker in 1809. The company became a major manufacturer of steam engines in the mid-19th century, a tradition that carried on until the 1920's. In 1932, a new company was formed after steam became obsolete, and the focus turned to the manufacture of semi-trailers.

Leonard Fuller shows off axle unit

It was a shrewd move by Leonard Fuller's grandfather, A. L Fuller, who was succeeded by Leonard's father, Arthur, and subsequently by Leonard himself. As the clouds of war loomed in 1938, the Air Ministry put out a tender to design and build trailers to transport fighter aircraft. Taskers were quick off the mark, and not only submitted a design but a fully working prototype within 10 days - and won the contract. The company supplied many hundreds of these celebrated units known as the Queen Mary trailer (pictured left).

Post war, life for many engineering small engineering companies became tough, and the Taskers name virtually disappeared after it was taken over by the huge John Brown Group. Andover Trailers was founded in 1968, after John Brown sold off a number of divisions. The company employs 68 people, and the engineering team design every aspect of the trailer or body, modelling in 2D or 3D CAD system. Skilled fabricators lay out the main modules of the trailer with high-specification steels. The main modules are welded together, then the final seam welding is carried out before the finished frames are shot blasted and painted. Once painted, the frames are fitted with axles and ramps, before hydraulic and pneumatic systems and electrical wiring are installed. Flooring follows before the functionality checks of a detailed pre-delivery inspection. Average build time for a bespoke trailer is around 12 weeks.

Chris Biddle

Andover Trailers built unit to carry Hitachi trains

Leonard Fuller

OBITUARY: Mervyn Billot 1925 - 2015

Mervyn Renouf Billot passed away on 19 September 2015, just days after his 90th birthday. He was born into a Jersey farming family at La Porte, in the Parish of St Saviour which had been a working farm for many generations with a dairy, breeding Jersey cows, growing potatoes, tomatoes, and flowers.

When war came Mervyn was evacuated to Bedford College together with other boys from Victoria College. When he left school in 1943, he joined the Royal Navy for the remainder of the war and was demobbed in 1945. He took advantage of the ex-serviceman's grant scheme and studied agriculture at Sparsholt and Agricultural Engineering at Chelsea College. While at Sparsholt, he and the instructor were the only two people who knew how to milk by hand and when the equipment failed one day they hand milked the entire herd!

He became a Graduate Member of the Institution of Agricultural Engineers and later a Member and an Incorporated Engineer. He worked for Ransoms Sims and Jefferies in Ipswich in the service, development and sales departments, and from there at Bomford Brothers of Evesham. In 1959, Mervyn returned to Jersey with his wife and three daughters when he took over the farm because his uncles could no longer manage. However, tragedy was to strike when the cattle herd caught Johne's Disease and was ordered to be slaughtered. It was back to England and to Bomfords and a short time living in a caravan in Upton–on–Severn while a new house was being built in Flyford Flavell.

In 1968, the family returned to Jersey where Mervyn set up his own company, Channel Industries Limited at La Porte, specialising in servicing and selling garden machinery. He was to run the business until 1990 when he retired.

While running the business, he joined the St. Saviour's Honorary Police, rising to Centenier. Then into Jersey politics, he was elected in 1981 as Deputy for St. Saviour No 3 and was to serve until 1989, serving on three Committees, Harbours and Airport, Postal, and the Resources Recovery Board, within the States of Jersey local government.

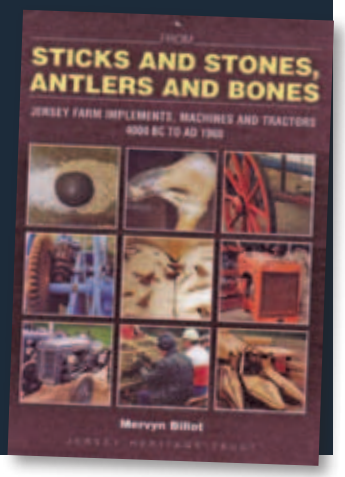
After retirement, new horizons beckoned and both he and his wife, Sheila, embarked on a series of sailing trips. He was a keen and enthusiastic sailor in local waters and his ambition was to sail along the French coast and into the Bay of Biscay and on to La Corunna, the north Spanish coast, then explore the Portuguese coast all the way round to Gibraltar. From there, they explored the Balearic Islands and more of the Spanish coast.

Mervyn also picked up on his other interest - local history with particular regard to agriculture and maritime matters. The one particular legacy my father will leave for us all to enjoy, is his book . A definitive history of agricultural machinery in Jersey; there are photographs of each and every implement ever invented and used since 4000 BC to AD1960. In 2008, Mervyn met HRH Princess Anne, the Princess Royal, who showed great interest in the book. Naturally, a copy of "Sticks and Stones" was sent to Buckingham Palace.

In Jersey, a local enterprise known as Pallot's Steam Museum is a wonderful 'Aladdin's Cave' of tractors and farming implements which are also featured in the book. There are also to be found many mechanical items manufactured by well known engineers, including a beautiful steam engine called Dolly May built at Ransoms Sims & Jefferies! Copies of the book are still available and can be purchased from the Jersey Museum, Pallot's Steam Museum, Waterstones, and the Royal Jersey Agricultural and Horticultural Society in Trinity.

Mervyn was a gentleman of the old school, a Jerseyman to his stubborn core and someone described as "very particular and demanding". He had robust views on issues, and had a very strong sense of public service. He was religious but in a very private sense. For a Jersey farming lad, and with an incredibly supportive wife and family, he led an interesting life and was never afraid to take on challenges.

In short, he was a farmer, engineer, sailor, writer, public servant and, above all, a dedicated family man.



OBITUARY: George Taylor-Hunt 1933 -2016

Born in 1933, George was old enough to sample a boy's appreciation of the excitements during the Second World War without, perhaps, understanding the enormity of the issues involved.

Whatever influences those early years had, George decided to take a diploma in Agriculture and this he did on one of the most practically-orientated courses available at the time at Writtle College from 1955-57.

After three years in Africa, George joined MAFF as a Drainage and Water Supply Officer. In 1968 he took up a post in the Advisory Service (Mechanisation) in Norfolk. Promotion followed, and in 1976 he moved to Northallerton, with responsibility for mechanisation advice to farmers in North Yorkshire.

Eventually, the call of Africa became irresistible, and he and

Margaret moved to Nairobi where George took up a post with the Government of Kenya. After three years he joined the International Potato Centre.

Thereafter, he spanned the link between agriculture and engineering throughout his career overseas. He completed his MPhil at Cranfield University, was an Incorporated Engineer and became a Post-Harvest specialist.

After farmers had toiled to produce, he deplored the high percentage of subsequent losses in store. His mission was to improve on this situation, and he did, with potatoes and other crops. Much of his work was carried out in Kenya and Tanzania. After 13 years in Kenya, he moved to Bangladesh for 5 years working on a food programme for the Canadian government. Only a few years ago he undertook an assignment through BESO in Uganda.

George was a stalwart, diligent and good-humoured Chairman of Tropical Agriculture Association (TAA) in the South-West for a decade, sharing the task with the late Bill Reed as Coordinator. He was a regular organiser of the TAA stands at Agricultural Shows and events, including supporting the annual BOAT (Bicton Overseas Agricultural Trust) tractor renovation scheme with which TAA SW is associated. His time-keeping at meetings was well-known and respected – making it easier for his successors! George also served faithfully on TAA Executive Committee with his ready wit and valued common sense.

He and his wife Margaret, continued to serve on the SW TAA Committee, including the preparation of this current year's programme and he gladly undertook to arrange and coordinate meals for the January AGMs at Exeter Golf & Country Club.

EAST MIDLANDS BRANCH

PIONEERING TECHNOLOGY SPECIALIST GROUP (PTSG)
Bygones and Model Engineering
A small but appreciate group came to the Marton Museum of Rural Bygones to be welcomed by the trustees who plied us with tea and homemade cake before we had a look round. I have visited before but as previously I found several exhibits that I had not seen before. The building is so full that that is not surprising but being with someone else makes you study things more.

Currently they are working hard to fully catalogue what they have got. That task is not helped by them not being sure what they have got, so when people like our group come it is very helpful. They are excitingly planning their improvements. One of their concerns it that the building is unheated and in the new plan there will be background heating in the winter and to get all exhibits under-cover.
Afterward we proceeded to the Warwickshire Exhibition Centre to the Model Engineering Exhibition to feast upon accurate scale yet working models of steam engines, workshop tools and even have a ride on a steam train. As ever it was hard to resist the temptation especially when you see that item and at such a reasonable price too.
Traction engines whether as road or field locomotives always fascinate full size or model are always worth studying. I lost track of members that had come to the exhibition but I was fascinated by gas turbines producing 7.5 horsepower and only five inches in diameter and rotating at nearly 200,000 rpm. Engineers always rise to the challenge.
William Waddilove

Visit to Marsh Seward, CLAAS dealership
Following our normal procedure of meeting the 2nd Tuesday of the month, 24 members and guests met on January 12th at the premises of **Marsh Seward** of Sleaford, a leading CLAAS Machinery dealer.
Again the Branch enjoyed an absolutely first rate visit. We were met and warmly welcomed by Tim Smith, General Sales Manager & Export Sales, who introduced colleagues from the sales, parts and workshop depts., who all played a big part in making the evening such a success.
Following the introductions, Tim gave a presentation detailing the Claas family and company history, then the Claas product time line, and where the various products are manufactured throughout the world.
Tim then went on to talk about the Marsh dealership itself, from it's early days. How the Company has grown and the structure and ethos of the Company which maintains its success. The word that Tim often used was "attitude". A good attitude across the board to employees and customers alike, proven by the fact many employees have been with the Company for many years, as have many customers.
Sales of new and second hand equipment is critical, and in a year when sales have seen a downturn, the turnover at Marsh's has remained constant. Tim went on to explain that there are 3 main options in customers purchasing S/H machinery: 1) basically sold as seen. 2). sold fit for purpose, having been totally checked over and sold with a warranty and 3) totally checked over and returned to nearly "as new" (including paint work) condition.
After this we split up and visited the sales department, workshops and the massive parts department, where we were met by enthusiastic staff who took us through each department, explained what was going on, and answered all our questions.
The final Q & A session was taken whilst we enjoyed an excellent and delicious buffet. It was just a great night, and sincere thanks to all who made it a very interesting and informative meeting.
Richard Trevarthen

MEMBERS NEWS

DEREK GREIG

Last November, Derek Greig received his Long Service Certificate commemorating 60 years of IAgrE membership which was framed and presented to him by his friend Brian Allsopp at the Care Home in Sussex where he lives.
He writes "Thank you so much for the Certificate which was a lovely surprise and wonderful 'pick me up' after losing my dog and companion Sparky recently.
Recalling my career, I spent a considerable amount of time in India when they were having troubles with their rice crop and with falling yields.We discovered that the fertiliser they were using was of little use as the nitrogen content was totally inadequate. Rectifying that, along with other refinement, led to substantial increase in crops and was a very satisfying achievement.
One amusing episode occurred when I was issued with airline tickets and told to get on my way urgently. I duly arrived in Timbuktoo, only to be met with blank stares from the local representative. When I contacted my office they said I should have been in Botswana, but had been given the wrong tickets. At least I can say that have been, albeit by mistake, to Timbuktoo!
So many episodes have lightened my life, particularly on my parent farm near where I once helped a local farmer re-capture an escaped Golden Eagle which has been harassing his lambs.
Thank you once again for this wonderful recognition".
Derek Greig

Derek Greig receives Certificate from Brian Allsopp

MEMBERSHIP CHANGES

ADMISSIONS

Fellow
Dr B Grieve, FIET, FHEA, FIAgrE (Yorkshire)

Member
Halsall R (East Midlands)
Dr P Pathare (Yorkshire)

Associate Member
Abbas J B (Electronic Member)

Associate
Violet C A (East Midlands)

STUDENTS

Brooksby Melton College
Addison B
Aylward J
Chapman R
Clarke E
Cooper JT
Cox DJ
Cropper N
Curtis AJ
Davies J
Driver R
East-Burke A
Flynn J
Geeson MT
Graham J
Grundy S
Weston J
Laird F
Lea N
Mitchell R
Parker A
Pearson J
Reffell-Stevens P
Richardson W
Ross F
Rutland S
Spells H
Tobin J

Coleg Sir Gar
Blackham RAB
Bowie LJ
Davies SR
Evans T
Hamer TS
Herbert RD
Hipkiss EI
Howells IJ
Hughes A
Lewis SE
Lloyd-Brewer LH
Martin DM
Mathias G
Mathias TW
Morgans GR
Owen C
Owen RW
Phillips S
Rees RW
Roach M
Sumner CJC

Greenmount College
Barr H
Byrne N
Campbell B J
Carson C J
Clarke N H
Coburn M
Connaghan B
Duncan J T
Dunn G
Finlay S R J
Hanna M
Junk N
Lagan J
Marshall S
McAlister M
McCann D
McCullough J E
McFadden M
McParland J
Montgomery S R
Moore A W J
Nairn C D
Porter T D
Robinson J A

Harper Adams University
Aldous-Ball HM
Ashton W
Barrett-Crosdil C
Baston GJ
Bennison WH
Blacker B
Bowman C
Calcutt KM
Carnell W
Chapman LP
Clark M
Clarke G
Cross JHC
Crossland JK
Cursham A
Davies JD
Day KJ
Devaney GJ
Dong B
Doonan C
Faulkner JE
Frawley P
Ge Y
Gowland NJ
Hamill GJS
Hamilton LJA
Hartshorn OA
Hauwaert M
Heaney P
Hewitt MAE
Hill BL
Hill OW
Hook WJ
Houghton JE
Hutchings N
Jenkins RO
Johnston J
Jones BJ
Jones F
Jones J
Jones T
Li L
Liang Y
Liu T
Livesey M
McNeill B
Mead TP
Mobbs A
Moore WTM
Morris J
Moss G
Nevin H
Nixon JE
Oliver R
Osmond WJR
Paton J
Payne E
Portman RJ
Roberts L
Robinson J
Shi G
Smyth ER
Thorpe H
Turnnidge SG
Turnock JJL
Underwood WP
Wang J
Wang S
Wang Z
Wilkinson J
Wilson CJ
Wood G
Xiong Y
Yang Y
Yu Z
Zhang M
Zhao D
Zhao L

Pallaskenry Agricultural College
Beirne E
Bowden J
Bulfin D
Burke S
Burns F
Canney C
Conway S
Duffy E
Dunne T
Fenton J
Flanagan A
Gilroy B
Gormally P
Gormley J
Hennebry J
Hickey C
Horan B
Jennings D
Kelly C
Kennedy J
Kierans M
Lacey T
Lenehan C
Linehan K
Linnane C
Loughney D
MacCarthy C
Maher S
Malone L
Mann P
Mather R
McCarthy VJ
McCarthy D
McDonnell I
McGettigan S
McGrath A
Meaney J
Minogue P
Miskella D
Molloy EP
Mulligan B
Norris B
O'Brien D
O'Brien M
O'Brien SJ
O'Callaghan L
O'Carroll KT
O'Connor A
O'Donoghue A
O'Reilly E
O'Shea M
O'Shea S
O'Sullivan M
Purcell E
Quinn L
Redmond J
Roche A
Ryan N
Sheehan E
Sheeran R
Sheridan LP
Stack P
Towey S
Traynor G
Walsh J
Ward B
Ward M
Whitney D

South West College - Omagh
Barclay GR
Crawford D
Dougan J
Farrell GIR
Fivey C
Hamilton M
Kerrigan J
Magee M
Maguire S
McCoy D
McCullagh R
McGirr C
McGlinchey A
McMany C
McMullan B
McNulty N
Newell S
Robinson D
Whiteside R

Tralee, Institute of Technology
Broderick K
Carroll P
Condell G
Donovan G M
Flanagan S T
Maher F
O'Conno E P
O'Hanlon J M
O'Regan D
O'Riordan S
O'Rourke T
Prendergast D T
Ryan S
Tracey D

Aristotle University of Thessaloniki
Balidakis A

RE-ADMISSION

Shipton P – AMIAgrE (Western)

DEATHS

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

Mr Mervyn Renouf Billot, IEng MIAgrE (Jersey) – a member since 1951
Mr Kevin Brian Leach, EngTech MIAgrE (East Anglia) – a member since 2014
Mr George Taylor-Hunt, MIAgrE since 1969 IEng since 1973

TRANSFERS

Fellow
Terry L A (S E Midlands)

Member
Carter R J D (S Eastern)

Associate Member

Associate
Baillie A (Scottish)
Crane L (East Midlands)
Lyons M (Ireland)
McGoldrick R (Northern Ireland)
Richardson T (Scottish)

ACADEMIC AND COMMERCIAL MEMBERS

ACADEMIC MEMBERS

Bishop Burton College
York Road
Bishop Burton
Beverley HU17 8QG

Brooksby Melton College
Asfordby Road
Melton Mowbray
Leics LE13 0HJ

Coleg sir Gar
Gelli Aur Campus
Llandeilo
Carmarthenshire SA32 8NJ

Cranfield University
Cranfield
Bedfordshire MK43 0AL

Duchy College
Stoke Climsland
Callington
Cornwall
PL17 8PB

Easton & Otley College
Easton
Norwich
Norfolk, NR9 5DX

Greenmount 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,
Bilsbarrow
Preston
Lancashire PR3 0RY

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

Pallaskenry Agricultural College
Co Limerick
Ireland

Plumpton College
Ditchling Road
Lewes
East Sussex, BN7 3AE

Reaseheath College
Reaseheath,
Nantwich
Cheshire, CW5 6DF

Royal Agricultural University
Cirencester
Gloucester, GL7 6JS

Sparsholt College
Sparsholt,
Winchester SO21 2NF

SRUC – Auchincruive
Auchincruive Estate
Ayr, KA6 5HW

Wiltshire College Lackham
Lacock
Chippenham
Wiltshire SN15 2NY

COMMERCIAL MEMBERS

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

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

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

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

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

Bomford Turner Limited
Salford Priors
Evesham,
Worcestershire WR11 5SW

City & Guilds
1 Giltspur Street
London EC1A 9DD

City Farm Systems Ltd
Paragon Studios, East Burnham Park
Crwone Lane, Farnham Royal
SL2 3SF

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

Douglas Bomford Trust
The Bullock Building
University Way, Cranfield
Bedford, MK43 0GH

FEC Services
Stoneleigh Park
Kenilworth
Warwickshire CV8 2LS

Fullwood
Grange Road
Ellesmere
Cheshire SY12 9DF

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

John Deere Ltd
Harby Road
Langar
Nottinghamshire NG13 9HT

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

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

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

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

IAGRE EVENTS

Tuesday 8 March 2016, 1900 for 1930
East Midlands Branch
Visit to Bailey Trailers Ltd
Venue: Bailey Trailers Ltd, Pride Parkway, Sleaford, Lincs NG34 8GL
Tel: 01509 215109
Email: richard.trevarthen@gmail.com

Wednesday 9 March 2016, 1830
Western Branch
Western Branch AGM
President's Address: Alastair Taylor, IAgrE CEO
Followed by Presentation
Vehicle and Plant Telemetry Systems
By David Lester, Head of Fleet Management, MAN Truck and Bus UK Ltd and Patrick Magee, Channel Account Manager at Microlise Ltd
Venue: Wiltshire College Lackham, Lacock, Chippenham SN15 2NY
For more information please contact Branch Chairman Rupert Caplet
Tel: 01235 522828

Thursday 10 March 2016, 8pm
Northern Ireland Branch
Unmanned Aerial Vehicles and Remote Sensing in Agriculture
Speaker: Dr Toby Waine, School of Energy, Environment and Agrifood (SEEA), Cranfield Univ
Venue: Drum Room, Glenavon House Hotel, Cookstown
Note: This meeting follows the Branch AGM which will be held at the same location commencing at 6.00 pm.
Please contact Branch Secretary Ian Duff for further information
Tel: 028 867 36977
Email: duffi@iagre.biz

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

Tuesday 15 March 2016, 1900 for 1930
East Midlands Branch
East Midland Branch Annual Dinner & AGM
Venue: Quorn Hotel Hotel, 46 Ashfordby Road, Melton Mowbray LE13 0HR
The evening will start with a two course dinner, pre-booked with Richard Trevarthen. Roast Beef or Vegetarian option Sticky Toffee Pudding or Cold desert selection or Cheese and Biscuits Tea and Coffee to follow. Please pre-book your meal before Thursday 10 March
Wives and partners welcome, cost £15.95 per head - pre-booking essential
Tel: 01509 215109
Email: richard.trevarthen@gmail.com

Tuesday 15 March 2016, 1900 for 1915
West Midlands Branch
West Midlands Branch AGM 1900
Venue: Friends Meeting House, Stratford upon Avon, CV37 6XT
Dr Mark Cooper will give the Presidential Address and take questions from the Members present. Following this, he will give a short presentation entitled 'Workplace Transport Accidents in Rural Industries', centred around vehicle stability.
We desperately need new Members to join the Committee. It is not an onerous job and only involves one or two evening committee meetings a year. So please do consider this. The Branch Committee needs new members with new ideas and initiatives. It also looks good on your CV! Please give Mike a call (or e-mail) and he can appraise you of what is involved.
Please contact Branch Secretary Mike Sheldon for more information
Tel: 01926 498900
Email: michael-c-sheldon-iagre@outlook.com
Download: WM_AGM_Papers_15_March_2016.pdf

Wednesday 23 March 2016, 1930
South East Midlands Branch
Advances in Field Spectroscopy Applications
Speaker: Abdul Mouazen
Venue: Cranfield University
Field spectroscopy in the visible and near infrared range has gained considerable interest from scientists working in precision agriculture. This talk will shed the light on fundamentals and problems encountered and propose practical solutions for the implementation of field spectroscopy. Case studies on variable rate fertilisations including nitrogen and phosphorus will be discussed and concluded.
Contact John Stafford, Branch Secretary, for more information
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk

Thursday 14 April 2016, 1930
South East Midlands Branch
Nat Sprayer Test Scheme
Speaker: Duncan Russell, AEA
Venue: St Neots
Details to follow
For further information contact John Stafford, Branch Secretary
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk

Monday 9 May 2016, 1930
Wrekin Branch
Latest Developments in Engine after Treatment - Topic & Speaker to be confirmed
Venue: Agricultural Engineering Innovation Centre at Harper Adams University
Tea & Coffee will be served from 1900.
Contact Branch Secretary David Clare for more information
Email: dclare@harper-adams.ac.uk

Thursday 8 September 2016
IAgrE Forestry Engineering Group
FEG Symposium 2016
Venue: Newton Rigg College, Penrith CA11 0AH
Dates from Newton Rigg have been confirmed and we will be holding this year's FEG Symposium on Thursday 8th September starting at 0930hrs registration from 0900hrs.
Cost to be set at £100 plus VAT £120. Student £25 plus VAT £30
Our main focus this year will be the hot topic of Flooding, and looking at how Forestry and Engineering can contribute to reducing impacts downstream.
Rory Stewart, Minister for Forestry at Westminster and local MP, has been approached to do the opening address.
International speakers will present papers on subjects such as Flooding, Environment and Recreation, to allow comparisons to be made with how forests and forestry engineering are managed in France.
Further papers will be chosen from;
Alan Eves – Yorkshire FD
Tom Nisbet – Forest Research
Speaker from – Dundee University
Heather Forbes – SEPA
Hugh Chalmers – Tweed Forums
Conor Price – Scottish Borders Council
Summing up for us at the end of the day will be Alastair Taylor CEO IAgrE
Booking details to follow shortly. Further info: 0131 464 0500
Email: bruce.hamilton@forestry.gsi.gov.uk

Wednesday 16 November 2016
IAGRE Annual Conference
Harper Adams University
Theme: **Agri-Tech – Engineering a New World**
Further information and booking details to follow

OTHER EVENTS

Wednesday 2 March 2016
EMESP
East Midlands Engineering & Science Professionals Prestige Lecture
Venue: Nottingham Albert Hall
Lecture Title: The London Crossrail Link
Please contact Richard Trevarthen if you have any questions
Email: richard.trevarthen@gmail.com
Web: www.emesp.org.uk/

Wednesday 2 March, 9.00-15.30
UKIA
UKIA Conference - Water Security & Food Security
Speaker: Various
Venue: Orton Hall Hotel, Peterborough PE2 7DN
We have a great line up of leading experts to discuss the latest thinking on these key issues. PLUS two special guests - Professor Tim Benton who is UK Champion for global food security and Professor Joaquín Andreu Álvarez from the University of Valencia who is one of Spain's leading drought management experts.
This conference is aimed at all farmers and growers who irrigate, consultants, suppliers, and researchers who want to make sure that agriculture gets a fair share of UK water resources.
For full details and to book please visit the UKIA website below
Web: www.ukia.org/

8 & 9 March 2016
Global Soil Partnership
GSP - Third European Soil Partnership (ESP) Workshop
Venue: FAO HQ, Rome, Italy
This workshop is an important event as it will be an opportunity for the European Soil Partnership members to discuss about the governance arrangements of this partnership and the finalization of its regional implementation plan for all GSP pillars.
Web: http://www.fao.org

9 March 2016, 10.30-15.00
Agri-Tech East
Big Data & Remote Sensing SIG: DEFRA Data – Opening Up The Treasure Trove
Speaker: Keynote: Jeni Tennison, OBE - Technical Director and Deputy CEO, Open Data Inst
Venue: Rothamsted Research, Harpenden, Hertfordshire, AL5 2JQ
In June 2016 DEFRA will be releasing over

The Institution of Agricultural Engineers

Notice of Meeting

Notice is hereby given that the Seventieth Annual General Meeting of the Institution will be held at JCB Rocester, Staffordshire ST14 5LS on Thursday 28th April 2016 at 10.30am.

Agenda

1. To receive and confirm the minutes of the sixty-ninth AGM held on 30th April 2015.
2. To propose as an Ordinary Resolution:
   "That the Annual General Meeting authorises the Council of the Institution to review members' subscriptions and to make such adjustment, if any, as may be required with effect from 1 January 2017".
3. To consider and adopt the Report of Council for the year ending 31 December 2015.
4. To receive and adopt the Accounts for the ending 31 December 2015.
5. To announce nominations for election to Council for the 2016/2017 Session.
6. To re-appoint Lander & Co, registered auditors, as reporting accountants and to authorise Council to fix their remuneration.

By Order of Council

A.J.Taylor.

Alastair J Taylor
Chief Executive & Secretary
11 February 2016

Note:
Admission to this meeting is not subject to ticket entry but attendance is restricted to registered members of the Institution. Only Corporate members are entitled to vote. Papers may be found on the website or are available by request from the Secretariat.

All Members Welcome, please confirm your attendance to Sarah McLeod secretary@iagre.org

8,000 data sets from its reserves, which are estimated to be worth "billions" to the UK economy, according to DEFRA Secretary of State Liz Truss (read her speech here). This event aims to understand better the implications for farmers about this data release, and identify the new technical opportunities and business models created for UK SMEs and farmers to gain competitive advantage and contribute to sustainable intensification.
Web: www.agritech-east.co.uk/events

22 March 2016, 16.00-19.30
Agri-Tech East
Pollinator: Undercover Agents – New Technologies for Controlled Environment Production
Venue: Sainsbury Laboratory, Cambridge University, Bateman Street, Cambridge, CB2 1LR
Growing under cover has enabled an extension of the growing season and an increase in quality of many high value crops, but how can you make the most of being in a controlled growing environment? How can you increase your profit margins, cut your costs, or increase efficiency? We'll be hearing from research and entrepreneurs about some of the latest technology in development that could help you do just that, as well as looking at some of the most innovative – and unusual – enclosed growing spaces.
Delegates will also be treated to an insider-tour of the state-of-the-art glasshouses supporting the work of the Sainsbury Laboratory. We'll be finding out more about insect pollination undercover, managing diseases in containment, and new technologies to keep the plants happy and health.
Web: www.agritech-east.co.uk/events

22 March 2016, 9am – 1.00pm
Priorities for the UK food and drink industry – implementing the 25-year food and farming plan
Central London. Organised by the Westminster Food & Nutrition Forum
This conference will bring together policymakers and key stakeholders to assess the priorities for the sustainable growth of UK's food and drink industry. It will be a timely opportunity to discuss Defra's industry-led 25-year plan to boost the growth of the UK's food and farming, being released early this year, focusing on growing exports and trade, increasing competitiveness, technology innovation, investment and developing skills and employment within the industry.
Speakers
- **Angela Smith MP** – Member, Environment, Food and Rural Affairs Select Committee (Chair)
- **John Stevenson MP** – Chair, All-Party Parliamentary Group on Food and Drink Manufacturing (Chair)
- **Sarah Church** – Director, Food and Farming, Department for Environment, Food and Rural Affairs
- **Jayne Brookman** – Head of Food, Knowledge Transfer Network
- **Catherine Brown** – Chief Executive, Food Standards Agency
- **Professor Timothy Lang** – Professor of Food Policy, City University London
- **Ian Meikle** – Head of Agriculture and Food, Innovate UK

www.westminsterforumprojects.co.uk

Tuesday 12 April 2016
AEA ***AEA AGM & Conference***
Speaker: Guy Smith, NFU & Michael Portillo
Venue: One Great George Street, London
For full details www.aea.uk.com

22 April 2016
Women's Engineering Society
WES Annual Conference
Venue: IET Headquarters, Savoy Place, London
www.wes.org.uk

26-29 June 2016
EurAgEng
CIGR-AgEng 2016
International Conference of Agricultural Engineering
Aarhus University
Aarhus, Denmark
http://conferences.au.dk/cigr-2016

24 & 25 October 2016
South Bank Consulting
CropWorld Global 2016
Venue: Amsterdam RAI, Netherlands
Includes Exhibition, Congress & 4 Briefings across 2 days
Web: http://www.cropworld.com/

UP TO DATE INFORMATION ON FORTHCOMING EVENTS CAN BE FOUND AT WWW.IAGRE.ORG/EVENTS

EVENTS OF INTEREST

MARCH 2016
18/03 - 03/04 Ideal Home Exhibition, Earls Court, London
www.idealhomeshow.co.uk

19-20 West County Game Fair, Shepton Mallet
www.westcountrygamefair.co.uk

31 CountryTastic,
Three Counties Showground, Malvern
www.threecounties.co.uk/countrytastic

APRIL 2016
16-17 BASC Gamekeepers Fair
www.bascgamekeepersfair.co.uk

26-28 The Commercial Vehicle Show, Birmingham NEC
www.cvshow.com

21-24 Harrogate Spring Flower Show
www.flowershow.org.uk/spring-show-2015

MAY 2016
2 North Somerset Show
www.nsas.org.uk

14-15 Nottinghamshire County Show
www.nottinghamshirecountyshow.com/

11-13 Balmoral Show, Belfast
www.balmoralshow.co.uk

19-21 Devon County Show
www.devoncountyshow.co.uk

21 Fife Show
www.fifeshow.com/

21-22 Royal Welsh Spring Festival
www.rwas.co.uk/spring-festival/

24-28 Chelsea Flower Show
www.rhs.org.uk/shows-events

28 Shropshire County Show
www.shropshirecountyshow.com

28-29 Herts County Show
www.hertsshow.com

30 Surrey County Show
www.surreycountyshow.co.uk

New marketing materials available for IAgrE members

A selection is shown below

- General IAgrE Membership Brochure
- Academic and Commercial Membership
- Student Membership Benefits
- Engineering Technician Brochure
- PowerPoint Presentation

Please contact the IAgrE Secretariat if you would like a copy, or visit www.**iagre**.org to download an electronic copy.