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Landwards

100% GREEN

SOMERSET CHEESEMAKER RUNS ON RENEWABLE ENERGY

In this issue

IAgrE

Biosystems Engineering

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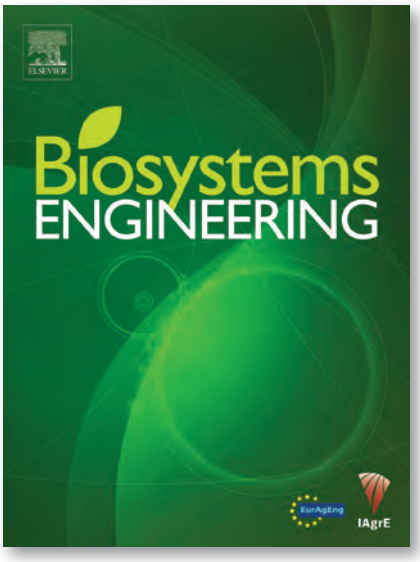

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The Managing Editor of Biosystems Engineering, Dr Steve Parkin, has kindly summarised some of the papers published in the last three issues of which he thinks may be of interest to IAgrE members

Biosystems Engineering
Volume 145, May 2016, Pages 65–75
Object recognition algorithm for the automatic identification and removal of invasive fish
Dong Zhanga, Dah-Jye Lee, Meng Zhang, Beau J. Tippetts, Kirt D. Lillywhite
Sun Yat-sen University, Guangzhou, China
Shunde International Joint Research Institute, Shunde, Foshan, China
Brigham Young University, Provo, UT, USA
Smart Vision Works International, Orem, UT, USA

Invasive fish species are a growing threat worldwide, causing great harm to biodiversity and ecosystems, and leading to large economic losses. As the most introduced group of aquatic animals in the world, fish are also one of the most threatened. For species that are considered invasive, removing them is the best way to reduce the long-term cost of eradication or control. This paper proposes an object recognition algorithm to automatically identify fish species. Our previous work on general object recognition was modified and adapted to construct features to classify different fish species. The proposed algorithm does not depend on human experts to design features for fish species classification, but constructs efficient features automatically. Results from experiments show the proposed method obtained an average of 98.9% classification accuracy.

Biosystems Engineering
Volume 146, June 2016, Pages 114–132
Special Issue: Advances in Robotic Agriculture for Crops
Ambient awareness for agricultural robotic vehicles
Giulio Reina, Annalisa Milella, Raphaël Rouveure, Michael Nielsen, Rainer Worst, Morten R. Blas
University of Salento, Lecce, Italy
CNR-ISSIA, Bari, Italy
IRSTEA, Aubière, France
Danish Technological Institute, Odense, Denmark
Fraunhofer IAIS, Sankt Augustin, Germany
CLAAS Agrosystems GmbH, Nivaa, Denmark

Robotic technology has been increasingly employed in agriculture to develop intelligent vehicles that can improve productivity and competitiveness. Accurate and robust environmental perception is a critical requirement to address unsolved issues including safe interaction with field workers and animals, obstacle detection in controlled traffic applications, crop row guidance, surveying for variable rate applications, and situation awareness, in general, towards increased process automation. No single sensor exists that can guarantee reliable results in every scenario. The development of a multi-sensory perception system to increase the ambient awareness of an agricultural vehicle operating in crop fields is the objective of the Ambient Awareness for Autonomous Agricultural Vehicles (QUAD-AV) project. Different on-board sensor technologies, namely stereovision, LIDAR, radar, and thermography, are considered.

Biosystems Engineering
Volume 147, July 2016, Pages 183–192
Comparison of methods for estimating the carcass stiffness of agricultural tyres on hard surfaces
Paula A. Misiewicz , Terence E. Richards, Kim Blackburn, Richard J. Godwin
Harper Adams University, Newport, Shropshire, UK
Cranfield University, Cranfield, Bedfordshire, UK

Loading soil via pneumatic tyres is a major cause of compaction of agricultural soils, which causes damage to the soil-water-air-plant system. This study was conducted to determine an effective method to measure the pressure distribution under a selection of pneumatic agricultural tyres. This was conducted initially on a non-deformable surface; a later study will consider pressures within the subsoil. From this the tyre carcass stiffness was determined and methods to predict carcass stiffness were evaluated. Carcass stiffness values obtained from the footprint area method gave results significantly lower (30–40%) than those obtained using the pressure mapping system. The technique of using the tyre manufacturer's specification data, where the estimation of the tyre carcass stiffness was calculated using the theoretical load that the tyre could support at zero inflation pressure, produced estimates that were within ±20% of the mean carcass stiffness determined using the pressure mapping system.

EDITORIAL: WIN SOME, LOSE SOME

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

SINCE the publication of the Summer issue of ***Landwards***, the result of the EU referendum means that everything has changed. But has it? Whilst huge question marks hover over the future funding of UK agriculture, the global challenges remain the same supporting the view echoed by our President Rob Merrall that "It has never been such an exciting time to be an agricultural engineer".

Having been given promises by the Treasury that farm support and agri-tech research will be underpinned until 2020, we appear to be in a limbo-period of four years, during which politicians have to build a sustainable and long-term agricultural policy for the UK.

As ever, factors such as the weather can boost or sink the best made plans. Benign weather in the UK during the harvest has been contrasted by dreadful conditions in France which has hit their export potential. One exporter of milling wheat has said that the UK could have up to one million tonnes of exportable surplus wheat this year.

Post referendum we've seen a spike in dairy cattle prices, sheep and arable prices, against which the value of farmland has been dented and is forecast to fall further in the coming months.

So planning for the future will be harder than ever, but the fact that a high proportion of the farming community supported the Out campaign means that there is a considerable feeling that change could bring about a boost to entrepreneurial enterprise.

For an example, in this issue look no further than Somerset where in the post-war years, Tom Clothier with his wife Ivy continued a cheese making tradition at Wyke Farms, based on recipes handed down over the years. Today, the third generation of Tom and Ivy's family have turned Wyke Farms into the largest independent cheese maker in the UK.

But that's not the whole story, it's the way the farm operates as a model of self-sufficiency that has caught the eye of the wider farming community, the food industry, media and politicians.

To produce enough recycled energy to power your cheese plant, the farm and its vehicles as well as local villages – and have enough surplus to sell a significant quantity of green gas to a major supermarket (Sainsbury) alongside their order for Wyke Farm cheese demonstrates that UK farmers are not short of innovative skills and enterprise.

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IAgrE is a founder member of EurAgEng, a licensed body of the Engineering Council and a founder constituent of the Society for the Environment

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OTHER FEATURES

LANDWARDS PRODUCTION TEAM
EDITOR: Chris Biddle Tel: 44 (0) 7785 295625 chris.biddle@btinternet.com
DESIGN AND PRODUCTION: Martin Hebditch
PUBLISHED ON BEHALF OF IAgrE BY: Chris Biddle Media

REPORT CRITICAL OF INACTION ON SOIL HEALTH

Rules 'too weak and don't enforce restoration'

The Government's ambition to manage the UK's soil sustainably by 2030 will not be met unless further action is taken, the All Party Environmental Audit Committee has warned in a report. Failing to prevent soil degradation could lead to increased flood risk, lower food security, and greater carbon emissions the report adds.

Environmental Audit Committee Chair, Mary Creagh MP, said: "Soil is a Cinderella environmental issue. It doesn't receive as much attention as air pollution, water quality or climate change. But, whether we realise it or not, society relies on healthy soil for the food we eat, for flood prevention, and for storing carbon. The Government says it wants our soil to be managed sustainably by 2030, but there is no evidence that it is putting in place the policies to make this happen. Soil degradation could mean that some of our most productive agricultural land becomes unprofitable within a generation".

"Every tonne of carbon we can retain in soil will help us meet our carbon budgets and slow climate change. The government wants to see all soils managed sustainably by 2030, but their current actions will not be enough to reach that goal."

The Government relies on rules linked to farm subsidy payments to regulate agricultural soil health. But the MPs warn that these rules are too weak, too loosely enforced, and focus only on preventing further damage to soil rather than encouraging restoration and improvement.

Monitoring changes in soil health over time is key to developing effective policy, says the report. The Department for Environment, Food & Rural Affairs (Defra) current ad hoc approach to conducting surveys of soil health is inadequate. The Government should introduce a rolling national-scale monitoring scheme for soil health to ensure that we have adequate information available about the state of the nation's soil.

See Membership Matters page 27

LELY TURFCARE GOES DUTCH

The turfcare activities of Lely in the UK, Ireland and Denmark has been acquired by Dutch company Royal Reesink NV.

These activities mainly comprise the distribution of Toro machines for the maintenance of golf courses and public green spaces and TYM compact tractors. Lely UK generated revenue of some €60 million in 2015 and has around 125 employees. Royal Reesink already handles the distribution of Toro machines in the Benelux through its subsidiaries Jean Heybroek and Packo.

Gerrit van der Scheer, CEO of Royal Reesink, says, "This acquisition adds the UK, Ireland and Denmark to the geographical spread of our activities and strengthens our position in the market for machines for the maintenance of golf courses and of public green spaces. Going forward, the activities will continue under the name Reesink Turfcare."

Lely Gerrit van der Scheer, CEO of Royal Reesink, left with Alexander van der Lely CEO of Lely Holding

NEW MD FOR JOHN DEERE

Jonathan Henry has been appointed the new managing director of John Deere Ltd in the UK and Ireland. He took over the role on 1 July 2016 from Antony Scott, who has retired after 40 years of service with the company.

Henry joined John Deere Limited as a management trainee in July 1993, following an HND in mechanisation, planning and business management at the Scottish Agricultural College, Auchencruive, and a spell in the service department of an agricultural dealership. From late 1993 he worked as an area manager product support in south-west England, and from 1997 to 2001 as a territory manager in the north of England and borders of Scotland.

Subsequent appointments included product manager of the then newly established agricultural management solutions (AMS) precision farming technology range, key accounts manager, combines product manager and division sales manager from January 2006. Since May 2015, he has been planning director for Deere's global crop harvesting business.

Jonathan Henry

£16 MILLION AGRI-TECH FUNDING

Taking innovations from concept to commercialisation

Twenty-four innovative agri-tech projects have been awarded a share of research **£16 million funding.** Through the latest round of the Government's Agri-Tech Catalyst, the aim is to solve some of the world's greatest agricultural challenges, from food security and sustainability to weed control and livestock disease.

This fifth round of the Government's Agri-Tech Catalyst, alongside industry co-investment, has provided awards between £200,000 and £1.5 million to pioneering science and technology projects within the UK's agricultural sector to help meet the global demand for food with the least environmental impact.

Successful projects include the development of a robot by Garford Machinery in collaboration with University of Lincoln that accurately eliminates and controls weeds, thus significantly reducing the use of herbicides in food production.

Another project will look at why potato greening occurs and how to prevent it – helping to reduce the 100,000 tonnes of potatoes thrown away annually.

Support has also been given to develop technology that will help fruit farmers monitor and control the storage of British apples – improving their availability window across the year and reducing the need for imports.

Farming Minister George Eustice said: "Although there has been great pressure on farm incomes over the past 12 months, I believe the industry has a good future and technological advances will help. Farmers have an essential role in building a strong economy and feeding the nation.

"Taking innovations from the laboratory to the farm is key to boosting productivity, and tackling pests and diseases"

The investment will help grow the UK's agri-tech sector, estimated to be worth around £14 billion to the UK economy, and employing over half a million people.

The Agri-Tech Catalyst was set up by the government with a £70 million investment to help make the UK a world leader in agricultural technology, innovation and sustainability.

The scheme helps take innovations all the way from concept to commercialisation, awarding grants for early stage, pre-industrial research feasibility studies, industrial research, and late-stage pre-experimental and experimental feasibility studies.

NO-TILL EVENT SHOWCASES HOLISTIC APPROACH

The Groundswell No-Till Show held at Lannock Farm, Weston, Hertfordshire on 30 June 2016, brought together several hundred farmers, agronomists, engineers, machinery manufacturers and importers for an information exchange with live demonstrations and seminars on no-till, cover cropping, mob grazing and practical conservation agriculture (CA) in its many guises.

CA is a relative novelty in the UK which is lagging behind many other regions of the world with just 3.2% of (approximately) 6 million hectares of arable land managed under the system. The basic principles of CA comprise: minimal soil disturbance (in practice no-till is the goal); permanent soil cover (with crop residues and cover crops); and diversity in cropping (including rotations, associations and even agroforestry).

CA starts with the premise that soil is the most valuable asset of our agricultural sector and that insufficient attention has hitherto been paid to its well-being in terms of structure, fertility, biodiversity and health. Without healthy soils sustainable production increases are impossible to achieve. It is not a system that can be implemented solely through the acquisition of a no-till seed drill, it requires a holistic ecosystems approach that takes into consideration the complete crop (and animal) environment and its complex interactions with the landscape and beyond.

The No-Till Show provided a platform for an impressive and informative array of enthusiasts to discuss and demonstrate the essential interactions and synergies that make CA a powerful tool for increasing the food supply for the world's burgeoning population. "CA is relevant to farming systems throughout the world and holds great potential for farmers in the UK" says Brian Sims.

Further info: www.groundswellag.com

IN BRIEF

The Oxford Farming Conference (OFC) is looking to award £10,000 in prize money to a recent invention, technology or scientific advance that has boosted on-farm performance or profitability. Nominations are being sought from farmers and the wider industry for the most deserving projects and people to fit these criteria. The winning nominator will win a fully-paid place at the 2017 Oxford Farming Conference, which runs from 3-5 January 2017. The Science and Innovation Award is partnered by the Royal Agricultural Society of England (RASE) sponsored by Adama.

TRACTOR SALES DROP, POWER INCREASES

In the first half of 2016 (Jan-June) a total of 5,382 agricultural tractors were registered for road use in the UK - a decrease of 9.8% compared with the first half of 2015, according to figures released by the Agricultural Engineers Association (AEA)
The average size of unit sold in the first 6 months of 2016 was 158.5 hp, a 2.7% increase on the same period of last year.

An analysis by Broad Power Group indicates a small increase at the upper end (over 160 hp) while the greatest decline is seen in the mid-power bands.

AARHUS UNIVERSITY HOSTS CIGR CONFERENCE

Dr Paul Miller is 2016 EurAgEng Award winner

Over 500 agricultural engineers from more than 50 countries worldwide gathered at Aarhus University in Denmark between 26th and 30th June 2016 to exchange research results and information on Automation, Environment and Food Safety.

Papers were presented in special parallel conferences and seminars as well as the main sessions on topics ranging from structures, plant technologies, post-harvest technologies, energy to information technologies and controlled traffic farming.

Keynote addresses were from Peter Tuborg, CEO of Arla, Prof. Fedro Zazueta, University of Florida on "Technology Convergence as a Driver of Innovation", Prof. Simon Blackmore of Harper Adams University UK on "Farming with Robots" and Prof Henrik Bindslev, Faculty of the South Denmark University on "Optimising Use of Biomass in Sustainable Energy Systems"

The conference was hosted by the University of Aarhus partnered by the International Commission of Agricultural and Biosystems Engineering (CIGR), the European Society of Agricultural Engineers (EurAgEng) and the Nordic Association of Agricultural Scientists and organised by the Conference President, Morten dam Rasmussen from Aarhus University.

Claus Grøn Sørensen, Head of the Operations Management Division, Department of Engineering at Aarhus University was appointed EurAgEng President for 2016 to 2018 during the conference.

During the conference, it was announced that Dr Paul Miller, agricultural engineer and expert in all aspects of crop spraying and fertiliser application had been awarded the 2016 EurAgEng Award of Merit for Scientific Understanding. The Award comprises a bronze statuette, a replica of the statue that stood in the main building at the Silsoe Research Institute.

The award, presented by Alastair Taylor CEO of the Institution of Agricultural Engineers, on behalf of EurAgEng, is in recognition of Dr Miller's work and achievements in agricultural engineering and spray technology. Dr Miller led the Chemical Application Group at Silsoe Research Institute and went on to hold the senior role of Director of Technology at the Silsoe Research Institute before leading his spray applications Group into commercial research and consultancy as part of The Arable Group.

Dr Miller said, "I am surprised and honoured to receive this award. It resonates with me for two reasons. Firstly, I have always tried to actively connect the understanding of science to the practical aspects of agricultural machinery design, development and operation and to be recognised in this field is a great honour.

Secondly, I can remember the original statue that was 2.7m tall, called 'Earth Man Tool and Sky' that stood at Wrest Park, Silsoe unveiled in 1984 to commemorate the Diamond Jubilee, so the bronze statuette will be an elegant reminder of my career at Silsoe".

For the full range and to download papers go to:
http://conferences.au.dk/cigr

Paul Miller receives award from Alastair Taylor

ECONOMIST ROLE AT AEA

Theodora Levanti-Rowe has joined the Agricultural Engineers Association (AEA) as an Economist, specialising in Outdoor Power, succeeding Chris Evans who has retired after 42 years in the post.

Theodora's responsibilities will not only include economic analysis, market intelligence and policy determination but will also include a strong involvement in Europe.

Theodora comes with a wealth of experience and knowledge, working for Bosch Lawn & Garden Ltd for more than fourteen years, covering market research and product management for the garden manufacturing sector. She has served in various roles including eight years as Marketing Committee Chair for the European Garden Machinery Federation (EGMF) in Brussels.

Theodora Levanti-Rowe

IN BRIEF *IN BRIEF*

Dame Helen Ghosh, director general of the National Trust has said that future farm subsidies should be directed at environmental schemes such as 'protecting wildflowers and butterflies' rather than food production. Her views were immediately opposed by the NFU. Martin Haworth who said "All NFU surveys showed that the public backed farmers to produce food"

Full season UK wheat exports for 2015/16 reached 2.85Mt, the highest since 2008/09, according to AHDB Cereals recent data release. Export levels of wheat in June totalled 276Kt, the highest volume exported in that month in 19 years. This caused full season exports to rise slightly above the 2.75Mt forecasted by Defra in May but was below the top end of some trade expectations.

Nottingham Trent University has revealed a new vision for its Brackenhurst Campus as a centre for landbased education, research and enterprise. Plans for the 500-acre campus include a visitor centre, environment centre, a series of food and drink business incubators, redevelopment of equine, canine and animal facilities and additional student accommodation. The project, expected to be phased in over the next five years, would showcase the campus as a farm and university working towards a sustainable and carbon-neutral future.

The cost of rural crime to the UK economy costs £42.5 million a year, according to a new report released today by NFU Mutual. Its Annual Rural Crime Report shows that despite little change overall, regionally, there were still winners and losers in the war on rural crime. The worst affected regions remain the North East and East of England, with claims costing £7.9 and £6.9 million respectively.

N8 AGRIFOOD LAUNCH

Research partnership between eight universities

Eight universities in northern England have joined forces to form a scientific powerhouse at the launch of an international food research programme. The N8 AgriFood partnership will be centred on three themes: sustainable production; strengthening supply chains; and improving health.

The university network brings together more than 370 researchers from the universities of Liverpool, Manchester, Lancaster, Leeds, Sheffield, York, Durham and Newcastle, who came together to set up the N8 AgriFood programme to deliver a change in the way the topic was researched. The £16m scheme was launched at a two-day conference in Manchester in June.

The Institutions hope that combining the world-class research being carried out within the campuses, scientists will be better resourced and placed to meet the programme's goal of delivering a paradigm shift in food production, supply chain resilience and consumer health.

N8 AgriFood founding director Professor Sue Hartley said: "We cannot grow our way out of this problem; we have to try to change the way that we behave. We need to look at how to grow food more sustainably, and to make better use of our scarce water and land resources."

"We also need to look at our supply chains and how to make them more resilient to the shocks of sudden extreme weather events or economic turmoil. We also need to look at the way we behave as people, as consumers of food."

Prof. Ian Noble, senior R&D director at Pepsico, told the conference that the UK food sector mattered because it was a "significant contributor" to the national economy and looked after 70% of the nation's land, as well as the seas and the coastlines. "It often comes as news to people how big and how important the sector is," he added. He said they had a "real opportunity to start owning the future of agri-food and what it will look like".

CLAAS ADDS SHREDLAGE MAIZE TECHNOLOGY

CLAAS has acquired the SHREDLAGE technology for the treatment of maize.

"We are convinced that SHREDLAGE delivers a clear benefit to the customer. By taking over this well-known brand, we are now adding the finishing touches to our technology for self-propelled forage harvesters" says Hermann Lohbeck, responsible for the Forage Harvesting Division on the CLAAS Executive Board.

The technology known under the brand name SHREDLAGE is a pioneering form of maize silage treatment used by increasing numbers of dairy cattle farmers in regions lacking in grassland. The method involves chopping the maize into unusually long sections of 26 to 30 millimetres. Downstream treatment using the SHREDLAGE cracker technology is key to the entire process.

The intensive conditioning of the material enlarges the surface area of the chopped product many times over in a way that is designed to significantly improve bacterial fermentation after ensiling and above all during digestion in the cow's rumen. The aim of this process is to substantially increase the structural effects of maize silage in the rumen while simultaneously adding to the availability of the starch contained in all plant parts. This could lead to an increase in milk yields. In addition, the rumen-friendly silage structure is believed to improve the health of the herd.

The inventors of the SHREDLAGE technology Roger Olson (left) and Ross Dale (second from right) with Hermann Lohbeck and Lutz Arndt of CLAAS

CEO

Reflections on a changing world

WHAT'S IN A NAME?

The process of considering our Memorandum and Articles have thrown up interesting and fundamental questions about identity

Alastair Taylor *IEng CEnv MIAgrE*

Not only am I the Chief Executive Officer of IAgrE but I am also the Secretary of the Company. IAgrE is a Company Limited by Guarantee and a Registered Charity and with that comes duties and responsibilities. I have learnt to take my secretarial duties very seriously. And so I should!

A typical conversation in the office might start with something like "shall we do this" The reply is often on the lines of "is that in our Memorandum and Articles of Association". It is when you delve into the latter you realise that the words are complex, written at a different time and for a different world, and not always clear.

IAgrE founding fathers, over fifty years ago, were spot on

An IAgrE Executive meeting in January discussed this challenge and concluded that we need to conduct a review. After all, back in 1960, concepts such as electronic voting and the importance of working in the public interest were not the important matters they are today. So it was with an open mind that we (that is to say Sally Wood and myself) embarked on the process.

As it turns out, the process has proven an interesting one. Advice from the Engineering Council (EngC) told us that they would look after any dealings with the Privy Council and as part of our EngC licence, they connected us with a lawyer who has been of tremendous help in suggesting a form of words which says everything which our acting Memorandum and Articles says but in a much more accessible language which is in line with twenty first century thinking.

We are now at a stage where the proposed new words will be discussed by the IAgrE Executive Committee and the Council with the ambition that an Extra General Meeting will be called where IAgrE members will have their say and hopefully approve the amendments.

Throughout this process, I have always asked myself whether the new words will make material change to the Institution. If the Objects stated in the Memorandum of Association are at the heart of what we do, the abiding view I have is that the IAgrE founding fathers, over fifty years ago, were spot on. Other than changes to grammar and removal of the redundant, the IAgrE objects are the same. That should be a relief to you as it was me. We have used the same review to reinforce why our work is "for the public good", and for the public good it truly is!

It has been interesting to work with a lawyer who has little understanding of our discipline. He does now! An interesting question is "What is Agricultural Engineering"? Ask ten people in the street and you would probably get ten different answers thus leaving you with the thought that it is all things to all people.

Working to refine the current definition of Agricultural Engineering

However, this is a question we do need to ask and at present we are working to refine the current definition of Agricultural Engineering and put our twenty first century version of this on the table. I am not sure that there has ever been a more important moment to do this. The Agri-Tech and other agendas are bringing technologists into our space in a way which is revolutionising our discipline. If we are to grow, we must attract the people who would not readily identify themselves as Agricultural Engineers but in the widest sense of the word they are one of us, through and through. All IAgrE members can help with that.

My final point is that it is my duty to give IAgrE members every opportunity to contribute to the debate – be that the definition of Agricultural Engineering and the approval of our revised Memorandum and Articles of Association, together with regulations such as our code of professional conduct. No doubt there will need to be some compromise but as we stare into an uncertain future, "Surfing on the Edge of Chaos" as Richard Pascale puts it, the opportunity open to us is as exciting as ever.

Overtime Model R tractor 1916 (Malcolm Robinson)

JOHN DEERE CELEBRATES

100 years of tractors and 50-year anniversary in UK

New JD 9620RX tractor (Farmingphotography.co.uk)

One hundred years of John Deere tractors will be on show at the John Deere 50 Celebration & Heritage Event at Langar near Nottingham on 24-25 September 2016, when John Deere Limited publicly celebrates its 50th anniversary in the UK and Ireland.

John Deere customers and fans are invited to join the anniversary celebrations by registering their attendance on the John Deere website at www.JohnDeere.co.uk/50years, with a chance to win special 50th anniversary merchandise in a prize draw.

As well as trade stands, static machinery exhibits and working demonstrations of tractors and implements, this special free outdoor event will feature activities and entertainment for all the family. These will include archery, laser clay shooting, falconry and skydiving displays, synchronised kite flying and live music. There will also be a range of local food and produce as well as a licensed bar.

A parade of 50 vintage, classic and modern John Deere tractors and machinery will start with a 1916 Overtime Model R tractor, belonging to Lincolnshire farm manager Malcolm Robinson. This will also include the iconic 4020 tractor, marking the beginnings of John Deere Limited at Langar in 1966, and represent every decade up to the present day, finishing with John Deere's new flagship 620hp four-track 9620RX.

The Overtime tractor was given credit for helping the World War I effort by putting in many hours of overtime producing food for the war zone and the home front. John Deere's first step into tractor production worldwide came in 1918 when the US company bought the Overtime's manufacturer, the Waterloo Gasoline Traction Engine Company in Iowa, who also made the Waterloo Boy. This machine's simple two-cylinder design became a feature of John Deere tractors for another four decades.

Later in the 20th century, John Deere's three wheel, high clearance tractors came into East Anglia from America at the end of the Second World War under the Lend-Lease deal. For a short time in the early 1960s, a few dealers sold large John Deere tractors such as the 4010 – the UK's first 100hp tractor – and 5010. These were imported from the USA by Lundell (Great Britain) Ltd of Edenbridge in Kent, who initially pioneered the use of large horsepower tractors in the UK, and who were bought by John Deere in 1962.

John Deere Limited started trading from Langar in January 1966, and the original premises are still in use today as the company's visitor centre and national parts distribution centre. Of the original dealers who continued with the new company from that date, two are still John Deere dealers today and are owned by the same families – Ben Burgess in Norfolk and L E Tuckwell in Suffolk.

In addition to the 4020 tractor, several of the machines that represented the John Deere Limited product line in 1966 will also be at the event, including the first 5010 and 5020 tractors sold in the UK, ploughs, the C10 cultivator and the 530 and 630 combine harvesters.

"Aside from the historic two-cylinder John Deere tractors on display, the main focus of the event is to gather together examples of John Deere tractors and machinery sold through John Deere's UK and Irish dealers from 1966 to 2016," says heritage event organiser Peter Leech.

UNLOCKING OUR POTENTIAL

Minimising set-backs that can hamper progress

President's Musings

IAgrE President
Dr ROBERT MERRALL
MIAgrE, Eng D

We, as agricultural engineers are all engaged in a people-based business. People are at the heart of everything we do. People are outstanding for lots of reasons. Thankfully, in my experience, mostly good reasons.

I'm privileged to engage with a wide range of fantastic research and development projects in our sector, so I get to see all sorts of dynamic, UK-based ventures in action. I'd like to start something of a conversation here in Landwards about the best ways to nurture some of these fantastic teams and their brilliant ideas, so that as a community, we can all do a rather better job of achieving some sustainable economic success, whether in engineering research, equipment production or engineering services.

Agile, enthusiastic teams get mired in red tape

Think of a really successful project you have personal experience of. Any project, any sector.

PROJECT'S VISION

It is a good bet that at its core, there are one or more selfless, tireless people with tremendous energy and motivation making it all happen. If you are fortunate enough to get a team of such people pulling in the same direction, then truly significant accomplishments are possible, the kind of accomplishments that provide significant positive economic, societal and environmental benefits.

Of course there are a few potential stumbling blocks. The project's vision might not be shared universally. The "establishment" in a key organisation might remain unconvinced. Egos might get in the way (even in our singularly agreeable sector), and of course, the culture of *any* organisation may make it hard for a project to succeed. Agile, enthusiastic teams get mired in red tape, and can be hampered by senior managers who perhaps don't communicate their vision. A monolithic corporate system might slow the decision process enough to create an opening for a competitor to step in and seize the prize of first mover advantage.

I've been hugely impressed by the automotive sector

Familiar frustrations to many, I'm sure, and even the best run initiatives suffer these kind of setbacks sometimes. What we can do is to minimise the impact of these setbacks by trying to ensure a supportive organisational culture exists and that everyone in the project's ecosystem is well trained and has adequate delegated authority to make appropriate, accountable decisions on the go.

The UK has been forward thinking enough to benefit from a coherent Agri-Tech Strategy which has paved the way to some well-structured economic stimulus, becoming the catalyst for enduring R&D partnerships and new supply chain relationships. Many interesting ventures have been spawned by this kind of investment, and I am hopeful that our Conference in November will be an opportunity for some of these to share their experiences.

STRATEGIC FRAMEWORK

However, I think there's more we can do to make the very best use of the funding available. Recently, I've been hugely impressed by the automotive sector and what they are doing in this general area. I believe there's a lot we can learn from the current push towards more sustainable on-highway vehicles, particularly in the way academic institutions and automotive manufacturers are assisted in delivering common supply chain goals via the "Catapult" system.

You will recall that IAgrE produced a report in 2013 entitled "Agricultural Engineering – a key discipline enabling agriculture to deliver global food security". This certainly had some impact on the implementation of the UK Government's Agri-Tech Strategy. My own view is that the time has come for a "sequel" report which investigates the UK's capacity to capitalise upon the technology-led research-to-manufacture supply chain opportunities in Agri-Tech.

I believe there is a lot that can be done to further unlock the potential of our profession to deliver long term positive impact. However, we need to enrich the strategic framework that exists in a way that helps people working in interdisciplinary teams to develop and communicate their ideas in a properly business-like way.

UK AND THE EU: MAPPING A NEW LANDSCAPE

BANNING THE B-WORD

There can be few uglier words in the English language than Brexit. We could be describing a brand of breakfast cereal or denture glue. Yet the word has stormed into the English Language creating division and distrust. Worse, it has spawned even uglier phrases such as Spexit, Grexit and Bremainers. My colleagues at IAgrE have all agreed that we resist the use of the B-word in Landwards - with one final exception from a higher authority. The new Prime Minister, Theresa May, has been clear in saying "Brexit means Brexit". Consequently, the UK is faced with striking new arrangements across all aspects of our life. In the three months or so since the referendum a few issues and priorities are becoming clearer, so within the pages of Landwards we will try and assess the likely impact for agriculture, food and farming; engineering (machinery and equipment); education and research funding and other related issues. It will be a longer road to travel than many will hope. But such is the magnitude and complexity of the task that negotiations, agreement and inevitably compromise, will require diligence and patience from all concerned.

Chris Biddle Editor

IAGRE VIEW

ROYAL ACADEMY'S EU ENGINEERING PROJECT Prioritisation of core themes

Alastair Taylor, Chief Executive IAgrE

Votes have been counted, the result is known. A different Prime Minister has been appointed with new cabinet positions to deal with the outcome of the referendum. These facts we know. However there is so much we do not know. That does not mean to say the Institution should ignore the facts and not plan for the future – whatever that might hold.

This article has been written to provide IAgrE members with an update on what has been happening nationally since the referendum; as well as sharing some thoughts on how we might proceed once the negotiations commence. Clearly we have a duty to keep members informed of relevant developments as well as contributing to the debate in order that the needs of our industry are properly considered.

Elsewhere in this edition of Landwards we have considered the difference between political lobbying (which is not our remit) and the provision of knowledge and evidence based facts from our expert members (which is within our remit). At this point it might be worth reminding IAgrE members that if they want to contribute to the debate, they must remember relevant IAgrE codes of professional conduct.

THE BIGGER PICTURE

A great deal of activity has gone on since the referendum took place. For the engineering sector, this has centred around the Royal Academy of Engineering who have set up an "EU Engineering Project" under the auspices of the Engineering the Future initiative. Some of the larger professional engineering institutions have seconded staff to support this activity. The outcome of this has been the prioritisation of a number of core themes where the engineering profession judges there to be a need to influence post EU thinking. These are shown in the table below.

Going forward, there are likely to be opportunities to contribute to the discussion and policy documents

EDUCATION
- Higher education – students
- Higher education – staff
- Schools – teachers and curriculum
- Access to funding for international programmes

SKILLS AND WORKFORCE
- Short term recruitment
- Long term skills shortages
- Higher level skills shortages
- Registration
- Movement of people

ECONOMY: NATION AND REGIONS
- Company relocation
- Industrial strategy
- Reactive policy
- Regional development
- Umbrella agreements

RESEARCH AND INNOVATION
- Attracting and retaining talent
- Collaboration
- Funding access
- IP and data

STANDARDS AND REGULATION
- Energy and environment
- Telecomms and data
- Bioengineering medtech
- IP and business management
- Employment

INFRASTUCTURE
- Digital and telecommunications
- Energy
- Environment and climate change
- Transport
- Waste and resource management
- Water, waste water, and flood risk management

that will result. Although the various themes are crosscutting and include several matters which interest Agricultural Engineers, there may be others (and Food Security comes to mind) where our specialism is not represented.

The Society for the Environment is responding in a similar way and so far this has been through a collegiate response to government calls for evidence. One such example is the Government Science and Technology Committee who have been seeking views on the impact, implications and opportunities for science and research.

Like all these things, IAgrE may wish to respond independently or as part of a group of professional institutions.

IAGRE APPROACH

This article has been written before the IAgrE Executive Committee has had an opportunity to finalise our approach but so far (and subject to final agreement) the plan is as follows.

1. The IAgrE External Affairs Committee will be re-formed. This draws on the skills and experience of members of the Executive Committee to agree our overall stance and initiate any formal actions. This may lead to the identification of subjects which have not been picked up elsewhere and consequently we may have to set up some working groups to address these.
2. As and when information becomes available, and this might include calls for evidence, events, or draft policy documents, we will share these through our e-news and on the website (it is perhaps useful to remind members that if they are not receiving our two weekly e-news, do contact the secretariat in order that we can add you name).
3. Landwards has an important role to play and over the next two years, as themes emerge and more is known, we plan to produce articles which dig deeper into the interpretation of these and how that might impact on our industry. As always, offers of help and editorial pieces are always most welcome.

MEMBERS HELP

Clearly it is early days but as time passes and expertise grows there is an opportunity for IAgrE members at all levels to make a contribution. With a limited number of full-time staff it will not be possible for us to respond to every request so where we have members who have the expertise and time, and above all are prepared to act on behalf of IAgrE (and therefore following the professional codes of conduct) then we would be pleased to hear from you.

These are certainly interesting times and present IAgrE with challenges to address as well as new opportunities which we should seek to embrace. More than anything, it gives IAgrE the opportunity to reinforce its role as an important voice in Agricultural Engineering and to expand our horizons to bring in new members who should look to us as a voice of reason and common sense.

ECONOMIC NEWS

UK TO SUPPORT FARM SUBSIDIES UNTIL 2020

Universities and businesses can continue to bid during interim period

Chancellor Philip Hammond has announced that the British Government will pick up the bill for the £6bn in annual EU payments to British farmers, academic researchers and regional support once the UK leaves the EU. However, this support is only guaranteed to 2020.

The pledge by Mr Hammond will give a degree of certainty to farmers who benefit from the EU's common agricultural policy, and development projects in Cornwall and western Wales, which receive an outsized portion of EU funding.

The National Farmers' Union welcomed the move. NFU President Meurig Raymond said financial certainty in the short term would allow time for the industry and Defra to formulate a new agricultural policy.

As part of Mr Hammond's plan, multiyear research programmes and public infrastructure projects that have already been awarded EU funding before Britain leaves the EU would continue to be funded by the Treasury, even if they extend beyond 2020. The move means that organisations such as universities and businesses can continue to bid for European funding in the interim period while Britain negotiates its exit.

Scientists have generally welcomed the assurance, but farm subsidies, which are currently funded through a multiannual EU budget that runs through 2020, would only be guaranteed until the end of the EU's current budget cycle. In addition, the government has not guaranteed the availability of funding for any projects awarded after the autumn statement this year.

Of the £18bn Britain commits to the EU budget every year, London receives £5bn in a rebate. Of the remaining £13bn, £6bn is spent in the UK on EU-funded projects and farm subsidies, leaving a £7bn net contribution.

The agricultural sectors in Scotland, Wales and Northern Ireland are expected to each receive the same level of funding that they would have under CAP Pillar 1 until the end of the Multiannual Financial Framework in 2020.

SUBSIDY REFORM

Two organisations, the Council for the Protection of Rural England (CPRE) and the National Trust have called for a full reform of the way the farm subsidies are paid. CPRE says that too much money goes to large-scale farms and says assisting smaller, more diverse farms would help the countryside and rural communities. The charity argued this would benefit the countryside, and help rural communities reconnect with farming.

Meanwhile, National Trust director general Dame Helen Ghosh says "The subsidy system is broken. Farmers are going out of business. The state of wildlife is in steep decline and large parts of that is because of intensive agriculture. The vote to leave the EU allows us to think radically about the future of the entire system".

The proposals by the trust would see the basic income support system of subsidies scrapped and farmers being paid out of public funds only for environmental services such as flood prevention, wildlife and nature protection.

The Engineering Council operates under a Royal Charter, and is responsible for regulating the UK engineering profession through its 35 Licenced Members and 20 Professional Affiliates. It is responsible for maintaining standards for registration, carrying out a continual review of Licensed Members, registration of Engineering Technicians and for the provision of guidance for engineers on their roles and responsibilities.

For the first in a regular series of collaborative articles in Landwards, we look at the need for security awareness by engineers across the profession.

SECURITY: SIX KEY PRINCIPLES FOR YOUR DAILY ROUTINE

New booklet promotes an open and honest approach

PAUL EXCELL, Engineering Council Board Member who led the working group that produced the ***Guidance on security for engineers and technicians***

With technologies and security threats evolving at an ever increasing rate, adopting a security-aware mindset in both the physical and virtual world is a necessity for all of us. Engineers and technicians have a particular responsibility.

Their vital and diverse work affects every part of modern life, ranging from aircraft and nuclear power stations to healthcare, agriculture and major infrastructure projects. Engineers and technicians need to be security aware and capable in order to keep our communities and staff safe on a daily basis.

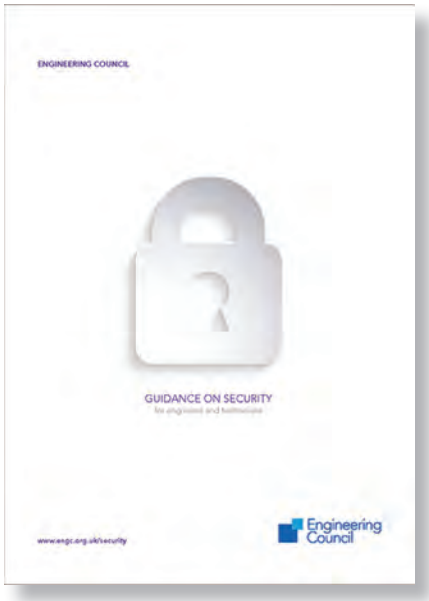
To support them in adopting a security-minded approach, the Engineering Council has produced ***Guidance on security for engineers and technicians*** to help identify, assess, manage and communicate security issues, opportunities and threats. The document, written in inclusive language, applies across all engineering disciplines and is relevant to **everyone,** from large organisations to one-person operations.

The Engineering Council was approached by the Centre for the Protection of National Infrastructure (CPNI) in 2015 with a proposal to produce a document on security for engineers and technicians. A working group was established and we then developed the guidance in consultation with 35 professional engineering institutions.

The result is an eight page, A5 booklet summarising the role of engineers and technicians in relation to security, setting out six key principles to guide them and outlining what each should involve. The booklet also offers additional references for further research.

CRITICAL READ

The guidance is a frank document that defines security as 'the state of relative freedom from threat or harm caused by deliberate, unwanted, hostile or malicious acts'. It promotes



an open and honest approach to talking about security whether you are the CEO, an engineer, engineering technician or an apprentice.

The six principles apply to all, because robust security is about **everyone** being aware, proactive

and, where necessary, reactive, taking action and appropriately sharing information to avoid reoccurrence.

The guidance also emphasises the importance of taking a security-minded approach in both your professional and personal life, and staying up to date as opportunities and threats constantly evolve.

At the launch event for the *Guidance on security for engineers and technicians*, hosted by the Rt Hon John Hayes MP at the House of Commons, speaker Terry Morgan CBE CEng FREng, Chairman of Crossrail, commended the guidance, describing it as a 'critical read'.

The head of CPNI, who also gave a speech, said the document is 'the beginning of a journey to change the culture of security'.

Security should be at the heart of any new or existing engineering project. The Engineering Council will continue to take a lead on behalf of the profession, advocating a security-minded approach at all times and using available networks to draw the attention of engineering employers, employees, institutions and educators to this guidance document.

HOW TO GET HOLD OF THE GUIDANCE

Guidance on security for engineers and technicians can be downloaded from www.engc.org.uk/security. Printed copies of the booklet are available, as well as wallet cards that list the six key principles. These can be obtained by contacting marketing@engc.org.uk. This new guidance complements the organisation's other documents on risk, sustainability, ethical principles and whistleblowing, which are all available at: **www.engc.org.uk/standards-guidance/guidance/**

The six key principles:

- **Adopt a security minded approach to your professional and personal life.**
- **Apply responsible judgement and take a leadership role.**
- **Comply with legislation and codes, understand their intent and seek further improvements.**
- **Ensure good security-minded communications.**
- **Understand, comply and seek to improve lasting systems for security governance.**
- **Contribute to public and professional awareness of security.**

REGISTRATION ROLES AND RESPONSIBILITIES

Making professional registration accessible and inclusive

In the Summer 2016 edition of Landwards, we published an article "Challenges of Professional Registration". Malcolm Carr-West, IAgrE Chairman of Membership Committee delves deeper into the arguments and responds to some of the points raised in the article

It is clear that although IAgrE members are aware of what they gain from their Professional Engineering Institution (PEI) they are less well informed of the role that the Engineering Council plays in the PEI. To put it simply the role of the Engineering Council is to set the standard followed by the engineering profession in the UK. This is articulated in the UK-SPEC document. It is also true that the term Chartered is widely used across a range of professions from accountancy to surveying, so it is critical that all bodies who award the title cooperate to ensure that it has a consistent value.

Whilst the Engineering Council sets the standards for engineering, it takes a clear view that the individual institutions have to interpret these standards to suit their own branch of engineering. The intention is that every registered engineer at a particular grade should be working at the same level and have a comparable knowledge base and set of competences, whatever their branch of engineering. To this end, Engineering Council works behind the scenes to maintain and protect the Register of Engineers.

Much of the work that Engineering Council does is achieved through licensing institutions to operate. The Engineering Council sets the standard that describes the competence and commitment requirements that have to be met for registration as a professional engineer or technician. It is then up to the individual Institutions to ensure that these are met in their own branch of engineering.

When it comes to professional registration, it is important to be aware of the relative roles of Licencing Authorities such as the Engineering Council, Society for the Environment and Science Council, compared to that of a Professional Engineering Institution such as the Institution of Agricultural Engineers.

The purpose of applying to become a CEng, for example, is not because it is easy. Some PEI's offer workshops which help candidates pull together all of the necessary evidence. The IAgrE approach is to allocate a mentor to support the applicant on a one-to-one basis.

SELF-REFLECTION AND COMMITMENT

Gaining the title is an achievement and only possible once an individual can demonstrate, not just in writing, that they have acquired the requisite skills, competence and attitude through rigorous assessment by peer review. The process involves significant self-reflection and a commitment by the applicant to continue developing themselves and to assist in the development of others.

It involves complying with ethical and sustainable principles, making the individual a more rounded, reliable and responsible engineer for the benefit of their employer and society. For engineers, IEng and CEng is portable and it is not uncommon for registrants to move from one institution to another as their career progresses. During recent months, IAgrE has welcomed several new transfers on board.

Members should note that their first stop for information, advice and guidance on applications for professional registration such as CEng, IEng and EngTech, is the Professional Engineering Institution – in our case, the Institution of Agricultural Engineers.

As IAgrE Membership Committee reflects upon this important subject and the scope for potential misunderstandings, it is with a renewed focus on making professional registration as accessible and inclusive as possible while at the same time ensuring the high standards required for registration are upheld.

I hope that this confirmation of roles and responsibilities helps IAgrE members to better understand the relative roles and responsibilities in the process of professional registration. Through Landwards, we will continue to celebrate our members who choose to become registered as professional engineers and technicians.

At this time it is important to express our thanks to our Membership Committee members who continue to conduct peer review assessments for those who apply for membership and registration.

WASTE NOT, WANT NOT

Somerset cheesemaker, Wyke Farms, has invested £14million in an anaerobic digester plant to run the farm and cheese making on 100% renewable energy. CHRIS BIDDLE meets up with third generation family member and Farm Director Roger Clothier.

IN the small Somerset village of Wyke Champflower, the world of family farming, modern retailing, state of the art food production, savvy marketing, science and environmental responsibility merge in seamless unity.

Wyke Farms is the largest independent cheese-maker in the UK, a tradition that stretches back more than 150 years. Today, the Wyke Farms brand can be found on the shelves of supermarkets and food retailers throughout the UK with a growing export market accounting for over 15% of sales. Over 15,000 tonnes of Cheddar a year are produced at the farm plant worth more than £60 million at retail for a cheese still based on a closely guarded recipe dating back to the time when the business was started by Tom and Ivy Clothier.

This is a family business in the best tradition, now in its third generation. Today, Tom and Ivy's son, John Clothier is Chairman, his sons Richard and Tom are Managing Director and Production Director with responsibility for Green Energy. The farming side is looked after by their cousins and fellow Directors Roger and David Clothier, sons of the late Jim Clothier, Tom's brother. They are responsible for the 1500 cow herd, and for maintaining Wyke Farms rich 1,500 acres of farmland that feeds the rural 'engine room', tending the cows producing the milk that turns grass into milk, cheese and butter.

Wyke Farms' cheese making credentials go unchallenged. The love and respect for their animals is palpable. Marketing and promotion is top notch. The farm's eye-catching TV commercials are even produced by Ridley Scott Associates (director of such blockbusters as Alien). Added to which, Wyke Farms can now back up its claim to be 100% Green. As the result of a £14 million investment in a three dome shaped anaerobic digesters (AD) three years ago, the farm is self-sufficient in energy to run the farm, the cheese making plant – and still produce surplus to sell back to the National Grid.

> "There has not been an ounce of granular fertiliser spread on our fields in 45 years"

Care of the environment has always had top priority says Roger Clothier "There has not been an ounce of

Anaerobic digester plant at Wyke Farms

granular fertiliser spread on our fields in 45 years" he says.

As a food producer with aspirations to sell its cheese in the national supermarkets, where price is king, the challenge couldn't be greater. The emergence of Lidl and Aldi as major challengers to established chains such as Waitrose, Sainsbury, Tesco, Morrison and others has put real pressure on food producers such as Wyke.

The crunch came a few years ago, when oil was around $100 a barrel and the average power bill to the dairy topped over £70,000 a month. "We couldn't pass on those costs" says Roger "so we started to look at alternatives, and that's when AD at Wyke was born".

NATIONAL GRID

A visit by the family to see the anaerobic digester installed at one of the farms operated by Velcourt in Dorset sparked the interest. As with so many projects, it needed the passion and drive of a member of the Clothier family, Richard's brother Tom 'a closet environmentalist', to persuade the others to install sufficient AD units to provide the farm with all the power it required – and more.

With a range of incentives on offer, Wyke Farms' 100% Green Initiative of three 4,600 cubic metre digesters were planned and completed in 2013.

The plant, which took five years to plan and construct, annually converts 75,000 tonnes of biodegradable waste from Wyke's dairy herd, local cider waste and other sources into energy, resulting in an annual carbon dioxide reduction of more than 20 million kilos.

A mile-long underground service pipe transports whey and milk waste from the cheese plant to the AD units, as well as slurry from the pig unit.

It provides Wyke Farms the capacity to source its entire electricity and gas usage from both solar and biogas, as well as exporting power back to the National Grid. In total the AD plant pumps out 13,500 cubic metres of gas and 23,000 KWH of electricity every day.

A couple of miles from Wyke lies the now fashionable small town of Bruton. Boasting three independent schools, a world famous art gallery and a growing collection of small hotels and boutiques, the 3000 residents probably do not realise that its energy comes from the dairy farm just up the road (the daily capacity of Wyke Farms AD unit is enough to supply 6000 households)

In its quest for 100% self-sufficiency, Wyke Farms also recycles up to 90% of water, operates electric cars – and is looking at a fleet of 100% green/electric tanker to collect its milk.

METHANE TRACTOR

Wyke Farms run a fleet of six tractors, all in the 170hp bracket. "They are mainly used for tanker work, ferrying waste to the AD plant and for operating the feeders on a daily basis"

Roger Clothier

New Holland methane tractor on test at Wyke Farms

Recently, Wyke Farms became a test site for New Holland's second generation T6.180 Methane Power tractor to see how it stood up to practical farm conditions.

The methane-powered tractor has been developed by New Holland as a 100% sustainable solution to increasing fuel costs. The Somerset farm, with its bank of anaerobic digesters suggested that an ample supply of fuel would not be a problem.

The tractor draws on commercial vehicle technology already used by New Holland's sister brand, Iveco. By adapting existing engine technology, fitting a small three-way catalytic converter housed within a standard tractor chassis and cab, the company has ensured the methane tractor looks and drives just like a diesel-powered tractor while exceeding the current Tier 4B emissions legislation.

Wyke Farms put the prototype tractor through its paces with a slurry tanker, used for transporting material to and from the AD plant. Combined gross weight was 27 tonnes when fully loaded.

Roger Clothier tested the prototype tractor. "We need fuel efficient vehicles with a good power to weight ratio to pull heavy tanks around the farm. First impressions were that this looks and feels just like a normal tractor" he said.

"The tractor and fully loaded tanker was a little slow to get off the line, but once moving the tractor came alive. Engine braking downhill was good and there was plenty of power in the mid-range and top-end with no torque issues when going uphill".

The Somerset farm, with its bank of anaerobic digesters suggested that an ample supply of fuel would not be a problem.

The methane powered prototype, which is normally based in Italy at La Bellotta, New Holland's 'Energy Independent Farm' provides 179hp max power, usually ideal for any of the duties required at Wyke Farms but Roger felt that an additional 20hp would be preferable, particularly when under heavy load.

The use of compressed natural gas (CNG) in vans, trucks and buses is well developed and limited only by storage capacity on the vehicle. New Holland is currently able to carry 300L (52kg) of compressed methane into nine tanks fitted around the tractor. Normally enough for around six hours of work depending on activity and load.

"In our test, we managed to achieve around four and a half to five hours for tanker transport. Whilst a comparable diesel tractor would work for longer on one tank of fuel, refilling the methane tractor wasn't too much of an issue. We used an onsite CNG trailer from Gas Vehicle Alliance during the test period. Filling the nine methane cylinders was quick and easy through a single inlet on the tractor"

Increasing the running time requires more gas cylinder storage. This is something difficult to achieve with current cylinder shape and technology, however, New Holland is looking at potentially adding extra tanks, perhaps to front ballast, without compromising balance, safety or sight lines.

COLLABORATION

Running costs for the New Holland Methane Power tractor were difficult to accurately assess on this short test, but New Holland estimates that fuel cost savings of 25 to 40% could be achieved. In addition, no Ad Blue is required.

In the cab the layout of controls is much the same as a diesel-powered T6, with a methane tank monitor to the driver's right. Front visibility was good but the large rear pillars containing gas tanks can restrict visibility. For the tractor drivers at Wyke Farms, this proved a slight issue as they need good visibility left and right when reversing tankers.

For a further independent view, New Holland asked machinery journalist Nick Fone to take the wheel at Wyke Farms. Nick felt the way the engine responded was quite different. "It pulls loads well up to a point, but then the torque drops off. However, it's understandable that it would have a different torque curve when it's using a totally different fuel to diesel.

"There's less engine noise so it's much quieter in the cab, though this had the effect of making the transmission noise more audible. The bigger rear pillars that house the gas cylinders make the cab feel a little smaller and darker than usual but it didn't impact too much on my visibility."

Nick Fone's view was that the biggest customer base for a methane tractor would be farms with their own AD plants, typically running 200hp plus tractors, in which case the T6.180 Methane Power could be a little underpowered.

Roger Clothier can definitely see the potential benefits. He said: "Not only does the methane tractor have the potential to reduce polluting emissions by 80% and cut our fuel costs by a significant amount, it could contribute to our commitment to lowering our carbon footprint - a key element of our '100% Green' Initiative at Wyke Farms, something which is highly valued by our customers."

Was the methane tractor practical in the present set-up?

"In theory yes" says Roger "but we would need to invest in a compressing plant to make the gas suitable for use in engines, either direct from the Biogas plant or drawn back from the grid".

"In practical terms, we would probably need to get together with other farms, and invest in a centralised filling point for the local area. Provided of course, there was sufficient demand from neighbouring farmers and hauliers running methane-powered vehicles".

CHEESE AND GAS TO SAINSBURYS

Cheese making plant at Wyke Farms

Farming in the UK today needs so many qualities to succeed, particularly in these pre-Brexit days. Ingenuity, resourcefulness, commitment, communication skills –the list goes on. Top of the list however is viability. The ability to generate income to invest wisely in the future of the business. Small family concerns, specialist food producers, such as Wyke Farms have heritage on their side, but as economy of scale drives the growth of mass production, the old adage of 'a good little 'un will always beat a good big 'un' becomes harder and harder to sustain.

A few years ago, Morrisons de-listed Wyke Farms who fought back by launching a Facebook campaign, gaining the support of thousands of Morrisons customers. Today, Wyke Farms cheese sells well on the deli counters of Morrisons stores. It's a continual battle, particularly as supermarkets move to own-labelling, but as Roger Clothier says "When one door shuts, you simply have to find others to open" For Wyke, this means export potential, and the company is currently excited about the growing demand for its products in the United States, which if developed could become a significant market.

Perhaps however, the best example of David working with Goliath to mutual benefit came with news earlier this year that national retailer Sainsbury's, that not only list Wyke Farms award-winning Cheddar, have also agreed a partnership deal, whereby the farm will supply a significant proportion of the supermarket's green gas, accounting for 6% of Sainsbury gas use over the next 12 months.

Resourceful and responsible farming is truly alive in this part of Somerset.

THAT'S THE SPIRIT

Terry Anderson had decided to retire from his consulting work in engineering. Apart from advising and designing, he had also seen the development and sale of no less than seven companies. It was when he visited a cousin's farm, and they started talking tractors, that the appeal of retirement waned.

His cousin gave Terry a guided tour of his new 4WD 400hp tractor, explaining the complex transmission, the auto-steer which he had added as an extra, and also pointed out some of those features which he could never see using. Terry took it all in and pointed out the ways the machine could be made less complex, and the cousin then challenged Terry to come up with a better design. He took it up and, over a ten year and more period, created a revolutionary tractor that can help farmers to cut costs.

"Tractor architecture basically hasn't changed since the 1920's," claims Anderson, "and after studying the problem we realised we could build a 200hp tractor for less than $100,000 (around £66,000) and achieve comparable savings on larger machines. While many might strongly disagree and say that tractors have in fact changed radically, and others might think it highly unlikely that a selling price of £66k can be achieved, Terry has done more than produce plans and blueprints, built more than a prototype, but now has a product to sell to farmers. From small beginnings, his company Autonomous Tractor Corp (ATC) has now reached the stage of having three separate functions.

An autonomous tractor as revolutionary as the electric Tesla car with a diesel-electric drive system

RE-POWERING WITH DIESEL-ELECTRIC

While he has made a new tractor, the main product his company has on offer is a re-power unit that is retro-fitted into an existing tractor. A tractor with a tired engine has a transmission that is going to cost plenty to re-build.

First is their E-Drive - a retro-fit package that replaces the engine, transmission, differential and axles of the conventional tractor with a diesel-electric pack and variable speed wheel motors. The replacement is for tractors in the 200 to 600hp range. The donor tractor provides the frame, cab, wheels and implement carrying and management. They claim the E-drive is 10-20% more fuel efficient, and has a service life many times that of the original system it replaces.

We know diesel-electric from the railways, where trains are long lasting, reliable and economic to operate. There's no clutch, no gearbox and the wheel motors are enclosed. The system has caught the eye of the St Louis based FamilyFarms Group which is a farm management company

This article, written and published in Practical Farm Ideas by editor Mike Donovan won the 2016 IAgrE Journalism Award in association with the British Guild of Agricultural Journalists (BGAJ). The Award was presented by IAgrE CEO Alastair Taylor at Cereals in June

Spirit tractor operating with set of discs

whose members farm 1.5 million acres of corn and other row crops. Alan Lash, the CEO says his 70 teams of operators run 495 tractors valued at $125m. and he has become ATC's first customer.

"If this technology is successful we can potentially save members in our system millions of dollars in capital costs, reduced operating costs and enhanced reliability," he says.

FamilyFarms Group made their first purchase of a John Deere 8760 eDrive retrofit and the farm business will be evaluating the machine under various conditions and applications. If all goes well they have the capacity to retrofit potentially hundreds of tractors using this technology. At the same time as buying the tractor the Group has also purchased equity in the business, which anyone can do through AgFunder: https://agfunder.com/. The company has already raised $4.5m and is looking for a further $5m through the peer-to-peer crowd funding agency which is involved in agri projects across the globe.

DRIVERLESS TRACTOR

The second innovation is a completely driverless control system that means there's nobody in the cab. Guidance is not reliant on GPS but works on positioning systems which rely on lasers and radio for accurate positioning and collision avoidance. He says this system has been used for the past 20 years in the N Atlantic to control ships servicing oil rigs to prevent them hitting the platforms.

The farmer has to set up poles around his fields to mount transponders which once programmed into the tractor these are used for each operation. The control relies on a series of signals which monitor each other. If there's a problem detected the machine shuts down.

CABLESS, DRIVERLESS TRACTOR

The third innovation is a complete driverless, cabless tractor that looks like a Lego brick and which uses both the diesel-electric and the control system.

Named The Spirit, the tractor rides on a pair of 2ft wide rubber tracks that are driven by wheels at both ends of the track. Drive wheels front and rear reduce the stress that occurs with single drive units. The electric motors are far less complex than controlling two mechanical drives. Power is supplied by twin 202-bhp, 5.2 litre Isuzu diesel engines which drive dual generators that provide power to four oil-cooled electric wheel motors. Depending on power needs, the dual-diesel configuration can be run at drawbar horsepower ratings ranging from 100hp to 400hp in 100hp increments.

Power is transferred to rubber tracks via powered truck tyres on each corner, which Anderson says provide more surface areas than traditional track systems. The weight of the tractor, 25,000 lbs, was kept low to minimise soil compaction. An additional 5,000lbs of weight can be added by ballasting the tubular frame with water.

THE RISE OF THE MAVERICK ENGINEER

Important and profitable innovations often come from small beginnings. Tesla Motors is now a $1bn company whose electric cars are no longer a rare sight. Dyson has an appreciable global market share of the huge vacuum cleaner business, and a growing one with hand driers and other products. Both Tesla and Dyson were effectively garage start-ups, done within the last decade or two. Airbus itself, while a conglomeration of smaller companies, was a fledgling 30 years ago. Each looked at the problem of motoring, cleaning and flying from a different engineering standpoint, and found a solution which others found compelling.

And so it might be with tractors. Traditional manufacturers are in their comfort zone offering their tractors with a 1,000-2,000 hour warranty, all the time creating new models with increasingly complex systems which help to limit their effective life span. The upgrades and new models justify price increases. While each of the multinational businesses play the same game, there's little alternative for buyers to finding a new tractor. Meanwhile the increased complexity creates work at the dealership, and encourages a relatively quick turn round as farmers swap for newer machines.

The maverick engineer is the one who comes in with a design or a business plan that breaks the mould. We have featured a good many in this publication over the years. Graham Edwards designed the Trantor which in many respects presaged the JCB Fastrac but has the innovation of a space frame making for a lightweight and strong machine.

The McLeod combine harvester from Canada is a two-part machine that collects grain and tailings which are separated by a second electric powered machine in the barn - one which doesn't tilt all ways, and doesn't need to be narrow to drive down the road. The Eyre header is yet another maverick design that has a mini separating drum on the combine header, so separation can be carried out over a width many times that of the conventional drum.

Terry Anderson comes into the same category of engineer, only perhaps even more so. He saw the tractor as a machine working in a harsh environment which needed basic functions of traction, PTO and hydraulic power, and needed to do this as economically as possible to suit world agricultural markets.

The eDrive diesel-electric drivetrain is available in 200-hp or 400-hp packages. Components include one or two 200-hp diesel generators, four 125-hp electric wheel motors, variable frequency drives, joystick control, a 21-inch touch-screen monitor and interface to control the farmer's implements.

He looked at the way some other industries provide this kind of power, in particular at mining machinery and railroad engines such as those made by General Electric. These machine's have to have high reliability, modest cost, and extended service intervals. he found the railcar engine, for example, has a 25,000 hour service life. Impressed with what he found, he has applied the concept to his new tractor.

Terry Anderson with the Spirit tractor

THE POWER UNITS

The machine is based on a 202hp Isuzu diesel which is coupled to a 150kW AC alternator. The 4 cyl Isuzu is an industrial engine with a reputation for long life, and shares many characteristics with the General Electric engine used on the railway. It has a 500 hr service interval. It's performance is carefully controlled by sensors.

Two engine/alternator units are used to provide 400hp, and three are used to get it to 600. Motors can be shut down if less power is needed,

It can never be cold started or hot stopped such as happens with many tractors. The system provides time for the engine to warm up while idle, and run down from hot the same way. The operating rpm range, like that on the railway, is fixed at optimal rpm, maximising fuel efficiency and reducing wear.

The transmission is based on wheel motors the company has designed themselves. They are liquid cooled in both the interior and exterior of the stator, and the liquid is used for lubrication. Electric motors are generally damaged by over-heating and/or poor lubrication, which this patented design prevents. Motors have a tough life, and need to be able to handle short bursts of power that is far greater than their rating, and also run efficiently at power outputs which are a fraction of their capability.

They are very simple. Indeed, immeasurably so when compared to a modern tractor gearbox. They are also easy to install, and the connection between wheel motor and alternator control box is simple and flexible.

"The farm economy is down, so new, expensive tractors are often not in the budget," Anderson says. "Conventional cabs and frames have a long life. They are sitting in fields, yards and junkyards all over the place. They can be retrofitted."

He says farmers can overhaul their tractors with eDrive for half the price of what they'd spend on a new tractor. The kit weighs less than a traditional powertrain, which can reduce soil compaction and increase fuel economy by 15% to 20%. ATC can do the retrofit. Servicing or repairs can be done by the farmer in about 45 minutes, says Anderson.

THE COMPANY'S FUTURE

The company president outlined their current plans in a recent webinar designed to attract investors. Building a business is far more than having an innovative product. The farmer market is traditional, and across the world farmers buy from dealers they have used for years. Low grain and livestock prices are forcing innovation, and encouraging farmers to think differently, but many will be wary of new technology like this. So the company intends to build sales through multi-franchise dealers, and others not committed to tractors, and the purpose is to get the kit working on leading farms across the world.

The business holds two important patents, one concerning the wheel motors and the other on the laser / radio control system. These are said to be secure and provide them with the protection needed for the essential parts of the product.

They figure that the future is as a part of a major ag company. Case spent nearly $1bn on Steiger tractors, a company set up by two brothers who decided to build a high hp tractor which was made from easy-to-source parts mainly from the trucking industry. Neighbours saw the tractor built by the Steiger brothers and wanted one as well, and then more saw the relatively simple machine and wanted one for themselves. And so the business snowballed. AGCO have bought Challenger, Fendt and others, obtaining technology and a brand at the same time.

The present objective is to get these first units out and working on farms, so they can be evaluated by neighbours and others.

More information:
www.autonomoustractor.com

This article appeared in the November 2015 – February 2016 issue of Practical Farm Ideas
www.farmideas.co.uk

DOUGLAS BOMFORD TRUST

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WORKING WITH THE ROYAL AGRICULTURAL UNIVERSITY

TRUST SUPPORTS NEW AGRICULTURAL ENGINEERING APPOINTMENT

Back in 2012, the Trust agreed to jointly support a Chair at The Royal Agricultural University (then The Royal Agricultural College) in Farm Mechanisation and Management for a period of five years and Dr Toby Mottram was appointed as The Douglas Bomford Professor. Good progress was made with work associated with the Chair for the first three years of the project and this was monitored with annual review meetings. In 2015, Professor Mottram reported that he had been successful in a bid to BBSRC/Royal Society of Edinburgh for a Fellowship Award that would effectively cover his salary costs for a one-year period from 1st October 2015. He also indicated that, on completion of his Fellowship, he would wish to reduce the time commitment to work at the University. Following discussions between representatives of the Trust and the University, it was agreed that:

- Dr Mottram would continue to hold the title of Douglas Bomford Professor in Farm Mechanisation and Management until the end of the original project in August 2017 but with no financial support from The Trust after August 2015;
- A new agricultural engineering post be created at The University with shared funding from The Trust for an initial three-year period so as to further develop the awareness of engineering technologies at The University.

The new post was advertised and Dr Karen Rial-Lovera was appointed to start in the role at the beginning of June 2016.

ABOVE: Dr Karen Rial-Lovera (second from left) with Professor Toby Mottram (second from right) with Trust Chairman Malcolm Crabtree (right) and trustee Peter Redman (left) at the Convocation Day at The Royal Agricultural University.

AWARDS AND PRIZES

Cranfield University

The 2016 Douglas Bomford Trust Prize at Cranfield University for the best student on the Land Reclamation and Restoration course was awarded to Rebecca Hollands. The award was presented by Trust secretary, Paul Miller, at the Prize Giving ceremony on the 7th July 2016 – the same day as the Graduation Ceremony for the School of Energy, Environment and Agrifood at Cranfield University.

BELOW: Rebecca Hollands receives award from Paul Miller

The Royal Agricultural University

The Douglas Bomford prize at The Royal Agricultural University for the best application of engineering to solve a problem in Agriculture, Food or the Environment was awarded to Francis Bartleet. The prize was presented to Francis as part of the Convocation ceremony held at The University on Thursday 21st July. The picture (right) shows The Trust Chairman, Malcolm Crabtree congratulating Francis after the presentation ceremony.

RIGHT: Francis Bartleet being congratulated by Trust Chairman, Malcolm Crabtree

OTHER NEWS FROM THE TRUST

- In January 2015 The Trust agreed to provide some support to Julia Carrell, a student in the mechanical engineering department at Sheffield University, for her project work concerning biodegradable lubricants for use in internal combustion engines. Julia has agreed to give a seminar relating to her project work and arrangements are being made for this to be held after the next trustees board meeting on 15th November at Harper Adams University. Anyone interested in attending the seminar should contact the Trust secretary for further details.
- Work is in progress to re-develop and update the Trust's website. The new site will aim to give more details of the activities of the Trust and should be launched very shortly.

16 November 2016, Harper Adams University

DR ROBERT MERRALL

An exciting time to be an Agricultural Engineer

The government's Agri-tech strategy and the new Agri-EPI Innovation Centre has put the spotlight on engineering and technological solutions to address the challenges of feeding the ever expanding global population. New partners are looking at Agriculture and its associated engineering excellence as never before with an eye to developing novel approaches and fresh technologies.

Business start-ups, new partnerships, re-engineering of existing applications, and new ways of looking at the world is fostering collaboration in a way unheard of for a generation. So ask yourself

- How do you deal with the challenge of ensuring your new idea remains with you and is not stolen by a competitor?
- How do you work with others in an open way at the same time as retaining all of that intellectual property?
- What business challenges will you need to consider if you are to avoid the obstacles to economic exploitation, and what funding can you access?

This conference seeks to equip you with the information and knowledge you need to answer these questions. As well as hearing from experts in research and development, copyrighting, intellectual property, and patents; established and respected technologists who have dealt with these issues will tell you how they managed the challenge and give insight to the various questions you need to consider

EVENT DETAILS Venue: Harper Adams University, Newport, Shropshire

The 2016 IAgrE Conference is for:

- Technologists/ inventors promoting new ideas in Agri-tech
- Senior engineers, designers or technical specialists
- Students, graduates, or postgraduates
- Consultants, advisors, business analysts
- Venture capitalists or company directors
- All those interested in innovation

Whether or not you are an IAgrE member, this conference is for you.

DELEGATE COST:
Standard delegate: £120 + VAT
Early Bird delegate: £100 + VAT
Retired delegate: £75 + VAT
Student delegate: £20 + VAT

MAIN SPONSOR:

SUPPORTED BY:

Booking and information: Tel: 01234 750876

CONFERENCE PROGRAMME

09.30 -10.00
Arrival and Registration

10.00 – 10.10
WELOME ADDRESS
Dr Robert Merrall, President IAgrE

10.15-10.45
AGRICULTURAL ENGINEERING PRECISION AND INNOVATION CENTRE David Ross

The Agri-EPI Centre: An update on the Agri-EPI Centre. Aspiration, Activity and Opportunities. Developing new links and a report on progress made over the first 6 months

10.45-11.15
RELATIONSHIP BETWEEN BUSINESS, RESEARCH AND INNOVATION Dr Mark Moore

Agricultural Development Manager for Africa at AGCO Experiences from the Future Farm Project
How do companies within the agricultural supply and value chain work together to realise the market potential of Agri-Tech? What challenges will we be facing as we deal with the roll out of new technologies? How will these technologies be delivered to end users (farmers) to ensure Agri-Tech, and its stakeholders, are successful?

11.15-11.45
COPYRIGHT / IP CHALLENGES – DYNAMIC SOLUTIONS
Gary Townley: Intellectual Property Office

Explain the technicalities and legal essentials of Intellectual property and copyright. Ideas on how to future proof the innovation. New approaches to dealing with copyright and intellectual property right in a world of public/private partnership funding.

11.45-12.15
AVOIDING OBSTACLES AND OPPORTUNITIES FOR RESEARCH FUNDING
Callum Murray and Team: Innovate UK

An overview of the research focus and grant opportunities.

12.15-13.30
Lunch and Networking

13.30-14.45
INNOVATIONS LESSONS AND PITFALLS
Four Engineers, Four Stories, Discussion, Insightful Questioning

Chair: Andy Newbold *(right)*, Farm Smart Events

Toby Mottram *(below right)*: Founder and Chief Engineer, eCow

Brian Knight: CEO and Chief Engineer, Knight Farm Machinery

John Baines *(below right)*: Technical Director, Fullwood

Richard Robinson *(below right)*: Founder, Autoguide Equipment

From ideas to production. Understanding, anticipating and dealing with copyright challenges.

14.45-15.45
CASE STUDIES IN INNOVATION
"Three 'out-there' innovations"
Review of projects at HAU, SRUC, Cranfield From innovation to practice and application. A round up of selected projects to showcase how projects are moving towards reality.

15.45-16.00
CONFERENCE SUMMARY AND CLOSE
Alastair Taylor: IAgrE CEO

LAST WORD:

Random thoughts by The Engineer

I AM OLD, THEREFORE I MUST BE WISE.

As far as I am aware we all enter the world and exit it in a similar fashion, these are fixed datum points, but what is it that happens in between these events that influences young people to take up a career in Land-based Engineering?

Good question I think.

The products employed within land-based engineering have never been more exciting and technologically advanced! The skill sets and places of work are infinitely variable, application of personal initiative and skills bring recognition of expertise and a rewarding career. So what is the problem? An exciting, rewarding career with progression routes is waiting for those who want one.

Having the privilege of age, perfecting the art of grumpiness and becoming more cynical by the day I can identify aspects that don't help the recruitment of young people into any industry.

Applicants need to come with the right attitude, that's all! Skills and knowledge can always be developed - bad attitudes are the barrier to this.

Let's start with education, education, education or the lack of it perhaps which has an impact on our recruitment pool. I am going to generalise here which is unlike me, parents expect the schools to teach discipline and good attitude, schools expect Further Education and apprenticeship programmes to teach the three 'R's, colleges expect manufacturer's training schools to teach the underpinning engineering knowledge that technicians rely upon. Employers expect competitors to train staff so that they can poach them without having to invest in training and as for government they don't know what to expect and if and when they do decide the expectations and ground rules have changed.

Stop the demoralisation of teachers, instructors and lecturers.

Stop the world, rewind and let's go back to basics with each party taking responsibility and ownership for the part they play in this crazy cycle we have descended into.

Government please fund schools, Further Education and apprenticeships so that education can be delivered to a standard not a price. Stop the demoralisation of teachers, instructors and lecturers. Their attitudes reflect on the youngsters they teach.

Parents, schools, Further Education Colleges, employers, apprenticeship programmes and manufacturer's training academies have specific roles to play. The way forward is for each party to concentrate on their area of responsibility without having to infill learning and behavioural deficits left by others.

Engineering in all its forms is not a dumping ground for 'under achievers' who don't make the grade to enter further education and university. Unfortunately, there are those in a position to influence young people who think that way. This is also underpinned by the fact that the New Trailblazer Apprenticeships have a mandatory requirement for English and Maths qualifications to be attained before the end of the apprenticeship. I would have thought it was a mandatory requirement before leaving school!

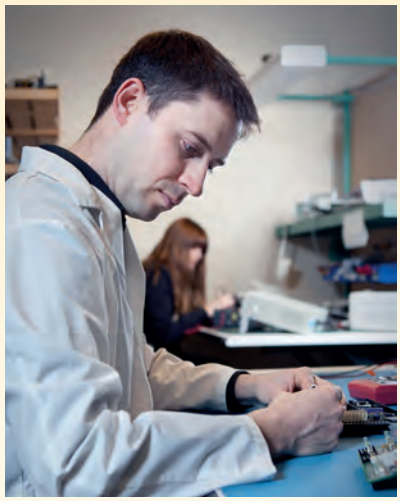
The new landbased engineering apprenticeships are an opportunity to redress some of the issues. Completion of the apprenticeship will turn out well rounded members of industry who are assessed as fit for purpose and a valued asset to both landbased engineering and the country.

This is despite the many challenges put in place by our government who had a vision of the holy grail of apprenticeships without any real grasp of how this could be achieved. I must admit to feeling sorry at times for civil servants facing embarrassing questions that they could not deal with. Landbased engineers intuitively think on their feet and provide a fix, whilst civil servants adopt an approach of 'we will just park that question over here and come back to it' (or not as the case may be)

Landbased engineers intuitively think on their feet.

Apprentice Landbased technicians learn and earn on the way to professionalism. Too many others develop knowledge without skills whilst accumulating debt and then possibly become civil servants!

Must go and have a lie down to recharge the batteries so that I have enough energy to shout at the television later.



LAST WORD

***Views expressed are those of the author and not of IAgrE**. The aim of **Last Word** is to present original, 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)*

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MEMBERSHIP GUIDANCE FOR THE PUBLIC GOOD

Diversity of views is always a positive sign of considered debate

Alastair Taylor, Chief Executive, IAgrE

IAgrE is a charity *writes CEO Alastair Taylor*. In its aims and objectives, it is made very clear that our core object is to promote and coordinate the study, development and regulation of the profession of Agricultural Engineering for the public good. Look at other professional bodies and you will find similar language reflecting the context of their work.

Where a charity steps beyond the boundaries of working for the public good this will make the news. Often this is down to a financial irregularity or an association with an issue where there has been insufficient due diligence. The real no go area is political association which is one of the reasons why it is very clear in our objectives that we are not allowed to be a trade union. This brings in an interesting area which members should consider.

If, as IAgrE members we should avoid political representation in the name of the Institution, this does not prevent individuals following their beliefs (we had a member stand for Parliament in 2015) nor does it stop the Institution, as a whole, contributing to the Parliamentary debate.

At any one moment in time there are many consultations, commissions, government committees and similar where it is only right that we contribute. Keeping up with these is something of a challenge and when something comes our way we will always let relevant members know in order that they can contribute. Similarly, our colleagues in the Royal Academy of Engineering will often respond on behalf of all professional engineering institutions with the Society for the Environment taking a similar stance on environmental matters.

In recent years, the IAgrE can take some credit for the impact it has made. For example, the introduction of Innovation Centres under the Agri-Tech strategy is responsible in part to the reputation of IAgrE, the provenance of its members, and the representation we made on behalf of our profession. Of this we should be proud. Similarly, I would like to think that some of the government's apprenticeship reforms have been influenced by our input. All of this comes under the general banner of "for the public good" Going forward, in whatever world falls out of the historic EU referendum, there is perhaps even more scope for professionals such as ourselves to influence thinking and direction.

It is useful to illustrate this matter by using a recent example of a report produced by the House of Commons Environmental Audit Committee (EAC) Report on Soil Health. One particular paragraph captured the gist of the report and who could disagree that:

"Soil is crucial to society. Neglecting soil health could have dire consequences for food security, climate change, and public health. Some of the most productive agricultural land in England is at risk of becoming unprofitable within a generation through soil erosion and loss of carbon, and the natural environment will be seriously harmed. The importance of soil has not always been reflected in public discourse or Government policy, with soil receiving little attention compared to issues like air, water and biodiversity."

Delving deeper into the report (and you are urged to do so) you will find listed some 80 organisations and individuals who have provided written evidence. A good number of them are IAgrE members and for that we should be proud. Whether the Institution should have marshalled a single response could be debated and if this had been done in parallel with the individuals this may well have added value.

On the other hand, that might not have been appropriate on account of the diversity of views held by our various members. This is a judgement call we have to take and that depends upon the issue.

I was pleased to read specific quotes in the report from our members including the Immediate Past President Professor Mark Kibblewhite and amongst others Dr Robert (Bob) Evans from Anglia Ruskin University. (I apologise to any member who I have not cited.)

It is noteworthy that within the report, individual contributors don't always agree. Following our own sharing of the report to members, Bob got in touch to point out:

"It is good that you comment on the House of Commons Environmental Audit Committee's report on soil health but Prof. Kibblewhite may be overstating the impact of soil erosion in Britain on soil health. Some of us think soil compaction, not soil erosion, is a more harmful impact on the soil over the short-term. Compaction increases runoff and the transport to water courses of pollutants (nutrients, pesticides, fine sediment), especially down tractor wheelings, but the volumes of soil eroded per hectare are very small and will have little impact on productivity over the short-term. However, agricultural diffuse pollution is a serious problem, especially for the water industry".

Mark responded saying "Bob Evans is always worth listening to as he has great experience and insights. And he is right – compaction does have more impact in the short term although topsoil compaction is often ephemeral".

The point here is that it is fine for us to have a diversity of views and it is the weighing up of these different viewpoints which allows our profession to arrive at a useful contribution as is so obvious in the government report mentioned here.

In talking to Bob Evans after publication of the report, he said "It is an important message that we should be in contact with MPs or Parliamentary Committees or take part in Consultations. I can understand why people do not want to be political, but if you don't join in, you don't get your message over and considered".

On the latter point, I agree with Bob wholeheartedly, so my plea to members at all levels is to remember that as an IAgrE member we sign up to a Code of Conduct which includes acting for the public good but please do not hold back when it comes to providing a useful contribution to any debate which informs thinking which in turn makes the world a better place.

IAgrE and National Centre for Precision Farming (NCPF)

Proposed Internet of Things (IOT) Special Interest Group

Professor Anthony Furness, Visiting Professor Harper Adams University and National Centre for Precision Farming

The Internet of Things (IoT) is a concept in the process of realisation, and now very much within the commercial gaze as a significant source of opportunities for enterprise and product, systems and services innovation in the agricultural sector*.

The widespread attention to its development through European and worldwide projects over the last decade has not clarified what the IoT is, nor what it has to offer. Unfortunately, a source of hype, throwaway statements, buzz words and obscure implications concerning the growing number of objects connected via Internet Devices have prevailed.

Many of the numerous white papers and media communications provide generalised expressions of the potential of IoT without any real grounding.

In general, the IoT concept means different things to different people, in different industries.

However, by looking at the concept objectively, and with regard to its foundational imperatives, the wider potential of the IoT must be demonstrated for the benefits to be realised. This requires a framework to be derived, that presents a practical outlook on opportunities to our (global) sector.

A special interest group is being proposed that seeks to deliver a global community and shared frameworks in a dynamic change-responsive way. More significantly it seeks to provide a platform for the agricultural community within the UK, EU and the Globe that seeks to provide a cohesive approach to IoT developments.

The SIG would align support for practical business developments with radical attention to productivity, profit, entrepreneurship and global outreach. The Interest Group will be launched at a one day workshop, date yet to be set, designed to provide a precursory view on what the IoT might mean for Agriculture.

It will also seek to define a set of initial guidelines on how the Interest Group can best serve the Agricultural Industries through exploiting the IoT concept in very practical terms.

Initially, attention will be directed at:

- Process-based developments that can radically impact upon performance and profitability,
- Machine-to-machine (M2M) developments in relation to connectivity,
- Sensing, and embedded systems,
- Commercial-off-the-shelf products and services supporting IoT developments,
- Normative and emergent standards, supporting IoT developments,
- Open and big data developments.

By developing the IoT Interest Group along the lines of the very successful Unmanned Aerial Systems (UAS), colloquially the Drones SIG, The National Centre for Precision Farming (NCPF) will seek to assist members in addressing IoT developments in relation to agriculture. This will be achieved by providing:

- A collective UK voice, in Europe and beyond, on IoT matters relating to agricultural development,
- An IoT strategy for engaging the food security challenge,
- Development of training events, product demonstrations and guidelines and engagement.

The SIG would facilitate a partnership between industry stakeholders and academe, ostensibly with industry stakeholders taking the lead in ensuring that practical and economic benefits can be gained from such an initiative.

To cover the cost of this initiative funding will be sought from UK sources and via membership fees, aligned to those currently charged for the NCPF Unmanned Aerial System Interest Group.

The essential benefits to be expected from this Interest Group include creating a forum between organisations, community networking, collective voice, promotion of IOT innovation, establishing standards, identifying employment and skills requirements, developing training initiatives, encouraging entrepreneurship . . . and much, much more.

If you are interested in becoming a member or sponsor for the IoT Interest Group please contact Professor Anthony Furness, through IAgrE Secretariat secretary@iagre.org, the NCPF at Harper Adams www.harper-adams.ac.uk or Linkedin, in order that interest can be assessed.

OBITUARY: Paul Cripsey 15th March 1951 – 15th August 2016

With F.B. Parrish and Son at Lodge Farm, Chicksands since 1972. Appreciation by Tim Chamen, Paul Miller and Gordon Spoor

Paul was not a member of the IAgrE, but his support of the Institution and his contribution to innovative and practical agricultural systems was immense and more than warrant an acknowledgement here in Landwards.

Paul was a larger than life character, always with boundless energy and enthusiasm which was infectious to all around him. He was always cheerful – rarely met without having a smile on his face, always ready to provide assistance when needed and to listen to what one had to say. The central interest that brought us all together was of course agriculture and agricultural engineering, including soil management and precision farming approaches. Always up for a challenge, he grasped immediately the potential benefits of having control of where all the machinery wheelings would go for example and the reduced compaction and lower inputs this could offer. Paul being Paul, he set to doing something about it almost immediately. Being responsible for growing a wide range of crops with diverse machinery and management requirements, achieving this would be no small task. Nevertheless, he thoughtfully dived into it and was still striving for improvement when he was so unfortunately taken from us. The range of crops (particularly different types of onion) and soil types on the land he farmed fitted well with precision farming approaches and he keenly evaluated and adopted many of the more recently developed technologies, including RTK GPS and targeted spraying.

Paul was never content to keep doing things as they had done in the past, he was always questioning, pushing the boundaries and coming up with innovative solutions for the very wide range of technologies in which he was involved. Having close contacts with the research community led to many a trial being set up at Lodge Farm, with all concerned being very supportive of all that was being asked.

Many of us travelled with Paul to different parts of Europe and he was always a pleasure to have in one's party and certainly not one to turn down a lager, even if it was 2 in the morning and having only just arrived in Denmark! An early morning walk in places new was also a favourite of his and the surroundings enjoyed to the utmost. What was so endearing about Paul was his schoolboy-like enthusiasm, which he never lost.

We will all miss Paul greatly but his legacy of innovation, passion and humour will always be relished and remembered in years to come. He, as well as the Parrish family for whom he worked, are a shining example of good farming and advancement and we hope all who follow in Paul's footsteps will enjoy and maintain his legacy.

PIONEERING TECHNOLOGY SPECIALIST GROUP

70 tractors for 70 years or Happy Birthday TE20!

William Waddilove reports

The first TE20 tractor came off the Banner Lane factory production line of the Standard Motor Company under the name of Harry Ferguson Ltd on 6 July 1946. To celebrate the seventieth anniversary of this event the Coventry Motor Museum had arranged a birthday party. Co-sponsors were AGCO (who now hold the Massey Ferguson marque) and FOFH (Friends of Ferguson Heritage).

The PTSG (Pioneering Technology Specialist Group) thought this was a great opportunity to join in and celebrate the birth of what many see as one of the greatest developments, the introduction of the 'modern' tractor complete with power take off and hydraulic three-point linkage.

The aim of the event was to gather 70 tractors in Millennium Square in front of the Coventry Motor Museum. The day started with a procession from the nearby coach park, which had been reserved for lorries and trailers transporting tractors, and led by the Lord Mayor of Coventry through the centre of the city, followed by one of AGCOs newest tractors named 'City of Coventry' and then one of the oldest TE20 tractors together with a Ferguson mounted plough.

These were followed by over 40 Massey Ferguson tractors of all ages and models. Upon arrival in the square the Lord Mayor made a welcoming speech and we had a celebration cake provided by AGCO.

Later in the afternoon there was a lecture about the life and work of Harry Ferguson. The big question was did we get 70 tractors? I think it was decided that yes we did. This was thanks to a lot of work recruiting by the organisers.

This event seemed an excellent opportunity for the PTSG /IAgrE to have a stand. We were given a part of the FOFH marquee. We did not record the numbers of members who attended but there was one who came from Lancashire. Certainly the IAgrE pens and copies of Landwards proved popular, or perhaps visitors just liked talking to me wearing my very smart factory overalls! When I worked at the Banner Lane factory we had fourteen Institution members on the staff. This was the most members with any single employer in the Institution.

BELOW: The PTSG/IAgrE stand. Left to right Hammy Baird (ex MF), James Wallace (Ex MF and long standing member) and William Waddilove (Ex MF and wearing his factory overall coat).

BOTTOM: Ferguson parade.

REPUBLIC OF IRELAND BRANCH

GRASS & MUCK DAY AT GURTEEN AGR COLLEGE Report by Mike Ryan and David Frizelle

THE Northern Ireland branch of IAgrE was well represented at the Grass and Muck Day held at Gurteen Agricultural College on 12 May 2016.

With a stand in the main marquee, we were well placed to respond to interest and enquiries about courses in Agricultural Engineering from prospective students and parents.

This year the number of trade stands had doubled, and attendance was reckoned to be in excess of 13,500 farmers, contractors, dealers and this time quite a number of parents with children.

The cutaway models were placed in front of the stand, and drew quite a bit of interest. A large number of graduates from both Colleges were on site at their respective employers' demo areas, or on their stands. This was a very useful factor when being asked about job prospects by perspective students and/or their parents.

As you will see from the photos attached, the stand was advertised as Agricultural Engineering & Mechanisation, (Education & Training), with I.T. Tralee and Pallaskenry Agricultural College being the main participants. The ROI Branch acted as the co-ordinators and it would be good to bring in both Ballyhaise and Kildalton Agricultural Colleges who each offer FETAC courses in a particular branch of agricultural mechanisation.

There was considerable interest in the services offered by IAgrE. Our Irish supplement to accompany the UK multi-colour brochure on a career in Agricultural Engineering / Landbased Technology was popular, especially with parents of perspective students.

Finally, the ROI Branch would like to say a big thank you to Brenda, Claire, Denis and Con at I. T. Tralee for their assistance with assembly of literature and hardware for the show.

WREKIN BRANCH

ROYAL AIR FORCE MUSEUM
Report by David Clare

Nineteen members of the Wrekin Branch met at the Royal Air Force Museum Cosford on 11 August for a tour of the Michael Beetham Conservation Centre.

The tour was led by Darren Priday who is the workshop manager there and manages a staff of ten plus approximately ninety volunteers. Their task is to conserve and rebuild items which are destined for display in the museum, and clean and maintain items already on display and on loan.

Darren showed us four major projects they are currently working on, a WWI German biplane, a Dornier Do17Z-2, a Wellington MK 10B Bomber and a Handley Page Hampden. The work Darren's team carries out ranges from cleaning and preserving as on the Dornier, to rebuilding from original drawings major sections of fuselage as on the Hampden.

The Dornier was recovered from the sea just off the coast of Kent and was encrusted in salt and silt, with hardly any recognisable detail. After months of spraying the plane with citric acid to neutralise salts and of washing off silt, the plane is in an amazing condition and it is hard to believe it has spent over 60 years in the sea. After a spray with WD40 some of the mechanical parts are in such good condition that one of our group mistook a piece of roller chain from the plane for a piece of new chain!

The group spent nearly two hours being shown various aspects of conservation work going on in the workshop and Darren knowledgably fielded an array of technical questions. I would definitely recommend a visit to anyone who has an interest in historical engineering, heritage conservation or aircraft.

RIGHT: Cosford Darren explaining the structure of a WWI plane wing.

BELOW: Cosford Hampden forward fuselage under construction

WREKIN BRANCH

Gladstone Pottery, Stoke on Trent
Bill Basford reports

Thinking outside the box members and their families visited Gladstone Pottery, now a museum to savour the lost engineering skills and art forms of a once totally dominant industry within the Stoke area. On a fascinating tour hosted by an extremely knowledgeable guide the mysteries of local clay, the various treatments needed before and during use, bottle kilns, cottage industries and canal transport influences were explained.

The use of rope drives from simple water and then early steam power challenged modern concepts of hydraulics with electronic control. The skill and ability of a bottle kiln operator judging temperatures over several days with variables of wind (speed and direction), fuel and kiln differences left all visitors in awe of just how the extremely high quality of the final fragile products was achieved.

As with all good engineering visits lunch was the conclusion but for some family groups the afternoon offered an extension to result in a thoroughly fulfilling whole.

RIGHT: Bottle Kilns

TOM OVERBURY WINS AWARD

The James Buckman Presentation Cup is awarded to a member of the staff of the Royal Agricultural University in recognition of excellence in education. This year the cup was presented to IAgrE member Tom Overbury, RAU Farms Director and Principal Lecturer in Farm Mechanisation at the School of Agriculture, Food and Environment Convocation ceremony on Thursday 21 July. Tom was selected for his immense enthusiasm and genuine passion for his subject.

BELOW: David Hopkins, Dean at RAU presents Cup to Tom Overbury, MIAgrE

WESTERN BRANCH

Woodlands Farm visit
Mike Whiting reports

The Western Branch of the IAgrE decided to add some flavour to their 2016 visit schedule with a trip to meet Nigel Finch at Woodlands Farm Ltd near Cirencester on 6 July. Nigel took us through the process quite literally, commencing with the tractor and Sitrix rake turning the grass ready for the round bale silage in the field. The farm milks 120 Meuse Rhine Issel crossed with Friesian bred cows with 25% of the herd been put to an Angus bull, the remainder to home bred sire using Artificial Insemination. Nigel opts for a closed herd in the fight against TB. The herd have a varied diet of propcorn treated barley, rolled wheat, Silage, rape meal and straw treated with molasses.

The blend contributes to producing milk with approximately 4% butterfat. Although Nigel Finch developed the concept of ACR's (automatic cluster removal) and sold the patent to Alfa Laval some 40 years ago, the 6 a side cow entry and exit parlour still operates with fully manual operation, a preference of the current dedicated herdsman. The application of compressed air automation for cow entry and exit ensures a smooth flow.

From their initial start in 1928 when Nigel's father moved to the farm, the family were retailing unpasteurised milk through local outlets in hand filled bottles. They then moved to plastic sachets and from there to marketing 120 gallons a day of milk through an automated plastic bottling line.

The move to developing live yoghurts was initiated 20 years ago as the business strove to develop new outlets and continue to add value to their produce. The current range of 11 flavours including Rhubard, Toffee and Blueberry uses Woodlands Farm own unique culture which is incubated for 4 hours before cooling. Two species of bacteria are used; Lactobacillus bulgaricus and Streptococcus thermophilus which have a symbiotic relationship meaning they work well together in a cultured dairy product like yoghurt. The fruit flavours contain No GM's and the turnaround from the cow to the cold store is less than 6 hours, ready for delivery.

Nigel Finch is certainly a man who likes to see "problems solved" and took pride in showing us the range of home designed processing equipment on the farm, including hand-made stainless steel vats with seam welding which was flawless.

The farm uses approximately 25% of its milk output for the yoghurt manufacturing, retailing over £15K per month through outlets such as Gloucester services on the M5, and shops in Hungerford, Birmingham and Worcester. A clear indication of the current milk industry with exploiting opportunities to develop new markets at the production source is the way forward.

The farm also has a shop which is open every day from 9-5 serving home-made ice creams, hot meals and a full range of meats from home produced livestock.

Nigel ensured we left with a sweet tooth by kindly providing free yoghurt samples of the day's production.

BELOW: Woodlands Sample of the yoghurt for the trip home

LEFT: Woodlands Nigel Finch with Richard Robinson

MEMBERSHIP CHANGES

ADMISSIONS

Member
M Hill (East Midlands)
R M Wambua (Kenya)
Lopez Rivera Z (United Arab Emirates)

Associate
Jones C (Western)
Marsh M J (Western)

STUDENT

Harper Adams University
Parkes S
He J
Li H
Li J
Liu S
Pang
Su M
Wang R
Wen
Yu Y
Yu Y
Zhang F
Zhang X
Zhou C
Zhou M

Newcastle University
Stott K

SRC Portadown
Scott R

University of Kassell, Germany
Nasirahmadi A

DEATHS

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

Mr Christopher M Wathes OBE FIAgrE (Western) – a member since 1991

Mr D F Kane MIAgrE (Southern) – a member since 1962

TRANSFERS

Associate
V L Cooper (West Midlands)
Maziwisa T (Wrekin)

ENGINEERING COUNCIL REGISTRATIONS

CEng
Miller PCH, CEng, CEnv, HonFIAgrE (South East Midlands)

IEng
Day GC, IEng, MIAgrE

EngTech
Hill M, EngTech, MIAgrE (East Midlands)

LONG SERVICE CERTIFICATES (JULY-SEPTEMBER 2016)

Name	*Grade*	*Date of Anniversary*
50 Years		
David Henry Burlingham	MIAgrE IEng	27/07/2016
Richard John Godwin	HonFIAgrE FREng CEnv	27/07/2016
35 Years		
Christopher William Plackett	MIAgrE CEng	01/07/2016
Richard Charles Osborne	FIAgrE CEng	09/07/2016

Name	*Grade*	*Date of Anniversary*
25 Years		
Lyle Edward Freeman	AMIAgrE	23/07/2016
Kenneth William Priddle	AIAgrE	31/07/2016
Andrew John Whitfield	AMIAgrE	19/08/2016
Peter John Longley	MIAgrE CEng	24/09/2016
John Gerard Sullivan	MIAgrE IEng	25/09/2016

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 College
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

HSS Hire
Head Office
25 Willow Lane,
Mitcham, London
CR4 4TS

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

FORTHCOMING EVENTS

EVENTS

All enquiries regarding IAgrE events, contact Sarah McLeod Tel: 01234 750876 secretary@iagre.org

Wednesday 9 November 2016
IAgrE Hub Event
Plumpton College
Speaker: Jack Howard, John Deere Sales Specialist
Venue: The Sussex Rural Business Centre, Plumpton College
Overview of John Deere today and then a more detailed look into their Precision Agriculture and Telematics solutions. An opportunity to get together members, staff and students for networking and to listen to an interesting speaker.

Wednesday 16 November 2016

2016 IAgrE Conference AgEng

Innovation: Concept to Cash

Venue: Harper Adams University

This conference seeks to equip you with the information and knowledge you need to answer these questions. As well as hearing from experts in research and development, copyrighting, intellectual property, and patents; established and respected technologists who have dealt with these issues will tell you how they managed the challenge and give insight to the various questions you need to consider. Full details in this issue of Landwards.

Monday 21 November 2016
IAgrE Hub Event
Easton & Otley College
Speaker: TBC
An opportunity to get together members, staff and students for networking and to listen to an interesting speaker.

Wednesday 7 December 2016
IAgrE Hub Event
Writtle University College
Speaker: TBC
An opportunity to get together members, staff and students for networking and to listen to an interesting speaker.

BRANCH EVENTS

EAST MIDLANDS
CONTACT: Richard Trevarthen
01509 215109
richard.trevarthen@gmail.com

Tuesday 11 October 7pm 2016
"Engineering Solutions for Trenching" visit to Mastenbroek Ltd
Venue: Mastenbroek Ltd, 83 Swineshead Rd, Wyberton Fen, Boston, Lincs PE21 7JG
The meeting consists of a talk entitled "Engineering Solutions for Trenching", followed by a tour of the works. This is one occasion where the start time is 7.00pm sharp, and numbers have been limited, so please let me know if you plan to attend. First come....first served
Book your place with Richard Trevarthen.

Tuesday 8 November 2016
Visit to Andrew Guest Ltd
Venue: Andrew Guest Ltd, Manor Farm, Cotham, Newark, Notts, NG23 5JS
A company that specialises in refurbishing Kuhn power harrows and Accord drills usually in the combination mode.

Tuesday 13 December 2016
Visit and tour of the facilities at the University of Lincoln
Venue: Rm MB1010, Minerva Building, University of Lincoln, Brayfield Campus, Brayford Pool, Lincol
Meeting 7.00pm for 7.30pm in room MB1010, in the Minerva Building, University of Lincoln, Brayfield Campus, Brayford Pool, Lincoln, LN6 7TS

Tuesday 10 January 2017
The work of the Agricultural Engineers Association
Venue: AEA, Samuelson House, 62 Forder Way, Hampton, Peterborough, PE7 8JB

Tuesday 14 February 2017, 7.00pm for 7.30pm
Visit to The Doubleday Group
Venue: Doubleday Group, Station Road, Swineshead, Boston, Lincs, PE20 3PN

Tuesday 14 March 2017
Excellence in Engineering 50 years of the Land Rover
Speaker: John Holland, Head of Jaguar Land Rover Group Strategy
Venue: Quorn Lodge Hotel, 48 Asfordby Road, Melton Mowbray, Leics LE13 0HR

Tuesday 21 March 2017
Annual Dinner and AGM
to which partners are invited
Quorn Lodge Hotel, 48 Asfordby Road,
Melton Mowbray, Leics LE 13 0HR.

NORTHERN IRELAND
CONTACT: Ian Duff
028 8673 6977 duffi@iagre.biz

October 2016
Design, Construction & Use of Modern Poultry Housing
Speaker: TBC
Venue: TBC
Date and venue to be confirmed

November 2016
Experiences of an Agricultural Business in Northern Ireland
Speaker: TBC Venue: TBC
Venue, date and speaker to be confirmed

Wednesday 18 January 2017
70 years of Zetor Tractors
Speaker: TBC
Venue: TBC
This meeting will be held at Banbridge and a representative from Zetor will speak - more details will follow.

February 2017
Agricultural Engineering teaching programmes and resources
Speaker: TBC Venue: TBC
This meeting will be held in Omagh in early February. More details to follow

Tuesday 28 February 2017
AGM followed by "Funding agricultural engineering research in the modern world"
Speaker: Dr Robert Merrall, President of IAgrE Venue: Cookstown (TBC)

SOUTH EAST MIDLANDS
CONTACT: John Stafford
01525 402229 john.stafford@silsoe-solutions.co.uk

Monday 10 October 2016, 7.30pm
Connected Farming
Speaker: Dr Sachin Shende, KisanHub, CEO
Venue: Maulden Church Hall, Church Road, Maulden MK45 2AU
KisanHub blends diverse datasets like farm records, weather, irrigation, agro-chemical applications, satellite and drone imagery and data about commodities, soil and farm machinery to make sense of huge heterogeneous datasets by generating and deriving intelligent trends and patterns. In doing so, they free growers from managing and analysing complex data. www. kisanhub.com

Monday 7 November 2016
Nano-Tech in Agriculture
Speaker: Dr Sophie Rocks, Snr Lecturer in Emerging Risks Cranfield Institute
Venue: TBC
Venue, time and details to be confirmed

Tuesday 13 December 2016
CNG-Fuelled tractors
Speaker: TBC Venue: TBC

Monday 9 January 2017
Tier 5 Emissions
Speaker: Rob Fillingham, Claas
Venue: TBC To follow

Monday 6 February 2017
AGM & Student Presentation Evening
Venue: TBC To follow

Monday 6 March 2017
Engineering for Precision
Speaker: TBC Venue: TBC
To follow

Monday 3 April 2017
Success with No-till – under any conditions – a Nuffield Scholar report
Speaker: Russell McKenzie
Venue: TBC
Russell entered his scholarship wanting to find out if crop establishment with tillage was doing more harm than good. He will share his Nuffield travelling experiences, reporting on know-hows of no-till farmers from the extremes of dry in Australia to the opposite in Brazil and of many places in between. He found more sustainable systems than those of the 1970s, and with the addition of cover cropping, also the means of enhancing soil organic matter levels.

Wednesday 17 May 2017
Visit to Silsoe Spray Unit
Venue: SSAU, Silsoe To Follow

WEST MIDLANDS
Contact: Ian Moore
0121 704 5700 ianw@whale.co.uk

Tuesday 11 October 2016, 7.30pm
Optimising direct drilling methods in no tillage farming systems
Speaker: Michail Giannitsopoulos and Iain Dummett from Cranfield University Venue: TBC
Presentation on their research in this area
Tuesday 8 November 2016 ***Branch meeting - subject to be confirmed***
Speaker: TBC Venue: TBC

Tuesday 6 December 2016, 7.30pm
'Assist Drive Technology - For When The Going Gets Tough'
Speaker: Mark Cheetham. Linde Hydraulics Ltd.
Location - Friends Meeting House, 37 Maidenhead Road, Stratford upon Avon

WESTERN
Contact: Mike Whiting
07751 345580
mike.whiting@newmac.org.uk

Wednesday 23 November 2016, 6.30pm
Presentation by Ray Clay, Chief Engineer at JCB Landpower 1995-2005.
Venue: Lackham College, Chippenham

Wednesday 25 January 2017
Visit to Miller Wiseman Dairies TBC

Wednesday 8 March 2017, 6.30pm
Branch AGM and lecture (TBC).
Royal Ag University, Cirencester

WREKIN
Contact: David Clare
01952 815087
dclare@harper-adams.ac.uk

All meetings will be in the Agricultural Engineering Innovation Centre at Harper Adam University unless otherwise stated. Tea and coffee will be available from 7:00pm with the technical meetings starting at 7:30pm unless otherwise stated.

Monday 10 October 2016
Kubota
Details and Speaker to be confirmed

Monday 7 November 2016
Matt Ingram
Topic to be confirmed

Monday 13 December 2016
Hella Lighting
Topic and speaker to be confirmed.

Monday 23 January 2017
Efficiency Gains in Hydraulic Wheel Motors
Neal Armiger and Matthew Maher, Poclain Hydraulics

Monday 20 February 2017
Engineering Solutions for Trenching
Christopher Pett, Mastonbroek Ltd

Monday 20 March 2017
6:30pm, ***Wrekin Branch AGM***
followed by light refreshment and a technical presentation at 7:30pm. Topic and speaker to be confirmed.

Monday 24 April 2017
Landbased Technican Accreditation scheme (LTA)
Subject, speaker and venue to be confirmed.

Monday 15 May 2017
Innovative welding technology
Chris Dungey of The Welding Institute will be talking about the latest jointing technologies, additive manufacturing and deposition coatings.

FOR UP TO DATE INFORMATION ON ALL BRANCH MEETINGS AND ACTIVITIES. VISIT EVENTS:
www.iagre.org/events
BRANCH DETAILS:
www.iagre.org/brgpselect

INDUSTRY EVENTS

Thursday 20 October 2016
Westminster Food & Nutrition Forum
Next steps for UK food waste policy: innovation, partnerships and energy recovery
Speaker: Dr Richard Swannell, Director of Sustainable Food Systems, WRAP
Venue: Central London
For more details www.westminsterforumprojects.co.uk/forums/events

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

2 & 3 November 2016
Rethink Events
World Agri-Tech Investment Summit
Venue: London
Europe's largest and most important gathering of the agri-tech industry, the World Agri-Tech Investment Summit, returns to London. For full details see the event download below
Email: jennie.moss@rethinkevents.com
Web: www.worldagritechinvestment.com Download: WorldAgriTechSummit2016.pdf

25 - 26 November 2016
The National Engineering & Construction Recruitment Exhibition
Venue: NEC, Birmingham
Web: www.engineerjobs.co.uk

Thursday 1 December 2016
09.00-13.00
Westminster Food & Nutrition Forum
Seminar - Policy priorities for the UK food, drink and farming industry
Speaker: Sarah Church, Director of Food & Farming at DEFRA
Venue: Central London
Web: www.westminsterforumprojects.co.uk/forums/agenda/food-drink-farming-agenda.pdf

Tuesday 10 January 2017
Westminster Energy, Environment & Transport Forum
Next steps for waste and recycling policy in the UK
Speaker: Baroness McIntosh of Pickering, former Chair, Environment, Food and Rural Affair
Venue: Central London
www.westminsterforumprojects.co.uk/forums/event

16-17 February 2017
MnM Conferences
European Intelligent Agriculture Congress
Venue: Brussels, Belgium
Email: ajay.nimbalkar@mnmconferences.com
Web2: www.mnmconferences.com/European-Intelligent-Agriculture-Congress

9-10 May 2017
Turret Media FZ LLC
GFIA Europe - Global Forum for Innovations in Agriculture
Venue: Jaarbeurs Expo Centre, Utrecht, Netherlands
Web: www.gfiaeurope.com

IAgrE Landwards Conference 2016

CONCEPTS TO CASH

Turning ideas into commercial reality

Wednesday 16 November 2016 **Harper Adams University**

Turning ideas into profit: The Engineers Survival Guide

Business start-ups, new partnerships, re-engineering of existing applications all provide new challenges including:

- **Intellectual Property:** Retaining and protecting your ideas
- **Collaboration:** Working with others whilst retaining intellectual property
- **Funding:** Business challenges and accessible funding

Experts in research and development, copyright, intellectual property, patents and established technologists will provide an insight into these and other issues

Dave Ross,
Interim CEO
AGRI-EPI Centre

It has never been so exciting to be an Agricultural Engineer

"We are delighted to be sponsoring this year's IAgrE Conference. Our centre has been developed to drive growth and support innovation to help farmers and business owners become more profitable and sustainable. This agenda is central to the conference as we address the challenges of feeding an ever increasing global population. IAgrE is an ideal forum for doing just that."

MAJOR SPONSOR

AGRIEPICENTRE
Engineering • Precision • Innovation

BOOKING DETAILS

When: Wednesday 16 November 2016

Where: Harper Adams University College, Newport, Shropshire

Cost:

Standard delegate:	£120 + VAT
Early Bird delegate:	£100 + VAT
Retired delegate:	£75 + VAT
Student delegate:	£20 + VAT

Booking and information:
Tel: 01234 750876
www.iagre/resources/conference2016