Landwards

Agriculture • Horticulture • Forestry • Environment • Amenity

LANDWARDS 2012 CONFERENCE

Pictures and report on the IAgrE Conference at Stoneleigh Park

THE ROLE OF THE AGRICULTURAL ENGINEER IN LIVESTOCK FARMING

Professor Christopher Wathes on meeting the growing global demand for meat, eggs and milk

NEW PRESIDENT FOR IAGRE

Andy Newbold succeeds Peter Leech for 2012-13

IAgrE Professional Journal www.iagre.org Volume 67, Number 2 Summer 2012

Biosystems Engineering

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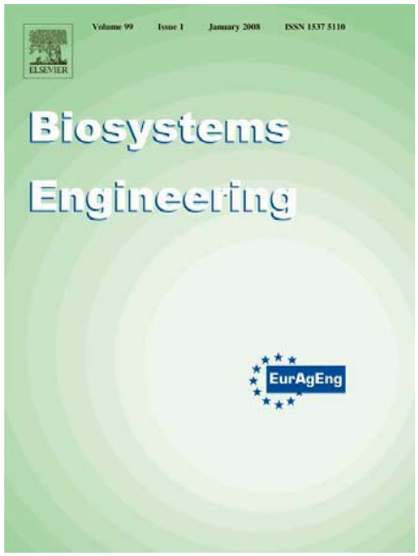

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IAgrE

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

Biosystems Engineering
Volume 111, Issue 2, February 2012, Pages 217-228

Simulated performance of a greenhouse cooling control strategy with natural ventilation and fog cooling

Federico Villarreal-Guerrero, Murat Kacira, Efren Fitz-Rodríguez, Raphael Linker, Chieri Kubota, Gene A. Giacomelli, Avraham Arbel

Universidad Autónoma de San Luis Potosí, Mexico
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Technion-Israel Institute of Technology, Haifa, Israel
Agricultural Research Organization, Bet Dagan, Israel

In addition to ventilation, daily cooling must be provided for greenhouses located in semiarid climates to maintain the desired climate conditions for year-round crop production. High-pressure fogging systems have been successfully developed for greenhouse cooling. However the lack of control strategies, in combination with ventilation systems, especially passive ventilation, has limited their capabilities. A new cooling control strategy, which considered the contribution of humidification and cooling from the crop, was evaluated by computer simulations. The strategy controlled the amount of fog introduced into the greenhouse, as well as the percentage of vent openings to maintain desired values of greenhouse atmospheric vapour pressure deficit (VPD) and enthalpy, respectively, which would consequently affect air temperature. The performance was compared to constant fogging rate strategy, which was based on VP. The improvements in the greenhouse climate achieved by the new strategy were due to its ability to dynamically manipulate fog rates, as well as, the vent configurations.

Volume 111, Issue 3, March 2012, Pages 298-304

A monocular vision-based diameter sensor for Miscanthus giganteus

Lei Zhang, Tony E. Grift

University of Illinois, Urbana, IL, USA

The stem diameter of Miscanthus giganteus (MxG) is an important parameter in the measurement of stand volume and yield. To measure the diameters of MxG stems automatically, a vision-based diameter sensor was developed, consisting of a camera and a laser sheet that was slanted downward at a 15° angle. The laser sheet projected Illuminated Line Segments (ILSs) onto the MxG stems, creating detectable features in images that enabled the depth from the camera to the stems and, subsequently, the stem diameters to be measured. To evaluate the method in a sample of 1364 MxG stems, originating from 100 randomly selected images, the depths and diameters of 150 stems were measured manually and plotted versus their automatically measured counterparts. Straight lines with intercept were fitted to both the depth and diameter data. The depth measurements, ranging from 368 to 1486 mm, yielded a slope of 1.002, an intercept of -1.2 mm and a coefficient of determination of 0.998. The diameter data, ranging from 3.1 to 14.6 mm, yielded a slope of 0.845, an intercept of 1.4 mm and a coefficient of determination of 0.926.

Volume 111, Issue 4, April 2012, Pages 325-335

Mechanical and self-healing properties of cementitious composites reinforced with flax and cottonised flax, and compared with polyvinyl alcohol fibres

Didier Snoeck, Nele De Belie

Faculty of Engineering, Ghent University, Belgium

Flax stems are often considered waste material. However, since flax fibre has superior mechanical properties amongst natural fibres, it can be used as reinforcement in cementitious composites. Durability of flax, however, is endangered in alkaline environments by the deterioration of alkali-sensitive pectin and hemicellulose. Cottonisation of flax not only makes flax suitable for producing textiles; it divides the technical fibre into bundles of elementary fibres and partially removes the alkali-sensitive pectin and hemicellulose. Therefore, the characteristics of cottonised flax (CF) in fibre reinforced cementitious composites were assessed. The fibre and composite properties were compared with technical flax (TF) fibres and synthetic polyvinyl alcohol fibres. Not only were tensile strength and stiffness evaluated, but also first crack strength, peak stress, work of fracture as a measure for multiple cracking (MC), and the visual closure of individual cracks by self-healing. The self-healing of cracks was independent of the fibre type. Cracks narrower than 30 μm healed completely and crack widths between 30 μm and 150 μm only partly healed.

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Landwards
Agriculture • Horticulture • Forestry • Environment • Amenity

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THIS ISSUE

EDITORIAL

Keeping a sense of perspective

AMONGST the many millions who turned out to celebrate Her Majesty's Diamond Jubilee, there were also a significant number on the airwaves and in the press, who questioned the place of the Royal Family in today's society.

An editorial in *The Times* reflecting on changing attitudes said, "***The younger generation today do not speak in such revered tones about the Queen and The Monarchy as was common half a century ago - are we therefore halfway to being Republicans?"***

Fascinating that. The editorial was published in *The Times* on the eve of the Coronation in 1953 - almost 60 years ago.

It illustrates that we need to retain a sense of perspective on all elements of our lives today.

Which is why I always enjoy looking back at the issues that challenged those who preceded us, for you inevitably discover that our 'new' challenges, our 'new' ideas - are not new at all!

This from the lead editorial of the *Farm Implement and Machinery Review,* July 1966, published on the eve the Royal Show. "***. . in some circles, it is not always recognised that agricultural engineering has earned for itself a status equal to that of other engineering disciplines. In the technological revolution going on throughout the world, agricultural engineers have an increasingly important and challenging part to play."***

The editor also adds, "***. . . we never hesitate to applaud and encourage the efforts of the Institution of Agricultural Engineers, a body which - sometimes against fearful odds - has striven over the past twenty-eight years to enhance the professional status of agricultural engineering."***

Fast forward 45 years to this year's splendid IAgrE Conference held at Stoneleigh. The subject matter, the debate, echoed the thought and sentiments expressed all those years ago.

The 'elephant in the room' was the challenges to agriculture posed by *The Foresight Report on Food and Farming Futures* which had extraordinarily omitted to recognise the part that agricultural engineering MUST play in meeting the need to produce '40% more food in the next 20 years'.

The Institution is currently addressing that oversight with its own imminent submission - but it illustrates once again why we need to use every opportunity to make our case - and make it forcibly.

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

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

EurAgEng
Engineering Council
SocEnv Society for the Environment

Massey support NFU campaign

MASSEY Ferguson is giving full backing to the NFU's high-profile campaign '*Farming Delivers for Britain*'.

MF's Paul Lay and the NFU President Peter Kendall

The company is endorsing the campaign which aims to inform the public about the many ways in which farming contributes to the economy. This coincides with a major new NFU report which demonstrates that UK farming is growing strongly and is the foundation stone for Britain's food and drink industry, now the UK's fourth largest export sector. Farming delivered more than £8 billion to Britain's economy in 2011 - an increase of 25% on the previous year.

The Farming Delivers for Britain campaign kicked off with a farm-themed boat sailing down the River Thames on 21 May to showcase the many aspects of British agriculture. On board were 100 specially invited guests and VIPs from the food and farming industry.

Despite continued impact of UK economic conditions

Engineering Council report growth in registrations

THE Engineering Council's annual statistics report for 2011 shows that the number of engineers and technicians joining the national register by gaining professional qualifications continues to grow year on year, despite there being an overall 2% reduction in the total number during 2011. The 6.85% increase in new registrations during 2011 further builds on the significant 26.9% rise seen during 2010.

The report also shows that the number of professionally qualified engineers and technicians on the register aged 60 and over has now risen from 37.4% in 2010 to 39.4%, reflecting the ageing population of the UK.

Jon Prichard, CEO of the Engineering Council says, "The need to continue attracting new entrants to maintain the skills pipeline is vital if we are to meet the demands of future national needs, and to avoid experiencing the significant skills shortages in key sectors that occurred when we emerged from the last recession.

"The current financial downturn has inevitably resulted in a short term reduction in the demand for professionally qualified engineers, despite all of the recent skills forecasts identifying a medium term need for a highly skilled and professionally qualified workforce. An ongoing commitment from employers and individuals to professional development and professional registration is one of the measures that can help mitigate future shortages."

The Engineering Council is therefore working with the Professional Engineering Institutions and other partners to boost awareness and understanding of the value of joining the register, to ensure that the workforce retains sufficient professionally qualified engineers and technicians.

"It is pleasing to see that the UK Government has also now acknowledged both the central role engineers will play in rebuilding the economy and the need for sufficient highly skilled and professionally qualified engineers and technicians to achieve this," adds Jon Prichard.

Jon Prichard

"The engineering profession today has a key role to play in tackling many global challenges, such as climate change or the need to become a low carbon economy through better use of resources and energy. It is also at the forefront of developing new medical solutions and new communications technologies that will offer significant benefits for future generations."

Alex Galloway appointed new Chief Executive of SocEnv

ALEX Galloway CVO has been appointed Chief Executive of The Society for the Environment (SocEnv), the independent umbrella body that regulates the licensing and award of the Chartered Environmentalist (CEnv) qualification.

Mr Galloway, 59, commenced his post as CEO on 2nd April and is an Honorary Fellow of SocEnv having previously been the Head of the Energy and Environmental Awareness Division of the Department of the Environment. In his role as Clerk of the Privy Council he oversaw the process that led to the grant of a Royal Charter to SocEnv. He leaves his present appointment with a City Livery Company to take up this role.

He has also served as Chairman of an environmental charity and is currently a member of the Architects Registration Board and the Professional Regulation Committee of the Actuarial Profession. He is a member of the Council of the Institute of Directors. Mr Galloway was appointed CVO in 2006.

Professor Ray Clark OBE the Chairman of SocEnv said, "I am delighted that we have appointed such an accomplished leader with an impressive record across several spheres. During his time with the Privy Council, he played a significant role in the establishment of SocEnv and is well known by a number of the professional bodies that currently make up the Society's Board.

"Alex has significant experience and contacts gained within the Civil Service and from senior appointments within professional bodies. I am sure that Alex will make an outstanding contribution as SocEnv enters a new and exciting phase."

Mr Galloway is looking forward to starting work at SocEnv later in July. He said:

"I am proud to have been given the opportunity to lead this renowned and respected professional organisation. As an Honorary Fellow of SocEnv, and with experience in this sector, I have an abiding respect for the work of the Society. It is pivotal to the successful delivery of good environmental practice and professionalism in the UK and globally that SocEnv's Licensed Members should be regulated and supported by a strong, national body."

Andy Newbold is new IAgrE President

Professor Mark Kibblewhite becomes President Elect

ANDY Newbold, managing director of technical events company, Fusion Events, is the new President of IAgrE.

A member of the organisation since 1993 and a Chartered Engineer, Andy also runs NEWMAC Ltd, an engineering risk management consultancy business and publishes Pro Operator, the specialist technical magazine for all NRoSO registered sprayer operators.

The son of a Cumbrian fell farmer, Andy studied agricultural engineering at Harper Adams University. Commenting on his appointment Andy said: "It is a great honour to be President of IAgrE. Agricultural Engineers are unsung heroes who provide the tools for farmers to feed the world, to help tackle climate change and to manage land.

"It is very motivating to be associated with the industry and I look forward to further developing the profession in my two years of Presidency."

President Elect is Professor Mark Kibblewhite. Mark, a Fellow of IAgrE, has 35 years experience in agricultural and environmental sciences gained in industry, government and universities.

L-R: Andy Newbold and Professor Mark Kibblewhite

He joined Cranfield University in 2002 as a Professor of Applied Soil Science and was formerly Director of its National Soil Resources Institute and then Head of the Department of Natural Resources. In 2011 he left his management role to concentrate on consulting, research and teaching in soil science and to focus on the strategic management of soil resources at national and international levels.

The outgoing President is Peter Leech, Regional Training Manager for Deere & Company, covering training within the region of Europe, CIS, North Africa and the Near and Middle East.

Your views required

LANTRA is asking for input into an important survey focusing on industry appropriate delivery of Apprenticeships.

They say apprenticeships remain high on all Government agendas and provide a recognised entry route into the land-based and environmental sector. However there is a particularly low take-up of apprentices within the sectors in which Lantra works, which needs addressing.

One solution may be an Apprenticeship Training Agency (ATA). These agencies work to attract, select and place apprentices and are set up to advise, support and guide businesses, apprentices, and training providers through the Apprenticeship process.

Views from industry are crucial to help Lantra respond to the needs of businesses within the land-based and environmental sector. This survey will identify opportunities to help businesses access and benefit from Apprenticeships. These will enable Lantra to create a tailored solution that suits industry needs.

Take the survey at *www.lantra.co.uk/ATA*

New brochure produced by the Douglas Bomford Trust

THE Douglas Bomford Trust has produced a new brochure to explain its activities to a wider audience

The Douglas Bomford Trust was set up in 1972 as an independent charity following the death in 1969 of Mr D R Bomford, by his widow and family shareholders of Bomford and Evershed Ltd, with the objective of "Advancing education, training and research in the science and practice of agricultural engineering and mechanisation".

The Trust has been fortunate in being able to build on its initial legacy with substantial donations from The Howard Trust in 1996 and from The Trustees involved with Silsoe Research Institute when it closed in 2006.

The Trust provides funding to enable individuals and organisations to pursue:

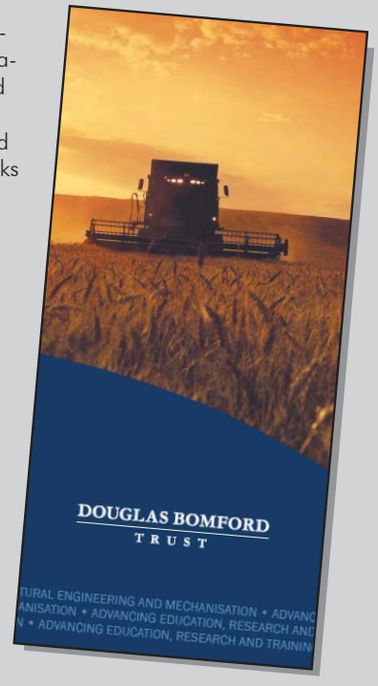
- **Education, training, research and knowledge transfer;**
- **Innovation and the application of science and technology to the design, development and construction of machines, systems and techniques;**
- **Travel to acquire or disseminate knowledge;**
- **The development and maintenance of professional competences;**
- **The development or acquisition of new skills, techniques and capabilities.**

In the past The Trust has produced a newsletter for circulation to those directly involved in its activities.

The new brochure is aimed at a wider audience and seeks to inform those wishing to:

- **benefit from or contribute to the activities of The Trust;**
- **make a donation or leave a legacy to The Trust.**

Copies of the brochure will be distributed to members of IAgrE with the September edition of *Landwards* and can also be viewed on the Douglas Bomford web site (*www.dbt.org.uk*).



New Operations Director for Engineering Council

THE Engineering Council has announced that Dave Hogan, CEng, FIET, FInstLM, has taken up the post of Operations Director.

In the recently revised role Dave will have various responsibilities including Quality Assurance, IT and Registration. Dave says: "I join the Engineering Council at an exciting time as we seek to balance the UK economy with manufacturing and infrastructure at the heart of the political agenda. It is here that the contribution of the UK's engineers and technicians is crucial.

"As part of this, I'll be looking to build on my past experience in driving forward the benefits to the UK, business and the individual of professional registration as a means of identifying those engineers and technicians who display not only technical skills but a commitment to developing their professionalism and adherence to our ethical principles."

Dave joins the Engineering Council from BAE Systems, where he has been employed for the past ten years in support programmes, most recently working as Manager of Engineering, Programmes & Support. Prior to this he spent 26 years in the Royal Navy, working his way up from Artificer Apprentice to Leadership Training Officer for 2nd Sea Lord, where he was responsible for monitoring the training of over 6,000 personnel each year.

As well as having sat on the Engineering Council's Board of Trustees in the year prior to his appointment, Dave has also worked closely with the Professional Engineering Institutions to help embed professional registration into BAE Systems' staff structure. He has also been involved in the work of the Technician Council, leading the employer's group.

Agricultural engineers awarded prizes from Lantra

A LAND-BASED Service Engineering Modern Apprentice has been recognised for his dedication to training at the ninth annual Lantra Land-based and Aquaculture Learner of the Year Awards ceremony.

Grant Arbuckle was recognised as 'Land-based Service Engineering Learner of the Year', which was sponsored by P1 Solutions and Associated Companies Ltd.

Grant said, "I feel my Modern Apprenticeship has given me lots of confidence and has helped me form good working relationships. I intend on staying in the industry and gaining more knowledge and keeping up-to-date with any industry changes.

"This career is great and I would recommend a future in the industry to anyone. This is something I always really enjoy doing because I look forward to work on a daily basis. This is going to be a good career for me in the future."

Rhys Murdoch, nominated by Oatridge College, was named as the 'Land-based Service Engineering Runner-Up of the Year' award. Rhys, a Modern Apprentice said: "My learning and training at Oatridge College and at my workplace has helped me greatly. I plan on developing my skills in the future by observing other qualified engineers working and by asking for help when I need it."

A total of 22 prizes were presented during the awards ceremony which was organised by Lantra, the Sector Skills Council for land-based and environmental industries. The awards are designed to inspire new entrants to take up a career in the land-based sector and make employers aware of the benefits of a well trained workforce.

Valerie Owen OBE, Lantra's Chair, said, "There has never been a more important time to be involved with land-based industries as problems such as food security are facing the world everyday. I applaud all of the finalists who show a real passion and dedication to training and the land-based industries.

"The Land-based and Aquaculture Learner of the Year awards attract the top learners from across Scotland every year who are committed to developing their skills and knowledge."

L-R: Valerie Owen OBE, Lantra's Chair and Grant Arbuckle

•PICTURED above are a group of 2nd Year Agricultural Engineering students from the Institute of Technology Tralee (ITT) visiting Dairymaster HQ at Causeway Co Kerry, Ireland, as part of their Dairy Engineering Module

Also in the photo are lecturers Mr. Michael O Callaghan and Mr. Fergal O Sullivan of ITT.

Bluesky and ADAS join forces

AGRICULTURAL and environmental consultancy ADAS and aerial mapping company Bluesky have joined forces to bring what they describe as 'a new dimension' to vegetation mapping.

Designed initially to support environmental and conservation projects, the partnership will also reduce the risk posed by vegetation on ageing infrastructure, such as falling trees causing power outages. Both ADAS and BlueSky aim to improve the quality and currency of information used by both commercial companies and public sector organisations.

By applying specially developed algorithms to up-to-date aerial photography Bluesky is able to automatically map trees and other types of vegetation. Known as ProximiTREE, Bluesky uses overlapping images so the exact location of every tree can be mapped and the height and extent of its canopy derived.

A communicator for the lifeboat

CEO VIEW

BY the time you read this, IAgrE should have submitted its report to the Government Office for Science entitled **Agricultural Engineering: a key discipline for agriculture to deliver global food security**. This report has been written because, quite rightly, there was a perception, in our community at least, that in the Government's Foresight Report (**Foresight: The Future of Food and Farming:** *Challenges and choices for global sustainability*), agricultural engineering was poorly served with only one passing comment made.

Following a meeting between the Government Chief Scientist - Sir John Beddington - and colleagues from Harper Adams University College (HAUC), IAgrE was tasked with preparing a report on how the ag-engineering sector as a whole saw its role in dealing with the issues well known to us all; these issues (laid out as "challenges" in the Foresight report) are:

- *Balancing future demand and supply sustainably*
- *Addressing the threat of future volatility in the food system*
- *Ending hunger*
- *Meeting the challenges of a low emissions world*
- *Maintaining biodiversity and ecosystem services while feeding the world*

Well I don't know about you, but isn't this what members of IAgrE have been striving to do since its inception? It is obvious however that nobody has noticed! (This just suggests to me that we are too good at what we do but not so good at telling others about it.)

Senior members of IAgrE, through the good offices of HAUC, and working together with others, including AEA, have been working to a tight timetable to deliver the report on June 15th.

All this happened concurrently with the IAgrE Annual Conference (reported fully elsewhere) on *Weathering the Perfect Storm - who do you want in your lifeboat?* Incoming IAgrE President Andy Newbold could not have timed this theme better.

The afternoon discussion sessions raised some interesting points. One of the key conclusions was that we do indeed need to be better at communicating just what it is that ag-engineers have to offer. So we need a communicator in the lifeboat at least.

But I would want ag-engineers at all stations:

- a soil and water man
- a forest engineer good at whittling (oars when the engine finally gives out)
- some LTA technicians (to keep the engine running as long as possible)
- a bio-mass specialist to keep the gas digester on-line
- a decent navigator (I wonder who that might be? He'd probably need a sextant though.)
- someone good at cooking (rules me out)
- and someone with the wisdom of Solomon and the patience of Job to take charge - preferably someone with fitting and turning skills. (My money's on Brian Finney. Could you please take your lathe.)

However, had we been better at communicating with Government, then we might have managed more than one mention in the Foresight report.

This is all my fault. It happened on my watch. Time I went!

(See the IAgrE report on line at *www.iagre.org*)

Christopher Whetnall

WES launches 'Leadership Unplugged'

THE Women's Engineering Society (WES) has launched, 'Leadership Unplugged', a new strand to its Technical Leaders series offering early-career leadership development workshops aimed at students and early career women.

The next workshop, supported by the IET, will take place in Birmingham on 21 June at the IET Austin Court building with registration from 1:30 to 5pm.

On the same day WES will be holding a panel and networking event with senior technical leaders.

Milada Williams, WES President urges companies to give their technical women exposure to leadership insights and inspiration by booking places at the workshop:

"We must act now to boost the pipeline so engineering and technology companies can work towards any future targets to achieve board level diversity otherwise they face losing out on the benefits of diverse boards. While WES has been working at this since 1919 we must work together with companies to capacity build the pipeline to increase the diversity of boardrooms."

WES is running the workshops in support of the dissemination programme of the HE STEM Set to Lead project led from UCL. During the hands on workshop participants gain insights into their personal strengths and develop personal intentional learning plans. WES partners Thoughtworks and Arup have helped to shape the workshop activities by developing scenarios based around real leadership challenges.

Jan Peters, Past President of WES and project director of Set to Lead, urges engineering and technology companies to step forward and showcase their senior technical women and take more care to recruit and retain the talented women graduates.

More info can be found at *http://conference.wes.org.uk*

New Holland visit European Parliament

NEW Holland delegates met with members of the European Parliament in Brussels to discuss sustainable agriculture recently.

The group, led by Chief executive Franco Fusignani, was invited by Paolo De Castro, Chair of the Committee on Agriculture and Rural Development, to attend the meeting on '*Innovation and Technologies for Sustainable Agriculture*', organised by De Castro himself, in Brussels on Tuesday 27 March.

Among the speakers at the event were Joseph Daul, Chairman of the European People's Party and many other MEP's including Matthias Groote, Chairman of the 'Committee on the Environment, Public Health and Food Safety', Phil Bennion, Elisabeth Jeggle and Mariread McGuinness.

The company say this meeting provided the perfect opportunity to outline for a very select audience of key decision-makers, the brand's current strategy of developing dedicated machinery and systems to increase sustainable agriculture and cut both polluting emissions and farmers' dependence on fossil fuels.

In his opening address, Paolo De Castro described the changes made to European legislation as a result of the new and recently approved CAP, underlining how environmental sustainability must go hand in hand with the economic sustainability of each planned measure; in conclusion, he described how energy independence and zero-emissions agriculture have become the only possible way forward.

Giuseppe Gavioli from CNH Innovation and Advanced Research explained that energy-efficient machinery, biofuels derived from biomass and clean engines are essential to cut emissions and achieve energy independence in agriculture.

L-R: Joseph Daul, Mariread McGuinness, Franco Fusignani, Paolo De Castro, Matthias Groote

Biofuels derived from biomass (biodiesel, bio-ethanol, bio-methane and hydrogen) are the next steps in the roadmap to zero emissions; bio-methane and hydrogen are also better suited to local production in small-scale plants located on farming land he argued.

Young dealer of the Year Award

EMMA Pugh of dealers RVW Pugh Ltd, was recently nominated by AGCO for the BAGMA young dealer of the year awards.

Emma went to the gala awards ceremony at the Town Hall in Birmingham on the 24th April, where she scooped the award sponsored by Draper tools.

Emma has been working with RVW Pugh Ltd since 2005, joining the family firm with a strong marketing degree and background. Emma has been able to assist Robert and Caroline in growing the family business, securing additional territory and franchises, along with assisting in the opening of two new depots in Market Drayton and Holmes Chapel.

The 34 year old has also ensured that RVW Pugh have hit their Massey, Fendt & Challenger business plans year on year.

Emma Pugh receives her award

On receiving the award Emma said, "I am thrilled to see young people in the industry being recognised and it's a great honour to be rewarded in this way."

Gary Henly from AGCO said in his nomination, "Emma shows the leadership skills and characteristics necessary to not only survive in the current difficult economic climate, but to develop and grow the business she is so deeply involved in. Emma's influence within the business has ensured continued growth and success."

•*THE first of a suite of Chartered Institution of Water and Environmental Management (CIWEM) publications on Ecosystem Services has been launched.*

*'**From microbes to mountains**' seeks to inform environmental professionals and the public by summarising the wealth of information available on this increasingly important subject into one easily digestible document.*

CIWEM's Executive Director, Nick Reeves OBE, says, "From 'Microbes to mountains' is informative and educational. It provides a good understanding of the role of ecosystem services in environmental management and its vital contribution to the economy. Such work helps to not only inform environmental professionals, but the public too; and so fulfilling CIWEM's charitable and public benefit aims. This important piece of work provides a spring board for CIWEM's policy development in this increasingly expanding and vital sector."

Visit www.ciwem.org

Honda Institute 'outstanding'

Assessment of recent Ofsted inspection

HONDA (UK)'s apprenticeship programme, delivered by its bespoke training facility, The Honda Institute, has been given an 'outstanding' grading from Ofsted – the Office for Standards in Education.

Two of Her Majesty's Inspectors and three additional inspectors carried out the inspection in January 2012 using a variety of methods such as questionnaires, observing learning sessions, group and individual interviews etc.

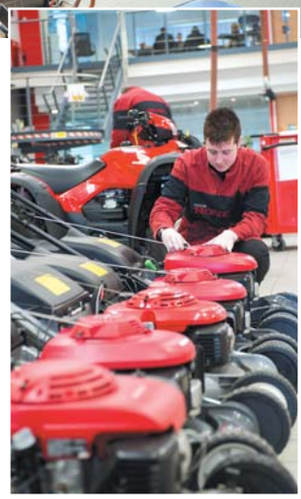
A key paragraph from the reports states that "*The overall effectiveness of Honda's apprenticeship programme is outstanding and the programme provides exceptional value for money. Learners enjoy their training and develop excellent occupational skills, making a highly valued contribution to their workplace*".

The report uses a four point scale to grade the report (1 = outstanding; 2 = good; 3 = satisfactory; four = inadequate) and the record of main findings state that the apprenticeship programme scores a grade of 1 in each of the following main areas:

- *Overall effectiveness*
- *Outcomes for learners*
- *Quality of provision*
- *Leadership and management*

The Honda apprenticeship programme takes place over two years for Lawn and Garden and Marine; and three years for Car, Parts Operations and Motorcycle/ATV. During this time apprentices are employed by their local Honda dealership and attend block training at the Honda Institute working on products within one of the five divisions. Qualified apprentice graduates achieve an Intermediate Apprenticeship for Lawn & Garden and Marine; and an Advanced Apprenticeship for Cars, Parts Operations and Motorcycle/ATV.

Paul Taylor, Technical Training Operations Manager at the Honda Institute said, "The Honda Institute is the



home of Honda's people development. A good understanding of both the economics of our industry and people's desire to learn and improve is fundamental to our operation. Having the right skill and knowledge to look after our products is key to maintaining performance and reliability. Our customers expect highly trained and skilled technicians in our network of dealerships and that's exactly what we deliver through apprenticeships."

French engineering students visit Ransomes

OVER 40 French mechanical engineering students from the Claude Lehec Vocational College in Saint-Hilaire-du-Harcouët, Normandy visited Ransomes Jacobsen's European headquarters and manufacturing facility in Ipswich recently.

The visit was part of a four-day educational visit to England to look at manufacturing processes and technology used in the agriculture and grounds care industry sectors.

All of the students were studying for an engineering qualification in agriculture or greenkeeping, while at the same time majoring in their chosen foreign language, English. The college has an old Ransomes 350D five unit ride-on mower, which is used in the college workshop as a teaching aid for hydraulics and basic engineering techniques.

The students and tutors were welcomed by Richard Comely, director of marketing and product management, who provided an overview of the business, its global reach and positioning within the grounds care industry. After being split in smaller groups, they toured the factory to see the processes that takes metal and components in at the beginning of the build, the cutting, machining, bending, welding, painting and eventual assembly on the production line that makes today's modern turf maintenance equipment.

They also toured the service parts division to see the after sales operation and the next day parts despatch system along with the warehousing and final delivery operations.

Outside on the company's three-hole golf course they were able to view a wide range of equipment in a working environment.

OBITUARY - Kem Baguant

IT was with shock and sadness that I read of the death of Kem Baguant in the recent copy of *Landwards*.

Kem studied Agricultural Engineering at Harper Adams Agricultural College between 1989 and 1993 when he was awarded a BEng. As his course manager and personal tutor I got to know him well.

During Kem's first year in the UK he found the contrast between our weather, the social norms of the student body and his life in Mauritius difficult, to say the least. His lack of knowledge of Western European agriculture further added to his early difficulties of studying for the Wolverhampton University BEng.

By the end of the course, through dedication, hard work and his cheerful disposition he had become fully integrated into his year group. This, to the extent that as part of their celebration for having completed their studies, he was party to throwing me into the college swimming pool fully clothed

I was delighted when Kem and his son found time to visit me in April 2010 when he came to the UK. It is a saddening thought that such a surprise visit can not happen again.

I will remember Kem with great affection as I am sure will his fellow students and the staff who taught him.

With great sadness,

GEOFFREY WAKEHAM

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Or the IAgrE Communications Officer, Marion King on:
pressroom@iagre.org

College supports charity tractor rebuild

STUDENTS from Bicton College recently completed a total restoration of a Ford 3000 series tractor on behalf of Bicton Overseas Agricultural Trust (BOAT) charity.

Using over £4,000 of parts donated by Vapormatic, the rebuild took place during the 3 days of the Devon County Show in preparation for the tractor being the star prize of BOAT's 2012 prize draw raffle.


The tractor before restoration

The charity has been working with Bicton College and Vapormatic for over 10 years to conduct an annual tractor rebuild, which helps in raising funds to support local agricultural education in developing countries such as, Tanzania, Gambia, Kenya and others.

For more information on BOAT visit *www.boatagtrust.co.uk*

Practical advice on putting precision equipment into practice

Record numbers for Precision Farming Event

MARCH's Precision Farming Event saw a record number of visitors looking to discover more about equipment and services to improve accuracy to help cut costs, increase efficiency and boost profit.

"This year's high turnout reflects the current high interest in systems, services and technology," said organiser Andy Newbold of Fusion Events and new IAgrE President. "Although arable returns are reasonable and in some cases very good, input costs continue to rise. Farmers and contractors at the event were clearly looking to improve efficiency from simply steering in straight lines right through to using telemetry to precisely monitor and manage every operation."

It was standing room only in all the seminars and the comprehensive technology exhibition was attended by all the UK's main manufacturers and suppliers. Alongside a wide range of control terminals, GPS receivers and systems, visitors were able to also quiz suppliers about soil sampling, find out how to map fields to vary fertiliser rates, see systems to control sprayers and spreaders as well as a range of computer software to manage, map and record applications.

A growing trend is the use of 'Apps' for smart phones that not only provide instant, in-field information, but can now also take a picture of a growing crop to assess the crop canopy's Green Area Index. Launched recently by BASF and developed in conjunction with ADAS, the Canopy Assessment Tool (CAT) that uses a digital photograph taken on the mobile phone to accurately assess a crop's nitrogen requirement and lodging risk.

This technology was on show in the new Advanced Technology Area, where visitors could also learn more about the HGCA's Be Precise training programme, the plans for the new Centre for Precision Farming at Harper Adams University College as well as check the compatibility between different implements and controllers.

Launch of Professional Technician welcomed

THE Engineering Council has welcomed the launch of the professional technician by the Technician Council.

Chaired by Steve Holliday, CEO of National Grid, the Technician Council has been funded by government to make recommendations on the future of the UK's technicians in engineering, science and technology. Oliver Letwin MP, Minister for Government Policy Advice, and John Hayes MP, Minister of State for Further Education, Skills and Lifelong Learning, spoke in support of the Technician Council's work at the launch, at which Steve Holliday unveiled a set of recommendations to employers, Sector Skills Councils, professional bodies and Government.

The launch in March was the result of an 18 month project, during which the Technician Council has reviewed the gaps and shortages in technical skills provision in the UK, set out the findings, presented a workable solution and developed the set of recommendations for addressing these over time.

The recommendations set out how stakeholders can strengthen the infrastructure underpinning the registration and professional development of technicians, how to provide active support for this, and highlight how to increase the pool, status, transferability and diversity of professional technicians across all sectors of industry.

Engineering Council CEO Jon Prichard said, "We see this launch as an ideal opportunity to raise the profile of the 14,000 professional technicians already registered with us as Engineering Technician (EngTech) or ICT Technician (ICTTech), highlighting the value that they add to the UK economy. It also allows us to promote professional registration as a tool for fostering employee development to a much wider audience.

"The UK has a rich engineering heritage which undoubtedly provides a foundation for future prosperity. Ensuring that we have sufficient well motivated professional technicians to be able to exploit this opportunity is an essential activity that the Engineering Council is delighted to be a part of."

The Technician Council was formed in July 2010 following two influential government White Papers examining the national skills strategy for future growth, which highlighted the economic need for the UK to recognise and develop a modern class of technician. This launch is a key milestone in the journey to delivering economic growth through a commitment to skills development.

To find out more visit the website at *www.professional-technician.org.uk*

How to be a good dinner guest

In his first President's Musings, ANDY NEWBOLD offers an occasional series which he may, or may not return to as inspiration arises

RULE ONE: Never discuss, religion or politics, so lets start with politics.

It was pleasing to see our leaders (Messrs Cameron and Clegg) choosing to use the CNH production line in Basildon, as the venue for their latest announcement last month.

Now whilst the verbal messages may be around austerity and the political necessities of cooperation between the coalition parties, the non-verbal bit of the communication exercise was that manufacturing, to whit engineering is important.

Your humble correspondent did Google how many times has a prime minister been to a tractor factory? With no success beyond this latest excursion.

By way of contrast former Chinese premier Deng Xiaoping , during the Cultural Revolution was publicly humiliated for his moderate ideals and had to work in a tractor factory in Xinjiang as a form of 're-education.'

If anyone is interested in helping with a 're education' programme for the political class, please let your President know.

Either way it is pleasing to see that, albeit in the sidelines at the moment, manufacturing in the UK, engineering jobs and (dare I say it?) Agricultural Engineering is slowly rising up the agenda of policy makers.

IT is timely that the Institution has been asked by the Government's Chief Scientific Advisor Professor John Beddington to respond to the Foresight Report '*The Future of Food and Farming*' with the '*Agricultural Engineering: a key discipline for agriculture to deliver global food security*' report.

The Institution is formally publishing and presenting this report imminently and I would like to acknowledge and thank the contributing authors, Harper Adams University College and especially Bill Day, who has done a sterling job of marshalling the input of many and editing a clear and succinct document for us to present back to the Government on behalf of the profession.

My apologies to all I have not named but you know who you are!

Ever since the Institution's Presidency beckoned, the thought of drafting *President's Musings* has filled me with dread! Especially when my first port of call is a review of the previous incumbent's excellent efforts.

As president, my intentions are twofold:

- Firstly to enhance the benefits of membership and to outwardly demonstrate the viability and reward of a career in agricultural engineering.
- Secondly to raise the profile of agricultural engineering to be seen as a vital discipline with policy makers, in agriculture and the wider world.

The Institution must be seen as the outward looking and progressive organisation for agricultural engineering professionals, which not only serves the needs of its members but also has a recognised role and place in wider society.

As to religion, one definition of religion is a specific fundamental set of beliefs and practices generally agreed upon by a number of persons or sects - perhaps the Institution is heading that way?

There is a saying that it's better to be lucky than good. In this instance I consider myself very lucky to be President and it is an honour and a privilege to serve you in this role.

Remember, as your President, I am here to serve you as members. My door is always open (or at least the voicemail and out of office is set!). I shall be out and about at agricultural shows and events this summer so please do keep in touch!

Finally I would like to thank Peter Leech for his service as President for the past two years. I am indebted for his support and guidance as I take over the reins.

> "The Institution must be seen as the outward looking and progressive organisation for agricultural engineering professionals"

Young Engineers Competition 2012

RICHARD TREVARTHEN, IEng, MIAgrE, reports from this year's hotly contested event which was held at Terex UK Ltd, Coventry

The Young Engineers competitors with Richard Robinson of Autoguide (left) and Richard Trevarthen (right standing)

THIS year's Young Engineers Competition was held on Wednesday March 28th, which, following a request from some Colleges, was held just before Easter for the first time. The venue was Terex UK Ltd, based at Prologis Park, Coventry, who made us very welcome.

The day began with Sylvia Harris (IAgrE), Richard Robinson (of Autoguide Equipment, who is the lead sponsor and the driving force behind the Competition) and myself (Richard Trevarthen IAgrE), preparing the excellent facilities, setting up the ramp and generally getting everything ready for the arrival of the teams. Sorry to say Chris Whetnall (IAgrE CEO) was not in attendance this year. Rumour has it that the excitement of it all in previous years is now too much for him. I am only repeating the rumour I heard!

This year three colleges entered: Easton, who we welcomed to the Competition for the first time, brought along 3 teams, Plumpton, who entered 3 teams and Reaseheath with 5 teams. All the colleges brought along some spectators also for moral (as well as technical, in some cases) support.

The day commenced as always with very careful scrutineering, carried out by the two Richards and Craig Grant of Bosch Rexroth, who also kindly sponsored the event again this year. The teams were classified into those who played within the rules and those who did not. All this was duly noted by Sylvia along with, in some cases, the imaginative names some had given their vehicles, (except for Plumpton, who came up with Plumpton 1, 2 and 3!)

Battle commenced immediately, and a very stiff competition ensued, with the usual pattern of some vehicles going well, and some not as well as their inventors would have hoped. As is often the case, those competitors who make the greatest efforts usually win.

The winning vehicle in Class 1 was well constructed, with some original thought - just what the Competition aims to achieve - and proceeded almost to the top of the ramp. Fortunately, mechanical failure prevented it from getting too high (much to the organiser's relief) but the use of fan assisted ground force was noted by a number of potential team managers for next year's event.

The requirement this year for the vehicle to transport the battery certainly achieved the object of eliminating the ballistic element in previous years' Competitions and ensured the fabric of the Terex conference room remained intact.

It was a great morning and everyone who took part thoroughly enjoyed the Competition, and the atmosphere created by the competing teams and their supporters.

The results are as follows:

Class 1

1st:	Plumpton 1
2nd:	Plumpton 2
3rd :	Ginge for the Win (Reaseheath)

Class 2

1st:	T2 (Reaseheath)
2nd:	Catch the Pigeon (Easton)
Joint 3rd	Spiker (Reaseheath), Proper Job and Scrapyard (Easton)

This just leaves one unclassified: Doomsday Machine (Reaseheath).

As always every competitor went away with a cash prize and the leading teams were presented with superb Cordless Power Tools courtesy of sponsors Bosch Rexforth.

Following a super buffet lunch high-viz jackets, hats and safety glasses were donned by all before departing on an excellent (and, of course, safe) tour of Terex UK Ltd's premises, including the assembly lines and testing areas. On leaving everyone was given a 1:50 scale model of their Back Hoe Loader.

Once again our sincere thanks for a most enjoyable and interesting day go to Terex UK Ltd, Bosch Rexforth, the IAgrE, Richard Robinson (the prime mover and shaper of the Competition whose enthusiasm is so apparent) and Sylvia Harris for all the work behind the scenes, without which there would be no competition.


The winning teams from Plumpton College receive their prizes from Richard Robinson and Craig Grant

Finally please note **The Young Engineers Competition 2013** will take place on **Wednesday 20 March 2013** (*venue to be notified at a later date*). We hope that early notification of the date will encourage more colleges to take part.

Thanks again to those that did take part this year and we look forward to seeing you again in 2013, along with colleges who have participated in the past, and those who haven't taken part . . . *yet*!

Available in full on Landwards e-Xtra - *www.iagre.org*

Our energy predicament

by **Chris Jones** CEnv IEng FEI MCIBSE MIET MIAgrE

Abstract

This paper discusses a range of serious issues on Energy availability and the efficiency of obtaining Energy resources.

It questions whether declining efficiency in extracting Energy resources (EROEI) could present an Event Horizon where fossil fuels become a limit on how far the transition to Renewable Energy can go.

The Energy Predicament

Setting aside the 2012 oil price crisis, the Energy Predicament is a problem that has been ignored for too long. The world faces major energy challenges:

- The age of easy oil is over - and many experts predict that oil production is about to reach a maximum, followed by an inexorable decline, Peak Oil: *Expect a market failure soon, where higher, volatile oil prices interact and become a ceiling on economic growth.*
- Competition, speculation or even conflict over the remaining energy resources needed to satisfy growth and rising standards of living in developing economies: *An increasing global scramble resources, first for oil, in a market which may cease to operate freely.*
- Declining Energy Return on Energy Invested (EROEI), a critically important but little known problem; energy profits made by investing energy to gain energy are on a declining trend; substituting tar sands and biofuels for conventional oil will accelerate that decline in EROEI; *The trend is for energy operating costs to eat more and more into the energy profits from fossil fuels and the energy profits from biofuel substitutes are even lower; but our realisation of declining EROEI will likely be when energy resources cease to be economic.*
- The Event Horizon: the transition to Renewable Energy needs a front-end investment of real fossil energy to make it happen; the long-term thinking foresees that the Energy Transition could ultimately be limited by declining energy profits and restricted availability of fossil fuels: *We must quickly decide whether to burn off the remaining fossil resources trying to extend our current lifestyles and inefficiencies - and suffer the climate consequences - or invest them now in a resilient and sustainable energy system and accept a less profligate energy future.*

Weathering the Perfect Storm

Thursday
10 May 2012
Stoneleigh Park,
Warwickshire

THE 2012 IAgrE Conference combined a range of top-class speakers who reflected on the challenges faced by agricultural engineers to meet the future world need for food, combined with a session where delegates presented their own ideas and solutions. WORDS: Marion King. PICTURES: Chris Biddle.

DELEGATES at the recent IAgrE 2012 Conference held at Stoneleigh Park came together to debate the serious challenges we all face to meet and feed a future potential 50 per cent increase in population.

Sir John Beddington the Government's chief scientist who commissioned the Foresight Report has estimated the world has 20 years to deliver something in the order of 40% more food, 30% more fresh water and 50% more energy.

For years many of the issues have repeatedly been analysed and articulated but this report is the first to integrate these and demonstrate the totality of the challenge.

The Foresight Report and the importance of agricultural engineering introducing innovations to counteract the effect of the perfect storm was the theme of the Institution of Agricultural Engineers (IAgrE) annual Landwards Conference: 'Weathering the Perfect Storm - who do you want in your lifeboat?'

The conference was chaired by Dr David Llewellyn, principal of Harper Adams University College. Delegates listened to a series of presentations covering:

GOVERNMENT RESEARCH PRIORITIES presented by **David Alvis** of the Technology Strategy Board

THE ROLE OF SOIL AND WATER MANAGEMENT given by **Professor Dick Godwin** of Harper Adams University College

SHOULD LIVESTOCK HAVE A PLACE IN THE BOAT? by **Professor Christopher Wathes,** Royal Veterinary College

THE ROLE OF PEOPLE presented by **Jack Ward** of City and Guilds, Landbased Services

Full details of the papers together with a video presentation of the event can been seen on the IAGRE website at: **www.iagre.org/conferences/landwards_conf2012**

The IAgrE 'Brains-Trust' gets to work

In the afternoon delegates split into discussion groups to debate their response to the Foresight Report and decide which areas of expertise they would want in the lifeboat.

"Inspired by the morning speakers, delegates came up with some interesting and innovative ideas," said Andy Newbold, President of IAgrE.

The discussion groups fed back that all communities have part of the solution and agricultural engineers will need to work with others. Fragile soils form the basis for much of our food production. If correctly applied, engineering is fundamental to optimising productivity from the soil and avoiding soil loss and degradation, the effective collection and utilisation of water, achieving efficiency in the use of all the inputs for food production and in controlling emissions and minimising waste across the food chain.

"If the engineering / manufacturing sectors are fundamental to solving the serious challenges faced we will need to get out of our silos and communicate to the consumer about the importance of agricultural engineering.

"We must think across the disciplines and effectively integrate all the relevant disciplines - biological, socio-economic and engineering in particular. We have work to do to improve the image of the sector as a career. Key skills need to be identified and the agricultural community will need to think long term.

"We also need to exploit technology to its full, there is an increasing use of smart technologies on the farm and even the potential for farmers to run their farms from smart phones. Agriculture and agricultural engineering are forward-looking sectors. If we are to meet the challenges of climate change and food security we must act now to address these issues," concluded Andy .

IAgrE AWARDS

2012 Conference saw the presentation of the annual IAgrE Awards

MEMBERS of the Institution of Agricultural Engineers (IAgrE) have been presented with Awards in recognition of their contributions to the landbased sector at the Institution's annual conference at RASE, Stoneleigh.

This year's Honourary Fellowship was presented to IAgrE's Chief Executive, Mr **Chris Whetnall**.

During his time as Chief Executive Officer of IAgrE he has been particularly committed to the 'technician community' raising their status within the industry and establishing the LTA (Land Technician Accreditation) scheme, which provides a path for career development and professional recognition. Presenting the award IAgrE President Andy Newbold said, "Chris is a thoroughbred agricultural engineer. He has served the profession with distinction and the IAgrE has been fortunate to have him at the helm. He is truly deserving of the Award of Honourary Fellow."

The Award of Merit, presented to a person distinguished by their work in agricultural science or engineering was given to **Professor Evandro Mantovani** of the Brazilian Agricultural Research Corporation (Embrapa). Evandro spent a year at Harper Adams University College as a Post Doctoral Researcher. Prior to returning to Brazil in 2011 he gave a presentation of his findings where he reviewed Brazilian agriculture and Precision Farming techniques and showed how his research could be adopted to further improve crop production systems and data management, hence enhancing the implementation of precision agriculture at the whole farm level across Brazil and perhaps around the world.

Awards for Contribution to the Landbased Industries sector made to a member who has made sustained contributions to the landbased sector throughout their career went to **David Shelton** and **Geoff Burgess**. While running a small farm and also responsible for high quality training at the Agricultural Training Board, David invented and produced a machine which could drain sports fields without causing too much turf disruption. As machine sales progressed David established Shelton Sportsturf Drainage Solutions which designs and markets other drainage equipment aimed at the sports and amenity markets.

Geoff Burgess worked for Massey Ferguson and spent the last 15 years as director of Dutch Engineering Group Redexim, parent of Charterhouse Turf Machinery in the UK. He was a chairman of Lackham College, leading to the creation of Wiltshire College from the merger with three other local colleges.

The Michael Dwyer Memorial Prize, which is presented to a mid-career engineer who has made outstanding progress in the agricultural engineering industry, went to **Tim Baker** of Kverneland. Tim started in his career with McConnell of Ludlow and became a development engineer with them before taking up a position with SKH/Greenland where he fulfilled the role of technical support for the range of machinery marketed in the UK. Presenting the award Andy Newbold said, "Tim is a motivated and talented hands on engineer who continues to make a difference within our industry."

The Douglas Bomford Trust Award, presented to the author who demonstrates originality and technical excellence in a scientific paper published during the previous year, went to **Clare Butler Ellis** and **Professor Paul Miller** for '***The Silsoe Spray Drift Model: A model of spray drift for the assessment of non target exposures to pesticides.***'

Branch Meritorious Service Awards made to members who consistently deliver outstanding service to an IAgrE branch went to **Graham Higginson** (Wrekin), **James Wallace** (West Midlands), and **Harry Barr** (Northern Ireland).

YOUR NEW PRESIDENT: Andy Newbold

Events, tents, 16-year whirlwind romance, hobby farming, 'bad' gardening and restorer of relics

ANDY Newbold, managing director of technical events company, Fusion Events, is the new President of IAgrE. A member of the organisation since 1993 and a Chartered Engineer, Andy also runs Newmac Ltd, an engineering risk management consultancy business and publishes Pro Operator, the specialist technical magazine for all NRoSO registered sprayer operators.

Reflecting on his route from a small Cumbrian farm to heading the agricultural engineering's professional body, Andy says, "From an upland small family dairy, beef and sheep farm in Cumbria, with a passion for technical lego and Britains farm toys, it was clear from an early age that even though I loved (and still love) farming, the opportunity to farm was limited at home.

"Decent A levels and a two day taster course at Harper Adams in 1988 sealed my fate with an offer of a place on the B.Eng degree in agricultural engineering. It was a lively and varied experience via several summer jobs arable farming, growing bulbs, peas, onions and potatoes in the fens, a 6 month placement with Dan Mitchell and Andrew Kneeshaw at the Farm Electric Centre (as it was then), a tour of duty with the Harper Adams porters, a campus wide radio station and a mechanical dinosaur (ask me about it) saw me bounce out of college with an average degree and a taste for making things happen.

"A couple of years erecting farm buildings, laying concrete and making silage persuaded me that I could be better applying my talents elsewhere.

"I started Newmac Limited to help companies to CE mark their products, and in due course now employ an agricultural engineer and a chartered environmentalist, to help companies with compliance, machinery safety, construction safety and the CDM regulations. Additionally I act as an expert witness on machine accidents and failure.

"During the mid nineties, ably assisted by one Geoffrey Wakeham, a conference was organised at Harper Adams on Machinery Safety and CE marking, which introduced me to a new avenue of event management.

"A telephone call to Simon Blackmore (then at Cranfield at Silsoe) and another to the *Farmers Weekly* saw the birth of the first Precision Farming Event in 1996 and Fusion Events.

"Fusion has grown from my landing at the top of the stairs, to an office with a team of six, and a portfolio of national specialist events, including the Precision Farming Event, the Agricultural Buildings Show, the UK Grain Event, The Farm Energy Event, the Dairy Technology Event and also several other events which we contribute towards including Tillage Live and running the secretariat of the Oxford Farming Conference.

"Along the way, business has spawned a marquee hire firm, a three year dalliance into agricultural contracting, repairs and depreciation, and a part share in Pro publications, which publishes *Pro Operator*, the magazine for sprayer operators.

"I also have a personal life, married to Ann, after a whirlwind friendship of 16 years and 3 months of courtship, we have a growing family with Rosie(7), Izzy (6) and Olly (2).

"I am a governor of Sedbergh Primary School, treasurer of my local church and in my spare time pretend to farm with a few hens and a dozen or so sheep!

"As to hobbies, I am an avid collector of model tractors, and vintage agricultural advertising materials. I am a bad, but enthusiastic gardener and act as the willing donor of marquees, labour and furniture for many aspects of parish life!

"Ann and I are busy restoring a 14th century listed pele tower into a holiday castle *(below)*.

"We have also recently converted an old van into a camper van and try desperately to get out and enjoy family life in the great outdoors when the weather allows!"

MORE CONFERENCE PICTURES

LEFT-RIGHT: AGM in session; New President Andy Newbold presents IAgrE plaque to outgoing President Peter Leech; Ivel Award winner Ian Currie (right) of Fuel-Guard demonstrates his Fuel Decontaminator which removes water and rouge solids from diesel fuel.

Weathering the perfect storm

Should there be room in the lifeboat for livestock?

SUMMARY

THERE is a school of thought that future demand for meat and other products of farm animals is unsustainable for several reasons, including greenhouse gas emissions, especially from ruminants; standards of farm animal health and welfare, especially when farm animals are kept intensively; efficiency of conversion by livestock of solar energy into (human) food, particularly by pigs and poultry; water usage by all types of agricultural production, including livestock; and human health and consumption of meat, eggs and milk.

Demand for meat is forecast to rise as a result of global population growth and increasing affluence. These issues buttress Sir John Beddington's impending 'perfect storm' of food shortages, scarce water and insufficient energy, which is forecast to coincide with a global population of about 9 billion people in approximately 2030.

This article examines global demand for meat, eggs and milk and the associated issues of animal ethics; the role of the agricultural engineer; and 'sustainable intensification'. In the UK, we suggest that though non-ruminant farming may become unsustainable, ruminant agriculture will continue to prosper because cows, sheep and goats utilise grass and other herbage that cannot be consumed directly by humans, especially on land that is unsuitable for other purposes. However, the demand for meat and other livestock-based food in BRIC countries is often for pork, eggs and chicken from grain-fed pigs and poultry.

The consequences of Beddington's perfect storm are beginning to be incorporated in long-term business planning by retailers and others. Nevertheless, marketing sustainable animal produce will require considerable innovation and flair in public and private policies if marketing messages are to be optimised and consumer behaviour modified.

by **Christopher Wathes, Heather Maggs & Madeleine Campbell,**
Royal Veterinary College, London and Henry Buller, University of Exeter

INTRODUCTION

IN 2009, Professor Sir John Beddington, the UK Government's Chief Scientific Adviser, forecast a 'perfect storm' of global shortages of food, energy and water, climate change and human population growth, which will coalesce in about 2030 (Beddington, 2009). Anticipating such a storm and the need to weather it, we ask in this paper if there should be any room for farm animals.

Farm animals are kept for many purposes, most usually food, yet livestock are relatively inefficient converters of solar energy into edible food for humans, compared with plants. Most people are omnivores and many care about animals, particularly farm animal welfare.

We might also ask how accurate is Beddington's forecast of a 'perfect storm'? It is a worst case scenario and while it is rarely useful to predict the future, planning for likely eventualities can be valuable. Helpful answers combine science and ethics while economic issues often dominate thinking.

In this article, we consider the prospects for livestock in the future (say 2030). We argue that certain types of livestock farming may struggle to thrive, despite a growing global demand for many livestock products such as meat.

The arguments are balanced finely and focus on food security. On the one hand, global demand for meat, eggs, milk and many other livestock products is strong and growing, especially in the BRIC countries (i.e. Brazil, Russia, India and China). Often called the 'Nutrition Transition', the emergence of middle classes with an increased demand for meat can result in the paradox of under- and over-nutrition (e.g. Popkin, 1994).

On the other hand, some criticise livestock farming because of: the inherent inefficiency with which water, grass, grain and other feedstuffs are transformed into food; consumption by livestock of soya beans with associated loss of the rain forest; emissions of carbon dioxide, methane and other green house gases, dust and ammonia; and the quality of life of farm animals in certain husbandry systems as well as the ethical considerations relating to meat consumption and the problem of antibiotic resistance.

What, then, should be the potential contribution of the agricultural engineer to live-stock farming in the future? Should he side unequivocally with either the critics or the supporters of livestock farming? How can he help livestock farmers to thrive in an uncertain market? What changes, if necessary, are needed in his education and training if he is to play a part?

GLOBAL SUPPLY AND DEMAND FOR MEAT, EGGS AND MILK

THE demand for livestock products is forecast to grow substantially as global population rises.

The rapid growth of an affluent middle class in China, India and other developing countries implies a growing demand for livestock products, particularly food protein; from 2004-2006 to 2010, gross production per capita of livestock changed by -2.6 and +12.2% in the UK and China, respectively (FAO, 2012; Table above opposite also).

A growing demand for livestock products would normally herald increased agricultural production, assuming economic laws of price elasticity and supply and demand. There are concerns about the adverse impact of a diet rich in animal-based food

on the health of those who eat much meat (e.g. Donaldson, 2004), as well as antibiotic resistance and livestock-derived zoonoses such as avian flu

Some commentators are concerned at the prospect of Western diets being taken up by millions of people in developing countries (e.g. Cordain et al., 2005) with adverse consequences for human health and health economies.

Table. Annual production of meat, eggs and milk in 2010 (FAO, 2012)

Country	Indigenous cattle meat, kT	Hen eggs in shell Billions	Cow milk, whole fresh, kT
UK	850	10	13,960
China	6,218	476	36,036
World	62,150	1,194	599,438

THE ETHICS OF LIVESTOCK PRODUCTION

THE scale of use of farm animals in Britain has grown substantially over the past few decades, such that annually, nearly a billion farm animals are reared in the UK, the majority of which are broiler chickens kept for meat.

Britain is mostly self-sufficient in meat, eggs and milk with the notable exception of pig production; the number of sows kept for breeding has about halved since 1999. The sharp rise in the number of broiler chickens farmed is usually attributed to the development of the UK broiler industry after importation of hybrid strains from the USA after the Second World War.

Whether livestock should be used in such a way is beyond the scope of this article, but ethical questions were discussed at the First International Conference on Veterinary and Animal Ethics in 2011 (see Wathes et al., in press). Suffice it to say that most people in most developed countries consume significant amounts of meat, eggs and milk produced by farm animals, which are protected in law from extremes of suffering: suffering which is considered necessary is lawful under British and many other countries' legislation.

Laws governing the welfare of farmed animals are generally more stringent in the UK (and continental Europe) than elsewhere; there is a moral imperative not to export agricultural production to a foreign country in which standards of farm animal welfare are lower than those in the UK.

SUSTAINABLE INTENSIFICATION - AN OXYMORON WHEN APPLIED TO LIVESTOCK

RECENTLY, the Farm Animal Welfare Committee (FAWC) has warned the UK Government and Devolved Administrations in Scotland and Wales about the dangers of applying the concept of sustainable intensification to livestock production (FAWC, 2012). A précis of FAWC's concern is as follows.

A recent Foresight Report (2011) promotes "sustainable intensification" as the agricultural solution to the many perils awaiting humanity in a few decades time. Some argue that the phrase per se is an oxymoron when applied to livestock, questioning its ability to capture the complex requirements when animals are farmed.

Others believe that sustainability means low levels of disease and high welfare, resulting in low emissions and great efficiency. Traditionally, sustainability is defined as a balance of economic, environmental and social issues. For many, farm animal welfare falls into the last area, given its links to ethics and the recognition of animals as sentient beings.

For others, welfare is an important part of economic sustainability, though market failure needs to be addressed. The concepts of Triple Bottom Line accounting and global green accounting could become the norm (as part of Corporate Social Responsibility), well before the onset of the perfect storm.

Like many others, FAWC is mindful of the need to meet a growing global population's demand for more meat, eggs, milk and other livestock products. It will be difficult to meet this demand without a thriving agriculture and careful consideration of the implications for food policy. FAWC argues that the food supply chain must not repeat the mistakes of previous agricultural and food policies, even though there were many benefits of a policy of cheap food.

FAWC advised that, in pursuit of sustainable intensification, agricultural production should not be promoted at any cost. The concept of sustainability must include the welfare of farm animals. This should avoid the danger that sustainable intensification becomes the new hegemony, thus making it difficult for alternative systems (and arguments) to flourish. FAWC concluded that livestock agriculture could not be considered sustainable if an animal's life was not worth living.

[Of course, intensification can mean several things too. In agriculture, many inputs are intensified, e.g. land, labour and capital, as part-and-parcel of profitable farming. However, in the context of livestock farming, intensification usually refers to those animals that are housed all their lives, mainly growing pigs and broiler chickens. Thus, describing sustainable intensification as an oxymoron implies that sustainable livestock farming should not include those forms of livestock production where intensification is the norm (i.e. animals which are housed all year round). Similarly, naming a husbandry system as free-range brings many benign connotations of naturalness, unless it is described as unhygienic and involving animals which are exposed to predators and the elements.]

BALANCING INTERESTS

FOOD production represents a complicated balance of interests. Consumers have come to expect food that is plentiful, safe, of known provenance and cheap.

The technical welfare standards of most farm assurance schemes go little further than compliance with statutory requirements. Nevertheless, they confirm that all that ought to be done has been done. Independent audit provides essential assurance to the consumer and retailer.

The concerned consumer frequently either lacks the information which he requires to make an informed choice at the point of sale or is overwhelmed by a confusion of labelling. Information provided about allergens, sell-by date, ingredients, calorific content and protein proportion and price is detailed and usually standardised.

However, as a recent BBC Television *Countryfile* programme (4th March 2012) clearly illustrated, welfare labels are frequently misinterpreted when it comes to food miles, standards of animal welfare, livestock transport and other matters.

MARKETING MEAT, EGGS AND MILK

SOME public health information campaigns have been spectacularly successful. For example, there has been a steady fall in cigarette smoking ever since smoking was linked with disease (e.g. of the heart and

continues over

. . . annually, nearly a billion farm animals are reared in the UK, the majority of which are broiler chickens kept for meat

lungs), a ban on smoking in public places was introduced and smoking became socially unacceptable to most.

However, others, for example, the 'five-a-day' message about diet and health, appear to have been less effective; it may be premature to judge success given that the former campaign began a long time ago while the latter was only promulgated recently; the evidence linking diet to disease is not (yet) as strong.

What is needed is a retrospective analysis of (British) information and marketing campaigns since 1945, including those designed to increase awareness about the risks of cigarette smoking and drink-driving, for example, using independent measures of suitability, accuracy and partiality of messages. Inclusion of health-outcome data could demonstrate the effectiveness of past marketing campaigns from a retrospective statistical analysis, ideally based on peer-reviewed, scientific reports. Such an analysis could be used to identify lessons for the future marketing of food.

Identifying what information consumers need to change their behaviour would benefit producers, retailers and policy makers across the inter-related disciplines of agriculture, food and health, as well as consumers per se.

WEATHERING THE PERFECT STORM. SHOULD THERE BE ANY ROOM IN THE LIFEBOAT FOR LIVESTOCK?

GIVEN these concerns over livestock production, should there be any room in the lifeboat for livestock?

One school of thought is that only by reducing the demand for meat can the global human population be fed sustainably in the future (i.e. reducing the proportion of meat on the dinner plate or making meat and other livestock products more of a luxury than a staple; (see D'Silva and Webster, 2010) while others champion sustainable intensification (by improving the 'efficiency' of livestock production).

Other potential solutions are: using insects for food; in vitro meat production; farming extensively-kept ruminants only, rather than pigs or poultry kept intensively; and the use of genetics, to adapt animals better to either current husbandry or future situations. Some radicals even argue for a reduction in global human population. The implications of each should be estimated for global supplies of energy and water and their potential contribution to the demand for food, not only for consumers in developed but also developing countries too.

Some argue that only meat and milk from ruminants should be 'encouraged', despite the inefficiency with which solar-derived feed is transformed into edible food and other hazards of ruminant farming such as emissions of gaseous ammonia. They argue that pasture on hills and uplands yield grass that can only be converted by ruminants into food for humans, though there are environmental issues about delicate ecosystems in the hills and uplands (see Wathes, 2011). Others do not accept this argument, even when land is unsuitable for grain production because of its slope and other geographical features.

The diets of pigs, chickens and other poultry are largely made up of cereals, pulses and other grains that can be consumed directly by humans, who prefer to eat pork, ham, sausages, chicken breast and eggs to (raw) plant ingredients. Feeding higher up the food chain is a characteristic of an affluent society. Some object strongly to this practice while others allow such consumption in a free-market, subject to certain limitations, e.g. statutory minimum standards of farm animal welfare.

Making room in the lifeboat for livestock implies that all domesticated animals will be there. Nothing could be further from the truth since some will prioritise ruminants over non-ruminants or vice versa. Some may even prioritise animals within a class, such as broiler chickens over growing pigs, on one ground or another, e.g. efficiency of conversion of feed inputs or ability to be fed waste products.

In summary, it seems that the livestock farmer of the future will have to thrive by competing in a shrinking market - or one that is growing less slowly than is the case for other foodstuffs - particularly for the products of non-ruminants; farm cattle, sheep, goats and other ruminants; or produce animal-free food such as Quorn. Ultimately, the market with all its restrictions and limitations will tell the farmer what to supply.

THE POTENTIAL CONTRIBUTION OF THE AGRICULTURAL ENGINEER

A versatile agricultural engineer will turn his hands to most things technological. Some will focus on things relevant to pigs and poultry production while others will concentrate on advanced machinery or ruminant production. All may choose to seize the opportunities afforded by precision livestock farming (PLF), which combines advanced technologies from machine vision to mechatronics (Wathes et al., 2008).

> The livestock farmer of the future will have to thrive by competing in a shrinking market

Above all else, the British agricultural engineer of the future will have to enthuse about livestock farming unless he wants to become a process engineer running a manufacturing plant producing Quorn - or insects.

ACKNOWLEDGMENTS

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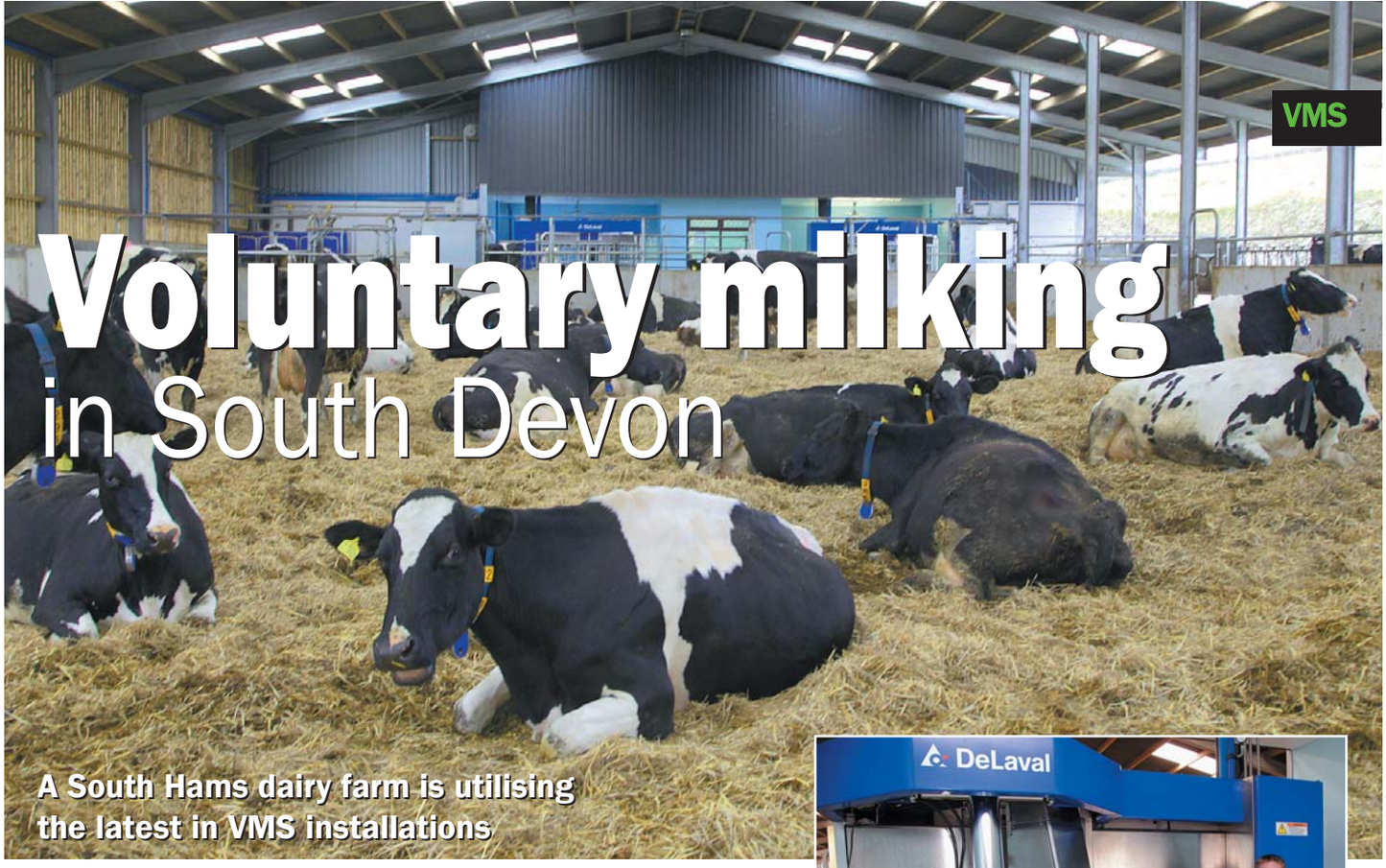
Voluntary milking in South Devon



A South Hams dairy farm is utilising the latest in VMS installations

BROTHERS George and Vernon Staddon farm on the outskirts of Plymouth in Devon in an area known as the South Hams where the rolling Devon countryside sweeps down from Dartmoor to the sea.

There are two farms, which together make up a real mixed farming enterprise. One comprises 450 acres of corn and beef with a herd of pedigree Charolais cattle, whilst the other is Dairy, with a closed herd of 125 Holstein Friesian cows looked after by George and nephew Louis aged 28.

The family established the herd in 1945. It has been Alfa-Laval \ DeLaval ever since 1951. In 1982, a new Alfa-Laval abreast parlour was installed and evolved to full automation over the years with the DeLaval Alpro system.

12 months ago, after Louis had returned from a scholarship visit to Holland where he had visited several farms with robotic milking and the factory where some robots are produced, the family agreed robotic milking was the best course of action for them.

Vernon said, "George and I are not getting any younger and the parlour has seen better days. We did not want to subject Louis to the strict regime of milking for the next 20 years by installing a new conventional parlour. We felt his knowledge and expertise with the computer would be better spent managing the cows rather than hands on the udders. On top of this milking staff are becoming more difficult to come by and we are really a family business unit."

Louis Staddon with one of the DeLaval VMS installations

Six months ago after visiting several other DeLaval voluntary milking installations in the South West their installation was commissioned. Louis said, "After looking at all the options we chose to go with the feed first solution. We liked the idea that only cows with milking permission are allowed to enter the station. This stops the VMS from getting cluttered up with cows who just like to go round and round."

He added, "We have 125 cows at the moment but with two VMS stations this will allow us to go up to 140 milking which is our target."

So far the herd is, on average, making 2.7 visits per cow per day with the highest being 3.5 with an average of 10.7kg per milking. The average milk yield is 29kg per cow per day, with the top milkers doing 48kg per day at 4.30 Butter fat and 3.37 proteins.

The cows are on a loose housing system and go out to graze as well. Vernon said, "It is amazing! The out and back walkways are next to each other, but even in this short space of time we are very surprised that the cows have lost the herding instinct and one is quite happy to be going out while passing a friend going in." He added, "The cows got used to it quicker than we did."

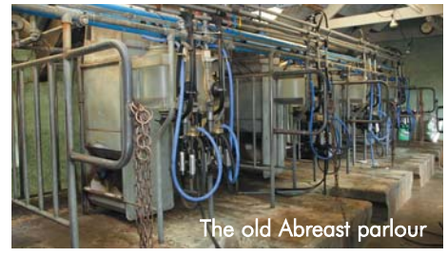
How did they like the extra information provided by the VMS?

Louis said, "The management information is first rate. I can see it all and adjust the settings remotely on my smart phone."

There are even cameras so that he can see the milking operation from the comfort of his office in the house!

Regarding the first six months Vernon said, "We had the usual small teething problems but Dairycentre our local dealer have given us outstanding service, second to none. We are very pleased with the installation."

Louis can adjust the VMS settings remotely via a smart phone



The old Abreast parlour

Womengineering - The missing half

GEOFFREY WAKEHAM asks what can be done to level the ratio of men to women in the agricultural engineering sector?

WAY back at the end of 2011 some of you may have watched the programme charting the early years of James Herriot.

The first of three programmes was centred round his early days at Glasgow Vet School in the 1930s. A sub plot dwelt on one female students' fight to get ladies toilets installed in the school. She succeeded in her battle at the expense of one of the senior members of staff who lost his office.

When I worked at Ransomes Sims and Jefferies I was not aware of any female technical staff though I doubt it crossed anyones' minds. There were none on the HNC course I was on at Ipswich Technical College or at Writtle College while studying their National Diploma in Agricultural Engineering.

When it was suggested we had female administrative staff located in the Development Department the general feeling was typical of the time and it was taken no further. Mind you we were banned from entering the marketing department. We were always suspicious that this was for the same reason that girls rarely entered our offices.

In the 1980s Harper Adams Agricultural College engineering courses recruited few female students. Though we did our best, or so we thought, there were few applicants and finding jobs in the industry was never easy. Some time during this period after a good night in the college bar our lone female engineering student was approached by the Principal as to why so few girls were interested in engineering and at Harper Adams in particular. I was not party to all she said but I doubt she moderated her comments. Very soon after this conversation my large office, the largest in the department, was cut in half and a female toilet installed in the space.

SO have things changed? If I visited my local secondary school and asked who was interested in engineering how many of those who raised their hands would be girls?

Are Harper Adams engineering courses made up of half male and half female students? If I went into a typical agricultural engineering company would I find many of their engineers and technicians young women? How many Members of the IAgrE are female?

The last question is easy to answer thanks to the secretariat; it is a little less than 3%.

I have talked to Jacqueline Baker, the Head of Maths at my local secondary school and 86% of girls are taking the higher GCSE paper in Mathematics but only 16% are taking single science papers Physics, Chemistry and Biology. These percentages are the same for the boys so no early difference between boys and girls. It is strange that the ability to do maths is not reflected in the sciences and this must restrict the pupil's future options beyond GCSE.

No girls have taken up the option to 'Travel to Learn' and go to the local Technical College and study on engineering related courses from Year 11 so far this year. From my experience this school has seen a marked increase in the dedication and aspirations of its students over recent years but girls do not seem to see engineering as a career option for themselves.

I do not know the figures for Harper Adams regarding female engineers but young members of the IAgrE total some 3% not far removed from across the more senior membership. I have talked to Elizabeth Hotchkiss, a final year female engineering student studying Engineering Design and Development both as a recipient of a Bomford Trust scholarship and with respect to this article. She was selected for a year in an agricultural engineering manufacturing company for her sandwich period where, as expected by her tutors, she excelled.

When interviewed for the DBT scholarship she clearly knew more about detailed

> “. . as an employer the wider your skills base and approaches to solving problems, the more likely you are to succeed ”

weld design than most senior design engineers I had interviewed for Chartered Registration over the years. It is interesting to note she attended the Secondary school referred to above.

Elizabeth’s father works in engineering and he encouraged her obvious fascination with what he did. She was encouraged to channel her studies to match her interest in design. At school her graphics design teacher understood her aspirations and uncertainties and encouraged her to pursue her dream. At Sixth Form College the split of girls to boys doing physics was 20: 80.

Though she is a local girl, throughout her studies, she had never heard of Harper Adams until they invited her and her class to an open day. She visited four other universities to look at Civil Engineering courses, possibly her first choice of degree. (I have the impression that Civil Engineering has managed to break down gender barriers far better than Mechanical or Agricultural Engineering) but chose Harper because of the style of teaching, including practical realistic project work and also the year of industrial experience. She realised this would stand her in good stead when she enters the job market.

Elizabeth secured a years industrial experience with Simba Great Plains and is still in frequent contact with Simba who are supporting and helping her achieve a further training programme with a number of Global corporations. Simba are also supporting her with her final year major project and she may well work for them over the coming summer months.

The outstanding question is how many females work in engineering related jobs; I have never seen any in dealers’ workshops and can not remember over many years when sandwich visiting seeing any working in design, manufacture, warranty or technical sales. I may have been unaware because I was not looking but only you can say if there are any female engineers working in your company. If there are, write to *Landwards*, prove there are opportunities alongside you and your colleagues for more girls to take up Agricultural Engineering as a career.

SO what else can be done to level the ratio of men to women or should we just blame it on two million years of genetic separation?

I think not; even if there are differences in the way we think or our priorities in life then as an employer the wider your skills base and greater your range of original ideas and approaches to solving problems the more likely your company is to succeed.

We need answers on a post card to *Landwards* to the following questions:

1. How do you persuade Mother’s of young girls that engineering produces some of the best toys?

2. At school why do few girls see engineering as a viable career choice? Is this year’s Co-winner of the Young Engineer of the Year right when she implies Science and Engineering are poorly served in secondary schools (or have I miss-interpreted what I heard on a recent BBC interview). Should we demand that the Engineering Diploma should be reinstated as equivalent to five GCSE? If you have a product vital to your future company would you decide to down grade its worth to your customers or would you increase its quality to ensure said customers see it as something they must obtain to secure their futures. Careers advisers and teachers of Physics, Technology etc may need to be made aware of the exciting careers open to girls as well as boys; hairdressing and animal welfare are not the only options.

3. Are Universities and Colleges hampered in their efforts to recruit female students onto their engineering courses by a lack of evidence of jobs after graduation? Alternatively do they not project their institution and particularly their engineering facilities in a way that appeals to the missing half?

4. Is the current practice, supported by the Government, of downgrading an ‘apprenticeship’ to as little as twelve weeks of stacking shelves or servicing customers destroying the appeal of such an option to parents, young people and employers?

5. Finally does our industry welcome females into their design offices, manufacturing departments and customer support teams? Do you agree with Sir Roger Carr writing in the *Daily Telegraph* that a mixed gender working environment is “simply better”? Are your career progression criteria stuck in the past or have you made “subtle changes” to meet current equality practices? Would the rest of the staff in the organisation “make a new member feel welcome and valued-particularly a woman alone”?

Did you know that 78% of a group of Mechanical Engineers surveyed for the *Professional Engineer* said they were willing to help out at local schools promoting and mentoring with regards to their chosen career?

If we surveyed our industry would we get the same response or are you all too busy? If you do encourage mentoring then choose with care from your best people not your least productive or easiest to release.

Remember **answers on a postcard** to these and any other relevant questions, or maybe just email: *chris@nelsonpublishing.co.uk*.

Robot revolution

New generation of robots poised to transform global agricultural production

WITH reported agricultural labour shortages all over the world and demographics showing the average age of farmers steadily climbing, complacency about the security of our food production isn't an option, the delegates to the **European Robotics Forum 2012** were told.

In tandem with this future uncertainty, in the Developed World at least, there are growing concerns about product quality and safety, as well as the environmental impact of agriculture.

"Until now, thanks to a reliance on large scale, mechanised agriculture combined with cheap labour in emerging economies, the routine deployment of robotics has been confined to a small number of specific tasks, such as milking, feed distribution and farm cleaning", explained Prof. Simon Blackmore, head of Engineering at Harper Adams University College.

"Earlier attempts to build complex robots capable of using virtual sight to, for example, harvest difficult to handle or delicate crops met with the conclusion that such robots were not sufficiently robust, were too slow and too expensive."

Robot researchers found that the combination of human hand eye co-ordination, dextrous manipulation and advanced object recognition was desirable, but simply too challenging. With support from the EURON and EUROP robotic networks, the Forum saw the founding of EARN, the Euro Agri Robotics Network.

"We've started with a clean sheet of paper", commented Blackmore. "We're re-evaluating the whole approach to agriculture. At the moment, crops are drilled in straight rows to suit machines, but what if they were drilled to follow the contours of the land, or to take account of the micro level environmental conditions within a portion of a field? The potential boost to production we could generate if harvests were staggered to suit the crop rather than mechanisation is immense.

"We're talking about micro tillage, mechanical weeding and planting using small, smart, autonomous, modular machines."

Delegates at the Forum saw demonstrator multi task robots from The Universities of Copenhagen, South Denmark, Wageningen and Kaiserslautern and the research institute of WUR in The Netherlands in action. One application was the robotic Crop Scout, a monitoring platform capable of measuring crops and checking for disease. Currently, farmers routinely use pesticide and herbicide as a prophylactic and spray their crops whether pests or disease are present. Trials with the Crop Scout resulted in a 98% reduction in the amount of spray used, as the Robotic Sprayer sent by the Crop Scout treated only the small area affected by disease or pests.

The new generation of agricultural robots have notched up some impressive trial results already. Though much smaller than typical farm machinery, they can act co-operatively and carry out tasks such as spraying with a boom. Lasers are used for multiple tasks, from harvesting to weeding. Tractor operations like ploughing, disking and harrowing always create soil compaction and also typically move over 65% of the field area while operating. Yet studies show that 90% of cultivation energy is used to repair damage caused by tractors.

"The obvious conclusion is we must stop running tractors on land wherever possible", said Blackmore. "The new generation of lightweight robots will move on wide, low pressure tyres and only cultivate the minimum volume of soil to create the required seed environment. Seeds will be precisely placed, according to soil moisture levels. Their movements will be controlled by SAFAR (Software Architecture for Agricultural Robots) and routes will be planned via Google Earth.

"These demonstrators have also proved themselves capable of selective harvesting, enabling farmers to grow a higher quality of crop, as those plants that still need time to grow, are left in the field.

"Unlike industries like aerospace, agriculture is a low margin industry, so it is vital that these new robots are both robust and affordable. Realistically, they are bound to be put to work on high value crops to begin with - there have already been trials on sensors designed to artificially "smell" ripeness.

"Agriculture twenty years from now will be a mix of the traditional and the new, but the new robots will be intelligent enough to work with the natural environment to maintain both economic competitiveness and sustainable, high quality food production."

. . . We're talking about micro tillage, mechanical weeding and planting using small, smart, autonomous, modular machines

Professor Simon Blackmore, Head of Engineering, Harper Adams University College

PROFILE:
Mr & Mrs

IAN & VICKY HAMILTON are that rare breed - a married couple who are both agricultural engineers

Names
Ian and Vicky Hamilton (*Nee Vicky Emerson*)

Academic qualifications
Ian: BEng Honours Agricultural Engineering
Vicky: BEng Honours Land and Water Engineering

Where and how did you both meet?
At Silsoe College

Q&A

What led you into agricultural engineering?

IAN: I grew up on a farm and was always more interested in the machinery than the animals. I then worked in a local agricultural engineering firm (Redrock Engineering) during the summer holidays.

These two things fuelled my natural interest in Agricultural Engineering.

VICKY: I was originally planning to study civil engineering with a view to specialising in water engineering. When I found the Land and Water Engineering course that was offered at Silsoe it was ideal as it brought together my interest in water engineering and agriculture.

How have your careers developed?

IAN: After graduating I worked for McConnells of Ludlow and then moved to New Holland based in Basildon where I started as an international service technician and eventually becoming a service trainer. I then moved to Kverneland in Devizes as a sales manager.

At this point I decided to have a career change and set up on my own as an ornamental blacksmith.

VICKY: After graduating I worked in the water industry as a design / project engineer. I rapidly became more and more involved in project management rather than design.

These project management skills left me well placed to change industries and I then became a project manager for NHS Estates. From there my career has developed within the NHS. I became a head of estates and I now hold a senior position responsible for performance improvement and service re-design.

How has having a family affected your careers?

IAN: Working for myself has been a real bonus as it has meant that Vicky and I are able to juggle work to ensure that we are able to look after our boys between us.

VICKY: Having a family helps me to maintain a healthly perspective on the work that I am doing. As I no longer work full time it means that I am very focussed at work to ensure that I do as much as a can in the time that is available.

On reflection, do you think your initial career choice of agricultural engineering was the right choice?

IAN: On reflection studying Agricultural Engineering at Silsoe was exactly the right choice of degree at the right place.

The skills and knowledge that it equipped me with gave me an interesting career within the industry and latterly the experience and confidence to set up my own successful business.

VICKY: I am really pleased that I chose Agricultural Engineering at University. Although when you look at my career it was not an obvious choice the skills and experience that I developed have left me well placed to thrive professionally.

Available in full on Landwards e-Xtra - *www.iagre.org*

Feeding the growth of the LTA

by **David Kirschner**

Summary

THE Landbased Technicians Accreditation (LTA) scheme was launched in December 2007 to be a readily identifiable benchmark for recognising the skill levels and competence of service technicians across the industry.

But after almost five-years, LTA has been described as the 'industry's best kept secret', elitist and the preserve of two or three major manufacturers.

DAVID KIRSCHNER, who is acting as a consultant to the industry takes us through the current state of play with LTA and looks at the opportunities for growth, much of which will be focussed on bringing independent dealers, those who do not hold one of the major franchises, into the scope of the scheme.

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MEMBERSHIP MATTERS

BRANCH REPORTS

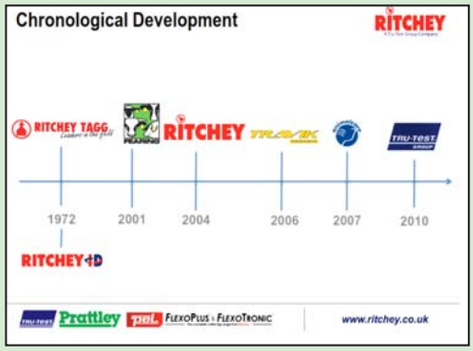
YORKSHIRE BRANCH

February meeting

THE Yorkshire branch held their February meeting on a Thursday night as the weather man had given a servere snow warning. On arrival I found two people in the bar one a member and the other the speaker. Later we had three more members arrive, so it was decided after a while as no one else was going to come that we should start.

We all 'crowded' round the speaker Paul Hunter's laptop in the bar and enjoyed a most interesting presentation on his company Ritchey.

Paul first of all gave a run down on the background of the company from its formation in 1972 until the present day. They started with producing tags for animal recognition until today adding electronic identification and many features allied to the tags.



Throughout these years they have had a few changes of ownership until eventually becoming part of the Tru-Test Group a New Zealand based company, thus cementing a long relationship Ritchey have had with New Zealand.

Their current portfolio consists of Tagging, Marking and Mating, New Born Essentials, Electric Weighing, Showing and Handling, Vaccinating and Drenching, Animal Health and Farm Asset Management Solutions and the Prattley Animal Management Systems, example shown below.

The most high profile is the Farm Asset Management Solutions, however Paul advised the rest of the Ritchey offering is important to fulfil the farmers livestock requirements.

The evolution of the ear tags was partly led by the legislation for traceability introduced by various international bodies. The current tags have an electronic chip moulded into the tag with the animal's individual identity programmed onto it as well as the number laser printed on the exterior. This then led to the need for a reader for recording this information, which can then be matched up to the weight of the animal, the date of birth, records of health etc.

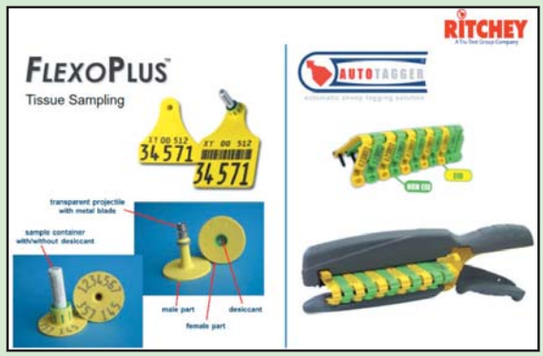
To give a weight reading a set of weigh bars were developed that would give an accurate reading even when the animal was spending a lot of time in the air. This is an example of a general set up, the Tru-Test Electronic Weigh bars fitted underneath the weigh crate or crush and the electronic weigh head cabled to the bars to give the reading.

Paul told us of one of their latest products, the FlexoPlus™ cattle ear tag range, which includes a tissue sampling flag tag and button tag. They remove a small portion of the ear as it is inserted and this is then sealed in a capsule and contains the biometric details of the animal.

The latest piece of equipment is the Autotagger®, which can tag a number of animals at one filling of the tool, so making it easier to tag them as the run through a race.

The Farm Asset Management Solution includes the Tru-Test electronic weighing equipment and electronic tag readers.

The latest Tru-Test Electronic tag reader is the XRS, which is like a wand and can automatically record the details from the animal as it is passes by.

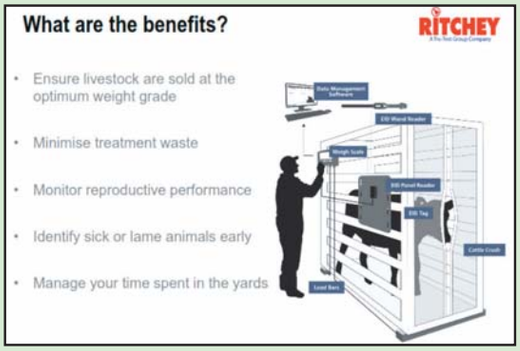


The software collects the data from the ear tag, weight from the weight bar and any other information the stockman inputs such as drench dose etc. This is then all down loaded to the Farms computer and the data is in one place for analysis.

Paul finally told us of the Prattley portable animal handling system which can be transported behind the farm vehicle and set up in any field. He then showed us a film of one of their customers who had almost fully automated this system in that he can automatically divide the sheep into different groups regarding their weights - *http://www.ritchey.co.uk/video-library/default.aspx*

A vote of thanks was given by the chairman and we all made our way home through the snow

Gordon Williamson



YORKSHIRE BRANCH

March meeting

THE March meeting of the Yorkshire branch was an interesting view of Australian tractors and equipment. Shelley Pinder gave us a talk on the various models which were on show at the Australian Vintage Tractor Show near Perth.

Shelley had been corresponding with a man who lived in Perth and spent his time tinkering with both engines and tractors, and he invited her over for the show which was held a few miles from Perth.

On arrival Shelley found that her pal had been almost blind from birth but could still repair machines. He had a small engine which was giving him trouble and Shelley happened to lift a piece of rag and a small spring fell out. Her friend immediately took it and fitted it to the engine and it ran perfectly.

The exhibitors at the show had come from all over Australia, one in particular had taken 3 months to get there having travelled with a tractor pulling a living van. They had virtually done a nation wide tour and collected money for charity on the way. This was just one of the guys to do such a tour to get to the show.

Shelley showed us many views of tractors both in working order and in need of a lot of TLC. We saw models which were well known here but also many unknown such as the Sunshine and many Chamberlains. As well as tractors many types of implements were on display, many of which were uncommon to the UK such as the plough with four wheels and a corn stripper.

As you can imagine there were quite a few questions and then the chairman proposed a vote of thanks.

We then all went out to the car park to see a model of a roundhouse which one of our members had produced for a manufacturer. This was nicely shoehorned into the back of his car and rounded off the evening.

Gordon Williamson

NORTHERN IRELAND BRANCH

Clean exhausts for tractor engines

THE choice of the Agrifood and Biosciences Institute (AFBI) at Hillsborough, Co Down site for a presentation, to the Northern Ireland Branch of IAgrE, about modern tractor engine technology was historically appropriate.

The guest speaker (Mr Declan Hayden, Vice President -Global Sales and Operations, AGCO) had come to talk about tractor engines to the same place where Harry Ferguson had achieved the first recorded powered flight in Ireland back in 1909. This was more than 20 years before the same Mr Ferguson went on to develop the revolutionary Ferguson system for agricultural tractors. His surname is the Ferguson in the AGCO Massey Ferguson brand which is now so well known throughout the world.

Mr Hayden's presentation on '*Diesel Engine Emissions and SCR - An AGCO Perspective*' dealt with the process of a major tractor manufacturer choosing and implementing appropriate technology to ensure that its engines complied with the emission control standards in Europe and other world markets. Mr Hadyen has worked with Massey Ferguson for 34 years and the brand is now part of the US based AGCO Corporation which specialises in agriculture machinery.

It was formed in 1990 and includes the other tractor brands of Challenger, Fendt and Valtra. The Valtra range evolved from BM Volvo to Valmet and AGCO also own the associated Sisu Power, based at Nokia, Finland, which has been making diesel engines for 60 years. AGCO increasingly use Sisu engines in their own product ranges as well as purchasing from Perkins and Deutz.

Emission regulations

In most markets, manufacturers now have to comply with progressively more demanding emission standards for engines.

These are imposed initially on engines in higher power categories and there is also a rolling programme to extend them to off-road vehicle engines of all sizes.

The presentation dealt with the standards for new tractor engines above 130kW (175 hp) and each of the Stages represents a substantial reduction in exhaust gas pollutants compared with non-regulated engines.

In 1996 Stage 1 required a 30% reduction in oxides of nitrogen (referred to as NOx) and 10% in particulate matter (PM), such as soot. By 2011 Stage 3B required 85% NOx and 97% PM reductions. Stage 4 requires 97% NOx reduction by 2014. These are tough requirements as there are stringent penalties for non-compliance.

Engine manufacturers have a choice of 2 main technologies to satisfy the requirements of Stage 3B. They are:

1 Cooled Exhaust Gas Recirculation (EGR) where part of the exhaust stream is diverted, cooled and fed back to the cylinders during the compression stroke. This reduces the NOx concentration but PM level is increased. Particulates get treated by a diesel oxidation catalyst (DOC) and a diesel particulate filter (DPF) in the exhaust. The soot accumulation within the DPF is burnt off automatically at intervals by injecting diesel fuel. Some engine manufacturers (such as Deere Power Systems) currently favour this approach because of the simplicity of using diesel only. The cooling package generally needs a bigger radiator to deal with extra heat from an engine using this process.

or

2 Selective Catalytic Reduction (SCR) which treats the exhaust gas as it passes over a catalyst being sprayed with urea solution (popular trade name AdBlue). The reaction converts the NOx to nitrogen and water vapour. The process is regulated by an electronic control unit (ECU).

AGCO's choice

AGCO has chosen the SCR option because it is relatively easily added as an after-treatment to a standard modern diesel engine for markets where Stage 3B applies and it can be omitted for those where it does not.

L-R: George Wallace (Branch Vice-chairman), Declan Hadyen AGCO) and Ian Duff (Branch Hon. Secretary)

SCR equipped engines have been proven to be fuel efficient and they run at normal temperatures so the cooling system does not have to be enhanced. This, in turn, means that the engine hood dimensions can be kept compact and driver visibility and turning circle are not compromised.

AdBlue is carried in a tank incorporated in the tractor and supplies in Europe were available because SCR use was already established in the heavy truck sector.

AGCO experience

AGCO was first to introduce SCR for use in an agricultural tractor in 2008.

The SCR equipped, 8.4 litre Sisu powered, Massey Ferguson 8690 was named as Tractor of the Year 2009 and they now have several years' experience of the system which has since been further updated to satisfy the 2011 Stage 3B standard. This involved increasing fuel injection pressures and adding a diesel oxidation catalyst to further reduce particulates before the exhaust stream goes on for treatment in the SCR catalysts.

The North American market

Compared to Europe and Scandinavia, the US market was less familiar with SCR technology in trucks and there was no existing supply infrastructure for AdBlue.

The United States Environmental Protection Agency had to be convinced that all would be well so AGCO agreed that dealer support and diesel exhaust fluid

continues over

would be readily available. A result is that they now have an increased role there in SCR equipped vehicle market development.

The future

The escalating environmental standards put a lot of pressure on designers of engines and control systems to keep on developing their products over short time scales.

The even lower emission levels for Stage 4 will be challenging for all and although different manufacturers have, so far, chosen different methods it is likely that some blending of the technologies will occur.

Diesel oxidation catalysts are already being fitted in some SCR equipped engines and future EGR versions are likely to receive some SCR treatment.

Discussion

As usual at IAgrE meetings, a technical question and answer session followed including topics such as:

- Method of AdBlue injection
- Fuel quality for modern diesel engines
- Diesel : AdBlue use ratio
- Fail safe control systems
- SCR use in cold climates
- Additional capital cost of emission control features
- Manufacturers' attitudes to after-market engine remapping
- Like- for- like replacement engines for existing tractors

The meeting closed with thanks to Mr Hayden for his most informative and enjoyable presentation.

Terence Chambers

WREKIN BRANCH

Getting a spark into an AGM

IN most organisations getting some interest into an AGM is a challenge. Few want to attend in case jobs are handed out but for those who attended the Wrekin Branch AGM, the session on Photovoltaics (PV) which followed, rewarded all those who came along.

Rick Bright of Bright and Associates introduced himself as an Architect but with an interest in PV as both a technical enterprise and almost a hobby so we were ensured an enthusiastic input. It soon became apparent through his excellent pictures and personal experience that his journey through planning, installation, sorting the snags and discussing the future of his the 98kW ground mounted system of PV arrays has given him both challenges and final rewards. An array was described as a group of panels which in turn was a group of the PV cells themselves.

Acknowledging the fact that the 'Feed In Tariff Scheme' (FITS) allowed good returns on electricity produced was key to development he described the current 147,000 registered interests in FITS as 90% PV which produced around 660 MW. This output being small in the country's challenge for renewables and represented by 67% of this as domestic and 28% commercial. From this just almost 128,000 of the domestic production was from domestic systems of under 5kW, thus his system represented just one in the 50-99.8 kW band.

The 50 x 30 m development, near Oswestry was subject to protracted planning, with various objects and conditions. One being that the ground height of the scheme to be not more that 0.8m. Having obtained permission the site was graded and piles driven for the array frames to meet the 300 angle necessary for optimum performance. A geotextile membrane was placed over the whole site and stone laid to give a uniform base to the scheme.

Getting the produced electricity from the site also required a new pole and transformer involving the DNO (District Network Operator) and a significant charge!

The system has now run for some 18 months allowing a production of 80,000 kW per annum. Problems of inverter use had seen significant modifications to their housing sheds (open grids in the doors to lose the excess heat) and shading of some arrays.

The inability to use this heat was disappointing in use and the latter was perhaps a greater surprise as even fence posts and low sun angles were restive to performance. The output also suffered as the pv cell surface temperature has been higher than expected

98 kW PV installation near Oswestry
pic courtesy of Bright & Associates

in UK which limits the cell efficiency and thus less electricity produced.

The business plan indicated a total cost of £250,000 with a suggested pay back in 14 years. In fact the performance obtained suggests, linked of course to FIT rates, that 11 years is more likely thus giving a return on this installation of around 6.7% on the 25 year life planned. Reducing costs as equipment rise in volume production even allowing for lower FIT rates were suggested as still allowing economic returns for such a venture.

So the AGM was livened up, questions flowed thick and fast after Rick's presentation which highlighted the many and various engineering challenges all could identify within such an ambitious development.

Bill Basford

WEST MIDLANDS BRANCH

Drip irrigation and efficient use of water

WE were very lucky that Julian Gruzelier , Director of Eden Irrigation Consultancy, agreed to give a presentation at short notice. This was very opportune, for Drought Orders had just been announced in many parts of Southern England.

Julian produced some rather startling figures that showed that agriculture uses very little water, possibly only 1% of the total used in the UK. Even on a global basis, it is still a comparatively small amount. However, Julian did point out that the use of accurate sensors and advanced monitoring equipment is essential in making these savings.

He reminded us of the problems of over-irrigation, such as fertiliser leaching and soil damage and also explained the importance of fertiliser placement as opposed to broadcasting. Orchards, in particular, benefit from accurate nutrient placement. Avoiding wind drift and evaporation and keeping a dry canopy are also key advantages of using drip systems. The crop yield is both greater and more uniform.

Current drip systems cost around £1,000 per acre to install. In arid parts of the world salinity build up in soil when using drip has been seen but in the UK with a maritime climate these problems have not been seen.

Another great advantage is that drip irrigation is not covered by the current licensing restrictions which are applied by the water companies and river boards although this situation will change during 2012.

Because of the very small outlets, filtration of the water supply is paramount and a 130 micron screen filter is used. These are self-cleaning and flush automatically if the flow rate is seriously reduced through the filter due to debris. The 20mm tubes can run the full length of the cropped field and 500 metre runs are possible. The drippers are compensated to cater for gradients, thus ensuring even output throughout the field. They are positioned at 40cm and have an output of 0.6 litres per hour. The dripper functions on a labyrinth design with an internal silicon diaphragm and filter. The usual incoming pressure is around three bar and zero at outlet point.

Liquid feeding through the system is invaluable and, in the case of a potato crop, up to 60% of the nitrogen is applied through the drippers.

The dripper system can be rolled up from the field and stored for the next season and potentially has a 10-year life.

Drip/trickle Irrigation is generally attributed as being first produced by Dr Blass in the 1930s and commercial systems were in use by growers in the late 1950s. By the mid 1970s, a great number of systems were in use worldwide but most of the technology originated in Israel. Julian emphasised that the key to today's systems was the ability to control and monitor the systems very accurately.

Eden Consultancy can be contacted by e-mail: *julian@edenirrigation.co.uk*

Ripple Aquaplast will supply, install and commission the entire system and Richard Warburton, Sales Manager, can be contacted by e-mail: *richard@rippleaquaplast.co.uk*

Michael Sheldon

FORESTRY ENGINEERING GROUP

Field visit - the A82 project

(Left) The A82 in Glen Righ is typical of the problem. (Right) The Timberjack forwarder, the skyline and the processor.

OVER many years, stands of timber growing on steep sites have remained unharvested because of the higher costs involved. Forestry Commission Scotland estimates that 7.6% of its future production (266,000 cubic metres per annum) will have to come from steep sites and have prepared for this by undertaking an innovative project in the Great Glen.

On 19 April, the Forestry Engineering Group visited a harvesting trial that is part of this project. Prior to visiting the site, attendees were given a presentation in the Community Hall at Glengarry by members of FCS staff based at Inverness.

Alex Macleod, the officer in charge of the A82 project, began by explaining that it is one of three projects that have been combined under a steep ground management programme. The A82 project, the slope stability and steep ground harvesting projects have common themes and represent a £16 million investment by FCS into tackling the problems of steep ground management across Scotland.

The object is to safely harvest the mature trees along the A82 corridor through the Great Glen between Ballachulish and Inverness. The work is particularly challenging given the oversize trees (up to 10 cubic metres over bark standing) requiring extraction (up to 600m) on very steep ground. Slope stability issues, the popularity of the Great Glen for recreation and the proximity to the A82 make the project particularly complex.

Much of the harvesting will be completed by skilled skyline teams and could take 10 to 20 years to complete, but it will remove the increasing risk of windblown trees causing unplanned disruption to A82 road users.

The second presentation was by Kim Leech, slope stability manager for FCS, who explained that phase 1 of a slope instability assessment on the National Forest Estate Scotland (NFES) had been completed in July 2011.

The assessment was a desk study undertaken by the British Geological Survey (BGS) who, using a combination of data, identified over 100 sites on the NFES at risk of landslide.

The information created by BGS has served as the foundation for phase 2, the slope stability project. Kim further explained that this will introduce a formal system of geotechnical risk management on the NFES with the aim of mitigating risk of landsliding and impacting on third party assets.

FCS have devised a system, using the BGS information, to prioritise the unstable sites by addressing the elements at risk and the consequences of them being impacted upon. Independent geotechnical experts will 'ground truth' each site, and depending on the level of risk, carry out two levels of non-invasive inspection. These will produce a basic appraisal and a more detailed assessment for higher-risk sites.

The outcomes of the project will provide prudent and appropriate advice through control measures to engineers, managers and forest planners tailored to the level of perceived risk.

Forest Districts will be provided with site-specific risk registers to include all high risk sites, with individual sites prioritised and supported by costed outline prescriptions, clearly identifying the risks and the mitigation measures to reduce them in planning future operations.

Kim said the project will be endorsed by Independent Technical & Quality Assurance to ensure the technical integrity of the project, the process, and that systems are monitored and maintained.

The final presentation, entitled FES Steep Ground Harvesting, was presented by Kate Tuer, project manager for the steep ground harvesting project. Kate explained that the aim of the project was to test and evaluate skyline systems and steep ground working techniques to establish the most efficient and cost-effective timber production methods. The project was also tasked with providing facts, figures and guidance for use by the wider forest industry on training requirements and technical developments for steep ground working.

Technical developments currently being evaluated included the use of synthetic Dyneema ropes on skylines, the use of both permanent and temporary catch fencing, the use of jacks when felling large trees on slopes, and excavator mounding on steep slopes. Kate's team gave assurances that all of these aspects are looking extremely promising, and final outcomes will be reported on as soon as the work is completed.

Prior to going on the site in South Laggan Forest, the attendees were given the following statistics. The estimated yield was 621cubic metres per hectare with a maximum tree size of 10 cubic metres and an average of 0.46 cubic metres. The area below the road had been planted in 1970 and the area above in 1936. The soil was 'mobile', with evidence of previous landslides. The average slope was 80%. With rock outcrops and steepsided gullies, the site is definitely a skyline-only option.

Once on site, Kate introduced the attendees to the contractor and machine owner, Calum Duffy, and the other FCS staff who were involved in the project - Grant MacIntosh and Peter MacDonald. Each explained the technical detail of their role.

Calum Duffy Skyline Harvesting Ltd was using an A&B Services converted Daewoo 220 Solar skyline system with a hydraulic Igland winch, a Koller USKA 1.5 carriage and an automatic dechokering system. This was being worked over a pulling distance of 350 metres and had a direct lift capacity of 2 tonnes, giving an extraction load of 3.5 tonnes. The processor is a Caterpillar 320CL with a John Deere 758 head. A Timberjack 1410 forwarder is used to keep the landing clear of produce and brash.

Once the evaluation of the various combinations of innovations in the technology and working methods have been fully developed and measured by Technical Development (part of Forest Research), complete reports on the findings project will be made available in the public domain.

www.forestry.gov.uk/A82operations
http://twitter.com/A82operations

This report first appeared in *Forestry Journal* - *www.forestryjournal.co.uk*

James Christie

WREKIN BRANCH

Young Engineers' Challenge

HARPER Adams University College was the venue for a light hearted billing, '*Wrekin Branch Young Engineers Challenge*'.

It proved to be a success by attracting a total of six teams which included a team representing Colleg Powys, two from Harper Adams University College and two from Reaseheath College. The sixth team was a motley crew of 'not so young engineers' calling themselves rather aptly the 'Norfolk Enchants' who managed a disgraceful 3rd place.

2nd place went to the 'Spanners' from Reaseheath College while the rather uninspiringly named '2nd Years' representing Harper Adams were the winners. Thanks also go to the teams, 'Piston Broke ', 'Where's the bar'" and the 'Ream Team' (who I suspect lost a D in all the excitement) for their participation.

The winning team of six, were from left to right, Rhodri Ellis-Jones, George Cooper, Will Copeland , Matt Cox, Andrew Dawson and Rheinallt Jones. The team took the safety in numbers approach but suffered slightly as the beer prize had to be split six ways.

At the same event, Jim Loynes, Branch Chairman presented Wrekin Branch Student Prizes to Tom Phillips, a BSc Agricultural Engineering top-up student at Harper Adams; and Luke Wear, Agricultural Engineering Apprentice at Coleg Powys.

The prize is awarded annually to a student studying at one of the Agricultural colleges in the Wrekin Branch Area, and recognises the student that has maintained a consistently good performance during their time at the college.

Jim Loynes

Andrew Dawson represented the 2nd Year's team and received the trophy from Wrekin Branch Vice-Chairman, Simon Cooper

Branch Chairman, Jim Loynes presenting the Wrekin Branch Student Prize to Tom Phillips

NORTHERN IRELAND BRANCH

The evolution of crop protection methods and management

THE most recent technical meeting of the Northern Ireland branch of IAgrE took place in Cookstown, Co. Tyrone when the guest speaker was Prof. Paul Miller from NIAB TAG who gave an illustrated talk on the subject of '*Adoption of precision approaches - past, present and future and the implications of managing inputs*'.

Prof. Miller is well known for his expertise in crop protection technology and is the specialist adviser 5 within the Spray Applications Unit of the National Institute of Agricultural Botany (NIAB) / Arable Group (TAG) organisation. This plant science organisation carries out plant variety and seeds evaluation, quality control and knowledge transfer. It now also incorporates the Arable Group which carries out applied crops research and provides advice to growers. The remit of the Spray Applications Unit is to develop and measure the performance of spray application systems.

Prof. Miller began his presentation by drawing attention to the rapid adoption of computer based equipment for all aspects of life and how this now applies to control and information systems on tractors and agricultural machinery. Modern tractor ranges are now available with Isobus connector systems which are the accepted international standard for electronic communication with implements.

The associated CAN (Controller Area Network) system permits coordinated actions through the tractor's computer. By linking sensors and actuators to the lift linkage, spool valves, p.t.o. clutch and diff locks the tractor / implement combination can automatically respond to preset instructions. Examples include raising / lowering during headland sequences and on-the-move control of the application rate on sprayers or spreaders. The operator controls and monitors these operations via a user friendly touch screen.

Implement performance data can be downloaded to or from a laptop / flash card. Most people could not previously have anticipated how quickly and successfully they have accepted the routine use of computers. The pace of electronic technological progress is illustrated by the fact that devices are now so lightweight and portable and that processor power has doubled every 18 months without a real increase in cost.

Use of the technology in the field

GPS (Global Positioning Systems) are now used to steer agricultural machinery with increasing accuracy.

The most accurate systems use a base station and can steer to within 25mm of the chosen path to ensure straight rows in the field without overlap. Many modern tractors are auto-steer ready and this facilitates accurate steering, faster field travel speeds and reduced driver fatigue. Electronic field maps of crop yield can be automatically generated from data collected on-the-move by harvesting machinery.

This in turn is the basis of a field map showing how the yield varies across the field and can be used to identify causes of reduced crop yield such as low nutrient status, soil compaction, crop disease or pest attack. Established growers using electronic field mapping now have several years' data which they can overlay and compare results between growing seasons.

Soil samples can be taken at predetermined locations by a quad mounted automatic probe and the data recorded against the map. This can form the basis for GPS directed variation of fertiliser rates on the move across the field during top dressing. A crop sprayer can be controlled in the same way if weed infestation is identified as being confined to specific areas.

The benefits

Independent research has quantified cost savings for precision control in cereal growing ranging from £6 / ha on a 300 ha farm to £19 / ha on the largest 750 ha enterprises. The savings come from more accurate cultivation passes saving fuel and machine wear as well as reduction in the amount of seed, fertiliser and crop protection products. Calculated savings vary between farms and areas and, so far, the clearest savings have come from using less fertiliser and fuel but savings in pesticide costs are more difficult to quantify. As for any equipment investment, the larger farms benefit from spreading the overhead costs over more hectares.

The probable imminent future

There is now real interest in developing steerage hoes or sprayers which can respond to individual weed plants in rows.

The concept is for camera identification of the target plant and rapid on /off control of the liquid from the nozzle. This is possible within 0.25 sec with a conventional nozzle but much faster reaction time has been

achieved with a new "Alternator" nozzle design system using an oscillating liquid stream to produce large droplets.

There is also practical progress in identifying crop cover density and colour (as a guide to nitrate status) by using spectral reflectance sensors and an active light source mounted on moving machinery. A crop density meter which takes force readings from a deflecting horizontal pendulum along the tram lines has been developed in Europe. It may also be possible to monitor the crop from satellite or aerial images.

Pesticide regulation

There is increased pressure to reduce pesticide use and some of the previously well known products have been withdrawn.

Traceability through all the growth stages is required to comply with official standards for food safety, quality and to protect the environment. Automated systems are now available to read the barcodes on pesticide containers and to control automatic filling and mixing of the spray tank contents.

The application rates and field locations are automatically recorded for proof of compliance with the requirements of the appropriate quality assurance scheme. In turn, all this information could be read from the radio frequency identification (RFID) label and used to give additional information on the final food package.

Meeting discussion

As well as being a very well informed and enthusiastic speaker, Prof Miller knows how to keep his audience interested so it was no surprise that a stimulating and enjoyable discussion period followed.

The range of topics covered included -

- Lag times for on /off nozzle control during automatic headland operation of a crop sprayer
- Potential use of drones to record crop growth stages and nutrient status
- Potential yield reduction using crop protection products versus complete weed control
- The limited role of mechanical hoeing in the UK climate
- Tracking systems and cost of returnable pesticide containers
- Loss of approval for established pesticide products
- Role of GM crops
- Potential for micro robots working 24 / 7 on small plots and acceptable time limits for weed control treatment.

In conclusion, the chairman thanked Prof. Miller for his most interesting and enjoyable presentation.

IAgrE branch members are now planning the next series of local technical visits and presentations to commence from October 2012.

Terence Chambers

WEST MIDLANDS BRANCH

New Holland And Tier 4A Emissions

IN February the West Midlands branch were guests of Murley Agricultural of Warwick where Nigel Fawdry, Sales Area Manager, from CNH gave a very interesting and informative presentation on New Holland and Tier 4A emissions.

Nigel started his presentation with a look at what the emissions regulations actually meant in real terms, he used the example of two tractors of different ages fitted with the same size engine doing the same job. The new one fitted with the Tier 4A engine would have to run for 100 days to produce the same emissions as the old one produced in 1996 fitted with a Tier 1 engine running for just one day.

Whilst the emissions of one tractor in isolation may not be too serious, FPT Industrial who manufacture New Holland's engines produce 2.6 million engines a year. These range in size from 20hp to 900hp and have numerous applications including; tractors, construction equipment, commercial vehicles, generators and marine to name a few. So the environmental effect of the reduction in emissions of these engines added together is quite dramatic.

The emissions that the legislation is controlling are particulate matter (PM) and nitrous oxides (NOx). As the allowable emissions limits for new engines are reduced the technology to achieve them has become more sophisticated. There is also a slight 'Catch 22' in achieving the new limits. If the combustion temperature inside the engine cylinder is increased it reduces the PM levels but increases the NOx levels. If the combustion temperature is reduced the opposite happens.

To avoid major chaos in the industry and allow manufacturers time to develop the necessary technology to meet the legislation the introduction dates for Tier 4A are staggered. So by 2011 all new tractors above 175hp needed to comply, by 2012 all new tractors above 100hp will be affected, and by 2013 all new tractors below 100hp but above 24hp will also need to conform.

The engineering challenge has been to achieve Tier 4A without compromising engine performance and fuel economy. This can be achieved by various technologies and Nigel explained that New Holland had taken two different routes depending on the size of the tractor's engine.

For tractors under 100hp they will use cooled exhaust gas recirculation (EGR) along with a separate external diesel particulate filter (DPF). This technology works on the principle of reducing the combustion temperature by reintroducing some of the exhaust gases back into the combustion cycle via a cooler. This reduces NOx in the cylinder and the resulting increased PM in the exhaust gases is trapped in a separate DPF downstream of the engine for later treatment.

This method is used because of space limitations on smaller tractors and cost considerations. There is also a slightly higher NOx allowance for smaller engines which this technology can achieve.

From a user perspective the DPF will need to be regenerated to burn off the soot it collects every now and then. This may happen whilst the tractor is working, or it may occur as a separate cycle, it all depends on how hard the engine is working. The DPF is also viewed as a serviceable item as it has a defined life and will need to be exchanged during the life of the tractor.

For tractors over 100hp New Holland have adopted an external selective catalytic reduction unit (SCR) and Adblue liquid. This technology uses the principle of increasing the combustion temperature in the cylinder to reduce the PM during the combustion cycle and then using the downstream SCR unit and Adblue liquid to clean up the NOx in the exhaust gases afterwards via a chemical reaction in the SCR unit to produce water and nitrogen.

The volume of Adblue used for this process is between 3 and 5% of the amount of diesel used. In general the Adblue storage tank on the tractor is about 10% of the main diesel tank capacity and the SCR unit is also designed to last the life of the tractor. This system has also allowed New Holland to achieve more power and better fuel economy out of their Tier 4A engines than their previous Tier 3 ones.

The Adblue liquid used in conjunction with the SCR unit is made up of 32.5% urea and the balance is distilled water. Though it is not normally a problem in the UK the Adblue liquid can freeze so the storage tank on the tractor is heated. The emissions legislation does give a 30 minute allowance for defrosting of the Adblue when the tractor is initially started from cold to overcome this problem. Adblue also has a shelf life, though how long this is depends on various factors including exposure to sun light, temperature, and if it gets frozen. So the storage location and conditions needs to be taken into account especially if purchasing the liquid in 1000 litre containers.

Filling a New Holland T8 with Adblue

From a running costs point of view Nigel gave some example figures comparing the new Tier 4A engines to their previous Tier 3 versions. With diesel at £0.59 per litre and Adblue at £0.40 per litre for every £1.00 spent on Adblue this saved £2.50 in diesel. Though this has to be offset against the 4% cost increase of a Tier 4A engine tractor against its previous Tier 3 engine version. Other factors that may be of importance to some customers is that the Tier 4A engines can only run on 20% biodiesel whilst the Tier 3 can run on 100% biodiesel.

Looking to the future and the Tier 4B emissions legislation that will start to come in to effect for larger tractors in 2014 Nigel explained that New Holland would still be able to meet this using SCR and Adblue technology. Whilst many of their competitors are talking about having to modify their engines further to use a combination of EGR and SCR technology, so increasing their complexity.

The meeting concluded with a vote of thanks for Nigel Fawdry for his presentation and for Murley Agricultural for hosting the branch.

Ian Moore

Membership changes

Admissions

A warm welcome to the following new members:

Member

Hill G R (Lincolnshire)

Associate Member

Bovett R (Dorset)
Clarke C R (Lincolnshire)
Dring J A (Lincolnshire)
Fletcher D (North Ayrshire)
Heanes P G (Lincolnshire)
Norman R (Somerset)
Rothwell M (Lancashire)
Winter-Taylor F J (Dorset)

Associate

Goodchild M S (Cambridgeshire)
Gurney M (Sussex)
Job D (Staffordshire)
Lim A (Hong Kong)
Logan G (Staffordshire)
Montero-Agusti B (Surrey)
Pitt A (East Sussex)
Priddle S(Devon)
Van Rijckevorsel M C F M (Netherlands)
Wilkins J P (Wiltshire)
Williams M (Herefordshire)

Student

Babcock Training

Barter D J
Bower J J
Hennah D R
Rattray S
Rouse M A
Wright J J

Easton College

Ayres M
Brett B
Davies G
Douglas J
Duffy M
Fletcher J
Johnson H
Key J
Kiddle B A
Kingfisher N J
Knight R
Miles B
Miller T
Nichols J
Pomfret B
Robson L

Greenmount College

Adams J A
Allister C
Black D
Boyle D
Browne A D
Campbell J
Carson A
Cassidy S
Corr J
Doherty D
Duggan M
Ferguson C
Fulton R
Gamble M
Givney B
Grant G T
Hamilton R
Higgins N M
Holmes A D
Kelly P D
McAlister A R
McCormick C
McFaul T
McGeown R
McKenna M F
Palmer C
Parke J T
Phillips N A
Scott C T
Scullion A J
Shiels A
Simpson M
Smith A J
Stevenson D
Thompson J
Tumelty C
Wilson J M D

Loughborough University

Robinson T R

Plumpton College

Hill P
Lenharth C
Maynard C
Newland O
Wheeler B D

Southern Regional College, Portadown, NI

Allely A
Bailie A
Beattie D J A
Byrne M
Fitzpatrick C
Lee J D
Magowan M L
McKearney J
Mullan B
Morgan M
Ringland A
White S W S

Institute of Technology, Tralee

Comerford W

Wiltshire College, Lackham

Mitchell B

Re-admissions

Associate

Thompson S E (Wiltshire)

Fellow

Bonfield P (Hertfordshire)

Deaths

Fletcher D J (Kent)

Transfers

Associate Member

Dolan B (Ireland)

Engineering Council

Congratulations to the following members who have qualified as Engineering Technicians entitling them to use the designatory letters EngTech after their names.

Registrations

EngTech

Bence T M (Norfolk)
Bovett R (Dorset)
Clarke C R (Lincolnshire)
Cunliffe S A (West Sussex)
Dring J A (Lincoln)
Fletcher D (Ayrshire)
Heanes P G (Lincolnshire)
Hill G R (Lincolnshire)
Howard J J (Norfolk)
Logan G A (Staffordshire)
Norman R (Somerset)
Pinnock C N (Cambs)
Rothwell M (Lancashire)
Salih R K (Derbyshire)
Ward A M (East Sussex)
Winter-Taylor F J (Dorset)

Long service certificates

Name	*Grade*	*Date of anniversay*
50 years		
Urban George **Curson**	IEng, MIAgrE	26 Jun 2012
Gabriel John **Harris**	AIAgrE	26 Jun 2012
Ronald **Russell**	CEng, MIAgrE	26 Jun 2012
Jeffrey Nicholas **Tullberg**	FIAgrE	26 Jun 2012
35 years		
Nelson Philip **Drew**	IEng MIAgrE	1 Apr 2012
Richard John **Smith**	FIAgrE	14 Apr 2012
Richard **Barrowman**	CEng FIAgrE	24 Apr 2012
Daniel James Christopher **Shaw**	IEng, MIAgrE	17 May 2012
John Peter **Frost**	MIAgrE	17 May 2012
Graciano Fermiano Mervyn **Abreo**	EngTech, MIAgrE	16 Jun 2012
Ivan Stanley **Burrowes**	IEng MIAgrE	16 Jun 2012
Donald Matthew **Roberts**	AIAgrE	28 Jun 2012
25 years		
James Wilson **Turnbull**	MIAgrE	23 Apr 2012
Stephen Andrew **Rendell**	CEng, MIAgrE	23 Apr 2012
Stephen Michael **Nott**	IEng, MIAgrE	30 Apr 2012
David Gordon **Blackburn**	CEnv, MIAgrE	12 May 2012
Michael James **Povey**	CEng, MIAgrE	13 May 2012
Norman John **Skea**	CEng, MIAgrE	28 May 2012
Adam Patrick **Robertson**	CEng, CEnv, MIAgrE	25 Jun 2012

Academic members

Askham Bryan College
Askham Bryan
York
YO23 3FR

Barony College
Parkgate
Dumfries, DG1 3NE

Bicton College
East Budleigh
Budleigh Salterton
Devon
EX9 7BY

Bishop Burton College
York Road
Bishop Burton
Beverley
HU17 8QG

Brooksby Melton College
Asfordby Road
Melton Mowbray
Leics
LE13 0HJ

Coleg sir Gar
Pibwrlwyd Campus
Pibwrlwyd
Carmarthen
SA31 2NH

Cranfield University
Cranfield
Bedfordshire
MK43 0AL

Easton College
Easton
Norwich
Norfolk
NR9 5DX

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

Harper Adams University
College
Newport
Shropshire,
TF10 8NB

Institute of Technology Tralee
Clash, Tralee
Co Kerry, Ireland

Myerscough College
Myerscough Hall
Bilsborrow
Preston
Lancashire PR7 0RY

Oatridge Agricultural College
Ecclesmachan
Broxburn
West Lothian
EH52 6NH

Pallaskenry Agricultural
College
Co Limerick
Ireland

Plumpton College
Ditchling Road
Lewes
East Sussex
BN7 3AE

Reaseheath College
Reaseheath, Nantwich
Cheshire, CW5 6DF

Royal Agricultural College
Cirencester
Gloucester
GL7 6JS

Scottish Agricultural College
SAC Ayr Campus
Auchincruive Estate
Ayr
KA6 5HW

Sparsholt College
Sparsholt
Winchester
Hampshire
SO21 2NF

Willowdene Training Ltd
Chorley
Bridgnorth
Shropshire
WV16 6PP

Wiltshire College - Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

Commercial members

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

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

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

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

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

Bomford Turner Limited
Salford Priors
Evesham
Worcestershire
WR11 5SW

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

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

FEC Services
Stoneleigh Park
Kenilworth Warwickshire CV8
2LS

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

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

John Deere Ltd
Harby Road
Langar
Nottinghamshire NG13 9HT

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

SSAB Swedish Steel Ltd
De Salis Court
De Salis Drive
Hampton Lovett
Droitwich
Worcestershire
WR9 0QE

White Horse Contractors Ltd
Lodge Hill
Abingdon
Oxfordshire
OX14 2JD

EVENTS

IAgrE Branch Meetings and Events

Wrekin Branch
June/July
TBC
Venue: tbc
For further information please contact the (acting) Branch Secretary: Jim Loynes.
Tel: 07836 602750 Email: jloynes@harper-adams.ac.uk

Yorkshire Branch
Sun 17 June 2012
OPEN FARM SUNDAY
Venue: tba
For further details please contact the Branch Secretary: Mark Andrews.
Tel: 0191 569 2380 Email: andrews_mark_a@cat.com

Scottish Branch
Sat 30 June, 2.30pm
GUIDED TOUR OF EDINBURGH BOTANIC GARDENS
Venue: Edinburgh Botanic Gardens
For further information and to register a place, please contact the Branch Secretary: Malcolm Cattermole
Tel: 0131 445 8717 Email: malcolm.cattermole@forestry.gsi.gov.uk

Scottish Branch
Weds 22 August, 1.30pm
DAVID MARSHALL LODGE
Venue: David Marshall Lodge, Aberfoyle
For further information and to register a place, please contact the Branch Secretary: Malcolm Cattermole, or organiser Jim Christie jrchristie1@btinternet.com
Tel: 0131 445 8717 Email: malcolm.cattermole@forestry.gsi.gov.uk

Scottish Branch
Weds 3 October, 1.30pm
BIOCHAR PROJECT
Venue: Edinburgh University
For further information and to register a place, please contact the Branch Secretary: Malcolm Cattermole
Tel: 0131 445 8717 Email: malcolm.cattermole@forestry.gsi.gov.uk

Other Events:

Thurs 21 June 2012
IMechE
CLEANROOMS 2012
Venue: 1 Birdcage Walk, Westminster, London SW1H 9JJ
Web: events.imeche.org/EventView.aspx?EventID=1444

Thurs 21 June 2012
Aqua Enviro
OPERATIONAL EXPERIENCES WITH FULL-SCALE ANAEROBIC DIGESTION PLANTS TREATING FOOD AND FARM DERIVED WASTE IN THE UK
Venue: Nottingham Conference Centre
Tel: 01924 257891
Email: sarahhickinson@aquaenviro.co.uk
Web: www.aquaenviro.co.uk

Sun 08 - Thurs 12 July 2012
CIGR
CIGR-AGENG 2012: INTERNATIONAL CONFERENCE OF AGRICULTURAL ENGINEERING
The Conference covers emerging research and new engineering solutions for food production and rural activities, as a means to enhance human well-being and promote social benefits.
The Conference is addressed to academia, industry, producers, manufacturers and service providers. PhD students, delegates of CIGR and EurAgEng, representatives of Developing Countries and Industry are especially encouraged to participate.
Web: http://www.cigr.ageng2012.org/index.php?go=inicio

Tues 10 - Thurs 12 July 12
GREAT YORKSHIRE SHOW
Venue: Great Yorkshire Showground, Harrogate, HG2 8NZ
Tel: 01423 541000 Fax: 01423 541414
Email: info@yas.co.uk Web: www.greatyorkshireshow.co.uk

16 to 19 July 2012
ALAM
ALAM ANNUAL CONFERENCE 2012
Venue: Bicton College, Budleigh Salterton, Devon
Programme includes: CNH technical updating on Precision Farming, Variable Transmissions, Engine Developments and emissions requirements; Earth and Environment Centre; Renewable Energy, marine Engineering; Vintage Tractor Collection; Texa & Pico Diagnostic Equipment. The ALAM 52nd AGM will be held on the evening of 18 July.
Cost: Members £220; Non-Members £240. Please contact John Gough for more information and to register a place.
Email: gough.j@btinternet.com

Tues 4 to Weds 5 September 2012
RABDF
DAIRY EVENT & LIVESTOCK SHOW 2012
Venue: NEC Birmingham Web: www.dairyevent.co.uk

Thurs 13 to Sat 15 September 2012
Confor
APF 2012
Venue: Ragley Estate, Alcester, Warwickshire
Tel: 01737 245081
Email: info@apfexhibition.co.uk Web: www.apfexhibition.co.uk

Thurs 08 November 2012
Forest Research and IUFRO
MANAGING FORESTS FOR ECOSYSTEM SERVICES: CAN SPRUCE FORESTS SHOW THE WAY?
Venue: Heriot-Wyatt University, James Watt II Building, Riccarton, Edinburgh EH14 4AS
This meeting will enable researchers, practitioners and policymakers to present and discuss findings on how best to translate the concepts promulgated by the Millennium Ecosystem Assessment (MEA) and successor documents into strategic, tactical and operational management regimes that will help adapt forests to meet changes in climate and in societal demands
Of interest to Researchers, practitioners and policy makers.
For further details contact Evelyn Hall.
Email: evelyn.hall@forestry.gsi.gov.uk
Web: www.forestry.gov.uk/fr/INFD-8K6C49

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

EVENTS OF INTEREST

JUNE 2012

21-24 Royal Highland Show, Edinburgh
www.royalhighlandshow.org

27-28 Royal Norfolk Show
www.royalnorfolkshow.co.uk

30-1/7 Smallholders Show, South of England Showground, Ardingly
www.smallholdershows.co.uk

JULY 2012

6-8 East of England Show
www.eastofengland.org.uk

10-12 Great Yorkshire Show
www.greatyorkshireshow.co.uk

13-15 Kent County Show
http://kentshowground.co.uk

18-22 CLA Game Fair, Belvoir, Castle, Grantham, Leicestershire
www.gamefair.co.uk

3-26 Royal Welsh Show
www.rwas.co.uk/en/welsh-show

24-26 New Forest & Hampshire County Show
www.newforestshow.co.uk

AUGUST 2012

1 North Devon Show
www.northdevonshow.com

1-2 Bakewell Show
www.bakewellshow.org

2 Honiton Agricultural Show
www.honitonshow.co.uk

4 Garstang Show
www.garstangshow.org

14-16 Pembrokeshire County Show
www.pembsshow.org

19 Mid-Somerset Ag Show
www.midsomersetshow.org.uk

22 Vale of Glamorgan Ag Show
www.valeofglamorganshow.co.uk

23 Melplash Ag Show
www.melplashshow.co.uk

30 Bucks County Show
www.buckscountyshow.co.uk

LONG SERVICE CERTIFICATE

Eur Ing, J P J Munson, CEng, FIAgrE - 50 years membership

THANK you for my Long Service Certificate marking fifty years membership of the Institution.

Membership of the Institution has been a very valuable part of my working life in agricultural engineering. It has allowed me to meet with significant people contributing to our industry and has enabled me to compare notes with others on many topics.

My background is roughly as follows and some of my experiences may be of interest to others.

My interest in tractors and farm machinery really started in 1940 when, as a child, I was evacuated to my uncle's farm in Buckinghamshire.

After the war I was a competent tractor driver and when I left school in 1950 with a Cambridge School Certificate I applied for a job with an old established farm machinery dealership. It was a main dealer for Ferguson tractors together with a general dealership for all types of horse drawn and tractor drawn farm machinery.

I really enjoyed my time there; working in all departments of the business through sales demonstrations, repair workshop and office administration. I found out by first hand experience how it feels in winter time to change and water ballast rear wheel tyres and inner tubes in the field!

On completion of my National Service in 1958 I was introduced to the Ford Tractor Engineering Department by my brother who was a Senior Design Engineer in the Car Engineering Department. Following a successful interview I met with the Ford Tractor Engineering Design Team under the leadership of the Chief Engineer John Foxwell FIAgrE and I began my time with Ford as a design draughtsman.

I had a very high regard for John Foxwell who was a very talented engineer and at that time our projects were the Fordson Power Major and the Fordson Dexta.

Over time my assignments involved design, development, field testing and also liaison with manufacturing plants during production launch. As I progressed through various assignments (I think that I had eleven job titles during my 34 years with Ford) I continued my studies and I qualified as a Chartered Engineer. Added to this, travel widened my experience.

When the U.K. and U.S. design departments joined together for joint projects in 1961 there was much more travelling involved. I spent time in the two design engineering offices in Basildon, Essex and Troy, Michigan, in the two field testing locations in Tuddenham, Suffolk and San Antonio, Texas and in the three manufacturing plants in the U.K., the U.S. and Belgium.

When the Company introduced the Ford industrial equipment from the U.S. into Europe I was selected to join a team having responsibility for coordinating the introduction in engineering and manufacturing. The major components of the backhoes and loaders were manufactured in Copenhagen, Denmark and I was assigned responsibility for quality control for the start-up.

This led to an overseas assignment relocating my family to Copenhagen for approximately one and a half years. Later I was the European quality control auditor for industrial Tractor/Loader/Backhoes in Europe visiting suppliers, equipment dealers and customers in many European countries including Scandinavia.

My interest in farm machinery continued outside my work time. I served as a Committee Member and Hon. Treasurer for the Herts and Essex Branch of the Institution and then in 1987 I was elected a Fellow. In 1989 I was nominated Hon. Treasurer for the Institution serving on the National Council and on the Executive Committee for about three years. This was all very interesting and exciting because I was meeting with the top people from industry, from agricultural colleges and from research establishments.

Perhaps the most exciting was meeting John Chambers, Harry Ferguson's draughtsman and Chief Engineer. To meet him and chat with him was a special time for me as he played a major part in tractor history. John was a key witness in the *Ferguson v Ford* lawsuit.

After my term of office it was a special honour to be elected a Vice President of the Institution for a year to bring my term of office to an end. For all that the Institution has been for me I would like to say, many thanks.

John Munson

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