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75

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Over 300 delegates from all over the world converged on Harper Adams University in Shropshire recently to explore the exciting opportunities that engineering for agriculture can offer as a career choice

FEG ANNUAL SYMPOSIUM

Economics of delivery – roads to market

TOBY MOTTRAM DELIVERS INAUGURAL SPEECH

Royal Academy hears professor's outline for the rethinking of our approach to keeping cows

IAgrE Professional Journal www.iagre.org Volume 68, Number 4 Winter 2013

Biosystems Engineering

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

Biosystems Engineering

Volume 115, Issue 4, August 2013, Pages 463-473

Estimation of two-dimensional fertiliser mass flow distributions by recording granule impacts

Sylvain Villette, Emmanuel Piron, Richard Martin, Denis Miclet, Gawain Jones, Jean-Noel Paoli, Christelle Gée

Agro Sup Dijon,France

IRSTEA, Les Palaquins, Montoldre, France

A new method to simultaneously measure the horizontal and vertical distributions of the mass flow in the vicinity of the spinning disc of a centrifugal fertiliser spreader is presented. The method records granule impacts on a cylindrical vertical screen placed around the disc. The screen is covered with a paper band, a carbon film and a protective coat, so that granules hitting the screen produce impact marks on the recording paper band. A mathematical model is used to estimate the local impact density by correcting the bias due to overlapping impacts. Algorithms were developed to process the recording band, taking into account its location with respect to the spreading device. The findings demonstrate that processing impact record clearly characterises the horizontal and vertical distributions of the mass flow for a compound fertiliser NPK and potassium chloride. For the horizontal distribution, comparisons are carried out with results deduced from a traditional compartmented ring.

Volume 115, Issue 1, September 2013, Pages 15-22

Rapid milk cooling control with varying water & energy consumption

Michael D. Murphya, John Upton, Michael J. O'Mahony

Animal & Grassland Research Innovation Centre, Teagasc Fermoy, Cork, Ireland

Cork Institute of Technology, Cork, Ireland

A control system for rapid milk cooling plant connected to a variable flow milking machine is presented. The plant consisted of a pre-cooler in the first stage that utilised ground water as a cooling medium and an ice bank that provides ice chilled water for the second cooling stage. Eight different precooling set points (13 °C-20 °C) were tested for feedback and feedback-feedforward controller configurations. Introduction of a feedforward loop to the controllers reduced the disturbance from the varying milk flow and by doing so reduced the final milk temperature deviation from the set point. Optimum water utilisation rates were calculated for varying water cost at the current price of electricity. These points represent the ideal combination of ground water and power consumption per unit milk to produce the most financially efficient means of cooling. Potential cost reductions of up to 34.5% through the selection of the ideal water rates were discovered.

Volume 116, Issue 2, October 2013, Pages 144-154

Controlled traffic for vegetable production: Part 1. Machinery challenges and options in a diversified vegetable industry

John E. McPhee, Peter L. Aird

Tasmanian Institute of Agriculture, Burnie, Tasmania, Australia

Serve-Ag Pty Ltd, Devonport, Tasmania, Australia

Mixed track gauges can be accommodated with careful selection of track gauge and working width combinations.Controlled traffic farming (CTF) maintains the same machinery wheel tracks in cropping fields year after year, thereby isolating the impacts of traffic compaction from the soil used for crop growth. Benefits of CTF include improved energy efficiency, soil health, crop yield, timeliness and economics.The successful adoption of CTF in the The Tasmanian vegetable industry faces a very different scenario, with a wide diversity of machinery, and topography ranging from gently to steeply undulating.Two key technical challenges to the adoption of CTF in vegetable and mixed cropping were investigated - 1) working and track width compatibility of current equipment, and 2) farm layouts suited to steeply undulating topography.Almost no machines are currently compatible with a common track or working width, although some are suitable for modification to enable CTF operation.

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Landwards
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THIS ISSUE

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EDITORIAL

Do we 'have the dream'?

"IT is up to us to go out and and prove our case and work together for the greater good, not in isolated bubbles".

Was that, I wonder, a summary of what former IAgrE president, John Matthews, is outlining in a letter to *Landwards* in this issue (page 19)?

In fact, it was a phrase used by TV gardening celebrity, Alan Titchmarsh, at the recent Garden Media Guild Awards I attended in London.

Referencing the public perception of gardening/horticulture/groundsmanship he added, with more than a nod in the direction of Martin Luther King, "I have a dream that one day, people will come to their senses, and far from professional horticulturists being deemed unfit and lacking in intelligence to do other jobs, our profession as a career will be worth more than a passing glance, and people will pursue it as a career worthy of far greater respect and gratitude.

"It is important that we work together . . for the well-being of the planet".

Substitute horticulture with agriculture - and they are closely connected - and you get a sense of what John Matthews is getting at.

The engineering community cannot, and must not, get isolated from the bigger picture.

Every sector within agriculture is screaming for its slice of the financial pie - but as John Matthews points out, "What is carried on by the engineers of the future will continue to be in competition with biological scientists - as well as in collaboration with them".

There, nobody said it was easy!

The bedrock of his vision of a future agri-tech strategy is that the only organisation with the body of engineers capable of achieving a cohesive strategy is IAgrE.

That is quite a thought as we end another year, and look forward to the challenges of the next.

May I, along with my editorial colleague Steve Gibbs, wish everyone a Very Happy Christmas and a Peaceful New Year.

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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 Vice President's message at LAND TECHNIK - AgEng 2013

Professor Rickson calls for sustainability to be at the heart of agricultural machinery development

Professor Jane Rickson

AGRICULTURAL engineering is a key discipline that will enable agriculture to deliver food security, and it must deliver sustainable solutions was the key message delivered by IAgrE Vice-President Professor Jane Rickson to over 1000 delegates at an agricultural machinery conference in Hanover, *reports Steve Parkin*.

Giving the opening plenary lecture to a packed hall at the LAND TECHNIK - AgEng 2013, the conference that opens AGRITECHNICA, Professor Rickson presented the findings of the IAgrE status report that is the response to the UK Government's Foresight Report: The Future of Food and Farming.

Describing the concepts of sustainable intensification, Professor Rickson outlined the problems of population growth, food production and food security that face the world and how climate change and biodiversity are linked.

"Global food security has to be achieved by balancing future demand and supply, ensuring adequate stability in food supplies, achieving global access to food and ending hunger, managing the food system to help mitigate climate change whilst maintaining biodiversity. Agricultural engineers are uniquely placed to meet these challenges," was the message.

Highlighting the recommendations of the IAgrE report, Jane Rickson called for the contribution of engineering in meeting global food security challenges to be recognised and opportunities for education, research and training in engineering for agriculture to be developed.

There was a need for a research theme for 'engineering for agriculture' that can compete on equal terms with other research communities and the farming industry, agricultural engineering businesses, innovators and educators need to establish an appropriate focus on innovation.

The traditional perception of agricultural engineering has been that it is limited to mechanisation for primary production. "Agricultural engineering is not just machines", stated Prof Rickson.

"We must get across the message that it is multi- and transdisciplinary, involving novel technologies and innovations requiring a systems understanding. Engineering for Agriculture should be the new paradigm."

> "..Agricultural engineering is not just machines"

DON MACMILLAN

Death of IAgrE member and John Deere expert

DON MACMILLAN, former Wiltshire dealer and author of several volumes of John Deere history, died at the age of 93 on 11th September 2013. He was married to Bunny and had three sons, Craig, Bruce and Ian and three grandchildren Nadda, Michael and Laura.

Don was recognised as the world's foremost authority on the history of the John Deere company. Holder of the first dealer franchise in the UK, he was the author of many books on the subject including the definitive '*John Deere Tractors and Equipment*' volumes.

Born in 1919, Don's passion for John Deere was kick-started by using a Model AR before the war and he was subsequently invited to visit the factory in America after the war.

During the hostilities Don decided to make his contribution by purchasing his own tractor and plough and working for the 'war ag' (The Agriculture Executive Committee). Starting with an Oliver 90, a Ransomes 4 furrow Multitrac and a fuel tender with a platform for his motorbike, Don moved around the South West looking for land ready to work eventually coming to Wiltshire where he stayed ever since.

Much in demand and with so much work ordered, Don applied for a new John Deere which duly arrived in 1943. The business went from strength to strength and by 1947 Don was running 8 combines, 3 pick up balers and 4 John Deeres. He had also picked up the knack of dealing.

1947 also saw his first visit to the States and the start of the lifelong John Deere relationship, Don was appointed John Deere's first UK dealer in 1958 and the business went from strength to strength in the following years.

Don's retirement from the trade in 1981 coincided with his authorship of the *John Deere Album* which was reprinted many times. Don's name was, as a consequence, put forward as a candidate for authorship of the official ASAE John Deere history, *Volume 1* followed in 1988 followed by *Volume 2* in 1991 - the subsequent Worldwide book was ready in 1994. Other titles followed such as *The Big Book* in 1991, *The Little Book* and *The Field Guide* in 2001, *The Legacy* in 2003 and *The Encyclopedia* in 2007.

Donald had been a member of IAgrE for 65 years, one of its longest serving members. He joined in 1948 as an Associate, became a Companion in 1974 and a Fellow in 2001. He received a 'Contribution to the Landbased Sector' award in 2009 (pictured above).

A keen cricket follower, Chris Biddle, Editor of *Landwards* said, "I often used to bump into Don in the Long Room at Lord's, sat up in one of the high stools, when we would 'chew-the-cud' about the state of the game, the state of the industry or the state of the country!"

A Thanksgiving service was held for Don at St John's Church, Devizes on Tuesday 24th September 2013.

IAgrE welcomes government's implementation plan for Apprenticeships

Building on the recommendations made in the Richard Review

THE Institution of Agricultural Engineers (IAgrE) has welcomed the government's announcement of its implementation plan for Apprenticeships.

These plans will build on the recommendations made in the Richard Review of Apprenticeships.

IAgrE notes a range of key points including:

- The role of employers, working with professional bodies to design the new Apprenticeship standards. This represents a step change from the current arrangements whereby the government determined the range of skills and occupational standards.
- Where relevant, new Apprenticeship standards will meet professional registration standards such as Engineering Technician (Eng Tech) and above.
- New Apprenticeship standards will be required to define the level of skill, knowledge and competency required to do a specific occupation well and operate confidently.
- All new standards must be publicly recognised by employers (including small businesses), recognised professional or trade bodies and, where appropriate, higher education institutions (HEIs), as fit for purpose.

A number of Trailblazers will be set up with two of particular interest to the IAgrE. These are:

- **Automotive** - Led by organisations including Bentley Motors, BMW Group UK, EEF, Ford, the Institution of Mechanical Engineers, Jaguar Land Rover, Siemens, Toyota Manufacturing UK and Vauxhall Motors. This will develop the standard for Automotive Mechatronics Maintenance Technician.
- **Food and Drink Manufacturing** - Led by organisations including Arla Foods (UK), Dairy Crest, First Milk, Fosters Bakery, Haribo, the Institution of Engineering and Technology, the Institution of Mechanical Engineers, McCain Foods (GB) Ltd, Mondelez International, Müller Dairy, Nestlé UK, Premier Foods, Thorntons PLC and Unilever UK. This will develop the standard for Food and Drink Maintenance Engineer.

Employers and professional bodies will lead Trailblazers for the new Apprenticeships described in this Implementation Plan. Each Trailblazer will develop the Apprenticeship standard and high level assessment approach for an occupation or number of occupations in their sector.

Alastair Taylor, IAgrE CEO commented, "I am delighted that the role of professional bodies in recognising new Apprenticeship standards has been recognised. In many respects, our work with Land-based Technician Accreditation and linking industry standards to professional recognitions puts us in a good place to deal with the new Apprenticeships."

He added, "The Trailblazers are particularly interesting. The Automotive Mechatronics Maintenance Technician brings together an interesting range of organisations. There is scope to add some of the larger agricultural machinery manufacturers to this list. The Mechatronics found in Agricultural Machinery are every bit as complex and advanced as those found in the automotive sector.

"Similarly, the Food and Drink Maintenance Engineer could include those technicians who install and maintain Milking Machines and associated plant."

Expressing a concern, he commented, "The need to obtain recognition from employers, including small businesses represents a particular challenge. In this sector there are many micro-business and ensuring that the needs of these are met will be very important if new Apprenticeships are to be successful."

. . . our work with LTA puts us in a good place to deal with the new Apprenticeships

Alastair Taylor, IAgrE CEO

Chris Whetnall signs off

Special lunch for retiring IAgrE CEO

THE retiring IAgrE CEO Chris Whetnall said farewell at a special internal lunch after a recent IAgrE Executive Meeting in October.

He was joined by staff members and senior members of the Institution. Chris had formally retired in May but stayed in post for a further few months pending the appointment of Alastair Taylor who took up the CEO post at the start of October.

Pictured are: Back row: Andy Newbold (President), Paul Miller, Richard Robinson, Steve Parkin, Mark Kibblewhite, Jane Rickson and Peter Leech. Front row: Sylvia Harris, Marion King, Chris Whetnall, Elizabeth Stephens and Alison Chapman.

Ag journalism award presented

Winner of IAgrE prize picks up another accolade

Feeding technology manufacturer Keenan presented its new award for published articles reporting agricultural innovation at an event in London in October.

The award was introduced last year in memory of company founder Richard Keenan, to highlight innovative thinking in the industry and to recognise the role of journalists in bringing it to a wider audience.

UK Market Director, Noel Keenan, presented the Keenan 'Innovation in Agriculture' journalism award to the winner, freelance machinery writer Peter Hill, at the annual Harvest Service and Lunch of the British Guild of Agricultural Journalists.

His article, published in *Farmers Weekly*, describes a novel grain moisture meter. The battery-powered Smartprobe has a simple 'traffic light' colour display that enables the user to see the temperature reading without having to clamber over the crop.

"We liked the way the article described the device but also explored in some detail how its inventor, farmer Micheal Summers, tackled design, manufacturing and distribution issues to turn it into a commercial product," said Noel Keenan.

Earlier this year, at a journalists' Guild reception during the Cereals Event, Peter Hill received the inaugural IAgrE prize for an article on GPS machine control published in *Crops* magazine. The Institution of Agricultural Engineers introduced the award to highlight the application of engineering within the land based sector.

Noel Keenan, UK Market Director, presents the Keenan 'Innovation in Agriculture' journalism award to machinery freelance, Peter Hill.

The Keenan runner-up prize went to James Andrews of *Farmers Weekly*, for an article on remote machine data collection through telematics that, the judges said, unravelled the puzzling world of the subject, explaining in simple terms how the technology works.

Tractor registrations increase

UK agricultural tractor registrations in September finished 17.4% higher than in September 2012 at 1,242 units, says AEA Economist Chris Evans.

This left the 9 month total 14.5% lower than a year earlier at 10,192 units. Taken in isolation the third quarter was 2% below the equivalent period last year and follows the expectation that the second part of the year would show some stability.

The average size of units continues to rise with an increase of 1.9% so far this year to 152.9hp.

John Deere support BASF farming campaign

JOHN Deere has announced its support for BASF's national '*Farming, the Biggest Job on Earth*' campaign.

"As a leading company in providing advanced technology, products and services to farmers and growers worldwide, John Deere is committed to the success of those whose work and livelihood is linked to the land," says John Deere Limited marketing manager Gordon Day. "We believe this campaign is an excellent way of highlighting the vital role our industry plays in meeting the world's ever increasing need for food, fuel and fibre."

Over the next few decades it is likely that the world will need to produce two to three times as much food as today, to higher nutritional standards, from the same available farmland. With the world population currently growing by more than 8700 people per hour, around 9.5 billion people are expected to inhabit the planet by 2050. As a result, demand for grain is expected to triple over the next 50 years, so a tremendous worldwide growth in demand is anticipated for ever more efficient and productive agricultural equipment.

According to experts, three factors are of critical importance to achieve the necessary higher levels of productivity: mechanisation, irrigation and genetics. John Deere say their agriculture division leads the global market in mechanised agricultural solutions, producing equipment designed to improve productivity and significantly reduce the lifetime costs of operation, while at the same time minimising the environmental impact.

This means constantly developing more energy-efficient products and systems to help farmers conserve resources, to sustain air and water quality, and to eliminate or reduce waste. John Deere solutions include new, more fuel efficient engines and transmissions and a range of 'intelligent' FarmSight technologies designed to enhance productivity, increase efficiency and reduce overall input costs.

Tractor & trailer consultation

On-road speed and weight proposals

THE Agricultural Engineers Association (AEA) welcomed the publication in November of the Department for Transport's consultation on proposals to increase the permitted speed and weight at which agricultural tractors and their trailers can be used on roads.

AEA Economist, Chris Evans, said, "UK legislation has for many years lagged behind technological advance.

"The AEA has for several years been working with the British Agricultural and Garden Machinery Association (BAGMA), the National Association of Agricultural Contractors (NAAC) and the National Farmers Unions (NFU and NFUS) to call for a change in the legislation to allow tractors and trailers that had undertaken a proprietary roadworthiness type test (undertaken by accredited industry inspectors) to travel at speeds up to 25mph and weights of up to 37,000 kg (for tri-axle trailers with road-friendly suspension).

"UK legislation has failed to keep up with technological developments since 1986 when the weight and speed limitations were enshrined in the Construction and Use regulations; i.e. a maximum weight of 24,390 kg for a tractor/trailer combination and a maximum speed for a majority of combinations of 20mph. Today tractors are Type Approved to European harmonised legislation 40 km/h (30 mph)."

The partner associations have proposed a scheme - the Agricultural Tractor Trailer Scheme (ATTS) - which would require an annual roadworthiness type test designed to ensure the standard of machinery at test and so promote road safety.

The AEA say they were also pleased to attend a factory visit by the Parliamentary Under Secretary of State for Transport, Robert Goodwill MP, where he was able to view example tractor and trailer combinations and hear more about the industry views.

Major Deutz-Fahr training and production initiative announced at Agritechnica

SAME DEUTZ-FAHR presented a major new project during the recent Agritechnica event in Hannover.

Deutz-Fahr Land is not only a new initiative for future tractor production, but also a facility which will also offer customers and Company staff, test areas, a welcome centre and training at the highest levels.

Key to the project is a new tractor plant covering 40,000m² which will be linked to the company's current production site at Lauingen in Bayern and boost production capacity in Germany to 16,000 tractors/year across two shift patterns. The emphasis will be oriented to the modern criteria of 'Lean Production' and to the highest standards in terms of safety, efficiency and consideration for the environment.

Strategic elements of the project will incorporate a new drive test area for the Research & Development Department, and for their customers, new areas dedicated to the training centre, showroom, museum, historical archive and shop.

The building of the new industrial plant will start during the first quarter of 2014 and is planned to be completed in three years.

NEW YEAR'S RESOLUTIONS - The CEO Shopping List

THE season of New Year's resolutions is catching up fast so why not make yours and at the same time support your Institution to reach new heights in 2014 and beyond. Here are a few things you should be adding to your list of resolutions.

- Fancy being involved in the Council and shaping the future of the Institution? This is something especially exciting at the moment as Engineering in all its specialisms is now viewed in a much more positive light by government and society. Be part of it!
- Why not get involved with the professional role of the Institution by joining the Membership or Education and Training Committees. It's a great way of developing your own business contacts as well as helping to take the Institution forward.
- Use your expertise to help the Institution have a higher profile. We have many requests, from a wide range of bodies, government and private sector, to get involved on committees and task groups. Why not combine your own expertise and interests and represent your institution at the same time?
- Become an IAgrE Ambassador. Schools and Colleges are always looking for professionals to promote Science, Technology, Engineering and Science subjects. We can connect you to STEMNET and Bright Crop to put you in touch.
- Join an IAgrE 'Task and Finish' Group and help us to use your expertise. You might be a specialist in communications, engaging young people, sourcing additional funds from charities, engaging employers. If you have it, we want it.
- Write an article for *Landwards*. We enjoy reading stimulating and thought provoking articles. Get your thoughts about Agricultural Engineering on paper. Tell us what you are doing.

Do it now and tell me what you can do to help. Whatever your expertise and whatever time you have, we can make good use of it.

Alastair Taylor - ceo@iagre.org

Agriculture still the most dangerous industry

ACCORDING to the latest figures released by the Health and Safety Executive farming and related industries are still the most hazardous.

A statement from the HSE said, "With high numbers and rates of fatal injury, agriculture, forestry and fishing is the riskiest industry sector. Just over one in a hundred workers (employees and the self-employed) work in agriculture, but it accounts for about one in five fatal injuries to workers."

The latest results in agriculture, forestry and fishing show:

- 29 fatal injuries to workers, the average over the previous five years was 36. Almost half as many workers were killed in 2012/13p as in 1981 (54), but the average worker fatality rate, over the last five years, is much higher than in any other industry section (RIDDOR);
- Almost half (41%) of the workers who were fatally injured were farmers; another 17% were farm workers;
- Seven fatal injuries to members of the public - the average over the previous five years was five;
- Major injury rates and numbers have not changed significantly over the last three years. The proportion of injuries actually reported in agriculture is low, so it is difficult to draw any meaningful conclusions about trends.

Peter Martin steps down

LANTRA Chief Executive leaves

LANTRA chief executive Peter Martin is leaving the organisation after 12 years to "take up an international career."

Martin is credited with securing re-accreditation of Lantra as a Sector Skills Council, and developing new strategic and business plans for the organisation.

Deputy chief executive Robert Tabor will take over as acting chief executive while Lantra reviews its operations. It plans to restructure the organisation around three main areas: Lantra Awards, online skills and projects.

Chair of the trustees Valerie Owen said, "It has been a privilege to work with Peter, who has championed key skills and policy issues for the land-based sector and ensured Lantra's work has been truly employer owned and led. The trustees wish Peter every success in the future."

Martin said, "Agriculture and the wider land-based industries have an exciting future, and I am sure that Lantra will share in their success."

In a statement the organisation said of the future, "We will focus on supporting agricultural and other land-based businesses to increase their profitability by raising the skills levels of their workforce. As a result, our work will also support wider economic development."

CEO VIEW

American friends

Alastair Taylor

BACK in September I took a holiday in America - the first trip to America in over ten years.

To be honest, I had been put off by the horror stories you hear about customs and immigration controls but I was surprised by how easy it was and having done the tour of national parks around the Zion, Bryce and Grand Canyons, I was reminded how beautiful the States are.

A highlight was a visit to an old friend, Larry Fischer and his wife Tammy, who live in Quincy, Illinois. We first met on an exchange programme in 1991 and have been friends ever since. Larry is retired now but his main career was as director of the Agriculture Programmes at the John Wood Community College. The college has an outpost in the nearby small town of Perry. This is very much small town America and when I first visited it was nothing but Soya Beans, Corn (Maize) and Hogs (pig farming in other words).

Twenty two years on and nothing much has changed although the 2013 harvest was delayed on account of a very late and cold spring in the mid-west. The weather extremes in Illinois are something to behold and having been there in both February and August, the range from minus 30 to plus 30 (not on the same day!) needs to be experienced to be believed.

Those of you with a good memory will recall the Mississippi floods around twenty years ago when the levees burst and a big area around St Louis, Missouri and Quincy, Illinois was flooded - in some places to a depth of 25 feet. Some small towns have not yet recovered from the devastation. I recall visiting the area a couple of years after the floods and weeds were still hanging from the overhead wires. Larry mentioned that the Mississippi came within a few feet of flooding this year but the flood defences held. We walk a thin line!

As you would expect, our conversation revolved around the state of the nation but never erred very far from farming and agriculture - this is the mid-west! "A visit to a farm would be nice", I commented, and before too long we were visiting one of Larry's friends who farms 1600 acres of soya and corn and raises pigs to the point of weaning on the higher ground close to Quincy.

This farm visit was an excellent lesson in the role of Engineering for Agriculture and during the tour we covered most aspects of our discipline. I will give you a flavour.

AS a working farm, there was a good array of green and yellow machinery (a lot of it is manufactured pretty close by - for those of you for an interest in the vintage side, I do recommend the Old Threshers Reunion which takes place in Mount Pleasant, Iowa).

The combine harvester was being prepared for harvest with a new GPS system just fitted linked to a yield mapping system. This was completing a circle in so far as sowing was already harnessing precision farming methods. There was a sense of anticipation and slight frustration that the late harvest meant this new technology could not be tested in anger.

In the farm yard, the grain storage bins had been revamped with new elevators fitted. Although moisture contents should be quite low, the need for post-harvest drying was needed given the lateness of the season. Nearby, the pig unit was using state of the art controlled environment and environmental monitoring to ensure that the sows were kept in an optimum state. All the usual bio security was in place. (I opted not to look at the pigs on account of the need to shower in and shower out). The story was recalled of a visiting feed truck which had to be turned away on account of it having visited a farm somewhere down the bio-security feed chain.

> "The farm visit was an excellent lesson in the role of Engineering for Agriculture"

The conversation turned to waste management and the value of the pig slurry as part of an integrated nutrient management plan. The pig enterprise could afford to make a loss (not that it did!) as the value of pig manures had been accurately calculated ($80.00 an acre as I recall). The conversation then turned to the precision application of animal wastes as part of the precision farming system. Something for the future it was concluded.

Then it was time for a farm tour. There were two centre pivot irrigation units and a third on order. These were fed from a reservoir which collected water run-off during the winter months. Managing the water run-off was a major undertaking with the general idea that any water and silt that ends up in the Mississippi is a wasted resource.

A continuous job was the building and maintenance of dams and water flow ways to ensure that all water was collected and recycled. With a gently undulating terrain, the engineering required to collect water was an impressive undertaking.

We spent some time looking at the challenge of the reservoir. Twenty years of use had led to a build-up of silt on top of the clay lined floor. During the summer months, reservoir was sufficiently low for a 360 degree digger to be used to dig out the silt although this appeared to be something of an endless task. The silt was stacked on the side and then during the winter months when the ground is frozen is returned to the fields (better there than running down the Mississippi being the general idea). The investment in earth moving machinery was proving useful.

The crops looked good although the late spring and harvest meant that yields were expected to be down. Not that this was a major concern as the crops were insured and any losses would be covered. Back in the farm yard, we contemplated the state of the industry and came to the conclusion that things are in pretty good shape although the problems are much the same - an aging workforce, too few youngsters coming into the industry, a public disconnected from the source of their food, etc.

IT was a very enjoyable two hours and one which reinforced the important role of Engineering for Agriculture.

It was all going on: soil and water management, conservation, precision farming, integrated waste management, machinery management, and farm mechanisation. I think the farmer I visited was perhaps one of the more informed ones I have come across and my friend Larry pointed out that not all American farmers are as switched on to the soil and water agenda as this one was. However, it gave me great heart that my chosen vocation is alive and well, and perhaps more important than it has ever been.

Our final conversation revolved around the need to protect soil structure and the impact of all that heavy machinery. It was suggested that in twenty years' time, we will have a higher number of smaller and lighter driverless units and the impact of this will be less soil damage, more optimum timing of operations, and a lower reliance on labour.

There are those at the cutting edge of research here in the UK who would find this music to their ears. My only comment was, "Yes, but we still need to think about who will keep those robots working."

But that's another story . . .

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AEA

A great time to be an engineer!

IAgrE President, ANDY NEWBOLD, is encouraged by the high turn out of young people to the DBT Forum at Harper Adams University

MY apologies for banging the drum yet again, however I want to say how exciting it is to be an agricultural engineer!

The government has launched an Agri Tech strategy which includes the novel concept of Agri-engineering - lets not split hairs, the spirit of it is right, even if the title is close! They are to be applauded in recognising the part Agricultural Engineering has to play in the challenges ahead.

It's wrong to indulge in self congratulatory back slapping that somehow 'we've cracked it!' 'Cos we haven't. All that's happened is a need has been acknowledged. One thing I will say is that irrespective of the Agri Tech strategy ('whatever that is' you may say), we still need the secret ingredient - engineers.

WITH this in mind I was delighted to be a guest at the DBT Forum at Harper Adams University in early November on Global Opportunities in Engineering for Agriculture.

What was exciting was once you had cut through the swathes of lecturers, venerated agricultural engineers and eminent professors, there was a very large group of young people, all keen to find out more about a career in Agricultural Engineering!

I was very encouraged with the turnout for the day, which was about double what was originally anticipated. On that basis the future of agricultural engineering is in safe hands.

The day was a great opportunity to be enthused by the panel of world class engineers and encouraged that this is a vital and positive industry to become a part of. Well done to the Douglas Bomford Trust for this initiative and to the IAgrE secretariat for all their hard work!

NOVEMBER has been a month of being out and about, and I was fortunate to be able to spend three days in Hannover, Germany at the biennial Agritechnica event.

Wow, what an eye opener! A mere 2000+ exhibitors, some 450,000 visitors over 1 week (only 65000 or so per day) on a site with 27 halls, which is approx. 1km square in area. In three packed days I only managed to visit 17 of the 27 halls. What a great showcase for agricultural engineering.

There were the latest, best and most innovative machines, products, technology and services from around the world all in one place. My only other observation is that before attending again in two years time I shall be getting my running shoes on and training hard for a few months prior as its very hard work getting around the event!

ON the note of challenges, IOSH's Farm Safety Group ran a very successful machinery safety day at Stoneleigh in early October and one key fact stood out - you are 5 times as likely to die working in agriculture in the UK this year as you would be as a member of HM forces in Afghanistan.

Now being a naturally distrustful sort of chap (especially as Adam Quinney NFU Deputy President gave the fact), I did what all good engineers do, I checked his sources. In this instance I referred to that great international online textbook 'Google' and he is right!

So the challenge to us engineers, is . . . How do we design great products, which don't kill our customers? Or is it more subtle than that, perhaps there's 'nowt' wrong with the machines but it's the information instruction and training of the operators? Its not for me to say, however we need to reflect on this.

Presidents reading: ***tinyurl.com/nf7yv6h*** all about the Google self driving car. One for the nay sayers about autonomous tractors.

I am not sure when you are reading this, but as we say goodbye to the old year and raise a glass to the new, it's a good time to reflect on where we are, what got us here and where we are going!

Here's to 2013 and all the best for 2014! (Piper enters stage left, audience link arms . . President regrets wearing kilt . .)

> . . the future of agricultural engineering is in safe hands

CAREERS FORUM

It's the best job in the world

Over 300 delegates from all over the world converged on Harper Adams University in Shropshire recently to explore the exciting opportunities that agricultural engineering can offer as a career choice

The expert panel


David Llewellyn


Mark Moore


Simon Blackmore


Debbie Beaton

ENTITLED 'Worldwide opportunities in engineering for agriculture' the careers event was organised by the Douglas Bomford Trust, supported by Harper Adams University and IAgrE.

The event was designed to inspire and encourage the next generation of engineers to play a key role in agriculture and food production. All potential recruits, such as school leavers, students considering a career in engineering and engineering graduates looking for a rewarding career, were encouraged to come along.

Welcoming everyone to the Forum, **David Llewellyn Vice Chancellor of Harper Adams** University commented that there are so many global opportunities available for agricultural engineers and now was a superb time to commit and really make a difference.

The event took place in the new Douglas Bomford lecture theatre, in the Agricultural Engineering and Innovation Centre (AEIC) and David set the scene for **Malcolm Crabtree**, **DBT's Chairman** who spoke about the work of the Trust and unveiled a plaque to commemorate the occasion.

Mark Moore AGCO Corporation agricultural development manager, chaired the event and said, "My role within AGCO is Africa and mechanisation systems. It's definitely the best job in the world as far as I am concerned and there is nothing more rewarding than seeing the huge smiles on the faces of people you meet because they know you have come to help them."

Head of Engineering at Harper Adams, Simon Blackmore reiterated that it is a very exciting time for agricultural engineering as we experience so many changes around the world in the way farming is carried out. Simon introduced the series of demonstrations that took place in the afternoon where students were able to see some of the latest advances in agricultural engineering from driverless tractors and aerial drones for field-mapping to lameness-detection scanners in dairy cattle.

One of the key presenters was **Sir John Beddington**, formerly UK Government Chief Scientific Advisor. Sir John said how much people's attitudes to agriculture are changing from the days of wine lakes, butter and grain mountains. He was keen to shock the audience with the realities of where the world is heading. For example, the worldwide population grows by six million every month, greater than the size of the UK population every year and by 2025

> “. . You need to be an innovator, a lateral thinker and a risk taker”
>
> Geoff Freedman, Consultant

there will be a billion extra people divided between Africa and Asia equally. Coupled to a population explosion is increased urbanisation, more people adopting what is called ‘a middle class diet’ and of course climate change. John admitted that the government had tended to neglect engineering for agriculture which was why he commissioned IAgrE to formally respond to the Foresight Report.

Clive Blacker of Precision Decisions who gave a presentation called ‘The view from the field’ said, “The whole event had a very positive feel about it and I particularly enjoyed the cross section of people at the event, which from meeting and talking to opened up numerous conversations and discussions on all aspects of agriculture.”

An international panel of experts spoke enthusiastically about how they believed they had the best jobs in the world. Geoff Freedman formerly a forestry civil engineering design engineer who now works as a consultant said, “You need to be an innovator, a lateral thinker and a risk taker and if you want to enjoy your job there’s no better way than being an agricultural engineer.”

Carla Gasparin, the first woman product manager at AGCO said she loved what she does and finds communication and analytical skills are extremely useful in her role where she talks to farmers to identify and define customer product and technology needs.

continues over


Clive Blacker


Sir John Beddington


Ying Gang Ou


Leon Terry


Carla Gasparin


Toby Mottram

. . . agricultural engineering has an unprecedented opportunity to come into its own


L-R: Paula Misiewicz and Emily Smith


Graham Halcro and Boyan Kuang


Students came from across the country

Professor Ying Gang Ou of South China Agricultural University spoke about how quickly China is developing and that industrialisation is changing the face of China's rural and agricultural communities. "There are huge opportunities in China with companies such as CNH, John Deere and AGCO setting up manufacturing facilities and joint venture companies," he said. He also joked that if you are thinking of coming to China it is a good idea to study a little Chinese.

Amy Gray, assistant adviser - science and regulatory affairs with the NFU commented, "I couldn't help but come away from this event inspired and hopeful. Yes, global populations are likely to explode in the coming decades and that's a scary fact. We will have more mouths to feed on this planet than we would realistically know what to do with at the moment. But that means that agricultural engineering has an unprecedented opportunity to come into its own - it has never been more needed and if that does not inspire the young engineering hopefuls of the future, I don't know what will."

IAgrE President Andy Newbold commented, "It was encouraging to see so many young people who were obviously interested in a career in engineering for agriculture and a great opportunity to hear positive and inspiring speakers from around the world talk about a broad range of exciting agricultural engineering topics."

And it doesn't end here. DBT and IAgrE are committed to promoting the opportunities and benefits of following a career in engineering for agriculture. Elements of the day have been captured on film and people will be able to view the presentations and highlights of the day on the DBT and IAgrE web sites. A careers brochure is also being prepared which will be sent to student attendees and used as a promotional tool for people interested in learning what they need to do to take their first steps on the path towards this rewarding career.


Practical demonstrations were given

GALLERY- Portraits of a very successful day

ABOVE: Malcolm Crabtree unveils a plaque for the new Douglas Bomford lecture theatre, overlooked by David Llewellyn

BELOW: A JCB tractor on display

BELOW: Watching a demonstration

BELOW: IAgrE President Andy Newbold; IAgrE CEO Alastair Taylor and Douglas Bomford Trust Secretary Paul Miller

BELOW: Outdoor demo

RIGHT: Richard Robinson and Peter Redman

ABOVE: Technology demonstration with Paula Misiewicz

RIGHT: Andy Newbold chats with guests

ABOVE: The day enjoyed a very successful turn out

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Activities of the DOUGLAS BOMFORD TRUST

An update

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

THE Annual General Meeting of The Douglas Bomford Trust was held in the new Agricultural Engineering Innovation Centre at Harper Adams University on Wednesday 6th November and was attended by eight trustees and two administrative staff.

At this meeting:

- Professor Dick Godwin stood down as a trustee: Dick has been at the centre of many of the activities of The Trust over a considerable period and has made a tremendous contribution to its work as Chairman, as a trustee and as a supervisor of a number of successful PhD studentships that have been supported by The Trust. All those associated with The Trust will recognise the huge commitment that Dick has shown and this was marked at the end of the meeting when the Chairman, Malcolm Crabtree, presented Dick with an engraved plaque - see picture;
- Mark Moore was appointed as a trustee: Mark is the Agricultural Development Manager for Africa and the Middle East for the AGCO Corporation and now spends a substantial amount of his time abroad. He has a strong interest in precision farming systems having completed a PhD at Silsoe concerned with yield mapping with combine harvesters and has attended Trust Board meetings over the past year prior to becoming a trustee;

Malcolm Crabtree presented Professor Dick Godwin with an engraved plaque

- The Annual Report and accounts for the financial year ending 31st March 2013 were accepted and signed: these will be submitted to The Charities Commission and made available via The Trust's web site.

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

At this meeting the Trustees:

- Reviewed the administration of The Trust;
- Received a report concerning the financial management of The Trust's assets - Jonathan Bomford, Elizabeth Stephens and Paul Miller had met with the three fund managers who handle Trust funds in October and were able to update Trustees on issues relating to these funds;
- Reviewed the progress of activities that are funded by The Trust;
- Examined new proposals for funding and made recommendations as to which of these proposals should be funded.

Studentships and Prizes

AS indicated in the Autumn edition of *Landwards*, The Trust awards prizes to students at Cranfield, Harper Adams and The Royal Agricultural Universities on an annual basis.

This year The Douglas Bomford Trust prize for 'the best FdSc Agricultural Engineering student' at Harper Adams University was awarded to James Silk. The award, comprising a scroll and a cheque, was presented to James by Malcolm Crabtree, The Trust's Chairman, at the Harper Adams University Graduation day on 20th September 2013. This event provided Malcolm with the opportunity to meet with two of the students, Tom Rushton and Jonathan Bradbeer, who had received studentships from The Trust and who were graduating this year.

At The Royal Agricultural University, The Trust awards a prize for the best student project that has some linkage with the application of engineering principles to agriculture. This year the prize was awarded to Thomas Anderton and a cheque was forwarded to Thomas as he was unable to attend the prize giving event at The University.


Graduating students Thomas Rushton and Jonathan Bradbeer at Harper Adams University - both were recipients of Douglas Bomford Trust Studentship Awards in 2012/13 and graduated with Distinction - they are pictured with the Chairman of The Trust, Malcolm Crabtree

Beyond Boutflour to
the 20,000 litre cow

The UK herd is genetically capable of 20,000 litres but falls far short of that figure. **PROFESSOR TOBY MOTTRAM** of the Royal Agricultural University outlined the case for higher yields and how we may have to rethink our approach to keeping cows, in his inaugural professorial lecture to the Royal Academy of Engineering in October. Below he summarises his presentation . . .

IN the immediate postwar period Robert Boutflour established a high yield and high margin system at the Steadings where the 22 cows were pampered and fed to achieve high performance.

By 1953 the herd was averaging 1987 gallons (9040 litres). The cows were a very mixed bunch bought at the Saturday market in Gloucester and many were elderly by modern standards so it was no mean achievement, and in the autumn of that year Boutflour gave a conference paper '*Towards the 2000 gallon cow*'. This was something quite startling as it translates to 9100 litres.

Now a mere sixty years later we are almost there. Our national average is close to 8700 litres but the big difference is that somehow we have allowed the assumption to creep in that high yields equate to short lives. I believe that we should aim to increase both the yield and the longevity of cows to emulate Smurf - a Canadian cow who retired recently at the age of 15 having given 216k litres in 10 lactations, over 20,000 litres for 10 years.

But before I get into the how, let's talk about the why of high milk yields. To reduce methane emissions, at yields of 20,000 we would only need 700,000 cows to supply what is currently supplied by 1.8 million. This alone will reduce our agricultural methane emissions by 30%. By extending longevity we will decrease the number of heifers we need to raise from probably 600,000 a year now to under 140,000 per year.

In addition, by intensifying we can release land for extensive systems that can lock up carbon and nitrogen. On the animal welfare front by reducing the number of animals that suffer poor management we reduce the sum of suffering, and I would also reverse that dismal Singerish calculation and state that we can give animals joy in their daily lives whilst still achieving high yields.

Three things we need to improve to get to the 20k litre, long-lived cow are managing cow health and nutrition; the living environment of cows; and conserved forage.

In 1976 the first results of measuring progesterone in milk to manage fertility were announced. Most, 96%, of cows have viable ovaries and we could cut calving index to under 400 days at a stroke but no-one except a prototype system I demonstrated in 2003 and the Herd Navigator system in Denmark have attempted the engineering approach. The investment required is a few million and the pay back would be in billions. We slaughter 500k cows per year that have viable ovaries saying we cannot get them pregnant.

Nutrient analysis particularly of silage is very unreliable and we don't know what cows will do with a diet until we feed it to them. The rumen pH bolus allows us to assess the energy intake of cows and adjust diets to encourage cows to eat frequently. With new sensors we could look at the nitrogen balance and VFA levels in the rumen and move from a model-based open loop control to sensor-based closed loop systems.

The principal difference between moderate milkers and high yielders is food intake, and the cows have an appetite for it if it is kept fresh and available. Many cows spend hours a day shut in yards where they cannot lie down or eat. Many of them do not get enough time to live their own lives as we impose a human oriented schedule on them. Robotic milking allows cows to eat and be milked at times of their own choosing, around 2.7 times a day, and milk yields climb as a result. The most stable rumen pHs we have seen are from a farm in West Devon with two robots milking 120 cows.

The perfect environment for cows might be characterised as a place where plentiful digestible food is always available, there is a surface to walk on which is non-slip and causes no damage to the feet, there are plentiful places to lie in family and friend groups, and where the air is clean and dry.

For about 10 days a year pasture meets all these criteria and there is nothing pleasanter to see than cows enjoying an outdoor life, but for much of the year there is insufficient nutrients in grass, the ground is either too wet or too stony for comfortable walking and the weather is inclement. I believe we should include a grazing period for all cattle and for autumn calving cows a spell at summer pasture is certainly beneficial. And it is also good for heifers to be accompanied by senior cows to teach them the culture of grazing.

Perhaps the main challenge is to replace bare concrete as the walking surface. Concrete is a very hard surface and it quickly becomes slippery. It is also impervious which means that urine and faeces mix together increasing emissions of ammonia. What we need is a surface that is non-slip, that separates urine and faeces, that is soft to walk on and is easy and cheap to lay and maintain. The road builders have developed numerous surfaces and it is time we applied those approaches to the places cows walk.

The diets used by Bobby Boutflour at the Steadings herd were based on hay and concentrates with some summer grazing. He said he liked his cows to take in plenty of water by drinking it, so I am not sure what he would have made of the revolution in forage production caused by the wider use of silage.

The speed with which silage could be made in our fickle weather became one of its selling points. Many farmers use contractors for the few days a year they are needed to cut and haul silage. I fear poor consolidation and weak clamp control is reducing silage quality. We need to improve silage analysis and pay contractors for quality rather than speed.

My crystal ball for the next 50 years is as follows:

- **Legislation or the supply chain insistence that cows spend 2-5 months outside (averaged over a lifetime)**
- **Supermarkets integrate welfare and health measures into supply contracts**
- **Milk and grain prices rise**
- **Silage is made at 50% DM**
- **Feed by-products prices do not track cereal prices due to increased availability of products**
- **Meat & bone meal becomes available again**
- **Average milk yields rise above 20k**
- **Average cow life is 12 years**

Finally, we need to recognise that high yields and happy cows with long lives are compatible, and not mutually exclusive as seems to be the current case.

It's all in a name

Dear Chris,

I refer in part at least to the editorial comments about the looking to replace the terms 'land based sector' and 'land based engineering' with terms like 'engineer for agriculture' and 'agri-tech'.

I have had the luxury of working almost as many years on the edge of the industry (on and around the canals) as I did in it, though I always considered it part of the 'land based sector'. I think it prudent at this point to cast our minds back to why and when those terms were coined and for what purpose.

In the late 1980s this organisation went through what at the time was a crisis that could have seen its end in the format that we recognise. Membership was falling, costs spiralling, agriculture our life blood was almost at critical mass and lacking direction and a stable future as CAP was dismantled.

Net result, the industry shrank, got market savvy, and the institution decided rather than merge with the IMechE or another similar body it needed to widen its horizons hence the terms 'land based sector' and 'land based engineering' were born and have, due to the efforts of many in this organisation over time, turned the tide.

The industry, and by that I mean agriculture and ag-engineering, have not grown but continue to consolidate although in a much more structured and planned fashion. I would argue that those terms define what we are about equally as well today as they did in those critical days in the late 1980s. Engineering for Agriculture is only a short step from Agricultural Engineer, (as Ka is only a small step from car - the IAgrE is smarter than that) and will only appeal to and be understood by those who are already involved in some form or other.

I think the term 'engineer for agriculture' is fine within the industry but as a tool to market the industry we hold so dear, it is a step back into the dark ages and that would be, after all the progress made, a mistake.

Agri-tech is a bit obscure, but again fine within the industry but far too vague in the big wide world.

Consider for a moment not what we are about but where we are going. I challenge you that this industry in the wider context is doing nothing less than 'engineering food for the future' and 'engineering food for survival and growth'. The bulk of Ag research in all forms comes from a handful of proactive countries in the western world (generally) and it is this Institution that stands to lead and focus the people at the core of that process. The two comments above are far more openly descriptive of the journey we are on than anything else I have yet seen.

We have as an industry, and as a career path, continually under marketed ourselves for years.

'But we were ignored in the Foresight oversight fiasco', I hear people cry, 'we need to change things'.

. . . as a tool to market the industry we all hold so dear, it is a step back into the dark ages

The only thing we need to ensure is that we are heard and recognised and above all 'remembered'. There is nothing wrong with the terminology, we were just far too quiet.

Fact, we do not have enough people operating at the level of Sir Anthony Bamford (now Lord) who ply the cause of feeding the nation (or the planet) in the velvet lined corridors of power. We do however have a House of Lords, many of whom own a plot or two....etc.

As we have discussed in the past it is my view that it is not up to successive governments to market our industry either to the public or to the student populace at large but the industry itself.

Adam Henson & the *CountryFile* crew have probably done more to promote Ag and Horticulture in the last twelve months. The last piece with the robotics at Harper Adams University was an amazing bit of PR, as was the highlighting of the crisis in the horticultural sector.

In the 1980s Reaseheath produced plenty of excellent horticultural students many of whom moved on to Pershore College to study further . . . this seems to have dwindled to a critical level.

It may interest members to know that the British Marine Federation is having conversations in much the same vein. We are not alone. We can at the most only look to government to assist with the funding of such ventures.

In a recent study published in the newspapers 80% of students today are studying for 'media and the arts' which when they graduate will constitute only 20% of the available jobs - this is criminal. Why media and the arts? Because it is seen as sexy and it might make them famous. I'm not suggesting Ag X Factor but at least making our industry as appealing as Kate Humble made the countryside on *CountryFile* would be a start.

It draws in my mind a picture of an education system in general, rather than Ag specifically, that is producing (just like British Leyland in the mid 70s) a great deal of a product that nobody wants and some of that of questionable quality.

It strikes me that in a lot of respects when I started my career in this industry what was presented to potential students in the form of City and Guilds 015 (later 394) and BTEC National Diploma, HND, etc. was a far more easily chewable chunk than a degree in this or that. A degree is not for everyone and not everyone needs a degree.

I think in terms of marketing to students we have lost a great deal; pushed the one size fits all thing a bit too far and lost a huge number of potential engineers in the process. Some of the best engineers I ever trained whilst at Renault Ag were time served without a 'ticket' to their name. There is more than a hint of truth in David Kirschner's article on page 19 of the Autumn 2013 issue of *Landwards*.

Simon Thomas

If you would like to respond to any articles which have been featured in *Landwards* please write to the Editor at : *chris.biddle@btinternet.com*
Or the IAgrE Communications Officer, Marion King on *pressroom@iagre.org*

Agri-tech Strategy

Dear Editor,

Perhaps I may be permitted a short paragraph to vent my spleen before making more constructive comments on the proposed strategy.

It seems to me (admittedly an interested party) that the strategy is calling for an agricultural and food research council (disbanded c. 1985) and a national institute of engineering for agriculture (closed in 2007). How short-sighted were those in authority then!

Also the strategy's claim for originality in government/industry co-operation ignores the multi-million pounds R&D contract we carried out which has assisted in the design of faster, more efficient tractors. This was funded by government (DTI and MAFF) together with 14 companies and involved five research organisations. Other examples could be quoted

These points are relevant in establishing the role of the engineer and physical scientist in Agri-tech. Also, it is important to emphasise that approximately 40% of agriculture's inputs relate to machines and the performance of machines (e.g. spraying).

What is carried out by engineers in the future will continue to be in competition with biological scientists as well as in collaboration with them. They will inevitably, as in the past, fight for the lion's share of the funding. (In the past this was largely responsible for the demise of the AFRC.)

Therefore the engineers' bid for funding must be convincing in economic and achievability terms; it must be collaborative with other disciplines and it must be delivered promptly.

This last requirement needs the immediate attention of IAgrE. What is needed is an outline, comprehensive research and development programme. Each project must have a cost/benefit estimate; it must have an objective timescale and show the expertise and collaboration needed.

Projects need to be given relative priorities and the share of activity given to crops and that to livestock must be carefully assessed. Drawing up such a programme needs expertise, experience and imagination as well as a good knowledge of the technologies and of agriculture.

There is currently in the UK no body of engineers within a single organisation with this capability. The only organisation which has them in its membership is IAgrE.

It therefore is vital that the Institution attempt to establish such a working group to crystallise what we can offer through research and development. It may be that open meetings (general or specific topic) will be needed to identify opportunities, constraints or possibilities of cooperation. However I would envisage ultimately (and soon) a group of a dozen engineers and physical scientists with complementary expertise drawing up a comprehensive R&D programme for bidding.

It would not be appropriate for me to name names, but I do know of enough members with this capability for an IAgrE cohort of experts to draw up a programme which should ensure that at least 15% of the funding comes to our sector.

> “. . It therefore is vital that the Institution attempt to establish a working group”

Leadership of the engineering work in the agreed (and funded) programme may create a few problems. Little can be decided until details of projects funded are known. Harper Adams are likely to be an important element in any programme, but it may be that a consortium needs to be established.

In closing, I must again emphasise that timeliness is vital.

Professor John Matthews, CBE

JIM CHRISTIE reports

Forestry Engineering Group Annual Symposium:

Economics of Delivery - Roads to Market

JULIE MCMORRAN the current Chairperson for FEG welcomed the delegates to the Symposium and intimated a last-minute change to the program that would stimulate a discussion session on the main topic of 'Roads to Market'. Julie explained that this would pool the accumulated knowledge of the delegates and would enable the compilation of a useful note on current thinking.

DAVID KILLER, Civil Engineering Consultant and past FEG Chairman, opened the morning Session by reviewing the *Basic Principals of Road Construction* that had stood the test of time.

He explained that a Forest Road had to be designed in order to protect the ground over which it was built while at the same time creating a road that could be used and maintained to a standard that did not damage the vehicles using it.

Achieving this required surveying the ground conditions so that the best road line and accompanying drainage could be planed, locating the correct materials, blending them to the correct specification, using the correct spreading and compaction techniques then capping what had been built to keep the structure dry, while withstanding the anticipated loading.

David then went on to explain the mechanics of 'frost heave'and the detrimental effect of using salt.

JOHN SCOTT of JST Services, next gave an overview of the service he provided and how he uses adapted and customised vehicles and equipment to move timber from the most extreme sites in remote coastal areas. This involved the use of Coastal Barges, Floating Piers and mobile cranes.

For in-forest transport the vehicle adaptations that JTS Services have developed were designed to overcome the vehicle damage experienced by damaged roads. In essence, John's argument was that on many sites the use of unsuitable vehicles primarily designed for highway use damaged the forest roads that then, in turn, damaged the vehicles. This created a 'damage spiral' with disastrous results.

By adapting his in-forest vehicles so that they not only avoided damaging the roads but also improved them, the damage spiral was disrupted. John showed slides that convincingly illustrated his claims.

John concluded by outlining a working system that involved stump to roadside by forwarder, then by in-forest specialised trucks to a transfer area accessible to the public road, before finally loading onto road going lorries. He was aware that this would involve an additional handling process and that road building tippers and heavy plant within the forest would still damage roads, but argued that the advantages of this system was still a viable solution in certain site conditions. He had proved it.

. . . if possible avoid disturbing peat, since it is a valuable carbon sink that will emit 66% of its weight in carbon when exposed to the air

ALAN DICKERSON, Forestry Commission Civil Engineering was the lead author of the paper on '*The reduction of Carbon Emissions during Civil Engineering Operations*.'

The paper advised that the first priority was to ensure that the planning and design stage took into consideration the route, so that high carbon soils were avoided, the minimum required specification was adopted and that the most efficient construction processes were used.

The paper also advised that by reusing existing road materials, savings in terms of energy, cost and carbon could be made.

Also by recycling other materials from outside the forest such as Bitmac road planings and clean crushed concrete could make further savings but that the import of 'unnatural' products into the forest should be kept to a minimum.

The final message of the presentation was 'if possible avoid disturbing peat' since peat is a valuable carbon sink that will emit 66% of its weight in carbon when exposed to air.

THE OPEN FORUM was the morning's final session. The FEG committee being always aware of the combined expertise present at the Symposia, decided that the subject of whether roads suitable for road-going vehicles are still the 'best' way forward or should the use of Low

John Scott's presentation gave an overview of how he adapts vehicles and equipment to move timber around extreme sites.
The combination pictured here features steering axles, tag axles, a range of tyre sizes, Central Tyre Inflation and a wheel alignment pattern that results in an even spread of weight across the width of the vehicle.

Ground Pressure Vehicles on 'Low Cost roads' be more widely used?

A lively and multi-sided discussion ensued and the outcomes could be divided into three problem groups:

Common Problems experienced but to different extents

- Changes in Landowner's management approaches
- Damage by non-forest traffic - (Construction traffic)
- Abuse by speeding vehicles.
- Un-timely use (Frost heave)
- Bad repairs
- Forwarder damage.
- Damage by unladen vehicles
- Damage by loaded lorries lifting axles unnecessarily
- Delays in preventative maintenance
- Maintenance costs.
- Dealing with the Complexity of Quarry legislation
- Allocation of costs
- Cost of Sourcing road-building materials (both Carbon cost and financial)

Problems peculiar to Roads suitable for road-going trucks

- Cost approaching £100/metre
- Bio-security issues arising from in-forest and public road use.

Problems peculiar to Roads suitable for use by LGP machines only

- Cost/availability of LGP machines.
- Cost of moving the LGP plant to site.
- Allocation of these costs.
- Access for other vehicles.
- Double handling of timber

The conscientious of opinion emerged that on a large forest block peripheral roads with access to the public road should be built to a specification suitable for road going vehicles, but roads that were more remote could be built to a lower spec and used exclusively by LGP vehicles.

The Session was summed up by Dr Geoff Freedman saying that he was not surprised that a clear answer had not emerged but that he reckoned a spreadsheet or a computer program could be devised such that if the variables associated with a particular site were to be input, it would be possible to predict the most cost effective answer as to where the road specification change point should be located.

CRAIG GRANT, FEG Chairman designate, chaired the afternoon session.

Firstly, **RYAN E SMITH, an Associate Professor and Director of the Integrated Technology in Architecture Centre** based in the University of Utah presented a paper that painted a grim picture of the devastation of the pinewoods in Colorado State.

Two million acres of National forest were subject to pine bark beetle infestation since 2008 equating to 44% of the National Forest. It was estimated that potentially 2,118,750 homes could be built if this resource could be used. Ryan's paper described the work involved in determining if this standing dead wood could indeed be used in construction.

Since the beetle had substantially weakened the timber, thicker sections would have to be created to compensate and cross-lamination offered the best possibilities. Before investigation the alternative methods of cross laminating began, trials were carried out into the structural performance that could be expected from panels made from the 'beetlewood.'

The results of this work were encouraging, having also established the loads that could be safely applied to withstand those encountered in the proposed applications. The various methods of cross laminating could now be explored.

This work resulted in establishing that the conventional laminating resulted in the adhesive costs being higher that the timber costs and so was discarded. The use of specially designed elongated nails was also discarded, again because of the relative costs.

Finally, by using a jointing method in both vertical and horizontal plains an economical laminating method was developed. This entailed milling dovetails joints and, the use of hydraulic presses to fit the panels together. In-spite of the capital costs of this equipment, the end product price was acceptable.

Ryan's paper concluded by showing some of the beetlewood structures that are already in use.

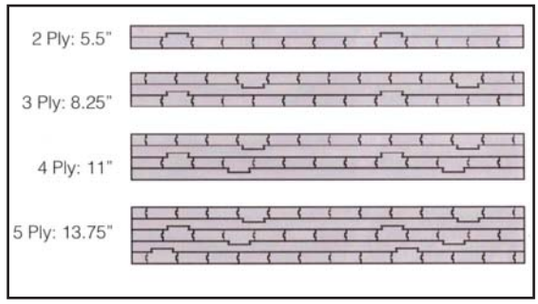


Diagram showing the jointing pattern of the four panels used in the construction of the structures.

The second afternoon paper was by **STEVE LAVERY, FISA Chairman**.

Steve began by outlining the 'why and how' of the setting up of FISA. Primarily it was in response to an ultimatum from the HSE based on the fact that since 2002 the UK industry has more fatalities per number of employees than any other UK industry. The essence of HSE's ultimatum was 'do something about it or we will.'

At a Summit meeting on the 15th June 2012 representatives from all the various interests in the Forestry Industry met and agreed to set up the Forest Industry Safety Accord along with the necessary funding. A Chairman (the speaker) was elected, a Steering Group and eight working groups with specific areas of responsibility were formed. The working groups are as follows:

- Safety Documents
- Communication
- Safety Statistics
- Behavioral Change
- Forest Haulage
- Electricity protocols, and
- Manager / Supervisor Competency.

Behavioral Change is recognised at the central issue that, if this is not drastically altered, the work of the other groups will be adversely impaired.

Steve reported that after their launch at the APF on the 13th September 2012 the membership has grown steadily and already initiatives in the areas directly affecting the highest accident rates have been introduced. These include Refresher Training for Operators and Supervisors, a revision of Timber transport practices, and electricity at work protocols.

Steve closed by urging all concerned with

continues over

> “. . the increase in globalisation of trade involving plants and plant products is largely responsible for the rising number of pests and pathogens that present a significant threat to woodlands in the UK”

the Forest Industry to take up membership and help make a difference.

Full details of FISA can be found on *www.ukfisa.com*.

Next, **IAN MURGATROYD the Forestry Commission's Plant Health Officer for the Northern Area** presented his Paper entitled '*Biosecurity*'.

Ian explained that the increase in the globilisation of trade involving plants and plant products was largely responsible for the rising number of pests and pathogens that present a significant threat to gardens and woodlands in the UK. Cross-boarder pathways have been identified and rated according the risk that they are perceived to represent.

- Timber - **low risk**
- Wood Packaging - **low to high (China)**
- Live plants and growing media - **high risk**

In response additional bio-security measures to disrupt the pathways have been introduced. These include A Plant Health Guide produced by the Commission covering the importing of wood, wood products and bark, and ISPM15 covering the Global import/export and the required Heat Treatment of Wooden Pallets. However, one of the main problems remaining is the control of dunnage (Loose packing material used to protect a ship's cargo from damage during transport).

Other dispersal pathways existing within the UK boarders are, natural dispersal, transportation with timber residues and/or vehicles, equipment, footwear and personal clothing.

Movement and Processor Licenses have been introduced covering the transportation of infected timber and a 'user friendly' information leaflet entitled '*Turning Over a Clean Leaf*' explaining how to protect trees from pests and diseases in woodlands and forests has been produced for more general use.

STEVE PENNY, Research Liaison Officer For Forest Research introduced The STEM Project that is partially funded by the FEG, Forestry Commission Scotland and Edinburgh University's Moray House School of Education.

He began by explaining that STEM was aimed at encouraging Scottish school children to take up Science, Technology, and Engineering or Mathematical subjects at secondary level so as to facilitate more scientists and engineers in the future.

Since secondary school curriculums have to meet the conditions of the 'Curriculum for Excellence' set by the Scottish Government, the STEM team decided to aim the project, not at the school pupils but at Student Teachers, thus giving the project a much wider potential catchment .

Twelve design and technology student teachers were challenged to design modules that would engage the pupils using trees woods and forestry related themes as a vehicle to deliver their lesson objectives. This approach was designed to be acceptable to the Moray House School of Education teacher training parameters and was therefore regarded as part of their teaching assessments.

The project is being run again in 2013/14 and will build on the feedback information from the pilot

ANDY NEWBOLD the current President of the Institution of Agricultural Engineers, closed the symposium by thankisng the speakers and complementing the organisers on again choosing a range of topics that were currently topical and for selecting speakers whose combined experience competently encompassed the subject matter.

FEG SYMPOSIUM CHAIR PERSONS AND SPEAKERS.
Left to right. Craig Grant, Ryan E. Smith, Julie Mc Morran, David Killer, Andy Newbold, John Scott, Ian Murgatroyd, Steve Lavery, Steve Penny and Alan Dickerson

Looking Landwards

COMMEMORATING IAgrE's 75th Anniversary, the *Looking Landwards* sci-fi short story competition, held in association with NewCon Press, concludes this issue, with a very special story by the late Geoffrey Wakeham.

Nine Bells by Geoffrey Wakeham

The other day while having a drink in the Nine Bells I met a mate from the Institution of Agricultural Engineers who thought our family would be an excellent team to enter the Institution's 75th Year Anniversary competition.

Church Farm was left to Alex, the eldest child, and he has been running the arable farm for the last five years. Ella runs the dairy herd, while Mum and Marcy the cheese making plant, which was set up five years ago. Holly and Charlotte took their share of the farm about the same time and were now studying plant pathology.

I, Chris, have been responsible for all the machinery related to the dairy, arable and contracting sides of the farm. And because of the work related to the cheese-making plant we feel that we are pretty much up-to-date with automatic milking for the cows. The customers of our contracting business fully expect that our field machinery would be no more than a year or two old.

As you need to know what happens in the future, I think the best we could do is ask the family to think of their part of the business then answer your question.

We will have a meeting next week and you can write our thoughts down in some logical order. At least you will get an idea of what the typical farming family might be thinking about the future. I am not sure you will get Holly and Charlotte but we will try to wet their interest as time goes by. We will meet you here next Friday.

At the next meeting, Alex was asked to give his thoughts first -

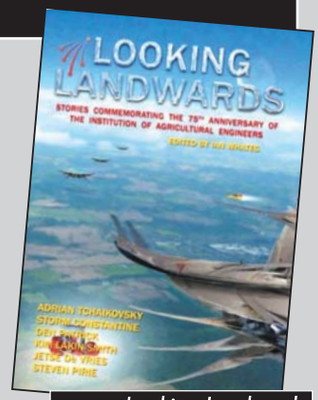
The 'future' is the life of a farmer but 50 years is a long time ahead. If we just think of climate change it would make any prediction almost impossible. I am sure farms will get bigger for economic reasons, direct sales out of the business; and possibly amalgamation of farms.

I feel with these larger farms they should seek to make fields a more logical shape, not like our current higgledy-piggledy system shaped over hundreds of years. Fields should be as long as possible, with a width that is compatible with at least twice the width of your smallest piece of machinery; thus insuring no side headlands. This would require the removal of hedges and trees, ditches and tracks. But in the long run it will be a more efficient use of the land and machinery.

New hedges and small copses could be established in awkward corners, so maintaining wildlife habitat.

This would lead to the need for larger machines and careful monitoring of the soil status. Machines will need to be linked back to central computers to adjust the amount of input regarding depth of tilth and the inclusion of specialist chemicals etc. In the longer term it is likely that sub-surface irrigation and drainage will be required to cope with the far more erratic droughts and flooding.

Machines will need to be linked back to central computers to adjust the amount of input regarding depth of tilth and the inclusion of specialist chemicals



Looking Landwards anthology publication from NewCon Press

Next up was Ella, and she quickly described their automatic milking system and said she hoped it would not need major changes in the next ten years. The current system has meant that we reduced labour and were given a more flexible life and it is working well. The economics were not as good as we had hoped but given more time I am confident we have made the right choice.

In the future I am looking for far more sophisticated feedback from the computer and I am expecting to have monitors fitted that will tell us of the cows' health and well-being. This means we can call in the vet for a wider range of health problems, before any future crises.

Forty years on, I would hope that the computer supported by the vet could administer pharmaceutical products, as is necessary. At some later date it will not be necessary to involve the vet unless a major crisis arises.

Marcy and Mum are looking to incorporate future developments that might result from Holly and Charlotte's work, in manipulating DNA in individual plant molecules. It is hoped that in some years to come this will produce yeast and moulds that will then give cheeses medical properties against currently intractable diseases capable of being patented.

After our next round of drinks we heard a man talking at the next table, he was giving details of a farming enterprise way before its time, its layout, its temperature controlled atmosphere for the crops and the yields they were harvesting.

We looked at each other in amazement; how had we not heard about such an organisation, so far advanced? Then he mentioned the planet Mars and the fact that Buckminster Fuller Carbon Crystals were currently being used there.

We were astonished that they had been developed at all! We looked at our drinks and decided that we had had too many and left the pub.

The *Looking Landwards* anthology is available to purchase from *www.iagre.org/resources/shop*

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COUNCIL MEETING

IAgrE Council Meeting held at Ben Burgess Coates, Peterborough on 24th October 2013

Following the morning IAgrE Council meeting Peter Leech outlined the afternoon program held at Ben Burgess one of the UK's leading agricultural machinery dealers.

Peter introduced our host Ben Turner managing director of Ben Burgess, a large modern agricultural dealership based in East Anglia. Ben Burgess have been serving the Norfolk and Suffolk farming community since 1931, and supplying horticultural machines since 1962 and are one of the four original dealers from when John Deere entered the UK market in 1963.

The Ben Burgess name has become closely associated with John Deere, Manitou and Hitachi along with several other leading manufacturers in the fields of Agriculture, Horticulture and Construction.

History

The members of the council were treated to an illustrated history of the dealership by Ben Turner.

Ben Burgess and Company was founded in 1931 by Ben Burgess, Edward Burgess and Norman Marshall, the perfect time for an Agricultural Engineering company to start, as it was the absolute bottom of the post war agricultural depression.

The first franchise held by the company was the Marshall tractor that was produced by Norman's father. Despite the early scepticism surrounding diesel engine tractors, and by means of a lot of demonstrations and some contracting, Marshall tractors soon became popular around Norfolk. With the success of the Marshall tractor came other franchises such as Turner Tractors, Claas Combines, and Lundell Foragers.


Ben Burgess Coates

Almost exactly 50 years ago in October 1963 the company were appointed one of the first John Deere dealers in the UK. At the time the John Deere 4020 tractors with 90hp and only 2 wheel drive were considered a relatively large wheeled tractor for the UK market. Mr. Turner said that despite initial local scepticism sales success soon followed, particularly after significant improvement in tractive performance brought about by increasing driving wheel size from 34" to 38" diameter.

Further expansion and diversification occurred throughout the 1970s, 80s and 90s when Ben Burgess purchased amongst others; electrical motor rewinders, Thomas Wilch & High, and F.C. Walkers, sheet metal engineers. Five years ago they purchased grain specialists Bloomfield Installations.

More recently the company has expanded into irrigation, golf course equipment and is a main dealer for Manitou tele-handling equipment. The company currently has a large hire fleet of some 100+ tractors, and also provides financial services and Health & Safety advice.

In 2013 further additions were made when the Coates and Ellington depots were acquired from Ankers who were also a long established John Deere dealers in the Cambridgeshire area. The company's success can be judged by a turnover that has increased from around £30M in 2007 to £65M in 2012.


The IAgrE Council meeting took place in Ben Burgess Coates' well appointed lecture theatre

How does this work?

Ben Turner thought the key to success was down to the staff who work for the company.

Ben Burgess now employs 220 total staff with an average length of service of 14 years. They currently employ 19 (17 ag, and 2 parts) apprentices who are at various stages in their three year training programme. Over 80% of their skilled technicians were trained through company / manufacturer apprenticeship schemes.

Trained agricultural machinery technicians have to have particularly high technical skills to deal with the wide range modern sophisticated machinery but also require particular personal qualities as they represent the company directly to the customer on a daily basis. Most customers are currently still hands-on farmers or contractors.

As a privately owned company with just three directors management decisions can be made rapidly. The values central to the success of Ben Burgess have always been Customer Satisfaction and Product Support. This has been achieved by having a sales force numbering well over 20, all specialising in various fields of expertise. They are backed up with the support of around 40 highly trained technicians, all with excellent technical skills and product knowledge.

The company now operates from six modern, purpose built facilities at Norwich, Newmarket, Aylsham, Beeston, Coates & Ellington giving good coverage to most of East Anglia. Customer service is crucial.

"We hold several million pounds of parts in stock and can get virtually any John Deere part we don't hold ordered before 5.30pm delivered to our depots at 7.30am

the following day," said Mr. Turner. He also said Ben Burgess valued close relationships and a mutual respect with all their key suppliers and in particular with John Deere who represent 40% of their turnover.

The large hire fleet helps stock turnover and the company also specialise in used agricultural and construction machinery, exported to anywhere in the World. In this aspect of their business their website and social media are important tools and the Royal Warrant they hold provides considerable kudos in overseas markets.

Land-based engineering apprenticeships and the LTA

Peter Leech, formally the John Deere Europe training manager gave a brief outline of the size of the UK agricultural machinery dealer network.

Of the 2400 businesses in this sector, the larger franchise dealers probably employ around 10,000 people with up to 60%, or 6000, classed as technicians. He assumed probably 15% of these where apprentices (say 900) which meant an average annual intake of 300. Of these approximately three quarters were in manufacturer lead apprenticeships.

By the 1990s the technical sophistication of modern agricultural machinery coupled nationally with a high attrition of trained staff to other industries due partly to poor career progression brought into question the value of some of the old apprenticeship schemes. John Deere was the first UK manufacturer to set up a manufacturer lead training programme in 1992, initially at Brooksby College and subsequently using the independent training provider Babcock.

They were followed over the next couple of years by all the other major UK machinery manufacturers / suppliers. In the ensuing 20 years John Deere advanced apprenticeships have trained 546 people on the technical programme with a further 70 on 'Turf Tech' and 44 on 'Parts Tech'.

Practical training is provided at the dealerships with distance learning systems provided by the manufacturers. In addition each apprentice has to attend and pass 4 two week blocks per year, 24 weeks over their three year apprenticeship. Ben Burgess for example has trained 89 apprentices over the past 20 years through the John Deere programmes.

With the backing of the major manufacturers of agricultural (including milking equipment), horticultural, forestry and ground care equipment, the Landbased Technician Accreditation schemes (LTA) have been developed by AEA and MEA, in conjunction with IAgrE, with the support of BAGMA, on behalf of the land based engineering sector. The objectives of the schemes are to provide a nationwide means of benchmarking, monitoring and assessing the competence of technicians employed within the sector.

The LTA schemes also provide encouragement and recognition for both employers and technicians who voluntarily commit to continual professional development in pursuit of technical support excellence.

There are four categories or tiers with all tiers being registered on a central database held by IAgrE.

- LTA 1 - Self registration on-line. Entries on this register would be categorised as (i) Students on a recognised landbased engineering course at a recognised Landbased engineering college, or (ii) Apprentices (on recognised programmes) or (iii) more skilled/mature entrants not yet otherwise assessed and categorised. There is currently no charge to register.
- LTA 2 - Newly qualified apprentices or assessed skilled technician meeting the required criteria.
- LTA 3 - A skilled & experienced technician who has successfully attended a series of assessed course programmes - may also be a product specialist.
- LTA 4 - A professional or master technician having a proven and assessed track record. Additional assessment criteria are included to demonstrate exceptional diagnostic and technical ability together with customer and technical mentoring skills.

Where appropriate (LTA 3 & LTA 4), IAgrE facilitates the registration of suitably qualified technicians as Engineering Technicians (EngTech) a recognised professional qualification with the Engineering Council (UK). More than 3000 apprentices or technicians are currently registered through the LTA scheme which represents around 50% of the total who are eligeable.

In addition to accrediting technicians, the scheme also recognises and accredits those working in dealerships who have attained recognised supervisory positions within their relevant service, parts and after-market departments.

Currently, the positions recognised are: Service Manager, Parts Manager and After-Market Manager. There is only one level of attainment for these positions.

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Ben Burgess Coates showroom

Ben Turner Managing Director of Ben Burgess group addressing a group of IAgrE Members in the slow moving section of the parts department

Chris Whetnall, Steve Parkin and Peter Leech inspect the internal parts of an 8530 transmission guided by Stewart Bowers LTA4 Master Technician and Workshop Foreman

Matt Branson LTA2/3 Technician performing tests on a tractor using his Service Advisor lap top connected to the tractor observed by Richard Trevarthen and David Roe

LTA decals on Ben Burgess vehicle


A John Deere 6150R tractor with LTA2/3 technician Matt Branson explaining the tests he is about to perform to Council members David Roe and David Morris


Peter Leech chatting with LTA2/3 technician Jordan Abblitt working on the track system of a John Deere 690i combine


IAgrE's Elizabeth Stephens with retired CEO Chris Whetnall

How product support is provided in a modern agricultural dealership

Joe Aspen the service manager at Ben Burgess Coates and Ellington branches gave a brief outline of aspects of product support.

Joe is a highly experienced technician with an early career background working for a large vegetable grower before joining a John Deere dealership. He said product support starts with careful pre-delivery inspection, and ranges through the first service.

Joe is also responsible for identifying any driver/operator training that might be required perhaps on better machine optimisation. Joe said, "Written on all our service vans is *'Reliability is our strength'*. This is not only the equipment we at Ben Burgess supply but the service we offer."

All Ben Burgess technicians and service staff are highly trained and experienced but they still attend regular manufacturer based technical training courses to keep them abreast of latest developments. This training is tailored to the individual's levels of experience (LTA 1 apprentice or LTA4 master technician) often utilising modern distance learning methods over the internet. Indeed, modern communication and computer techniques form important parts of the technician's armoury.

He has, if necessary, a direct link from the farm to the Dealer Technical Advice Centre (DTAC). The dealer may be able to utilise JDLink infrastructure to carry out remote diagnosis without having to make a farm visit. This obviously saves time on unnecessary call-outs and improves first time fix rates for reduced downtime.

If machinery has to come to the dealer for service or repair Ben Burgess provide a large purpose built workshop, heated and well lit, with plenty of space allowing the technicians' room to park service vans containing all their tools adjacent to the job.

Tour of Facilities and technical demo

Members of the Council were given a tour of the Coates site.

We had already seen the attractive showroom and service counter and benefited from the use of the well-equipped lecture theatre which is normally used to give courses to farmer operators. We saw a senior technician working with an apprentice on the most appropriate way of carrying out a particular repair before going to the workshop. Pre-arrival diagnosis also means appropriate spares are likely to be in place.

In the workshop we saw a combine harvester rubber track suspension unit being repaired and the semi-automatic transmission of a large tractor being stripped down and repaired.

Outside we saw a tractor diesel engine being put through its paces, calibrated and set to run at optimum performance by a technician using the John Deere Service Advisor application on his laptop, directly connected to the tractors Can-bus system. The technician then proceeded check and calibrate the front suspension using the Service Advisor application on his laptop, all the time identifying any part or system not working correctly.

In conclusion

For those of us who hadn't visited an agricultural machinery dealership for a number of years this was a real eye opener. How things have changed for the better.

The technicians work with cutting edge highly sophisticated equipment, using the most modern diagnostic tools linked to the efficient supply of spare parts. They are supported both by a strong dealer/manufacturer partnership through training and continuous professional and technical development.

Working conditions at the depot are much improved and on farm IT technical support makes things more efficient. The career path and progression are better defined with the LTA scheme helping provide achievement recognition, motivation and a widely recognised and valued professional qualification.

All the staff we spoke to at the depot were knowledgeable, confident in their ability and happy to discuss any aspect of their work. Thanks to all at Ben Burgess who hosted our visit.

Chris Watts

BRANCH REPORTS

NORTHERN IRELAND BRANCH

Wind energy for rural businesses

THE Northern Ireland branch members of IAgrE recently enjoyed a talk on the subject of *'Wind Turbines - opportunities and constraints'* by Mr Barry Meeke, Managing Director of Co Tyrone based Silverford Renewables.

His company was formed in 2009 to supply, install and maintain wind turbines. He represents several manufacturers whose products include, amongst others, the Danish designed Gaia-Wind turbines. As the company had just completed its 24th installation of the popular 133 model much of the talk centred around it.

As well as discussing the technical features of the product, Mr Meeke (a graduate mechanical engineer) discussed the environmental constraints for site approval, turbine design technology and the application of engineering skills to take a project through from planning to full service operation. He also can supply other larger turbines such as the 50kW Endurance E-3120.

Site approval

When it has been established by records or monitoring that a site is potentially suitable the process can begin.

Not every site which initially looks good is feasible as wind patterns can be upset by turbulence from buildings or other nearby structures. The typical overall project timescale can be 12 - 18 months. The required planning application system will check visual appearance in relation to the site and whether the proposed turbine size is appropriate to the business. A range of official bodies and business interests need to be consulted to check how it may affect them.

One of the criteria is background noise which should not exceed 35dBa at the nearest neighbour's boundary fence or amenity space. This evaluation will include the combined effect of any other turbine operating within 1 kilometre. There are also considerations of potential interference with other installations such as communication towers, phone masts or fixed telecom links for local water pumping stations.

Encouraging renewable power generation

Most installation owners will plan to take advantage of incentives to spill excess power to the grid. These exist because of the national need to displace dependency on fossil fuel imports and the contribution from renewable energy sources is recognised by a system of Renewable Obligation Certificates (popularly referred to as ROCs) which have monetary value.

Northern Ireland Power coordinates these locally for Ofgem (short for the 'Office of Gas and Electricity Markets'), which is the national regulatory authority for the UK energy market. As the payments are funded by a levy on the industry, energy customers pick up the cost. As the installation of renewable energy source capacity increases these incentives are gradually being reduced. At the time of the talk the reward rate for supply from installations under 250kWs was set four times higher.

Producers get paid to export to the grid although it still is financially best to use as much as possible of their own power on site.

Grid compatibility

Up to now the local grid has been designed for distribution and so it may not always be suitable to accept additional power inputs from generation in remote rural areas.

For example, feeding in more than 20kWs on a single phase connection could upset the 3 phase balance further back. The ideal link-up location would be close to a sub station. Such connection carries a cost and some turbine owners in Northern Ireland have successfully applied for grant aid assistance for this under the Rural Development Scheme, Control systems within the grid control whether or not the quality of input from specific turbines is acceptable.

The Turbine and its technology

The main discussion centred on the popular Gaia -Wind 133.

It is an established Danish sourced design optimised for average wind speeds between 4.5 and 7m/sec targeted at the agricultural, rural residential and light industrial sectors. It has a 2 blade GRP 13m diameter rotor sweeping 133 square metre at a fixed rotational speed of 56rpm.

The large diameter rotor is a key aspect of increased efficiency compared with smaller types. It drives its marine grade generator through an 18:1 reduction gearbox. The generator is rated at 11kW for 400V at 50Hz. The nacelle and rotor weigh 900 kg and is normally mounted on an 18m tower. The large diameter 2 bladed design is said to produce up to 80% more energy than other similarly rated conventional machines.

The 133 has an integrated microprocessor with multiple sensor inputs. The data collected includes wind speed, power, voltages, currents and phase, vibration and temperature alerts.

It has 3 levels of system protection which include:-

1) Passive stall of blades to limit power input when wind speed is too fast.
2) The control system activating a mechanical brake in the event of wind speed exceeding 25m/s, abnormal vibration, grid disconnection or the generator overheating.
3) Use of the manual override button to apply the mechanical brake.

Barry Meeke delivering his wind power talk to the Northern Ireland branch members

Centrifugally activated aerodynamic brakes within the rotor tips take off pitch by distortion when wind speed is too high.

The wind power industry works to the standards of:-

- Cutting in when wind speed reaches 3.5 m/sec
- Cutting out when wind speed gets to 26m / sec or a 3 sec gust of 26 m/sec (56mph).

Getting the Gaia - Wind 133 turbine on site

The components, including the tower sections are modular and fit within a standard shipping container.

On site, a high strength concrete raft base is cast in advance incorporating 1.5 tonnes of steel and 18 cubic metres of concrete. The sectionalised tower construction facilitates the use of a modest sized (30 t) crane. It was especially interesting to hear the engineering detail of how the structure is placed and bolted together.

Ongoing maintenance

The installations require an annual service which typically costs around £360. It includes brake pad replacement, shear bolt checking and gearbox oil sampling as well as any other fault investigation.

The speaker's professional engineering background and his in-depth knowledge of both the technical and practical aspects of his business proved to be an ideal platform for a most interesting discussion

This expanded topics including :-

- Make up, design and performance of the turbine blades
- Machine interaction with the grid
- The operation of the protection systems during extreme weather conditions.

The chairman thanked Mr Meeke for all his efforts in preparing and delivering such an informative and enjoyable presentation.

More detail of the products and services available from Silverford Renewables is available at **www.silverford.com** or Tel **0845 2723502.**

Terence Chambers

WESTERN BRANCH

Lecture report - '*Forestry Machinery*', given by Jim Christie, FIAgrE, Member of the Forestry Engineering Group at Lackham College, 9th October 2013.

The first Western Branch lecture of the 2013-14 season held at Lackham College was well attended for what promised to be an interesting subject.

Jim has been in the IAgrE for 50 years and had previously worked at the Leyland tractor factory at Bathgate in both design then service. Previous to that he worked at the National Engineering Laboratory. One project there looking into steam powered transport was headed by Sir Alec Issigonis.

The lecture covered not all applications of engineering in Forestry but focused on the main operations which use large mobile machinery such as ground preparation, planting, surveying, thinning/clear felling, extraction, transport, brash bundling and root removal.

A forestry harvester on a slope

When planting a new forest its very rare today to use a virgin site such as moorland or hillside, usually it will be on a previously harvested existing forest. Basically the method of preparation before planting is to create mounds of soil the sapling can be placed in. This method prevents the sapling root from becoming waterlogged.

When new ground is used the terrain will determine the method used - either special twin disc ploughs pulled by tracked dozers or, on steep hillsides tracked or specialist walking excavators will be used to mound up the soil. When re-stocking existing previously harvested ground where stumps and brash are present then either disc tranchers or two-row mounders are used fitted to the forwarders.

Planting of the cell-grown saplings is either carried out by hand or by mechanical means. Jim showed an example of a mechanical planting attachment fitted to the dipper of a medium sized tracked excavator and also a photo of a spade - he asked "Which would you choose?".

The mechanised planter attachment comprised of a blade which created a soil mound of the correct profile. This then had a hole punched in it by a hydraulically operated spike. Above the blade was fitted a rotary 'magazine' which held around 50-60 saplings. When the mound was ready a sapling would be fired into the hole by compressed air.

A number of different surveying techniques are also employed by those managing forestry. This can take the form of vehicle mounted cameras or ground penetrating radar or a combination of the two synchronised to give accurate mapping and condition reports of haul roads etc. Unmanned Aerial Vehicles (UAVs) fitted with cameras and GPS systems flying pre-determined routes are also used to monitor disease and pest infestations, mapping and also stock taking.

Harvesting machinery can be very specialised and complex with custom built 4, 6 and 8 wheeled vehicles equipped with harvesting heads fitted to manipulator arms used on larger operations. In smaller forests the harvesting attachment is often again fitted to an excavator. These can be positioned into place around the trunk base, will cut and rotate the tree to the horizontal then draw the tree using powered gripping rollers through de-limbing knives to take off the branches. The trunk is then cut into pre-determined lengths which are then grouped on the forest floor for later collection.

The lengths the trunk is cut to is dependent on species and height/trunk diameter ratio. This information along with current timber prices is pre-programmed into the harvester control so once the head has determined the trunk diameter it will be cut automatically to the required lengths instead of a judgment made by the operator.

On steep slopes the harvester can be anchored via a synchronised winch to a fixed point (usually an excavator at the top of the slope with its bucket buried in the ground). The winch pays out as the harvester is driven down hill but will brake/recover the machine if traction is lost. (See photo). In North America tracked harvesters with self-levelling upper carriages are often used although this practice is not so common in Europe due to accidents.

Forwarding

On larger operations this tends to be performed by specialised articulated forwarders with a crane arm for lifting the grouped timber left by the harvester onto platforms.

The process of harvesting and forwarding is not random and is carried out to systems worked out between the operators to maximise efficiency. Collection is generally done working with the forwarder reversing uphill to prevent losing the load.

Forwarding on steep slopes is not always possible and zig-zag roads need to be built into the hillside.

Another alternative to forwarding with tracked/wheeled vehicles on steep slope sites is 'Skylining' where aerial winches are used to lift and move grouped timber up or downhill. These winches tend to be fitted to converted tracked excavators.

Brash, or the tree branch material removed from the trunk, can be bundled and baled if there is a local market for it and its economically viable. If not it is left to decompose. The brash is budled and baled by dedicated attachments fitted to the harvester.

The bales are sized such that they can be picked up by the grapples on the forwarders for transport. The same occurs for the tree roots if there is a local source for them. These tend to be dug up using special attachments fitted to tracked excavators.

However, an interesting point is that stump removal can only be done on mineral soils, not peat soils as with the latter excessive CO2 is released to the atmosphere.

Jim then went through the various transport options for getting the logged timber out of the forests including lorries with special axle designs which spread the load across the whole width of the forest tracks, whilst not legal on public roads this lessens the rutting which can occur.

Also in some parts such as the west coast of Scotland timber can be loaded onto barges using pontoons and transported by sea.

The talk was then rounded up by discussion of the future of machinery in Forestry.

The forestry industry suffers from an above average accident rate which must be brought down by the implementation of safer machinery and work practices. Reduced machinery downtime and increased service life were discussed. Robotics, laser cutting and even developing trees with square section trunks were proposed.

Richard Robinson, ex President of the Institution, then summed up the meeting and thanks were given to Jim from all present.

Rupert Caplat

NORTHERN IRELAND BRANCH

Visit to Fleming Agric Products, Co. Londonderry

MEMBERS of the Northern Ireland branch of IAgrE recently visited the Fleming Agric Products factory at Newbuildings, Co. Londonderry.

The party, and two visitors from Norway, were welcomed by Managing Director George Fleming who described the company origins back in 1860 when his great grandfather, Mr Robert John Fleming commenced the manufacturing of basic implements near St Johnston, Co Donegal.

More recently, in 1983, a new manufacturing base was set up in a rented 3,000 square feet building on the present site at Newbuildings. Since then, the product range has expanded to 140 machines produced within a new factory, with 20 times the original covered floor area, on a site of 8 acres. There are now 80 employees and the company is still owned and managed by the Fleming family.

The modern facility uses the latest production techniques including CNC machines and robotic welding. The IAgrE party then enjoyed a conducted tour of the preparation and production facilities.

Design and production

Fleming Agri Products has its own in-house design team. New designs and developments also often arise as the result of taking up customer suggestions. Pre-production prototypes are tested on local farms. A technical file is prepared and maintained for each machine design.

Detailed forward planning is a key part of the business and some materials are on order up to one year in advance of assembly.

Production teams work to produce groups of machines for which all the components are batched in advance from the central store.

The company also operates a 'next day' parts delivery service from here.

Steel is washed / degreased and dried in advance of fabrication. Where appropriate, specialist components are brought in from local precision engineering companies such as Hutchinson Engineering and Inishowen Engineering.

Fleming rotary spreaders in final assembly area

Assembled machines are cleaned, primed, colour painted and passed through the oven before adding decals, colour strips and information plates.

Product range

The emphasis is on quality farm sized equipment. By offering a wide range of sizes and specifications Fleming also serves the niche markets for countryside care with products such as trailers, paddock grass toppers and arena conditioners in sizes suitable for use with smaller tractors.

The present product range includes:-

- Water ballast rollers
- Standard, tipping and hydraulic transport boxes
- Disc or wagtail type fertiliser spreaders
- Grassland aerators
- Spring tine cultivators
- Grassland harrows
- Land and arena levellers
- Mounted or trailed grass toppers and finishing mowers
- Rubber bladed yard scrapers
- Rear linkage mounted bale carriers
- Front loader attachments - buckets, grabs, shear grabs and bale handlers
- Rotary manure spreaders from 1 to 9.5 cubic yard capacity
- Slurry tankers of up to 2300 gallon capacity
- Tub mixer feeders
- Powered rotary cultivators
- Hay tedders and grass rakes,

A few of the PTO powered machines are the result of a joint marketing and service agreement with other manufacturers. Examples include the rotary cultivator and disc spreaders from SICMA as well as the pendulum spreaders from COSMO.

Marketing, distribution and customer service

The company motto '*Servicing from stock, stocking to service*' is evident with the large amount of buffer stock held ready for delivery to dealers.

Dealers carry generous stocks facilitating the fact that immediate availability is a strong incentive for customer purchase decisions. Fleming Agri-Products Ltd supplies a large number of dealers (more than 250) throughout the UK and Ireland who hold stocks appropriate to their areas. A typical stock delivery to a dealer tends to include 10 -15 products at any one time.

Machines are also supplied to Europe (including some marketed under the AGRAM brand in France) as well as other overseas markets. A product representative is now working in Australia and New Zealand promoting sales there. The company runs a national advertising campaign and exhibits machines at events such as the LAMMA show (near Peterborough), The FTMTA machinery show (Punchestown, Co Kildare) and the Royal Ulster Agricultural Society's Balmoral Show. This year Fleming products were also shown at the Agri Technica show (Hanover, Germany).

Staff recruitment, training and team building

Fleming normally takes on 6 -7 trainee entrants each year with the aim of them working to attain an NVQ Level 3 qualification.

The company strongly believes in empowering its workforce with training and team building corporate events. Staff turnover is very low with some employees having been working there for more than 30 years. 'Investor in People' status was

continues over

The IAgrE Northern Ireland branch members with host George Fleming (5th from right)

Fleming Agri Products' Engineering staff. L-R: Burton Taylor; Production Director Jonathan Lecky; and Bernard McCloskey

obtained in 1999 and the company continues to win awards for its people management.

Discussion period

The visit was completed with an in-depth discussion session for which the group was joined by Managing Director George Fleming, Production Director Jonathan Lecky as well as in-house engineers Bernard McCloskey and Burton Taylor.
The topics discussed included:-

- Product branding and presentation
- Sourcing of components and materials
- Differences in market preferences and requirements between areas
- Identifying and taking advantage of niche market opportunities
- The relative demand for 'agriculture' or 'commercial high-speed' axles on trailers
- Patents and design protection
- Overseas markets

Mr Fleming and his staff were thanked for their warm hospitality and for hosting such a practical, informative and enjoyable visit.

The Northern Ireland IAgrE Branch wishes Fleming Agri Products continuing success with their impressive range of products.

Further details can be viewed on *www.fleming-agri.co.uk* or by calling 028 7134 2637 for the latest product list and location of local dealers.

Terence Chambers

EAST MIDLANDS BRANCH

Richard Larrington Trailers

THE IAgrE East Midlands Branch held their first meeting of the 2013/4 season at Richard Larrington Trailers of Boston on the 29th of October, starting at 6pm.

The 23 strong group attending were treated to an absorbing and entertaining evening looking at the Larrington production process, understanding much about the philosophy behind the quality and innovation present in the product line that is on offer. There were some intriguing insights into the path the business has taken since its inception in 1965, and Richards take-over from his Father in 1994 .

Richard is an able and eloquent presenter and surprised the group with the depth and level of innovation in many products which extend far beyond the normal agricultural trailers which many must believe form the mainstream items manufactured on site.

Richard outlined some of the many developments which form a product range including chaser trailers/bunkers/box loaders, straw and residue spreading and processing equipment, self-propelled trailers and bunkers, together with industrial-scale processing machinery for a range of industries including the Biogas, and Energy production sectors.

Central to all such products are many differing and innovative details which complement the overall philosophy of a product line driven by the needs of the customer. In-house production remains central to the Larrington philosophy, with many items of modern production equipment being used including some extensive items including an 8m brake-press and associated plasma cutting equipment.

The group were indeed fortunate that a number of products destined for the Agritechnica Show in Hanover, Germany, together with a bespoke four axle, self-propelled bunker trailer based on a Terex running gear were available to be seen and

A Larrington trailer

discussed - in these cases being seen for the first time by any people outside the Company.

The entertaining and varied discussions were closed by Richard Trevarthen giving a vote of thanks to Richard on behalf of the group and wishing him continued success as one of a dwindling band of English Manufacturers capable of genuinely innovative thinking, and having the means and will to turn such ideas into high quality products.

Philip Wright

SOUTHERN BRANCH

Sammy Millar Motor Cycle Museum and Wickham Vineyard

WALL to wall sunshine greeted members when they made two visits on their late summer outing. The first was a visit to the Sammy Millar Motor Cycle Museum at Bashley, New Milton.

Sammy Millar, 80, still rides Bikes. He was 11 times British Champion and won over1400 races. He demonstrates bikes at events all over the world especially in Europe, New Zealand and America

Before making the tour of over 350 bikes on show members enjoyed refreshments at the adjoining café. All the bikes are in immaculate condition and all in running order apart from five. The bikes were in mint condition and had the appearance of just being produced. Of particular interest was the Norton Hall, which had a range of Norton bikes going back to the first production models

All enjoyed a biker's lunch and members thanked Barry Linton for recommending the venue

A comfortable drive to Wickham Vineyard followed, where a guided tour of the vineyard and winery was enjoyed. The vines were planted in 1986 after a discovery of Roman wine containers prompted further investigation and planting of 6acres of vines followed by further plantings to 40acres. There is a complimentary Wickham Vineyard in Suffolk

Southern Branch members at Wickham Vineyard

Ten different grapes are grown. These include Pinot Noir, Triomphe and Domfloder for the reds and ucchus, Reichsteiner, Folus, Waltizr, Schoenburger and Kerner for the whites.

The soil is a mixture of chalk, gravel and clay. It has excellent drainage and mineral content. It is the same soil as the Champagne region of France.

The day was nicely rounded off by a tasting of five wines and a visit to the shop where members stocked up their wine for Christmas.

Denis Welstead

OBITUARY:
Harry Catling, BA, Hon MRAC, FIAgrE
1931 - 2013

HARRY CATLING possessed a unique combination of academic and practical engineering, coupled with an understanding of modern farming, that he blended with common sense, resulting in an outstanding career in agricultural engineering education at the Royal Agricultural College, Cirencester (now the Royal Agricultural University).

Harry left his native Sheffield, where he had been an agricultural engineering apprentice to study the National Diploma in Agricultural Engineering at Lackham College, Wiltshire in 1952. He returned north, to Leeds University farms where he was the farms mechanic.

It was not long before he returned south again, to take up an appointment as an assistant lecturer at the Royal Agricultural College. He taught Farm Mechanisation at the College from 1957 until his retirement in 1995, for most of that period he was Head of the Department of Agricultural Engineering and Farm Mechanisation. Former students will remember his amazing knowledge of farm machinery, his detail on how machines worked, how to compare them in the market place and what level of investment to make in them.

His teaching career spanned nearly forty years, his lectures were well prepared and well attended, his knowledge based upon his academic studies as well as his practical understanding of farming.

Harry supervised the sandwich (industrial) placement of the HND Agriculture course for many years, visiting each student over the summer months, providing good advice to them and instilling in them his Yorkshire views on the benefits of hard work. He also arranged the annual HND Year 3 study tours of highly mechanised farms in East Anglia, a week long trip to see the best of eastern counties agriculture.

Harry kept up-to-date via his farm trips, professional meetings and as editor of the *Green Book* - a directory of farm machinery. Harry could be found tapping the keys of his old typewriter making editorial changes as farm equipment changed each year. Harry also undertook an Open University degree, no mean feat for an already busy professional person, and graduated with a BA in Science and Technology in 1985.

Harry arranged for many machinery manufacturers to lend equipment gratis, if not donate their equipment to the Machinery department - a laudable achievement considering most companies ran expensive educational hire schemes and an illustration of how the machinery industry respected him and valued the importance of his department.

Harry provided good advice for the young lecturers who joined him in the department over the years; his guidance and knowledge provided them the opportunity to excel.

As the demands of students changed, so did Harry. He embraced new subject areas such as Precision Farming, Alternate Energy and Environmental Engineering; he also encouraged and helped develop the Rural Skills Centre at Coates Manor Farm (the fore-runner of the recently opened Rural Innovation Centre at Harnhill).

Following the success of Barley '79 and the establishment of the Cotswold Cereal Centre (later to become Arable Research Centres) he was heavily involved in the design, development and manufacture of trial plot equipment.

Harry was awarded an Honourary MRAC in 1995, a richly deserved award for one who had contributed so much to the education of thousands of students and the good name of the Royal Agricultural College.

Harry worked tirelessly with his professional body, the Institution of Agricultural Engineers (IAgrE).

He served in all capacities from secretary to chairman of the Western branch and represented the branch on the National Council. He was a long-time member of the membership committee ensuring fair standards were met and upheld. He never forgot his roots and was a champion of the need to provide recognition for apprentice mechanics into the professional body - a wish that has now born fruit.

He also represented the Institution on the Engineering Council and was a keen examiner for the National Proficiency Tests Council in the neighbouring counties. One of his greatest honours was to be asked to join the board of governors of his alma mater, Lackham College and help steer it towards the 21st Century.

In 1995 Harry was elected a Fellow of the Institution and two years later awarded the Branch Meritorious Award for his services to the western branch. In 2008 he was the well-deserved recipient of the IAgrE award for his life-long contribution to the land-based sector. In January 2012

he received his 60-year membership certificate.

Not wishing to be idle, Harry did not stop working when he retired. Wishing to stay involved with the industry, he became the warranty claims specialist for the local farm machinery distributor in Cirencester.

Harry was a very remarkable, loyal and well-respected man, he worked tirelessly for the College, for the Institution and for the farming and engineering industries. He followed a simple rule, *you get out of life what you put in*: Harry accomplished much.

Harry was encouraged and supported through all his endeavours by his wife Elizabeth. Although a man of few words, he would always speak with great pride of the achievements of his children. He was a great family man, bringing up his children at Ammonite Cottage, near to the College.

Harry Catling died peacefully on 3rd November 2013 surrounded by his loving family.

Dr Andrew Landers,
C.Eng, FIAgrE, MRAC
Cornell University,
Geneva, NY, USA
andrew.landers@cornel.edu

Membership changes

Admissions

A warm welcome to the following new members:

Fellow
Barnes M (Essex)

Member
Gregg P (Yorkshire)
Riding-Felce K (Northamptonshire)
Shende S A (Cambridge)

Associate Member
Du Feu S J (West Susex)
Welbourne M D (Lincolnshire)

Associate
Ali A M (UAE)
Every S (Worcestershire)
Pilley M H (Hertfordshire)
Small J (Gloucestershire)
Wilson F R (Midlothian)

Deaths

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

Mr Harry Catling (HonMRAC IEng FIAgrE)(Gloucestershire) - a member since 1952.

Mr Donald MacMillan (FIAgrE)(Wiltshire) - a member since 1948)

Transfers

Member
Rogers D M (Canada)

Associate Member
King R D (Dorset)
Franklin K F P Gloucestershire

Associate
Cree W R (Bedfordshire)
Parke J T (Northern Ireland)

Engineering Council

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

Registrations

IEng

JEaston A (Dumfries)

EngTech

Barrowcliff K N V (Derby)
Du Feu S J (West Susex)
Welbourne M D (Lincolnshire)

Long service certificates

Name	*Grade*	*Date of anniversay*
60 years		
David J. Balmforth **Calverley**	CEng FIAgrE	13 Oct 2013
Ian **Constantinesco**	CEng FIAgrE	13 Oct 2013
35 years		
Lancelot **Butters**	EngTech MIAgrE	05 Nov 2013
Leo Paul **Wunder**	MIAgrE	11 Dec 2013
Michael John **Bennett**	MIAgrE	13 Dec 2013
John Robert **Watkins**	MIAgrE	14 Dec 2013
Nigel Malcolm **Fox**	EngTech MIAgrE	14 Dec 2013
25 years		
Robert Paul **Hillier**	AIAgrE	01 Nov 2013
Stephen Charles **Constable**	AMIAgrE	01 Nov 2013
Dominic William **Barraclough**	CEng MIAgrE	01 Nov 2013
Luis Alma George **Wedd**	FIAgrE	03 Nov 2013
Edward Allan **Hiler**	FIAgrE	03 Nov 2013
Clive **Champion**	AMIAgrE	17 Nov 2013
Stuart George **Fraser**	IEng MIAgrE	14 Dec 2013
David Nicholas **Hinchcliffe**	MIAgrE	18 Dec 2013

We want to hear from members

Landwards
Agriculture • Horticulture • Forestry • Environment • Amenity

Send branch reports or correspondence to:

The Editor, Chris Biddle
Email: *chris.biddle@btinternet.com*
Or the IAgrE Communications Officer, Marion King on
pressroom@iagre.org

Academic members

Askham Bryan College
Askham Bryan
York
YO23 3FR

SRUC- Barony Campus
Parkgate
Dumfries, DG1 3NE

Bicton College
East Budleigh
Budleigh Salterton
Devon
EX9 7BY

Bishop Burton College
York Road
Bishop Burton
Beverley
HU17 8QG

Brooksby Melton College
Asfordby Road
Melton Mowbray
Leics
LE13 0HJ

Coleg sir Gar
Pibwrlwyd Campus
Pibwrlwyd
Carmarthen
SA31 2NH

Cranfield University
Cranfield
Bedfordshire
MK43 0AL

Easton College
Easton
Norwich
Norfolk
NR9 5DX

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

Harper Adams University
Newport
Shropshire,
TF10 8NB

Institute of Technology Tralee
Clash, Tralee
Co Kerry, Ireland

Myerscough College
Myerscough Hall
Bilsborrow
Preston
Lancashire PR7 0RY

SRUC - Oatridge Campus
Ecclesmachan
Broxburn
West Lothian
EH52 6NH

Pallaskenry Agricultural College
Co Limerick
Ireland

Plumpton College
Ditchling Road
Lewes
East Sussex
BN7 3AE

Reaseheath College
Reaseheath, Nantwich
Cheshire, CW5 6DF

Royal Agricultural University
Cirencester
Gloucester
GL7 6JS

Riseholme College
Riseholme Park
Lincoln
LN2 2LG

SRUC - Auchincruive
Auchincruive Estate
Ayr
KA6 5HW

Sparsholt College
Sparsholt
Winchester
Hampshire
SO21 2NF

Willowdene Training Ltd
Chorley
Bridgnorth
Shropshire
WV16 6PP

Wiltshire College - Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

Commercial members

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

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

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

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

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

Bomford Turner Limited
Salford Priors
Evesham
Worcestershire
WR11 5SW

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

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

FEC Services
Stoneleigh Park
Kenilworth Warwickshire CV8 2LS

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

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

John Deere Ltd
Harby Road
Langar
Nottinghamshire
NG13 9HT

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

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

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

EVENTS

IAgrE Branch Meetings and Events

South East Midlands Branch
Monday 13 January 2014, 19:30
WIND AND BIOMASS RENEWABLE ENERGY SYSTEMS - FARMER AND INDUSTRY PERSPECTIVES
Speaker: Richard Landen and James Hunter (EcoEnergy, Tillbrook Grange)
Venue: Maulden Church Hall, Maulden, Beds MK45 2AU
For further information please contact the Branch Secetary: John Stafford
Tel: 01525 402229 Email: john.stafford@silsoe-solutions.co.uk

Wrekin Branch
Monday 13 January 2014, 19:30
PRECISION LIVESTOCK FARMING
Speaker: Dr Tomas Norton and Dr Mark Rutter
Venue: Engineering Innovation Centre Lecture Theatre, Harper Adams University, Newport, Shropshire TF10 8NB
Dr Norton and Dr Rutter will be presenting the latest research and developments in the area of Precision Farming as applied to livestock in both the field and housed livestock.
For further information please contact the Branch Secretary: David Clare
Tel: 01952 815087 Email: dclare@harper-adams.ac.uk

West Midlands Branch
Tuesday 14 January 2014, 19:15
CONTROLLED TRAFFIC PROJECT
Speaker: Joanna Niziolomski
Speaker: Emily K Smith
Venue: Friends Meeting House, Maidenhead Road, Stratford-upon-Avon, Warwickshire CV37 6XT
Emily is a researcher at Harper Adams University and has been working on improving soil and crop yield sustainability with controlled traffic farming and low pressure systems since 2011. The Douglas Bomford Trust is the funding body.
For more information contact the Branch Secretary: Michael Sheldon
Tel: 01926 498900 Email: michaelcsheldon@yahoo.com

East Midlands Branch
Tuesday 04 February 2014, 18:30
ALOIS PÖTTINGER UK
Venue: Alois Pöttinger UK Ltd, 15 St Marks Road, Corby, Northants NN18 8AN
For further information please contact either the Secretary (details below) or Philip Spencer pspencer@brooksbymelton.ac.uk
Tel: 07977 521231
Email: sandytd2000@tiscali.co.uk Web: www.poettinger.at/uk/

Wrekin Branch
Monday 10 February 2014, 18:30
TRAFFIC AND TILLAGE: THE EFFECT ON SOIL AND CROPS
Speaker: Emily Smith
Venue: Engineering Innovation Centre Lecture Theatre, Harper Adams University, Newport, Shropshire TF10 8NB
Emily Smith who is studying for a PhD at Harper Adams will be presenting a background on the effects of traffic and tillage on the soil and on crop growth, and will give an update on the long-term trail at Harper Adams which includes controlled traffic farming.
For further information please contact the Branch Secretary: David Clare
Tel: 01952 815087
Email: dclare@harper-adams.ac.uk

South East Midlands Branch
Monday 10 February 2014
STUDENT MEETING AND BRANCH AGM
Venue: Maulden Church Hall, Maulden, Beds MK45 2AU
For further information please contact the Branch Secetary: John Stafford
Tel: 01525 402229 Email: john.stafford@silsoe-solutions.co.uk

West Midlands Branch
Tuesday 11 February 2014, 19:15hrs - *tbc*
GLOBAL FOOD - WASTE NOT, WANT NOT
Speaker: David Williams
Venue: Stoneleigh Village Hall, Hall Close, Birmingham Road, Stoneleigh, Warwickshire CV8 3DG
David is a Branch Member and has given presentations on Grain Storage and Farming in the Ukraine. David intends to enlighten us, not so much on food production but on how food can be used better and more efficiently rather than wasted.
For more information contact the Branch Secretary: Michael Sheldon
Tel: 01926 498900 Email: michaelcsheldon@yahoo.com

Western Branch
End Feb, beginning March 2014, 13:30 - *tbc*
JCB
Venue: JCB, Rocester, Shropshire
For further details contact the Branch Secretary: Rupert Caplat
Tel: 01235 522828 Email: rupert.caplat@lindehydraulics.co.uk

East Midlands Branch
March 2014 - *date tbc*
JOHN DEERE - FARM ROBOTICS
Details to be confirmed.
For further information please contact either the Secretary (details below) or nigel.penlington@talktalk.net or richard.trevarthen@gmail.com
Tel: 07977 521231 Email: sandytd2000@tiscali.co.uk
Web: www.deere.co.uk

Western Branch
Wednesday 5 March 2014, 18:30 - *tbc*
AMAZONE UK - AND BRANCH AGM
Venue: Lackham College
For further details contact the Branch Secretary: Rupert Caplat
Tel: 01235 522828 Email: rupert.caplat@lindehydraulics.co.uk

South East Midlands Branch
Monday 10 March 2014, 19:30
DEVELOPMENT OF A WIDE SPAN VEHICLE SYSTEM FOR VEGETABLE PRODUCTION
Speaker: Tim Chamen (CTF Europe)
Venue: Maulden Church Hall, Maulden, Beds MK45 2AU
For further information please contact the Branch Secetary: John Stafford
Tel: 01525 402229 Email: john.stafford@silsoe-solutions.co.uk

Wrekin Branch
Monday 10 March 2014, 18:30
BRANCH AGM FOLLOWED BY "THE LATEST JCB FASTRAC PRODUCT DEVELOPMENTS"
Speaker: Robin Carter (JCB Landpower)
Venue: Engineering Innovation Centre Lecture Theatre, Harper Adams University, Newport, Shropshire TF10 8NB
For further information please contact the Branch Secretary: David Clare
Tel: 01952 815087
Email: dclare@harper-adams.ac.uk

West Midlands Branch
Tuesday 11 March 2014, 19:00
BRANCH ANNUAL GENERAL MEETING, FOLLOWED BY THE PRESIDENTIAL ADDRESS
Speaker: tbc
Venue: Friends Meeting House, Maidenhead Road, Stratford-upon-Avon, Warwickshire CV37 6XT
For more information contact the Branch Secretary: Michael Sheldon
Tel: 01926 498900
Email: michaelcsheldon@yahoo.com

East Midlands Branch
Wednesday 2 April 2014, 19:00
RON KNIGHT, VINTAGE FARM MACHINERY
For further information please contact either the Secretary (details below) or richard.trevarthen@gmail.com
Tel: 07977 521231
Email: sandytd2000@tiscali.co.uk
Web: www.fensvintage.co.uk/collections/index.htm

South East Midlands Branch
Tuesday 22 April 2014, 19:00
TOROTRAK VARIABLE SPEED DRIVES: FROM VARIABLE RATIO SUPERCHARGING TO OFF-ROAD VEHICLES
Speaker: Dave Burtt and Brian Donohue (Torotrak plc)
Venue: Gold Lecture Theatre, Whittle Building, Cranfield University, Cranfield, Bedford MK43 0AL
Torotrak products and partners span both the on- and off-highway, and passenger car industries. It designs products to meet the common need for cleaner, more efficient vehicles, focusing on key areas of supercharging, kinetic energy recovery and main drive transmissions.
For further information please contact the Branch Secetary: John Stafford
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk

South East Midlands Branch
May 2014 - ***date tbc***
RENEWABLE ENERGY TOUR
Speaker: Andrew Needham (Commercial Director, Biogen) and James Hunter
Venue: tbc
Tour of local renewable energy sites, including BioGen's AD plant, a solar panel farm and an on-farm wind turbine.
For further information please contact the Branch Secetary: John Stafford
Tel: 01525 402229
Email: john.stafford@silsoe-solutions.co.uk

Wrekin Branch
Monday 12 May 2014, 19:30
MEASURING RIVER FLOW USING RADIO CONTROLLED BOATS
Speaker: Nick Everard and Stephen Baker (Environment Agency)
Venue: Engineering Innovation Centre Lecture Theatre, Harper Adams University, Newport, Shropshire TF10 8NB
A presentation on the developments of river flow monitoring and bed surveying techniques using Acoustic Dopplar Current Profilers mounted on board radio controlled boats.
For further information please contact the Branch Secretary: David Clare
Tel: 01952 815087
Email: dclare@harper-adams.ac.uk

Wrekin Branch
July 14, *date tbc*
BRANCH SUMMER VISIT
For further information please contact the Branch Secretary: David Clare
Tel: 01952 815087 Email: dclare@harper-adams.ac.uk

Other Events:

Monday 13 January 2014, 19:30
Norwich Engineering Society
THE SCIENCE AND TECHNOLOGY OF TEA MANUFACTURE
Speaker: Dr Stephen Temple, NES & IAgrE Member
Venue: Holiday Inn, Ipswich Road, Norwick
Web: www.engineeringsociety.co.uk/events.php
Web2: www.engineeringsociety.co.uk

Tuesday 14 January 2014 (*also 10 & 11 February 2014)*
HGCA and Catchment Sensitive Farming
LEARN ABOUT THE FUNDAMENTALS IN PRECISION FARMING
Venue: Yorkshire
Be PRECISE course for growers wanting to learn more about the fundamentals of precision farming. Half-day workshop.
Web: www.farm-smart.co.uk/news/article/57/Learn-about-the-fundaments-of-precision-farming

Wednesday / Thursday 22-23 January 2014
LAMMA 2014
Web: www.lammashow.co.uk/

Wednesday 5 March 2014
Farm Smart Events
PRECISION FARMING 2014
Venue: Peterborough Arena, The East of England Showground, Peterborough PE2 6XE
Precision Farming is an event for farmers and growers which showcases the best practical solutions available to implement precision farming.
Web: www.farm-smart.co.uk/precision/

Wednesday 9 April 2014
IAGRE'S YOUNG ENGINEERS COMPETITION
Venue: JCB, Rocester, Staffs ST14 5JP
Annual competition for students with cash prizes as well as products from our sponsors. Visit the Young Engineers page of our website for more information.
Tel: 01234 750876
Email: secretary@iagre.org
Web: www.iagre.org/careers/devcareeryecomp

06 Jul y 2014 to 10 July 2014
EurAgEng
AGENG 2014 - ENGINEERING FOR IMPROVING RESOURCE EFFICIENCY
Venue: Zurich
A conference focusing on the latest research and development in the whole field of agricultural engineering.
Deadlines: Submission of abstracts: 1 November 2013 Submission of Full Papers: 1 May 2014
Contact Robert Kaufman
Email: AgEng2014@art.admin.ch
Web: www.AgEng2014.ch

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

CONFERENCE 2014

21st May 2014,
Cranfield University

Landwards
Agriculture • Horticulture • Forestry • Environment • Amenity

Re-imagining agriculture:

engineering as the strategic enabler

Why there is a need to create an imaginative, strategic, agricultural engineering action plan to inspire and deliver future agricultural strategy

We have arrived at a crucial, challenging and creative point for agriculture. Satisfying increased demand for food and biofuels is crucial for human security. The objective of 'sustainable intensification' - more output with less resources - is technically very challenging. New engineering and scientific advances offer unparalleled opportunities for creativity.

In May 2014, the Institution of Agricultural Engineers annual conference will explore how engineering could enable a step-change in agricultural productivity, by enabling the adoption of entirely new agricultural systems.

.The conference will seek to:

- EXPLORE cutting-edge developments in ecological engineering and their potential application to agriculture
- IMAGINE radical possibilities for more productive agriculture
- HIGHLIGHT where innovative engineering may enable a step-change in agricultural productivity
- ESTABLISH an agenda for follow-up workshops

"The conference will explore radical options, in which machines are developed to enable entirely new and more productive agricultural systems"

Convenor, Mark Kibblewhite

Come along, join in and be part of the debate on how we calm the storm that's brewing

Innovation, science and technology in Agriculture and the Rural Environment

AGRICULTURE FORESTRY ENVIRONMENT AMENITY HORTICULTURE

The professional body for engineers, scientists, technologists and managers in agricultural and allied industries including food, forestry and biological systems.
IAgrE is a licensed body of the Engineering Council and a founding body of the Society for the Environment

Engineering Council
SocEnv Society for the Environment

FOR FURTHER DETAILS: IAgrE Secretariat 01234 750876 conferences@iagre.org
ONLINE BOOKING: www.iagre.org