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MAKING FORESIGHT WORK

Professor Chris Pollock launches Feeding the Future

HARPER ADAMS INVESTMENT

Prime Minister announces £1.5m engineering support

IAgrE Professional Journal www.iagre.org Volume 67, Number 4 Winter 2012

Biosystems Engineering

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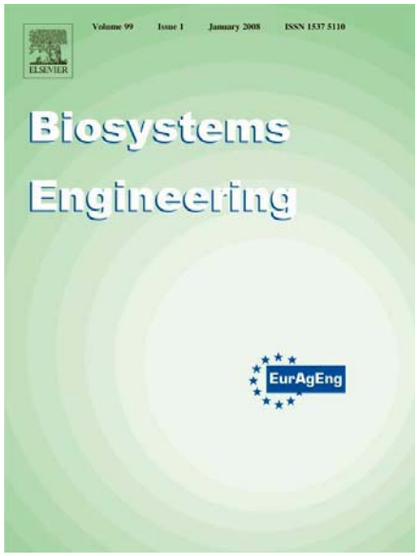

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The Managing Editor of ***Biosystems Engineering***, ***Dr Steve Parkin***, has kindly summarised some of the papers published in the last three issues which he thinks may be of interest to IAgrE members

Biosystems Engineering
Volume 112, Issue 4, August 2012, Pages 304-318

Simulation modelling of nectar and pollen foraging by honeybees

Juan Jose Garcia Adeva
University of Western Australia, Perth
Cooperative Research Centre for National Plant Biosecurity, Canberra, Australia

A simulation model for the foraging activity of honeybees (Apis mellifera) as they collect nectar and pollen is desribed. Understanding such behaviour and observing the resulting foraging spread patterns and distribution are vital from an ecological perspective and has useful applications in areas such as agriculture or biosecurity. The simulator is based on a spatio-temporal model and implemented following a Web-based architecture. This simulation model takes into account of detailed floral distributions, weather, hours of daylight, and variations in daily nectar and pollen production by flowers. The simulation model is evaluated by performing multiple experiments and verifying the results obtained

Volume 113, Issue 1, September 2012, Pages 22-32

Airflow measurements in and around scale model cattle barns in a wind tunnel: Effect of ventilation opening height

Merlijn De Paepe, Jan G. Pieters, Wim M. Cornelis, Donald Gabriels, Bart Merci, Peter Demeyer
Institute for Agricultural and Fisheries Research (ILVO), Merelbeke, Belgium
Department of Biosystems Engineering, Ghent University, Belgium
Department of Soil Management, Ghent University, Belgium
Department of Heat, Flow and Combustion Mechanics, Ghent University, Belgium

Animal houses require an adequate ventilation system to allow for efficient production and, indirectly, high product quality. Indoor air quality is also important in relation to a healthy work and housing environment for both farmer and animal. To acquire a better understanding of the complex natural ventilation process in and around animal houses, air velocity measurements were carried out in 1:60 scale models of a dairy cattle house placed in a wind tunnel, using a reference air velocity of 3.5 m s-1. Enlarging the inlet opening height, led to lower velocities near the inlet but higher velocities were measured at the outlet. The air velocities at the centre of the house were hardly affected by the inlet opening height, even with the front wall completely removed. Removing the outlet wall at the same time, however led to much higher velocities at the centre of the scale model (3-4 times higher).

Volume 113, Issue 2, October 2012, Pages 148-157

Design and application of a weed damage model for laser-based weed control

Christian Marx, Stephan Barcikowski, Michael Hustedt, Heinz Haferkamp, Thomas Rath
Biosystems Engineering Section, Leibniz University Hannover, Germany
Laser Zentrum, Hannover, Germany
University of Duisburg-Essen, Essen, Germany

Horticultural weed control strategies based on chemical and thermal methods are environmentally and energetically questionable. A promising alternative appears to be the use of laser technology. This study evaluates the influence of CO2 laser radiation (10,600 nm) taking into account three laser spot diameters, three laser spot positions and six laser intensities on three growth stages of two weed species (monocotyledonous: Echinochloa crus-galli, dicotyledonous: Amaranthus retroflexus). Monocotyledonous 2-leaf-plants were damaged at high energy levels, whilst 4-leaf-plants were difficult to kill. Dicotyledonous 2-leaf-plants were already damaged at moderate intensities. Thus, the damage of monocots required higher minimum laser doses than the damage of dicots. In combination with robotics and image processing, the damage models developed here can be used to develop laser-based weed control.

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VOLUME 67 Number 4 2012

THIS ISSUE

EDITORIAL

A growing belief

FOR too many years, the agricultural engineering industry has tended to look backwards.

It has bemoaned the loss of research facilities at Silsoe, and it has struggled to find its voice in the wider debate about future food production as evidenced by the recent Foresight Report virtually ignoring the role of engineering.

But it is possibly this oversight that has proved to be the catalyst for a new determination to enure that our views are given equal prominence alongside those in the fields of crop science or animal genetics.

It was a central point made by Professor Simon Blackmore in his visionary lecture to a packed audience in the august surroundings of the Royal Academy of Engineering in London recently.

Professor Blackmore is in no doubt that our industry has found its voice again.

"For too long, agricultural engineering has been ignored by policy makers," he said. "But now there is growing belief and evidence that we have good political and commercial support."

He cited IAgrE's rapid and well argued response to the Foresight Report as one factor, along with the creation of the new £3 million National Centre for Precision Farming currently under construction at Harper Adams.

An initiative that was launched in the House of Commons, and which has received significant support from Government and from the Prime Minister himself.

Additional funding from Defra, on-going consultations with BIS on agric-tech strategy and growers seeking solutions, are all indications of a recognition that agricultural engineering research must play a central role in future food production policies said Professor Blackmore.

"Big changes are ahead, and we simply have to find new ways of doing things."

Professor Blackmore's view is that we have reached the optimum size for tractors and machinery, and that robotic operations with units that work faster and smarter, have got to be part of the answer.

But putting concept into practice is quite a thing.

Convincing the major manufacturers that the same old, same old is no longer the answer is going to be one of the toughest challenges.

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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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David Cameron says precision farming centre "great for UK"

PM reveals investment in engineering at Harper Adams

PRIME Minister David Cameron announced on September 28th that Harper Adams University College is to be awarded nearly £1.5m to help it develop a new engineering building to accommodate and support the National Centre for Precision Farming, and related teaching and research activities.

The announcement of the award, from the Higher Education Funding Council for England's Catalyst Fund, was made from Brazil. Harper Adams Vice-Principal Professor Peter Mills had joined the Prime Minister on a two-day trade mission to Sao Paulo and Brasilia, furthering the University College's role in the *Science Without Borders* initiative, which will fund Brazilian students to study agricultural engineering at Harper Adams from 2013.

The Prime Minister said: "It's great for the UK that Harper Adams is establishing the National Centre for Precision Farming. This new higher education and research facility in Shropshire for engineering and farming students will lead to the creation of 160 jobs.

"I'm delighted that the university has joined Brazil's science and education programme and that Brazilian students will start studying there next year. It will help to strengthen the links between the UK and Brazil and will bring in increased revenue for the university."

The HEFCE Catalyst Fund contribution will be combined with funding from the Marches Local Enterprise Partnership, the University College and two philanthropic donations from the Douglas Bomford Trust and the Eric Lea Estate to deliver the new Harper Adams engineering centre, which is expected to create 160 jobs through graduates entering the engineering sector.

Principal, Dr David Llewellyn, said: "Harper Adams University College has unique expertise in agricultural engineering, including precision farming techniques, and is the only provider of undergraduate agricultural engineering programmes in the UK. The University College will therefore play a critical role in developing an advanced engineering response to address Government policy priorities, help support this important STEM subject area and contribute to agricultural research and education via a cross-disciplinary and cross-institutional initiative."

The building will supplement existing facilities and will provide a physical resource around which university/industry collaboration can be stimulated in a new field supporting innovation in high-technology food production. The NCPF will also have unique features, such as a novel full-scale 'all terrain' vehicle simulator room, that will support product development and training, but will also provide a means to verify health and safety measures in the design and development of new agricultural machinery and precision farming applications.

A scheme has already been developed for the new building, planning permission has been obtained and the project has been tendered. The overall cost of the project is £2.93m and the facility is expected to be ready and in use by October 2013.

Harper Adams Vice-Principal Professor Peter Mills on the plane in Brazil with Prime Minister David Cameron

Dr Llewellyn adds "Working alongside our considerable agricultural production expertise, our engineering staff will play a critical role in developing, with private sector industry partners, other universities and research institutes, new strands of applied research to implement and 'join-up' precision farming technological developments; educate future generations of engineers and farmers on the application of precision farming; provide updating courses to develop the precision farming skills base of the current farming community; and act as an independent source of advice on precision farming methods."

The HEFCE Catalyst Fund, under which Harper Adams was awarded nearly £1.5 million, has two major goals, both focussed on delivering the public and collective student interests in HE: to manage transition - to and through the new finance arrangements in HE, so as to protect students and sustain important activities; and to support key objectives by promoting and enhancing activities that address HEFCE and/or the Government's key policy priorities where an innovation could lead to a step change in achievement and efficiency widely across HE.

•IN other news, Harper Adams is also celebrating six years as the UK's best University College, as revealed in the recently-published *Sunday Times University Guide 2013*.

The University College is also hailed by the guide as the best UK higher education institution for graduate employability and third best for teaching excellence - behind only the Open University and Cambridge.

And Harper Adams sits joint fifth (third based on equal scores) in the *Sunday Times* student satisfaction table, based on the results of the National Student Survey, published recently.

Guide editor Alastair McCall writes: "Students like the Harper Adams experience, consistently ranking it among the top 10 institutions in the country for teaching excellence and for overall satisfaction with their choice of course and college. This sustained success has cemented Harper Adams' position as the leading university college in our guide.

"Students are more than just a number at Harper Adams and the low dropout rate reflects that. The subject areas, with their accent on the practical, translate into the lowest graduate unemployment rate of any university."

Welcoming the 2013 guide, Dr David Llewellyn said: "We could not be more pleased with this tremendous set of results. The indicators in which we have scored well are some of the most important to students and recognise our efforts to give them a fantastic experience at Harper Adams."

The Sunday Times University Guide draws information from the National Student Survey, the 2008 (most recent) Research Assessment Exercise, Higher Education Statistics Agency, and a questionnaire sent to every institution, renewed annually.

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IAgrE offer Jubilee award at LAMMA show

AT the LAMMA 2013 show, taking place on January 16th and 17th 2013 at the Newark and Nottinghamshire Showground, IAgrE will be sponsoring a special, one-off award to celebrate their 75th anniversary Jubilee year.

The Maurice High Trophy will be presented to the **Best New Product or Innovation at LAMMA 2013**.

Decided by judges who are mainly, though not exclusively, members of IAgrE, the recipient of this prestigious honour will be chosen from the winners of the following awards presented at the show:

1 *The IAgrE Ivel Award - for the New Product or Innovation which has the most positive impact on the environment.*
2 *Best New Product or Innovation with a retail price less than £10,000*
3 *Best New Product or Innovation with a retail price greater than £10,000*
4 *Best Improvement to an Existing Product*

John Sartain, Chairman of LAMMA said, "With a show which is likely to have 800 stands, it is important to point out that only those products or innovations which are entered by the exhibitors for the competitions at the show can be considered by the judges."

ABOVE: The special Landwards logo designed for use throughout the Jubilee year
BELOW: Crowds at the LAMMA show

Looking Landwards sci-fi writing competition launched

IAgrE gives aspiring authors a chance to get into print

HAD you asked a farmer before the last world war what innovations were likely to affect his industry in the future, he would most likely have spoken in terms of faster, stronger horses and bigger steam engines, little imagining where engineering technology and science would take us.


What might the future of agricultural engineering look like?

So . . . what lies ahead today?

Founded in 1938, the Institution of Agricultural Engineers celebrates its 75th Anniversary in 2013. To commemorate this, they are teaming up with NewCon Press to sponsor a flash fiction competition, open to all.

Stories should reference speculation regarding what the future might hold for agricultural engineering, farming and food production over the next century.

The winning story will receive a cash prize of £75.00. It will also be published in *Landwards* (circulation approximately 3,000), as will the immediate runners up (the authors of which will each receive £20.00).

The winning story will subsequently be included in *Looking Landwards*, a similarly-themed anthology of original science fiction due from NewCon Press in late 2013.

Entries should be between 800 and 900 words (these limits are strict), and should be sent to the following email address no later than January 12th, 2013: *flashfic@newconpress.co.uk*

Royal Parks pull out of agreement

Hyde Park says no to farming festival

A MAJOR farming festival planned for central London is looking for another venue after Hyde Park pulled out of the event.

Organisers behind the Farming In The Park bonanza aimed to attract more than one million visitors to Hyde Park during May 2014. But the Royal Parks authorities now say Hyde Park is no longer available for the event, which would showcase the best of British agriculture.

Essex farmer Guy Smith, one of the events's directors, said, "Royal Parks have changed their minds about the availability of Hyde Park for Farming in the Park, so it's back to the drawing board."


HRH The Duke of Edinburgh at the Farming In The Park launch

Some 100 food and farming representatives - including the Duke of Edinburgh - attended the official launch of Farming in the Park at St James Palace last year. Prince Philip was patron of a similar Festival of Food and Farming in 1989, which drew over one million visitors to Hyde Park.

Grand Ring displays and central exhibits would have included cutting-edge farming technology - including tractors and machinery - as well as livestock.

"We're the fastest growing landbased college in England," says CEO

£9m new investment at Askham Bryan

NEW plans have been announced by Askham Bryan College which will see a £9m investment into new projects both at Newton Rigg College and at the York campus, at Askham Bryan.

Chief Executive, Liz Philip said, "We have just received news that our bid to the Skills Funding Agency for capital funding has been wholly successful. We will receive £3m from the SFA which will be matched by a further £6m from our funds. This is hugely significant, not only for the College, but for the education of tomorrow's young people, for the economy across the North of England, and for the positive impact it will have on agriculture generally."

Additional jobs are also expected to result. "I would anticipate that around 75 new jobs will be created. We currently employ 520 people in full and part time roles, but as you would expect, to deliver more courses to more students, we will need to recruit and that will be a further boost to the local economy," said Mrs Philip.

The plans will also lead to greater student numbers and a larger portfolio of courses offered. "We are already the fastest growing landbased College in England - our student numbers have increased three fold in the last five years - from 800 full time students in 2007 to today's figure of 2,500, plus around 3,000 part time students," says Mrs Philip.

"Our students deserve the best learning environment possible, and certainly whilst our latest Ofsted (Jan 2012) designated us as a '*good college with outstanding features*', it stated that the standard of some of our buildings was poor. We needed to address that, and now we are able to put that into action."

Commenting on plans for Newton Rigg, Wes Johnson, Principal said, "We have some wonderful original sandstone buildings, the library and of course the original Newton Rigg farmhouse. We want to open up the campus with green areas to enhance the whole feel of the college and make the most of these buildings. At present they are hidden amongst a real mish mash of buildings, several of which are in disrepair and need to be replaced."

The first visible sign of progress is the start of the dairy at Newton Rigg which began in November. Also underway is tendering to upgrade buildings on the campus with the hope of construction beginning next summer.

Councillor Eddie Martin, Leader, Cumbria County Council said, "I'm delighted to see Askham Bryan College's commitment to improving and investing in Newton Rigg College is bearing fruit with this significant inward investment into the county. The Skills Funding Agency has clearly recognised the important part Newton Rigg plays in Cumbria's rural economy."

Liz Philip, Chief Executive at Askham Bryan

Lord (Donald) Curry said, "I am delighted that Askham Bryan College has been so successful. It is vital that young people are inspired to achieve their educational potential so the farming industry has the best workforce and leaders possible. The benefits that the vision and confidence the College has shown will be reaped by the industry for years to come."

Dr Caroline Sudworth joins Engineering Council

As Education and Skills Senior Executive

THE Engineering Council has announced that Dr Caroline Sudworth has taken up the newly created role of Education and Skills Senior Executive.

The Council says Caroline will play a valuable role in the Policy and Standards team, taking responsibility for the HE, FE and Skills areas of their work, including academic accreditation.

She will be working closely with professional engineering institutions and other relevant stakeholders, focussing on understanding and developing the number of pathways and flexible learning packages leading to professional registration as Engineering Technician (EngTech), Incorporated Engineer (IEng) and Chartered Engineer (CEng).

Having forged strong links with Government, industry, academia, professional bodies, sector skills councils, and other stakeholders through previous roles, Caroline has already developed a critical understanding of the needs of the sector as a whole, as well as the issues faced by engineering organisations and the individuals within them.

Caroline joins the Engineering Council from Cogent Sector Skills Council where she was Higher Education Manager, responsible for a range of programmes primarily related to employer engagement in STEM education.

Prior to this Caroline worked as Research Director in the Medical Laser Institute, Lasers for Life and Business Development Manager for the Faculty of Science and Engineering of Manchester Metropolitan University. She holds a PhD in Medical Physics, was a Post-Doctoral Research Fellow in the Centre for Medical Imaging Research at the University of Leeds and has lectured in both the Universities of Leeds and Liverpool.

Of her new role, Caroline says, "I am looking forward to working as part of the Engineering Council team, to meet the challenges faced by a changing skills and education landscape and working to support Government priorities on progression in STEM careers as well as its recognition of the need for skilled and competent engineers in the future to support business growth and innovation."

> "... I am looking forward to meeting the challenges faced by a changing skills and education landscape"

A harvest offering

CEO VIEW

IN October, I was privileged to attend, as a guest of Chris Biddle (*Landwards* Editor) and his wife Trish, the Harvest Thanksgiving Service and lunch held by the Guild of Agricultural Journalists. The service was held in St Brides Church, Fleet Street, spiritual home of the media, with the lunch at the Livery Hall of the Stationers Guild where the guest speaker was Adam Henson of *Countryfile* fame.

Both the service and lunch were excellent but what struck me most was the self-composed reading delivered by Guild Member Peter Grimshaw, which I reproduce below (with Peter's kind permission), entitled:

Do They Know?

Do they know, these lambs bouncing on spring-loaded legs, why they are there, and just how short their joyous season will be?

Do they know, these folk thronging the supermarket, the pains that were taken to deliver clean, safe, appealing purchases to feed the ever-rolling check-out belts?

Do they know, the urban millions, turning up the heating while rain dissolves their weekend plans, that our climate is our greatest asset?

Do they know, the youngsters, those who 'think of nothing but farming' how limited are the opportunities for them to walk and farm their own land?

Do they know, our children and grandchildren, the awesome facts of real life beyond touch-screens and cartoon characterisations?

Do they know, some of the politicians and commentators who dismiss farming as small and unimportant, how vital its simple products instantly become when acts of God, or of mankind, disrupt their steady flow?

Do they know, the campaigners for and against this and that, how good science - - in the hands of those who love their land - offers a better, maybe the only way, to save this precious blue-green planet?

Do they know, the planners who condemn precious soil to death beneath concrete and tarmac, just how tiny are the good places left to feed the world?

Do they know, the media moguls who portray agriculture as a jokey costume drama, what responsibility they bear for the attitudes of those who consume our priceless products?

Do they know, the multi-national executives, how their whims can destroy the hopes and ambitions of good, skilled and hard-working folk - at a stroke - or just by slow attrition?

. . And do we know, gathered here in the presence of an all-knowing God, our true task - on behalf of all these unknowing lambs?

We know, and the telling is our harvest offering.

On behalf of the Staff and Secretariat at IAgrE, may I take this opportunity to wish you all a very Merry Christmas and a Happy New Year.

Christopher Whetnall

IAgrE at Guild of Agricultural Journalists Harvest Service and Lunch

WITH Robbie Williams' *Angels* giving a contemporary twist to an otherwise traditional thanksgiving celebration and rose veal on the lunch menu enjoyed by all, the Guild of Agricultural Journalists 2012 Harvest Service and Lunch was a hugely popular event for the 200 members and guests including IAgrE ceo Chris Whetnall and *Landwards* editor Chris Biddle.

The Harvest Service was held at the famous St Brides Church in Fleet Street, followed by lunch at the nearby Stationers' Hall.

Guest speaker Adam Henson, farmer and BBC *Countryfile* presenter, set out the opportunities and challenges that the farming industry faces and underlined the importance of open, honest and effective communication with consumers.

He said, "As farmers we can all do our bit to promote our own businesses through local papers, coffee table magazines and the radio and we have to think of agriculture as a brand. We must be seen as professional and responsible and consider carefully our values in what we do. I often say we are on the crest of a wave but we need to ride it well. Our professional communicators need to put over the facts correctly rather than trying to fan the flames of discontent like some cheap tabloid paper. We have a responsibility not to confuse the reader, listener or viewer; again, integrity is key.

"I have to say I think on the whole, the agricultural press does an amazing job, particularly with a shrinking market. Effective communication is a fundamental part of our industry's future. Ultimately, consumer choice and demand will govern our success. I believe that working together we can ensure the continuing success and growth of agriculture - an industry that I'm very proud to be part of."

ABOVE: Lunch at Stationers' Hall
BELOW (L-R): Chris Biddle, Trish Biddle, guest Kim Macfie and Chris Whetnall (IAgrE)

Access to Biosystems Engineering

MEMBERS of IAgrE may subscribe to Biosystems Engineering at the personal rate of £238 per year for the paper edition or the preferential rate for IAgrE members of £57.60 (including VAT) annually for the electronic edition.

Such subscriptions must be for personal use only and must not replace full price copies. See *www.iagre.org/publications/bioeng* to sign up for this electronic edition.

Members can get a lot of information about the BE papers that is freely available in the public domain. Certainly there should be enough information freely available on the journal web site for members to decide if they wish to contact IAgrE headquarters and make a special request for a personal PDF copy of a paper, which the Secretariat are able to do on an occasional basis.

Details that are freely available through Science Direct include:

- **Full title** - including authors details and their affiliations and contact details
- **Research highlights** - bullet points describing the main findings
- **Abstract** - a full abstract up to 250 words describing the research
- **All Figures and Tables** - they can viewed as a thumbnail and then expanded

To access the journal electronically go to *www.sciencedirect.com/* and type 'Biosystems Engineering' in the journal title box.

Note: You can also get free access to all Journal of Agricultural Engineering Research abstracts from 1965 to 2001 using the same method.

Apprenticeships back at Ransomes

New training scheme to be launched in January

RANSOMES Jacobsen is re-introducing Craft and Technical apprenticeships beginning in January 2013.

The company, which has been manufacturing mowers in Ipswich for the past 180 years, is currently looking to recruit five apprentices; three Craft and two Technical.

Craft students will rotate through the welding, fabrication and machining departments with their final placement dependant on areas of highest competency or need at the time they complete the programme. All apprentices will have the opportunity to gain a comprehensive insight into the practical aspects of engineering, supported by a firm academic baseline.

Technical students will be rotated through the company's engineering functions including production engineering, quality engineering and continuous improvement. The successful applicants will be expected to demonstrate a practical capability supported by a high level academic baseline.

Both Craft and Technical students will be expected to complete a minimum of three to five years training achieving an HNC or equivalent qualification in mechanical or electrical engineering on completion.

Ransomes Jacobsen's operations director, Simon Rainger

Simon Rainger, operations director at Ransomes Jacobsen said, "We are delighted to re-introduce apprenticeships back into the business. For several reasons they were phased out in the late-1990s, but we hope that their reintroduction will be as successful as they were in the past. Our customer care director Jason King began his career as an apprentice and several senior managers have come through the previous apprenticeship schemes.

"This is a wonderful opportunity for well motivated and conscientious young people; we are part of a multi-industry US company that is always searching for new talent, so for the lucky five, the possibilities are endless."

Over the years the Ransomes apprenticeship scheme has produced numerous well-known faces within the groundscare industry including Bob Bevan, Bernhard Grinders; Graham Dale, Lely UK; Bob Buckingham; Nigel Church; Adrian Kersey, Bartram Mowers; Justin Hunt, course manager, Woodbridge Golf Club; Richard Walne, managing director, Toro Australia; Ian Mitchell; Paul Watson, Medland Sander & Twose; Julian Coppin, Toro and many more.

Inaugural Lecture by Professor Simon Blackmore
Royal Academy of Engineering: 27 November 2012
Report by Chris Biddle

Tractors . . but not as we know them

A VISION of the future, new techniques, and new ways of doing things was the theme of the entertaining and thought-provoking inaugural lecture given by Professor Simon Blackmore to a packed audience at the Royal Academy of Engineering, central London on 27 November.

It was refreshing to be taken out of our comfort-zone by Professor Blackmore, to challenge our views on an age-old industry in which he claimed "we have not moved far from Harry Ferguson's iconic TE20".

After giving an overview of the challenges facing world leaders to produce enough food in future years, Professor Blackmore first defined the role of agricultural engineers as those who devise practical solutions, solve problems and develop the answers to new challenges.

"But there are big changes ahead, and we simply have to find new ways of doing things," he said.

But his was a message of hope as well.

After years of being ignored by policy makers, "We are now getting very good political and commercial support," he said, citing as examples the building of the National Centre for Precision Farming as well as IAgrE's rapid and well-argued response to the absence of engineering solutions in the recent Foresight Report.

"But our world problems cannot be solved by individuals or single states," he said. "The agricultural engineering industry must develop new systems, teach people how to engineer solutions, and put concept into practice. Above all it can lessen the impact of uncontrollable factors."

By these he meant, the weather.

"Global warming is a two-edged sword," he said, "bad for the climate but good for the future of agricultural production in Europe".

> "❝ . . .90% of the energy is being put into cultivation in order to repair the damage caused by the tractor in the first place ❞"

It was perhaps apt that he should be talking about the impact of weather on a day when much of the country was suffering from excessive rain and widespread floods.

For this gave him the ideal opportunity to expand on his vision for crops being grown and harvested using robotic machines.

He argued strongly that we have reached the optimum size for tractors and combines.

"300 horsepower tractors are now the norm, but I would argue that we have reached a stage where they are going to do more harm than good.

"Given recent weather, horsepower does not matter, when weight is the problem.

"Large tractors cause compaction resulting in 90% of the energy being put into cultivation in order to repair the damage caused by the machine in the first place," he said.

"As for combines, they have now reached a size where even larger machines simply cannot be transported from the factories by road or rail.

"So we need a family of machines that work smarter, faster and more efficiently.

"Big horsepower tractors are fine - in favourable weather - but we can't afford to be dependent on the weather. Tractors which can't move because they are stuck up to the axles in mud, sprayers that won't work because of the wind, none of that will be acceptable in the future.

"In the future, new mechanisation techniques will be based on the plant's needs."

Professor Blackmore gave us a vision of selective harvesters, robotic machines only picking those plants that are right for harvesting now, and leaving those unfit to ripen for later harvesting.

"As things stand, consumer demands for 'perfectly-shaped' fruit and vegetables mean that 40% of that which is harvested is rejected by the supermarkets. That's a major issue that has to be addressed if we are to avoid waste."

He also introduced us to laser weeders, those that simply 'zap' the precise part of the plant that need to be destroyed; smart sprayers that 'save over 90% of herbicide' and precise seeders that guarantee maximum germination.

"This new technology is available now," he said, "but we still have major issues to overcome.

"How do we ensure that machines from different suppliers can 'talk' to one another? How do we convince the major manufacturers to start proceeding along the robotic route when their future strategy is for bigger and better machines of the current mould?"

Professor Blackmore's view was that it would be smaller, niche suppliers who would make the first moves toward specialist robotic mechanisation, not the multinationals, who would then play 'catch-up'.

Whatever the practical considerations, Professor Blackmore's vision of the future was a stimulating approach and much food for thought.

HRH learns about agricultural engineering and sustainability developments

Princess opens Harper Adams hall of residence


The Princess meets students in the Princess Royal Hall

A NEW student residence at Harper Adams University College received the Royal seal of approval, when it was officially opened by the HRH Princess Royal.

The £1.6 million hall, which was named after the Princess, with the consent of HM The Queen, is now home to 55 students, some of whom met Her Royal Highness.

The Princess visited the study bedroom of first-year student Harriet Sutcliffe and chatted to the remaining residents of Harriet's flat. She also received gifts from student warden Robert Boffey, and Madelaine Wilson, a first-year resident of the new hall.

Robert, 21, a final year Food and Consumer Studies student, said, "It made me incredibly proud to be asked to present a gift to Her Royal Highness. And it was a great privilege to welcome the Princess to the new hall. We are pleased that the building has been named after someone we all know of and admire. It has already become affectionately known as the 'PR Hall'!"

Chairman of the Harper Adams University College Board of Governors, Roger Mercer, addressed the Princess and invited guests in a marquee erected alongside The Princess Royal Hall for the occasion.

He said, "It gives me great pleasure to formally welcome Her Royal Highness The Princess Royal to Harper Adams this afternoon. As many of you may know, Her Royal Highness has undertaken the role of Honorary Fellow here at the University College for a number of years and we are extremely grateful that you have found the time to visit us once again to open our new hall of residence.

"Nothing is more important than ensuring that our students have the best possible facilities in which to live and study during their time with us. It is only through investing in excellent facilities on our campus that we can continue to provide the high quality graduates that our industries are actively seeking."

Speaking briefly after officially opening The Princess Royal Hall, Her Royal Highness praised the expansion of the campus, saying, "I expect a lot of people think that colleges like this don't change very much. They should come here more often because it changes all the time. You've got to keep up!"

Harper Adams Principal Dr David Llewellyn said, "We were very pleased to be able to welcome Her Royal Highness back to Harper Adams and to provide an opportunity for her to see some of our latest work. It was particularly good that a number of our students were able to meet the Princess and discuss their plans to work in the agri-food sector, where the skills they are developing at the University College will play a vital role in securing our future food supplies."

Before unveiling the plaque to officially open and name the residence, the Princess spent an hour touring the campus to learn about developments since her last visit in December 2009. Her first stop was the first National Centre for Precision Farming seminar. There the Princess enjoyed a presentation by Professor Simon Blackmore, Director of the NCPF, on the importance of Engineering, Robotics and 'Smart' Systems in Precision Farming.


HAUC Principal Dr David Llewellyn chats to The Princess outside the new hall of residence


In the bioenergy building with Jim Waterson and Paul Moran of Harper Adams

A new engineering building, which will be home to the NCPF, is due to open in autumn 2013, funded by the Higher Education Funding Council for England, Harper Adams, Marches Local Enterprise Partnership and two major philanthropic donations from the Douglas Bomford Trust and the Eric Lea's Charitable Trust, together with a range of donations made by individual supporters to deliver a new engineering building at Harper Adams

HRH then saw agricultural engineering in practice when she toured the Soil Hall, the University College's 'indoor field', where aspects of the environment can be managed to provide controlled test conditions for agricultural and off-road vehicles and equipment. A range of projects was on display, demonstrating the type of work undertaken by students and the range of employers with which they work.

The Princess Royal also visited the Harper Adams Bioenergy Centre, where new technologies are being trialled. Led by the European Bioenergy Research Institute (EBRI) at Aston University and funded by the European Union INTERREG IVB programme, 14 European partners, including Harper Adams, are working together to support the development of small-scale, local innovative bioenergy facilities through the BioenNW project.

For the last 10 months, Harper Adams has been the demonstration site for a new bioenergy technology developed by EBRI researchers called a Pyroformer. The Pyroformer is unique in its ability to process multiple feedstocks to generate heat and power, and researchers from Harper Adams and EBRI have been testing a wide range of feedstocks including wood, sewage sludge, straw from rape, wheat and rice, grass clippings and dried anaerobic residues.

Resilience, redundancy and research

IAgrE President, ANDY NEWBOLD, contests that a flexible group of individuals will innovate better than 'integrated farming solutions'

A RABOBANK Report dated 19th November entitled: '*Agricultural machinery must innovate in order to meet increasing food demand*' stated that:

"*Companies in the agricultural machinery supply chain will need to change their business models to meet the growing global demand for food. . . With global demand for food expected to increase by 70 percent by 2050, the role of the machinery manufacturer and equipment dealer is changing, and machinery is becoming an integral part of the all-encompassing solution to increase productivity.*"

This caused me some reflection. We can all work out the commercial imperative of a bank trying to stimulate the agricultural engineering community, as it will need more premises, production facilities etc, all of which will need finance, which presumably Rabobank will be thrilled to help with. However the report continues:

"*Machinery manufacturers can either take a leading role in developing integrated farming solutions by tapping into the larger market of all farm inputs, or take a secondary role by contributing to integrated farming solutions led by others. Either way, they will need to consolidate further in order to fund R&D and to gain the critical mass to collaborate with other input suppliers. For equipment dealers, machinery sales will change from a one-off sale of a fixed asset to the long term provision of services.*"

Your humble correspondent is not so sure about this. As engineers we all know about the concept of redundancy and of having more than one level of protection - diversity is good. How will society be served by developing integrated farming solutions (i.e one service provider helping - *or telling*?) growers how to grow, and moving the responsibility of food production up the 'food chain'?

I contest that a flexible group of individuals effectively competing in the marketplace to provide food will always innovate and manage change better than the proposed leviathan of 'integrated farming solutions'. A look at this year's harvest progress and autumn drilling campaign shows that the year has favoured those with a flexible 'get on' approach, and smaller combines and powerharrow drill combinations have been in demand due to their ability to travel.

If we look at the record of innovation within agricultural engineering, we have a rich pedigree in the UK of small business coming up with these smart solutions, and some of these small businesses over time have become world class leaders in their fields.

What I do take on board very clearly is that the agricultural machinery supply chain needs to get on with providing the agricultural industry with the tools it needs to do the job.

I am concerned that Rabobank see that R&D is the preserve of the machinery manufacturers with no clear linkage to the established research community (presumably the research community does not have the same borrowing requirement?).

Perhaps if the author of the Rabobank report had attended the recent stakeholder event run by the National Centre for Precision Farming at Harper Adams, they would have seen an opportunity for the machinery manufacturers and research communities to come together and discuss how they can work together?

THE Prime Minister's announcement of an investment of nearly £1.5M into the the new engineering building at Harper Adams is to be applauded.

Perhaps this is an indication that there is a political will to re-invigorate the UK's land based economy?

. . . the year has favoured those with a flexible 'get on' approach

Research priorities post-Foresight

THE annual conference of the Institute of Agricultural Management (IAM) held at the Royal Society in London on 21 November was the platform for the launch of a study, '*Feeding the Future*', led by Professor Chris Pollock CBE, which recommends crucial research priorities for future food production in the UK. CHRIS BIDDLE reports.

THERE was a packed audience at the Royal Society for the Annual Conference of the Institute of Agricultural Management on 21 November, which had been chosen as the venue for the launch of the initial findings of a report, '***Feeding the Future: Innovation Priorities for the Primary Food Production in the UK to 2030***'.

Commissioned by four farming industry organisations, the Agricultural Industries Confederation; The Institute of Agricultural Management; The National Farmers Union and the Royal Agricultural Society of England, the findings of the study were introduced by Professor Chris Pollock CBE.

Introducing the report he said, "We now need a united approach from government, researchers and industry to develop new technologies which are required to meet the challenges of feeding an increasing global population.

"Over the next 20 years, British farmers will be part of a global food network that will require them to produce 50% more food with less available land.

"However, government departments and research councils are not working as effectively with farmers now as in the past - yet they are being expected to address a much broader range of issues.

"Food producers have tended in recent years to deal with today's problems. If we want to shift the research agenda to deliver for 2030, we need to make sure that primary producers work together and with the funders of more basic research," said Professor Pollock.

"We need to fund programmes for longer-term, applied research that link different sectors of the industry.

"The global food system is going to come under pressure and all of those pressures are going to combine to produce (Sir John) Beddington's 'Perfect Storm'. Effectively, since there is no more land, the only game changer is technology.

"In cereals, for example, research showed that yields were increasing on average at 2% a year and if this trend continued between now and the middle of the century, agriculture would 'just about plug the calorie gap'.

"Unfortunately, maintaining that and reducing impact is going to be a real challenge," said Professor Pollock. "But the only argument that land managers have is better technology."

The emerging findings of this project form the basis of a new consultation which is open for further comment.

A presentation of the final report will be made in March 2013.

www.feedingthefuture.info.

Panel discussion (L-R), Professor Charles Godfray; David Gardner, CEO RASE; and Professor Chris Pollock

Professor Chris Pollock

Key recommendations of the report for R&D innovations

A programme of long-term applied research.

Improve precision and efficiency of agricultural management practices, like genetic and breeding programmes to increase productivity.

A united approach from government, research councils and producer groups.

Identifying missing skills and knowledge.

Government departments working together.

Technology must unlock the potential of farming

DEFRA minister Lord de Mauley told the conference that innovation plus the development and application of technology were the "keys to unlocking the potential of our farming industry".

But, he said, the "unduly slow operation of the EU approval process" was deterring investment and innovation into GM technology.

"We want the EU regime to operate more effectively, grounded on an objective appraisal of the potential impacts of GM crops on health and the environment," he added.

"Of course, we must be careful and base decisions on science and scientific evidence. But it is important that safe GM products should have fair access to the EU market and UK farmers should be able to use this technology where it would help them produce more efficiently and sustainably."

"We cannot wait for one manufacturer to wait for the others to catch up"

Only just starting to see the benefits of precision farming

SPEARHEAD International farm 75,000 hectares across six countries, and precision farming is playing a major part in maximising output, said chief executive Tom Green.

The company runs farms in the UK, Poland, Czech Republic, Romania, Slovakia and Serbia, all of which are linked to a single computer-based operating system.

It employs 1,163 people, all of whom are shareholders in the business.

"We have a single reporting system which allows total transparency across the group," said Mr Green.

"We could not farm efficiently without employing new technology," he said. "Of which the most important have been the introduction of no-till cultivation, satellite imagery and reducing soil compaction through GPS systems.

"However, I think we have only just started to see the benefits of precision farming," he added.

He said that amongst the issues the company was currently considering was whether it should standardise on one tractor brand across all the farms.

But he urged for there to be more 'joined-up thinking' in the field of precision farming.

"No one system can be of benefit on its own and we cannot wait for one manufacturer to wait for the others to catch up," he said.

CONFERENCE *Quotes*

"If we didn't have pesticides, 40% of our food would not exist"
Dr Mike Bushell, Syngenta

"It took 30 years for the industry to agree PTO speeds for tractors. That must not happen today"
Professor Chris Pollock

"With weather forecasting, there is lots of potential for uncertainty - which must then be quantified"
Dr Robin Clark, Met Office

FORESIGHT: THE ROLE OF ENGINEERING UPDATE

IT seems that the recent IAgrE report '*Agricultural Engineering: A key discipline enabling agriculture to deliver global food security*' is having an effect. November was a particularly active month.

The Department for Business, Innovations and Skills called for evidence to support the development of a strategy for agricultural technology to which IAgrE responded.

The BBSRC held a workshop on '*Engineering for Agriculture and Food Security*' as part of its Global Food Security programme aimed at informing the strategy for the Government's Science Councils. IAgrE was strongly represented among delegates from other disciplines across the industry.

IAgrE members have made presentations to a variety of fora on the theme of engineering's contribution to food security that have attracted fresh interest from individuals, organisations and businesses not previously associated with our discipline.

These have included senior officials at Defra, the Technology Strategy Board's '*Sensors in Agriculture*' workshop and The Young Professionals Group of the Institution of Engineering and Technology.

Likewise the HAUC / IAgrE seminar on '*Robotics for Agriculture*' raised awareness of the potential for this technology amongst specialists from other sectors.

As a further sign of mounting interest in this area the *New Scientist* has published an article on '*Farmerbots: a new industrial revolution*'.

November also saw the publication of an important and comprehensive report '*Feeding the future - innovation requirements for primary food production in the UK to 2030*' commissioned by AIC, RASE, AHDB and the NFU. The need to "utilise modern technologies to improve the precision and efficiency of key agricultural management practices" was rated of the highest priority.

The month was rounded off by Professor Simon Blackmore's inaugural lecture at the Royal Academy of Engineers, again to an audience with wide ranging interests that is reported on page 9.

Dr Bill Stout, an internationally renowned figure in Agriculture Engineering, and past President of CIGR recently heralded the IAgrE report as being much needed and long overdue.

IAgrE is keeping up the momentum of spreading our message to the wider world by co-hosting a fringe meeting with the Knowledge Transfer Network (Environmental Sustainability) under the title '*More for less*' at the Oxford Farming Conference on 2 January 2013.

PETER REDMAN

Innovation for survival

JIM CHRISTIE, reports from the Forestry Engineering Group's Autumn Symposium

THE morning session was chaired by FEG chairman John Turnbull, who welcomed the delegates to the 2012 FEG symposium.

INNOVATION

WILLIAM Mitchell made the keynote presentation. As the Design Director of 4c Design, which specialises in providing solutions to all product design problems, and enabling rough concepts to be developed through to the finished product, his presentation focused on the most effective ways of solving problems using innovation.

"The first essential is to clearly define the problem that requires a solution," suggested Mr Mitchell. He then listed a number of processes that could be worked through until a possible solution arose. It is at this stage that his company can be of practical assistance, thanks to its in-house facilities, including computer aided design, finite element analysis and a well-equipped workshop capable of manufacturing both scale models and full-sized prototypes.

To further illustrate how the process works in practice, his colleague Michael Aldridge, a product design engineer, explained the various steps in the process using an example based on a timber transport project. John Paterson, of Egger Forestry, had identified the potential to better utilise timber lorries by enabling them to carry woodchips and sawdust as well as timber, and Mr Aldridge explained the various processes involved in taking John's original idea through to the prototype stage.

The presentation was very effectively completed when, at lunchtime, a timber lorry with the first full-sized prototype of the modification was made available for inspection in the car park.

www.4cdesign.co.uk

THE FUTURE OF FORESTRY

THE second speaker was Richard Greenhous of Forestry Commission England, who presented an update on the progress of the recent review on the future of forestry in England by the Independent Panel on Forestry, chaired by the Bishop of Liverpool.

With the Government response due to be published in January 2013, Mr Greenhous's presentation highlighted the initial response by FC chair Pam Warhurst, which welcomed the report and expressed the importance of doing justice to the report for the businesses that provide jobs, the wildlife that relies on healthy woodlands, and the communities that have such strong bonds with the nation's forests.

The Independent Panel had worked closely with Defra, and the recommendations closely aligned with much existing policy, such as the *Making Space for Nature* review led by Professor Sir John Lawton.

Their recommendations also referred to the need for resilient public forest organisations with a mandate to catalyse the management and expansion of England's woodlands for the benefit of the nation.

To achieve this, the Independent Panel envisaged that a public body should be evolved alongside a cross-border capability with powers to protect and increase benefits from woodlands and forests, for the benefit of the green economy.

The recommendations also advocated that the woodlands and forests currently in public ownership should remain in public ownership, which the Secretary of State had confirmed.

Mr Greenhous finished his presentation by explaining that the Commission / Defra's role would now be to provide support and advice to ministers in drafting the Government's response. He invited the audience's views on how the Independent Panel's recommendations might be achieved.

richard.greenhous@forestry.gsi.gov.uk

AN INTRODUCTION TO INNOVATION

THE third presentation of the day was by Dr Geoff Freedman.

After explaining the differences between innovation, invention and development, Dr Freedman identified the impressive list of innovations already adopted by the industry, not only in engineering, but also in arboriculture, silviculture, timber processing, data processing, communications, business management and in the utilisation of timber products.

Dr Freedman closed his presentation by stating that, "Since 1950, the production of timber per man has risen from 2 cubic metres a day to 33 cubic metres a day, but in order to compete with steel and concrete, we need to maintain a 2 to 4% increase in output year on year. 'Engineering' has been key for much of the industry's past innovations, and must surely be the key to the future."

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UNMANNED AERIAL VEHICLES

DUNCAN Ireland from the Commission's Forest Research next provided an introduction into the emerging technology involving the use of unmanned aerial vehicles (UAVs) for high resolution aerial photography over small areas of forest (circa 100 hectares per flying day).

Mr Ireland began by describing the capability of the Swedish built 'SmartOne' aircraft. It had the capability to fly automatically over a predefined area while taking high resolution (5cm per pixel) photographs to give time-critical information. It was designed to withstand frequent use in typical forest conditions.

Experience in use showed that the level of resolution had exceeded expectations, and showed better detail than traditional aerial photography - well suited to windblow assessment, biosecurity monitoring, site planning and vegetation monitoring.

Currently, battery life and weather conditions are the controlling factors in successful use. The greatest improvement to image quality can be achieved by careful flight planning, reducing propeller vibration, and UAV maintenance. Steep terrain offers the most challenging conditions, due to unpre-

The SmartOne UAV

The prototype 'chipbag'

dictable air movements, but for the majority of forest sites, their remoteness from built up areas makes the technology ideal for such applications.

www.smartplanes.se/technical/specifications

UAVs IN IRELAND

JOHN Lyons of Coillte Forest next gave a presentation on their experience when using the same equipment as the previous speaker over a 59-day period.

Mr Lyons explained that since a wind speed over 18.5km/h was too strong, and that performance was at its best with wind speeds below 14.5km/h, flight was only possible on 37 days. In fact, only 7 days were utilised, due to other factors not attributable to the aircraft technology. Uploading and downloading the images could take an hour. The percentage of unusable images was initially 5% but dropped to 3% as the operator became more experienced.

Mr Lyons concluded by saying that the project is currently investigating how to integrate the aspects of this technology that still remain to be evaluated.

www.coillte.ie/coillteforest

TREE BREEDING RESEARCH

DR STEVE Lee of Forest Research made the first presentation of the afternoon, on tree breeding, describing many projects being undertaken by various international research facilities.

Dr Lee explained that since 1960, new research tools have made it possible for a substantial increase in Sitka spruce's ability to satisfy the home market by increasing both volume and the percentage of green logs.

With regard to broadleaf species, Forest Research was working with the Future Trees Trust and had been able to identify better seed sources, species and new, improved provenances, leading to better disease resistance and climate tolerance.

These new technologies will also mean tree breeders can respond to new demands much more rapidly, shortening generation turnover and reducing the wait for improved material to be planted in the forest.

Technological advances in software and computer capacity are enabling statistical theory to be more effectively applied, leading to more accurate selection of the 'best trees'. This has enabled complicated traits like 'wood quality' to be broken down into their individual components, such as microfibril angle, latewood, earlywood, lignin and cellulose content, each of which has potential economic uses.

In conclusion, Dr Lee predicted:

- Big, hi-tech developments.
- New traits, new species, new tools.
- More international exchange of technologies, ideas, materials, people.
- Resistance breeding.
- Possibly genetically modified trees.

www.forestry.gov.uk/forestresearch

TIMBER CONSTRUCTION

JOHN B Wood, a reader in architectural technology at the Napier University School of Engineering and the Built Environment, made the next presentation, entitled *Innovation in Timber Construction*.

Mr Wood's presentation gave an insight not only into innovations in the field of ever-expanding uses for timber in construction, but also into the work being done in the proving and evaluation of building systems that improve the performance of timber-built structures.

Case studies included the RD-DCR restraint bracket, designed to avoid disproportionate collapse in multi-storey, timber frame buildings; the Wallcap that reduces cavity-convected heat loss, and improves sound insulation and airtightness; the Icopal Bridgestop, for use on brownfield sites, offering a saving of 20% on substructure costs while offering other substantial environmental benefits, and the ITW-Cullen AWS acoustic wall strap, offering enhanced acoustic performance, twice the structural strength, while using 30% less steel, and giving improved build tolerances.

Much of the proving work was carried out in a facility mysteriously named 'Hangar 17'. This is of a size that allows the performance of substantial, whole buildings to be measured.

Already, this work has shown its value with many of the innovative aspects being incorporated in building projects, typified by the nearby Springfield Properties PLC's low-cost housing project.

www.napier.ac.uk

HARVESTING ON STEEP GROUND

THE next two presentations on steep-ground harvesting are interlinked to show how site operational management, the contractor and the machine manufacturer are contributing to this project to make an invaluable contribution to future timber harvesting under Scottish conditions.

Kate Tuer, Project Manager of Forest Enterprise Scotland's steep-ground harvesting project, began by explaining the urgent need for the investigative work being done by this initiative. An estimated 7.6% of FES's annual production is scheduled to come from unstable, steep sites, where, because of the harvesting difficulties, the timber is over-mature and vulnerable to wind-blow. These circumstances create a high potential risk for FES being held liable for accidents involving timber falling across public roads.

The objectives of the project were to research the advances in technology and their associated training requirements on all aspects of steep-ground working, and to provide proven technical data and costs while harvesting the trial site safely and economically.

Preliminary desk evaluations had eliminated climber and winch-assisted conventional harvester / forwarder systems, tractor and trailer mounted skyline systems, and large imported skyline systems. The conclusion was that excavator-based skyline systems offered the best option, and although the UK availability was severely limited, there were machines with competent operational teams locally available.

Ms Tuer described the trial site at South Laggan Forest as having an average gradient of 80% on a mobile soil with evidence of previous landslides. The average tree size was 0.46 cubic metres with a maximum tree size of 10.88 cubic metres.


Kate Tuer

For working on this site the skyline of choice for the trial was an A&B Services system based on a 22-tonne Daewoo excavator with an Igland 8000 winch with a pull capacity of 3.5 to 5 tonnes, a lifting capacity of 2 tonnes, and a maximum range of 500 metres. The carriage of choice was a Koller USKA 1.5. On the landing, a Timberjack 1410D on rubber tyres (to reduce damage) stacked and cleared the landing area, and a Caterpillar 320cl excavator with a John Deere 758 harvesting head processed the timber. On the hill, three men worked as both fallers and chokermen.

The output was measured as varying between 30 and 147 cubic metres a day.

Ms Tuer then summarised the operational findings evident at this stage of the project.

They were that the output from the skyline element of the operation could be improved only by increasing the winch pull and drum capacity, and by eliminating the need for mechanical braking systems with their attendant overheating problems on downhill extraction. Consultation between the contractor, Calum Duffy, and Gordon Aitken of A&B Services confirmed that

continues over

these changes would require an upsizing of the weight, hydraulic power and engine power of the base excavator.

(While the other aspects of the project continued on site, the design and build of the up-rated machine was begun by A&B Services.)

The other aspects of the project included:

- Alternative felling methods using explosives.
- The use of tree jacking systems.
- The use of nylon chokers and Deema ropes.
- Evaluation of methods to tie back trees post felling.
- Brash and whole site management.
- The establishment of operational cost per cubic metre and per hectare.

Although it was clear that the first item was not a practical method for production felling due to stem damage, the next two did show real benefits, but will have to be approved by HSE, FMOCS and AFAG.

Ms Tuer gave an assurance that a full report will be issued when the project is completed.

www.forestry.gov.uk/forestry/HCOU-4U4HZK

EXCAVATOR SKYLINE CONVERSIONS

GORDON Aitken of A&B Services next presented his paper entitled *Building The Next Generation Skylines* which opened with a brief background account of the evolution of excavator based skyline systems.

With many contractors using excavators on steep harvesting sites to build hard-standing, repair roads and build forwarder tracks, it was an obvious step to also attach a mast and winches so that the machine could harvest areas of the site too steep for the custom built harvesters. Starting from this concept, it was evident that, by using the boom and bucket to stabilise the rig, set-up time was not only quicker, but safety was much improved since it eliminated the need for tree stumps as anchors.

Additionally, since the excavator is self-propelled and able to build its own access ramps and landing area, it has many advantages over tractor and trailer mounted systems; so the future of the excavator concept is assured.

A&B Services had over its early years converted many base machines to suit particular customers' preferences, and had introduced the use of on-board hydraulic pumps to drive the winches. Control was facilitated by enabling the excavator's controls to double up as winch controls at the flick of a switch.

A&B Services also introduced many other improvements to guard the machine and its track assemblies against forestry site conditions. Other options include the use of cameras to allow the operator to have mast-top views of the site or a view of the winch drums from within the cab.

Skylining in New Zealand

Gordon Aitken concluded his presentation by indicating that all of these facilities will be incorporated on a Volvo 360 excavator currently under conversion, and that he was confident that the 279-horsepower, 40-tonne machine with up-rated hydraulic winch drive would extend the operating performance to a range of 600 metres, with 7-tonne empty drum line pull, faster set-up times, and much reduced downtime.

abs-scotland.co.uk

MADILL YARDER

JOHN E Macdonald of Scotwood Macdonald reported on his recent visit to New Zealand where he took advantage of an opportunity to observe skyline harvesting on a grand scale with a Madill 171 yarder. In New Zealand the main commercial species is Radiata pine, and over 30% of the 24 million cubic metre annual output is extracted by cable logging.

Trees average between 2 and 3 cubic metres and are felled motor manually, chokered and hauled to a landing bay by the skyline. The landing bay area is large enough to accommodate the excavator that drags the trees through a fixed de-limber before they are graded and cross-cut motor manually into 14 specifications. They are then stacked, ready for transport. Output was between 1500 and 1600 tonnes per 5-day week. The skyline worked set-ups between 250 and 400 metres, with a 20-minute target set-up time for each move.

At a second site a Madill 123 yard arm with grapple choker, backed up by four excavator based machines, was extracting a comparable volume.


The speakers, FEG committee, and the prototype 'chip bag'.

Mr Macdonald concluded his report by observing that this high input operation was made profitable by the large tree size, and having sufficient loading/stacking areas. Also, both operations were being carried out for competitive prices equivalent to approximately £16.50/tonne.

john@scotwoodmacdonald.co.uk

TRACTION ASSISTANCE

CRAIG Grant, key account manager with Bosch Rexroth, delivered the next presentation outlining a hydraulic traction assistant (HTA) system recently developed by his company.

The HTA is aimed at road-going vehicles that require improved traction for parts of their duty cycle, but which cannot justify full, permanent multi-wheel drive.

Essentially, an HTA consists of high-torque, radial piston motors built into the front axle hubs. When not required, the pistons are withdrawn from the cam by permanent magnets, allowing the motors to freewheel without drag.

The motors are powered through a closed loop by the output from an axial piston variable-angle swash-plate pump.

The HTA system is offered in five options according to the required performance, and at present has to be fitted by the vehicle manufacturer during build; but further development is in hand to supply the system in a kit suitable for retrofitting.

Mr Grant concluded his presentation by showing an impressive video clip of a DAF XF105 FT 4x2 demonstration vehicle that generates 6,400Nm from each front wheel when the HTA system is deployed. On this vehicle the system can be used at up to 30 km/hr.

www.boschrexroth.co.uk

AFTER a brief and very informal question, answer and discussion session with the speakers, the symposium was very ably summarised by the president of the Institution of Agricultural Engineers, Andy Newbold.

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Activities of the DOUGLAS BOMFORD TRUST

An update

RECENT AWARDS MADE BY THE TRUST

Over the past few months The Trust has been working towards making two major new awards as follows:

- To Harper Adams University College, a donation of £150,000 towards the costs of a new agricultural engineering building - and it is hoped that construction will start shortly. The Trust has provided one component of a larger investment package needed to enable this major building project to go ahead and is very pleased that The University College has been successful in securing all of the funding needed. Trustees are looking forward to working with Harper Adams University College as the facilities provided in the new building are developed over the next twelve months and beyond.
- To The Royal Agricultural College to jointly support the establishment of a chair in Applied Farm Mechanisation and Management. A funding package extending over a five year period has been agreed in principle with The College. Trustees were very pleased to learn that Dr Toby Mottram has been appointed to the post and look forward to working with Toby on this exciting new project.

CHANGES TO THE BOARD OF TRUSTEES

At the Annual General Meeting of The Trust held in October, The Board was pleased to welcome **David White**, a senior lecturer in the Engineering Department at Harper Adams University College as a new trustee.

Ray Clay, who prior to becoming a trustee was a senior design engineer with JCB working on the Fastrac, retired as a trustee having served on the Board for a period of six years. Dr Malcolm Crabtree, incoming chairman of The Trust, thanked Ray for his input to the work of The Trust indicating that his detailed knowledge of agricultural vehicle design and his great enthusiasm for the subject will be greatly missed by The Board.

DONATIONS AND LEGACIES

The Douglas Bomford Trust has no income other from investments derived from Mrs Bomford's initial legacy and other donations to The Trust since its formation in 1972.

For those who recognise a continuing need for agricultural engineering activities, including research studentships, to be supported then a legacy or donation to The Trust is an excellent way of contributing to this support. There are tax-efficient ways of enhancing such donations as The Douglas Bomford Trust is a registered charity.

Further details of how to make a donation or legacy can be found on *www.dbt.org.uk* or can be obtained from the Secretariat.

Sponsored student project work

ONE of the projects that The Douglas Bomford Trust is currently supporting concerns soil cultivations and the addition of mulches to minimise erosion and run-off in UK asparagus fields.

This project work, which started towards the end of 2011, seeks to:

- Investigate whether shallow (< 350 mm) soil disturbance without mulch can significantly reduce runoff volume, and associated nutrient and sediment loads.
- Investigate whether mulch application (type, rate and method) can significantly reduce runoff volume, and associated nutrient and sediment loads.
- Evaluate whether mulch application (type and rate) in combination with shallow soil disturbance can significantly reduce runoff volume, and associated nutrient and sediment loads.
- To evaluate the effects of tine configuration (geometry, arrangement, and depth) on soil disturbance and machine dynamics.
- To appraise critically the practicality of the different soil management systems in asparagus production

Currently 30 experimental plots have been set up on a commercial farm in Herefordshire (*Fig. 2*) and have been monitored throughout the asparagus growing season from bed formation to fern.

The extreme rainfall events that have occurred this summer have meant that all plots produced a large volume of run-off and the resulting erosion highlighted the need to address the problems being addressed by the project (*Fig. 1*).

The PhD project is being conducted by Joanna Niziolomski at Cranfield University with funding support from EPSRC and Cobrey Farms (a commercial sponsor) in addition to The Douglas Bomford Trust.

In addition to the field trials, Joanna is using experiments in the soil bin at Cranfield to examine the degree of soil disturbance and the draught forces associated with different tine arrangements and operating parameters (e.g. depth).

This part of the study aims to maximise soil disturbance to improve water infiltration while minimising damage to asparagus roots that could result in Phytophora and Fusarium infection.

Fig. 1. Gully formation in an asparagus field - the worst case scenario that the project work seeks to address. Furrow run-off causes deep rills which can merge together to form deep gullies. Photographs taken in Herefordshire in May 2012

Fig. 2. Erosion plots setup at Cobrey Farms

www.iagretech.org

UPDATE

WINTER 2012

David Kirschner appointed to take on LTA role

DAVID KIRSCHNER has been appointed manager and coordinator for the LTA scheme by the joint-industry Land-based Engineering Training and Education Committee (LETEC).

He said, "I am thrilled to take this opportunity and will do whatever I can to further the development of LTA for the benefit of our industry, its employers, their staff and the suppliers represented by the distribution networks.

"Being wholly independent and having experience in both the distribution and manufacturers supply chains I feel well placed to apply an unbiased approach."

He added, "For those of you that do not know what the objectives of LTA are, they are as follows: -

- **Raise the profile of the industry and the career prospects within it.**
- **Aid retention of skilled staff by offering a career pathway recognising an individual's professionalism.**
- **Attract and develop technicians capable of meeting the challenges placed upon us by today's and tomorrow's technological advancement.**
- **Ensure that the high standards of service demanded by our customers are maintained and advanced.**
- **Enhance efficiency and profitable growth of businesses within the land-based engineering industry and those of our customers.**
- **Create an industry recognised benchmark of skills, knowledge and expertise.**

PROGRESS

"IT'S also not rocket science to conclude that to support the technology already in place, let alone the technological advances awaiting us in the various R & D departments around the world, industry needs to focus on developing a new generation of technicians.

"The elephant of technology that was once a small spec on the horizon is now upon and as optimistic as I am I cannot see the back room geniuses developing 100% reliability or self healing technology.

"Meanwhile, whilst we wait for the impossible to happen, LTA supporters are demonstrating their foresight by getting behind the LTA technician's career pathway.

"Congratulation to **Merlo UK** Ltd for achieving LTA accredited training provider status thereby supporting technicians within their network who can now gain LTA credits from their excellent training and progress towards professional recognition through the independent LTA route.

"Congratulations are also in order for **Krone UK** Ltd who have entered into the process of having their training LTA accredited. The commitment and investment in training by companies such as these two is to be applauded. It is an essential part of developing the technicians of tomorrow.

"LTA encourages and recognises this continuous professional development as being a vital component in the armoury required for our industry to face the challenges of the future.

"Barony College, Brooksby Melton College, Easton College, Wiltshire College and Reaseheath have all undertaken to register their full time land-based engineering students at LTA 1.

"These colleges see the potential of LTA to encourage a higher calibre of young people into an industry that offers a career pathway rather than a dead end job.

"Progress is being made by industry for industry.

"If you are a college wanting to become a recognised LTA 1 registration centre or a manufacturer providing training for your network and require further information on what is involved in becoming an LTA accredited training provider, mail me."

mrdkirschner@btinternet.com

Technician Award to David

LTA member, David Hollingshead of Sharmans Agricultural has finally received his Technician of the Year Award. He could not be present at the Industry Pro Awards dinner at Windsor in September where it was accepted on his behalf by Stuart Minter of John Deere.

Recently, *Landwards* editor and publisher of *Service Dealer*, Chris Biddle, visited Sharman's branch at Grantham to hand over the Award to David accompanied by Group Service Manager James Madge and Grantham Service Manager Andrew Woolerton.

Last April, David celebrated 50 years as a technician with the company having joined from school at the age of 15. His father was in farming locally and suggested that David gain experience in mechanisation, before perhaps rejoining the farm. However, David quickly grew to love the job and stayed.

Commenting James Madge said, "It is great for the newer members of the service team having someone with so much experience on hand. David can fix almost everything, but has also taken to the new diagnostic equipment we use now like a duck to water!"

L to R: Andrew Wollerton, David Hollingshead, Chris Biddle and James Madge

Graduation for Claas apprentices

Completion of courses held at Reaseheath and Barony

GRADUATION ceremonies were recently held for the latest group of Claas apprentices to complete their four-year studies at Barony College in Scotland and at Saxham for the students from Reaseheath College in Cheshire.

The graduation ceremony at Barony marked the completion of the course for the first group of students to start at the college four years ago. Their achievement was witnessed by their friends, family and dealer representatives, together with the most recently recruited apprentices who joined the Scheme in August and will continue in the footsteps of the graduates.

Claas is still the only major land based manufacturer to offer a specific apprenticeship course based in both Scotland and England. Demand for the course in Scotland has been consistently evident not only from dealers in Scotland and Northern England, but now also in Ireland, and runs in parallel with the course based at Reaseheath College

This year, a total of 21 students are joining the Apprenticeship Scheme. Over the four years they attend Reaseheath or Barony, they will work towards a National Diploma in Land Based Technology, plus they will gain advanced technical and industry certificates that have been introduced by Claas.

These elements are all focused at a practical level which is applied through the students' dealerships by ongoing workshop and field experience. In addition to this, the Apprentices also have exposure at the company's headquarters in Harsewinkel, Germany and at the UK headquarters at Bury St. Edmunds, Suffolk

Throughout their time within the Claas dealer network, the training and development pathways available to young technicians are progressive and aligned with the Landbased Technician Accreditation (LTA) Scheme. This sees the apprentices enrolled at LTA 1 at the start of the Apprentice programme and then upon graduation they become eligible for LTA 2 (Service Engineer).

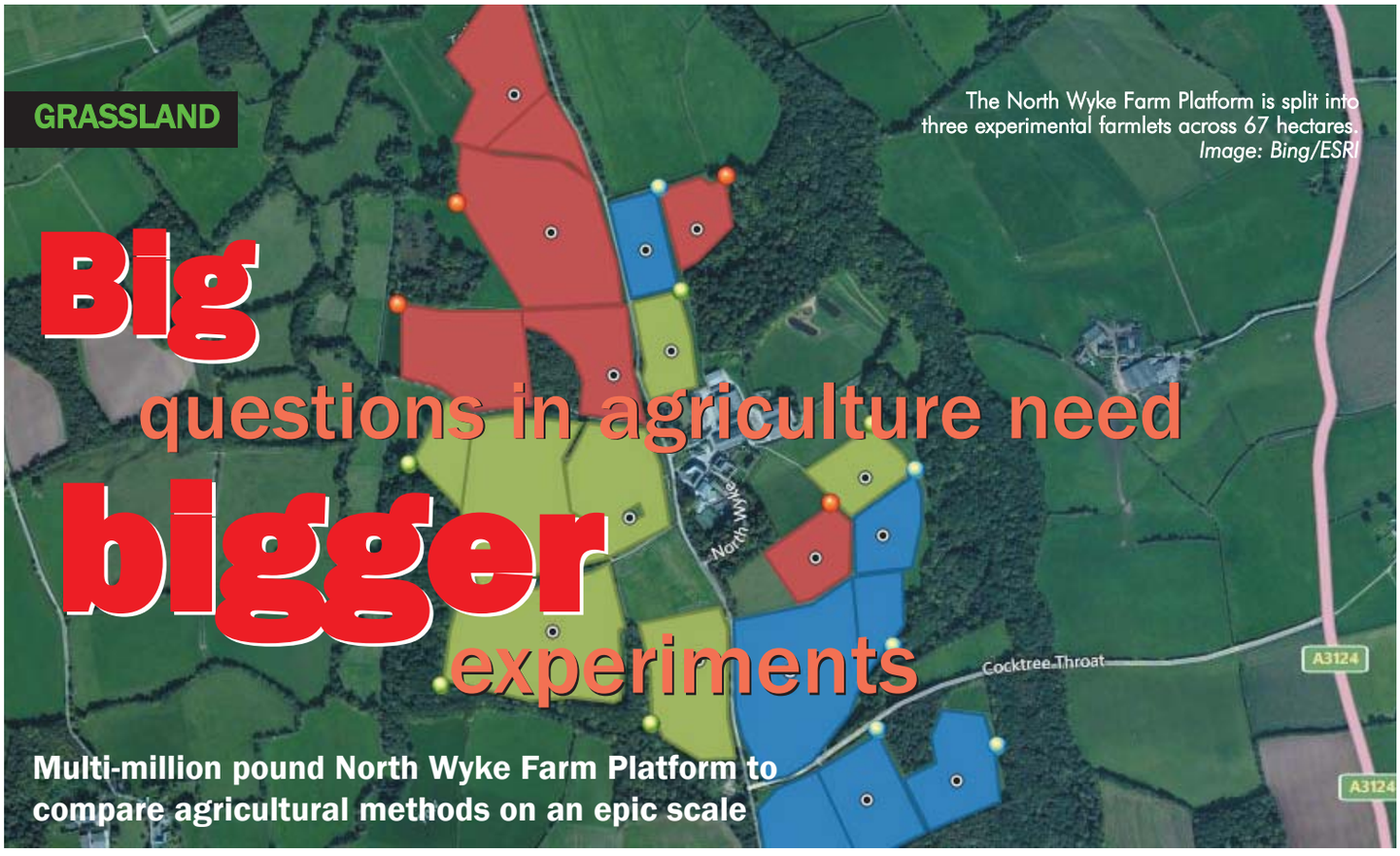
Subsequent dealer experience and Claas training can see them achieve LTA 3 (Master Mechanic) or even LTA 4 (Master Technician) status.

Barony intake: Students starting their training at Barony College are: Kevin Killeen (DH Farm Machinery, Galway), Graham Grant (Erwin Agricare, Antrim), Seamus Finnegan (Leinster Farm Machinery, Meath), John Mattimoe (Alan Douglas Machinery, Meath), Cameron Brownlie (Sellars), Ross Butchart (Sellars), Iain Birnie (Sellars) and Michael Hailey (Rickerby).

Barony Graduates are Andrew Ellis, Stuart Reid, Jack Wright and Michael Stronach, all from Sellars, and Chris Benoit, Jamie Henderson and Mark Bell from Rickerby.

Reaseheath intake: Students starting their training at Reaseheath College are: Tom English (Manns), Simeon Warren (Manns), Kaine Green (Kirby), Henry Bruce (Southern Harvesters), Jason Burt (Mill), Charlie Langston (Mill), Harry Steer (Marsh), Matthew Ashton (Marsh), Chris Spensley (Seward), Brett Bargery (Hamblys), Ian Woodward (Sharnford Tractors), James Foster (Oliver) and Declan Reynolds (Ellis Dawe).

Reaseheath graduates are Sam Scrowston (Seward), Dieter Thresh (Marsh), Jamie Ashton (Manns), Liam Eyres (Kirby) and Rhydian Davies (Riverlea).



The North Wyke Farm Platform is split into three experimental farmlets across 67 hectares. *Image: Bing/ESRI*

Big questions in agriculture need bigger experiments

Multi-million pound North Wyke Farm Platform to compare agricultural methods on an epic scale

Imagine a study comparing the productivity of entire farms in a grassland ecosystem, recording the chemical constituents of water running from each field, detailing every input that goes onto the ground before finally measuring animal production. Now multiply that complexity by three contrasting farming systems and you're close to the scale and ambition of the North Wyke Farm Platform (NWFP).

SET in the Devon countryside at North Wyke, a part of the Rothamsted Research institute that receives strategic funding from BBSRC, the NWFP is one of the largest experiments underway in the UK and a unique project designed to compare different approaches to sheep and beef farming on forage yield, water and air and soil quality

"The North Wyke Farm Platform is a facility that allows researchers to better understand aspects of the productivity and sustainability of grassland science and farming systems," says Head of Site at North Wyke Dr Phil Murray.

Officially launched in summer 2012, the farm platform is a BBSRC National Capability and funded via a national capability grant to provide a strategically important resource for the UK bioscience community. "The NWFP will help to enable researchers to tackle some of the biggest questions for food security, which is one of BBSRC's top strategic research priorities," says Dr Jef Grainger, Strategy and Policy Manager for the Agriculture, Food and Environment Unit at BBSRC.

Growing more food using fewer inputs, such as fossil fuel based fertilisers, is a major challenge in ensuring food security whilst reducing the negative impact that agriculture can have on the environment. The NWFP is now set to begin collating data which, Murray says, will ultimately provide a background and evidence for agricultural policymakers and policy development in the UK.

AS YOU LIKE IT

THE NWFP covers 67 hectares and specifically looks at the agri-environmental footprint of beef and sheep farming.

The area has been sub-divided into three farmlets. The first serves as a control where conventional livestock practices will continue, such as using inorganic fertilisers to optimise grass growth for the yearling beef cattle, and sheep, to feed on. The second farmlet will largely replace fertilisers with nitrogen-fixing legume crops, such as red and white clover which can transfer plant growth-boosting nitrogen from the atmosphere to the soil via symbiotic bacteria living in their roots.

"We'll be able to compare optimal use of nitrogen fertilisers against biological fixation from legumes and see the impact that has on production," says Murray. "We want to optimise the production from our grasslands, but of course there's an environmental impact and the trade-offs are something we can look at."

The third farmlet will trial innovative species and varieties of plants, especially those being developed by the Institute of Biological, Environmental and Rural Sciences (IBERS), a sister BBSRC funded Institute. Examples include high-sugar grasses and deep-rooted plant varieties to lock carbon away in the soil and provide a controlled release of soil water in grasslands. This treatment will allow a greater degree of intervention and finer adjustment, allowing for precision farming techniques to be measured for example.

"The overall aim is to improve grassland productivity by optimising production from the three systems," says Murray. "Because we have the three contrasting systems, farmers will be able to see how they might use the outputs from the research to improve their own productivity."

The research aims to be as relevant and applicable to livestock farmers as possible, down to the last detail. For instance, at the farm platform, cattle and sheep will be housed separately during the winter, bedded on straw, and the farmyard manure produced will be returned to each respective farmlet.

Murray adds that they have established a group of farmers who will act as a 'sounding-board' for how they are managing the farmlets and who will ultimately champion the work to their peers.

MEASURE FOR MEASURE

THE big idea of the farm platform is to record inputs and outputs that go into, and come off each farmlet. But measuring what comes off each farm is a more complex issue than just weighing the animals reared to get a measure of productivity - many nutrients are washed away by rain for example.

This is where the design, layout and uniqueness of the site come into play. Most of the site is set against a natural slope with water-impermeable clay underneath, meaning that all the water falling onto and flowing off the site can be captured by simple structures called French drains. These

. . . The overall aim is to improve grassland productivity by optimising production from the three systems

Head of Site at North Wyke, Dr Philip Murray, pictured here speaking at the farm platform opening in 2012. *Image: BBSRC*

Simple but effective: French drains at North Wyke use perforated pipes to capture and funnel water to special flumes. *Image: North Wyke*

stone-filled trenches contain a perforated pipe into which the water flows. The drains lead to 15 flumes where water-measuring instrumentation records the physical and chemical characteristics of the water that passes through.

"We can make many comparisons in terms of water quality, for example for nitrate, phosphorus, ammonium," says Murray. "And we're also measuring greenhouse-gas emissions from the system. The environment is a big issue within agriculture today, and on the farm platform we have full control over the inputs and outputs that we can measure."

At each of the 15 flumes, a data-reading station sends the water quality information and more than 200 instruments are deployed across the NWFP including those measuring rainfall, soil moisture and soil temperature. These are all reporting back to a central server every 15 minutes and the system can be monitored, controlled and adjusted from anywhere on the World Wide Web.

To obtain accurate data over the project's lifetime, it is critical to calibrate the multi-parameter water sensors. "One set of sensors is out in the field while the other set is back in the lab being calibrated," says Bruce Griffith of North Wyke's Sustainable Soils and Grassland Systems department. "We swap them every fortnight."

Griffith and colleagues have spent much of the past year testing and validating the site in readiness for the next phase when the new treatments begin. During the 2011-12 baseline period the team has been monitoring the site to understand more about the soils' nutrient content and structure. To this end, they've overlaid a grid over the farm platform with an intersection every 25 metres where they've taken a soil sample. This data is mapped using Geographical Information Systems (GIS) which are used as visualisations and to integrate information on local geography with statistics and analyses for all the NWFP data.

"Over 67 hectares that gives us more than 1000 soil samples," Griffith explains. "They are dried, ground and processed. They then go to the labs for analysis for total carbon, nitrogen, phosphorus and potassium measurement, as well as other factors such as bulk density analysis."

In fact, the team is trying to balance out some parameters such as pH, phosphorus and potassium levels over the whole site. "It's so the three farmlets we're comparing are in the same agronomic state in terms of productivity, fertility and going to grow similar yields at the start," he says. "Then we can change the management and compare the three systems and understand when they are similar, and if they are not, why not."

A series of drains and flumes measure chemical characteristics of water running off the farm. *Image: North Wyke.*

ALL'S WELL THAT ENDS WELL

THE NWFP is certainly an ambitious project built on an industrial scale so that the results can be applied to real farming systems that operate at similar scales.

Construction of the infrastructure cost around £3.5M, which includes all 9.2 km of French drains, water quality measuring stations, and the instrumentation and laboratories. Murray adds that they have a National Capability grant which will run the project for the next five years.

"As a national capability, we're providing a background of core data against which other researchers can come and complete their own investigations," says Murray.

Other researchers include Defra scientists working on the Demonstration Test Catchment (DTC) project. Spread across three large river catchment areas in England, the DTC also aims to monitor environmental parameters in response to small-scale field manipulations.

The farm platform at North Wyke thus provides a unique farm-scale 'research hotel' for agri-environmental activities to attract researchers from different communities and disciplines to promote new ideas, better address key issues in sustainable agriculture, or to tackle old problems in innovative ways.

"This will ultimately be critical for informing land management decisions and policies that do not simply move particular issues for sustainability to another part of the farming system, and which take account of benefits and costs across the full range of services provided by agricultural landscapes," says BBSRC's Jef Grainger.

"The NWFP presents a major opportunity for UK researchers to build on existing excellence and take a lead in this crucial area."

Further resources

WEB:
www.rothamsted.ac.uk/northwyke/FarmPlatform.php
www.bbsrc.ac.uk

TWITTER:
@FarmPlatform

YOUTUBE:
tinyurl.com/c4n64lf

Future thoughts

GEOFFREY WAKEHAM considers how British farming might change in the future and looks at alternative aspects of the industry

WELL goodbye to 2012, the Jubilee enjoyed by millions, the Olympics dominated a short period of the summer, but for the Institution of Agricultural Engineers the most significant event was when the Chief Scientific Officer acknowledged that without Agricultural Engineers all the plans to produce 40 to 50% more food over the coming few decades will fail to meet their targets. Since then significant positive signals and sums of money have emanated from the government for our industry.

Over the past five thousand years or more the British countryside and farming systems have evolved and changed. At times these changes were major and short lived, or gradually saw new landscapes and small but significant developments in ways to manage the production of agricultural outputs. How might British farming change over this period and what will be required from our industry?

For the sake of this article, I will look at various alternative aspects of the farming industry starting with the cultural systems.

CULTURAL SYSTEMS

TO me there are three alternatives available; monoculture, multi-culture and omni-culture.

Monoculture is clearly the dominant system of producing agricultural crops and is well understood and supported by major manufacturers of machinery and systems.

Critics point to the problem of disease and pests quickly spreading through the crop; control is becoming more difficult and is approaching a crisis in some areas. Restrictions and public perceptions mean that in the future greater precision of a restricted range of materials will have to be applied to increasingly resistant pests, etc.

Soil damage by current heavy equipment is an increasing limiting factor with current tillage practices. Precision farming systems are being developed and much of the technology is available.

There are natural systems where monocultures have existed for hundreds of thousands of years but these have usually come about due to harsh climatic conditions. Examples of such systems are the mangrove forests of Bangladesh and the alpine evergreen beech forests of New Zealand.

Better systems of locating a problem and identifying the nature of that problem are required. This may be lack of water, nutrients or pests and diseases. Changes in thinking regarding machinery are needed to reduce weight and lessen ground pressure; faster lighter equipment?

Multicultural systems where different crops are grown in close proximity are favoured in some instances, as they are better able to make use of available resources and are less prone to pest and disease problems.

An example of such a system would be fruit trees shading delicate drip irrigated crops, separated by deep rooted drought tolerant cereals. Such systems are well understood and where practiced are supported by the necessary infrastructure.

Planting a range of cultivars that are compatible for synchronised planting and harvesting, as well as having a common usage, such as animal feed, formed part of farming systems in the past and provided better pest and disease control than monocultures.

Use of short or long rotations can be considered under this heading and with long term rotations can significantly reduce problems of weed, pest and disease build up. However, with cereals and rape accounting for over 80% of arable crops in the UK such rotations are problematic.

Current feed cereals will have to be replaced by alternatives such as Soya, if suitable strains can be made available for growing in the UK, along with beans and peas and maize.

If such systems are adopted in the UK, driven by climate change and limitations to monocultures, then there will be a need to provide the necessary infrastructure to support them. This will include machinery and technical support that may not be currently available.

Omni-culture, where a wide range of different plants grow in close proximity, should make maximum use of natural resources and once stable, resist the ravages of pests and diseases.

Natural systems that come close to such systems are temperate deciduous forests and some grassland. The problems associated with maintaining and harvesting such a cultural system would seem to limit them to forage or bio mass energy crops, and

> . . In the future should regulations be driven by more logical thinking and be largely supported by the industry they refer to?

they then would become closer to a multi-cultural cropping system.

Were such systems adopted to produce forage crops then current machinery should be available. However, a system that aims to produce biomass as a fuel, will mean the production of high output equipment able to cope with a wide range of material ranging from small trees to fine grasses.

FINANCIAL SUPPORT SYSTEMS

ACROSS the 'first world' agricultural industries are supported by the tax payer in a number of ways.

The resulting industry structure and commercial efficiency in one country can differ significantly from its neighbour due to the nature of this support. However, much of agricultural activity is carried out at subsistence level, with any support coming from NGO's and crisis funding when major droughts or flooding leads to widespread food shortages.

Farming at World prices with little or no support leads to instability in food availability and price. Food then becomes subjected to speculation by powerful financial organisations more interested in making a profit, than improving the general availability of food or the profitability of individual farms. The poor of the world suffer while in most rich nations, where food is a relatively small part of an individual's budget, such fluctuations are absorbed and accepted.

In the few advanced nations where no support is provided, then farming can show massive increases in efficiency. New Zealand dairy and sheep farmers are 30 to 40% more efficient than UK producers and market their products around the world. They influence world prices and hence UK farming, as witnessed by dairy farmers in the summer of this year.

Tax payer secondary support, such as using waste straw burning power stations and electricity production from gasses produced by anaerobic digestion of farm and food waste, end up giving value to what were in the past of little or no worth to the farming community.

Producers of farm machinery need to be able to adjust production and supply to meet fluctuations in demand that will follow periods of high or low farm income. Efficiency is achieved by reducing staff levels, use of automated systems and concentrating on market requirements. If selling into such markets then equipment and services need to match these criteria.

AT the current rate of progress this *Wakeham's World* will not be ready for publication till Christmas 2013 let alone Christmas 2012.

For that reason it is necessary to concentrate on two areas only. I have six pages of notes I could write from but this just illustrates the difficulties of all the future possibilities thrown up by the changes in the world economies, farming systems, climate change, taxation and government regulation (EU) amongst many others. Because of the long time I have been out of circulation within the industry this will possibly be my 'Swan Song'.

We need to be looking for someone younger and more involved in the impact of our technology on the rural scene.

I will, therefore, concentrate on industries reaction to some of the EU's less rational activities that impact on agricultural engineering and agriculture in general. As 2012 is designated by the United Nations, Year of the Co-operative, I will look into the future on how we might respond in this area.

In the past, most regulations and restrictions on our industry would have been driven by commercial or technological needs.

The EU appears to drive its regulatory programme based on politics and popular perception. Starvation and its negative consequences are well known, as are the benefits of agri-chemicals and plant breeding, but the EU appears to want to restrict the uses of agri-chemicals and also has ambivalence towards GM crop development. Without the development of new agri-chemicals, and the breeding of crops able to withstand harsh conditions, then the task of feeding the growing population will be made that much more difficult.

Recent developments in tractor technology have been largely driven by the EU's pollution requirements from diesel engines, rather than improving the overall performance of the machine. Let us assume that these costs amount to 1 monetary unit on tractors produced, while for 'Chelsea Tractors' and other domestic diesel vehicles it would approximate to 0.014 monetary units.

If this is true, then this is an unreasonable burden on tractor manufacturers.

As far as pollution saving goes, if we assume agricultural tractors produce 1 unit of pollution, which is largely dissipated in lower populated areas, then the equivalent for our 'Chelsea Tractors' is 35 units of pollution discharged into urban environments, such as on the school run. This seems an illogical and expensive burden to put on food producing equipment.

In the future, should regulations be driven by more logical thinking and be largely supported by the industry that they refer to? Should tractor manufacturers, agri-chemical companies and crop breeders withdraw from the European markets and try to claw back some of its losses to countries like China and India?

Some little time ago, I listened to a program on *Radio 4* that investigated the longest commercially trading organisation in the United Kingdom. Subsequent searches of the net have failed to turn up any reference of this organisation.

As I remember it, however, it was made up of a series of independent businesses working together to service some particular market, i.e. transport. The businesses continued to trade independently and even possibly in different areas in their specific expertise, i.e. a local cabinet maker may provide a service that maintained the cooperations wagon fleet.

Such an organisational model might serve British agricultural engineering in giving it the clout to undertake larger and wider ranging projects than is currently possible. Individually the companies would find it difficult to tackle overseas markets, but by drawing together different expertise, including from outside the industry, they maybe able to tackle such a task more easily.

A particular thought that comes to my mind is that they could provide services to NGOs that have very specific aims and expertise, but would need to put in place wide ranging infrastructures to support their aims. To provide food for children, say, requires there to be a functioning agricultural co-operative that will be sustainable over the years. This would include training and continuing support as part of the contract.

Maybe the AEA or IAgrE could look to the possibility of setting up some cooperation made up of independent organisations both from within and outside our industry to tackle some specific problem.

And in the short term what about 2013? This is our 75th Anniversary.

Can we surpass 2012 and come up with events that match the Diamond Jubilee and the Olympics?

Happy Christmas and Best Wishes for 2013!

Geoffrey Wakeham signing off.

GEOFFREY WAKEHAM

SINCE receiving this latest and prophetic, *Wakeham's World*, Geoffrey Wakeham MIAgrE passed peacefully away surrounded by his family on 30 November 2012. He was 73.

Geoffrey had been on the staff at Harper Adams University College for 23 years, becoming principal engineering lecturer before his retirement in 2004. His trenchant and single-minded views of engineering in particular and life in general have 'lit up' *Landwards* over the past few years. He leaves a wife, Ann, two daughters and a son to whom everyone at IAgrE and the production team at *Landwards* extend their deepest sympathies.

A full appreciation of the life and times of Geoffrey Wakeham will be included in the next issue of *Landwards*.

Chris Biddle, Editor, Landwards

A view from the other side of the fence

by Brian Sims

THE Autumn 2012 issue of *Landwards* contained a report of the IAgrE meeting with the All Party Parliamentary Group on Agriculture and Food for Development, and also an article on the IAgrE response to the UK Government's Foresight report, which was the subject for discussion with the APPG.

I was pleased to be able to participate in the APPG meeting (and, in fact, to contribute, albeit modestly, to the IAgrE's document: *Agricultural engineering: a key discipline enabling agriculture to deliver global food security*. For most of my life I have been involved with agricultural engineering and farm mechanization in developing countries and my reaction to the discussion was primarily from the viewpoint of UK plc's potential role in contributing to global food security in the future.

Here are some of my initial thoughts:

SMALLHOLDER FARMING

First of all we need to recognize the crucial importance of smallholder farms on food provision (*Figure 1*).

Figure 1. Smallholder farmers produce 80% of the food in developing countries. Their practices must ensure the protection of natural resources (especially the soil) while producing more, and more sustainably.

In the developing world 80% of food is produced by the sector and it is here that sustainable crop production intensification efforts will be most fruitful. At the risk of over-simplifying, we are at the moment too frequently confronted by a situation of poor and declining crop yields, degrading natural capital (especially soils), poor water use efficiency, increasing population pressure and poverty, and rural-urban migration.

THE ROLE OF AGRICULTURAL ENGINEERING

Agricultural engineers, in very close collaboration with the many others involved in achieving improvements in agricultural productivity, will need to continue to play a vital part in the application of yield enhancing and natural resource conserving technology to smallholder farming systems.

Figure 2. Direct planting with a Brazilian planter on a smallholder farm in Kenya

The soil is, arguably, the most precious resource that we have available for food production, and its protection is a fundamental requisite for continued and intensified crop yields. Conservation agriculture (CA - *www.fao.org/ag/ca/*) (direct seeding, maintenance of organic soil cover and rotations of crops and cover crops) can make a huge contribution to improving the present situation; but this requires modification and application of concepts and machines for smallholder CA.

Perhaps the most notable example would be the direct planters and seed drills for placing seed and fertilizer at the correct depth in a soil covered with organic mulch (*Figure 2*).

Another example of the need for agricultural engineering is in the adaptation of precision agriculture (PA) philosophy and practice to smallholder farming. Smallholder farmers are frequently averse or unable to invest in vital production inputs such as pesticides, herbicides and fertilizer.

Some examples of relevant PA approaches include the adaptation of precision weed control using reflecting red and near infrared light sensors; field mapping of growing crops to facilitate geo-referenced applications of fertilizers and pest or weed control chemicals exclusively on particular, mapped, problem areas; optical sensing of the crop condition by electronic NDVI (*Normalized Difference Vegetation Index*) interpretation, amongst other possibilities.

By applying herbicides only where weeds are growing and N fertilizers only to areas of crops which will profitably benefit from them will help a great deal to improve the efficiency of use of these essential inputs.

MORE EFFICIENT IRRIGATION

Irrigation water is becoming increasingly scarce and will need to be used far more efficiently in the future as demand outstrips supply.

Improved irrigation water use efficiency is essential if we are to produce more food with diminishing water supplies (*Figure 3*). Profligate over-use of this increasingly scarce resource is no longer an option.

Figure 3. Drip irrigation not only improves water use efficiency but can markedly improve the income of smallholder farm families when high value crops can be grown out of the normal season

VALUE ADDITION

Sustainable crop production intensification (SCPI) necessarily means increased output and this needs to be stored and processed to reduce wastage and add value.

Figure 4. Value addition of these smallholder crops in Brazil for urban markets involves the employment of processing and packaging machinery in hygienic conditions

Adding value to agricultural produce is becoming increasingly attractive for farmers and other rural sector entrepreneurs. Value addition through crop processing will usually involve the application of engineering solutions in such areas as crop storage and transport, vegetable processing, milling, dairy and meat product manufacture, and so forth (*Figure 4*).

UK TRAINED ENGINEERS

In the course of my conversations with the agricultural development community in the developing world, I frequently encounter professionals who have received training and education at Reading or Newcastle Universities or Silsoe College (the former National College of Agricultural Engineering).

These are precisely the people who have the ability and will be responsible for ensuring the application of SCPI, more efficient irrigation and value chain enhancement technologies in the smallholder farming sector.

It is rather depressing to survey the current scene of the diminished agricultural engineering, manufacturing, R&D and educational status of the UK. There is, for example, genuine and general astonishment that world class and well respected institutions such as Silsoe College and Silsoe Research Institute have been allowed to disappear. In fact Harper Adams University College is now the only place offering undergraduate agricultural engineering courses in the UK.

However our reputation is still rock-solid in many developing countries and regions and perhaps we can have the foresight to reflect on the self-inflicted damage and rebuild on the foundations that are still perceptible. Arguably the provision of qualified engineers could be one of the greatest catalysts of SCPI for global food security that UK plc could contribute to, and is an aspect that the UK government, especially DFID, should reflect upon profoundly.

All of these improvements (and others) will require the application of good engineering expertise. Together with others, genetic engineers for instance, we may be able to feed our projected 9+ billion population in 4 decades from now.

Two wheels too few?

I WAS interested to see the large item on conservation agriculture and two wheeled tractors in the previous edition of *Landwards* and would like to recount my experience of these machines.

In 2011 I was assigned by the EU to visit around 50 farms in North Korea to evaluate the benefits of this type of two wheel tractor. Farms had been supplied under an EU donor programme with up to four 12 hp, two wheeled tractors together with a range of implements. The programme was generally not successful for a number of reasons.

As the *Landwards* article describes, they were found to be ineffective for draft cultivation as they could not achieve the required depth. Even when soil conditions allowed their use, the slatted mouldboard ploughs shown in Figure.1 (*reprinted here*) had a very high rate of wear and quickly became unusable.

Almost all operators complained of the excessive amount of physical effort required to use these machines. This is understandable especially when considering a mower-swather being used in a paddy field.

In order to counterbalance the mowing unit at the front, the two wheel tractor must be fitted with a cultivator at the rear. The combined weight of the tractor and two implements is well over 500 kilos which is extremely tiring for one man to operate for more than 2 hours especially in soft ground. That is assuming that the machine can even negotiate the bund at the field edge due to the overall weight of the machine and the two small tyres.

Although I consider myself to be physically fit, and considerably larger in frame than the average farm worker in North Korea, I was almost unable to steer the combined machine at all.

The choice of a single cylinder horizontal diesel engine causes real problems in the operation of this machine. In exactly the same way as the Field Marshal of the 1940s, the tractor suffers from high levels of vibration which causes components to quickly fail through fatigue. In 95% of tractors examined, the exhaust silencers and air cleaners had failed in this way. Steering handlebars and belt guards also suffered frequent failures.

Since the most common use of this two wheel tractor is for transportation, this level of vibration places the operator at significant risk. The drawbar of every single trailer used with these two wheeled tractors had suffered repeated failures due to vibration and fatigue. In several cases this had resulted in injury to the driver who steers the combined machine from a seat on the trailer using large handlebars.

When the drawbar breaks, the driver is generally dumped onto the ground directly in front of his loaded trailer which then runs over him.

In countries that operate consumer and worker protection legislation, these machines would be outlawed as hazardous.

On sloping land we found that the large flywheel on the left side of the engine makes the machine inherently unstable and overturns were very common. The lack of any adequate guarding to drive belts for the flywheel and pulleys increased the risk of injury. In fact I recommended to the European Union that they should not supply such a machine which fails to comply with any relevant EU safety standards.

> “. . I was almost unable to steer the combined machine at all”

The two wheel tractors were supplied with a variety of power driven attachments including cultivators, cultivator seeders and swathers. In the main, these attachments were not used because of the heavy physical effort involved in manoeuvring the machine when fitted with the attachment.

In the few cases where machines had been used, the rate of wear of soil engaging parts was so rapid that once again they quickly became useless. Gearboxes and structural members suffered frequent failures, once again most likely attributable to the excessive levels of vibration from the engine.

Not only did the two wheel tractors suffer from heavy fuel consumption, their fuel system exhibited rapid wear and needed the injection pumps to be replaced after only a few months of operation.

I did wonder whether this situation was peculiar to North Korea until earlier this year when I visited Tanzania. Accompanied by a former Ministry of Agriculture official, I drove past a dealer’s yard full of two wheel tractors and implements.

My companion reacted with real passion against these machines and described them as useless and dangerous, but popular with government and donor agencies because of their low cost. At the same time, a Tanzanian newspaper article reported the significant number of road accidents involving these machines.

May I suggest that low cost is their only notable feature?

David B Williams
Chartered Engineer
Warwick

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MEMBERSHIP MATTERS

BRANCH REPORTS

IAgrE COUNCIL

Visit to NIAB (National Institute of Agricultural Botany)

THE IAgrE Council visited NIAB's Cambridge site for their recent Council Meeting. They heard three presentations, before being given a tour of the facilities.

The first talk, from **Stuart Knight**, was about the organisation as a whole, and particularly Crops and Agronomy Research, which combines a network of field-based variety evaluation and crop husbandry research, located at a wide range of regional centres, with the specialist field and laboratory capabilities of NIAB's plant pathology team.

Clare Butler Ellis gave a presentation on the work and facilities of Silsoe Spray Applications Unit, which is now also part of NIAB. She described the sophisticated laser-based spray-characterisation instruments and the purpose-built wind tunnel that can simulate the movement of airborne pesticide droplets. She paid tribute to the team who have worked hard to keep pesticide application research going following the closure of Silsoe Research Institute, so that the unit is now able to invest in new staff and equipment to give them a secure future.

The final talk was from **Ron Stobart**, who presented some of the agronomy research, in particular the STAR project, a long-term rotation experiment supported by The Felix Thornley Cobbold Trust, which is examining the interaction of rotation and cultivation techniques. So far the work has shown that the highest margins are associated with a managed approach with winter cropping systems.

Ron also presented the New Farming Systems project, which is a series of long term studies seeking to develop bio-sustainable cropping systems for conventional arable cropping, funded by The Morley Agricultural Foundation (TMAF) and The JC Mann Trust. This is seeking to maintain or increase system output while at the same time improving efficiency, sustainability and resilience within conventional arable cropping systems.

The tour of NIAB facilities included the seed-handling unit, the growth rooms, and the equipment for inoculating plants with fungal diseases. Also toured was the new Innovation Farm Visitors' Centre, which currently under construction and is expected to be completed by spring 2013. This has been designed to achieve the highest sustainability rating and zero-carbon balance in operation, using locally sourced and sustainable materials wherever possible.

Dr Lynda Smith showing visitors work in NIAB's new Glasshouse

Mark Leaman, NIAB Farm & Estate Manager, in front of the zero carbon reception building due for completion next spring

The tour also included the new glasshouses in the McCleod Complex, where a wide range of plants are being grown, and varieties can be tested, which incorporates the latest greenhouse technology and biomass heating.

Finally, we had an informal discussion of the RTK system and the precision approach being taken to the field trials on the NIAB site.

It was a fascinating day, and NIAB staff were very hospitable and informative. IAgrE would like to thank all of those mentioned above, as well as Ros Lloyd, Lydia Smith, Mark Leaman and Emma Coventry who made the tour so enjoyable.

Mark Leaman and visitors examining NIAB's Plot Drill

Clare Butler Ellis

WREKIN BRANCH

Recent meetings - Claas and Massey Ferguson Harvesting equipment

THE Branch started its winter programme with two very well attended, excellent meetings both on combine harvesters; one on the Claas range and the second on the MF harvesting range, including balers.

Both meetings included presentations from ex-Harper Adams students employed now in the highly impressive harvesting area of modern agricultural engineering technology.

In October **Dean Cottey from Claas** included both a full description of the combine range and then a section on the company's successful Guinness World 2011 record obtained with their Lexion 770 Terra trac combine.

Spending time using modern computer graphics he gave a thoroughly informative review of the basics of harvesting principles whether straw walker or rotary machines. Extending the exceptional visuals used he developed the reasoning behind the company's combine field management systems into the use of their Telemechanics system allowing monitoring by telemetry whether to factory or farm laptop.

Such data collection from harvesting rate, area, moisture, specific weight, unloading time, fuel use being then available for analysis aiding efficiency of operation.

He described the logistics of the World Record operation and showed a DVD supporting this on the practicalities of dealing with 80 plus tonnes/hour harvesting right through to working with Guinness and working alongside the film crew with their exceptional remote controlled helicopter, a fascinating 'toy' for most engineers!

Claas combine

Bill Basford as an independent consultant also described his role in observing and monitoring all data and field routines during the record attempt. This ensured that the Guinness representative on site could accept that all involved were not doing anything other than a truly commercial operation.

Not to be outdone the November meeting included not just exceptional graphics and visuals again but an opportunity to inspect and question around an MF Beta combine live in the soil hall at Harper.


Massey Ferguson combine

Alan Haycock, ex Harper, and Howard Warnes from AGCO combined their talents to describe initially AGCO comprising 29 companies worldwide and their locations.

Alan then developed the presentation to cover the whole range of combines whether from USA or their base at Breganzia in Italy. This included the smaller side cab straw walker models not seen in the UK through to 8 walker models used in the USA right through to their Hybrid Rotor models similar to the Claas machines described in the October meeting.

Features of the AGCO Advanced Technology solutions offering most operating parameter monitoring were described leading to overall improvements in efficiency, a long way from 'jump off and look round the back' of years gone by.

Taking this approach further he offered thoughts for the future development both by film and comment. Particular reference was made to the physical dimensions of road traffic use limiting or challenging designers thoughts, though the split header image seen reminded older lags of the Fisher Humphries combine of the 70's!

The 'practical' part of the evening allowed close inspection of the Beta combine with its new Skyline cab and in-cab controls and data presentation. All panels were opened and ladders downed to allow everyone a good crawl over the unit and an up close and personal review not normally associated with a winter meeting.

Both meetings saw encouraging support from two major worldwide companies to the IAgrE and to the good number of students attending, reinforcing the place of our institution communicating latest technologies in an impressive and rewarding manner.

Bill Basford

SOUTH EAST MIDLANDS BRANCH

'Confessions of a British Eurocrat'

THIS talk was given to South East Midlands Branch on 1 November 2012 by Geoff Rudd, an ex-Silsoe post graduate.

He is about to retire from his post of Policy Officer in the European Commission. However, this doesn't mean he has been sitting behind a desk in Brussels for the past 26 years or so!

Geoff gave an interesting and very personal reflection on the role, impact and work of the European Commission, based on his experiences of working in various departments of the 34 '*Directorates-General*' (including ones leading on 'Development', 'External Relations' and, currently, 'Climate Change').

He has also represented the EU and has coordinated development projects in various sectors throughout the world. These were illustrated in a multi-media presentation, as photographs of many of these projects in interesting and challenging environments were simultaneously projected alongside his presentation slides.

Tim Chamen and Geoff Rudd

This meeting was a new departure for the Branch as it was held at Cranfield University in IAgrE's HQ and started earlier in the evening to encourage students and staff to attend after their lectures. Not only did Geoff explain the inner workings and structure of the European Commission and the EU, he provided an insight into decision making and project management processes, funding and infrastructure, as well as job opportunities and requirements. All useful for anyone working in areas affected by EU Regulations (*and who isn't?*), or who are seeking funding for projects, or even employment.

He also reflected on the contrasting attitudes, commitment and perspectives of different Member States. Clearly we in the UK do not do ourselves any favours. The common '*blame Europe for everything*' stance rather than embracing the potential of Europe is perhaps a reflection of the lack of wider (*political?*) support and enthusiasm.

Other more involved countries include Europe from an early age in their curriculum, so they are more positive. Their officials commonly speak many more languages too - helpful in those 'corridor talks', where policy and alliances are often framed.

So, it looks like the End of Term Report for the UK might say '*4 out of 10 - must try harder*'. This is consistent with the regular pleas coming from the Secretary-General of EurAgEng after his attendance at Technical Fairs and meetings around Europe, where 'The Brits' are often conspicuous by their absence!

"Mai oui!" Obvious, really?

Alan Plom


Whilst the cartoons above used on our poster might reinforce those negative perceptions of 'Europe', this talk covered wider aspects than the 'machinery' of the Europe institutions.

REPUBLIC OF IRELAND BRANCH

National Ploughing Match, Co Wexford

THE Branch, took a share of the ITT College stand at the National Ploughing Match held near New Ross, Co Wexford 23rd to 25th September 2012.

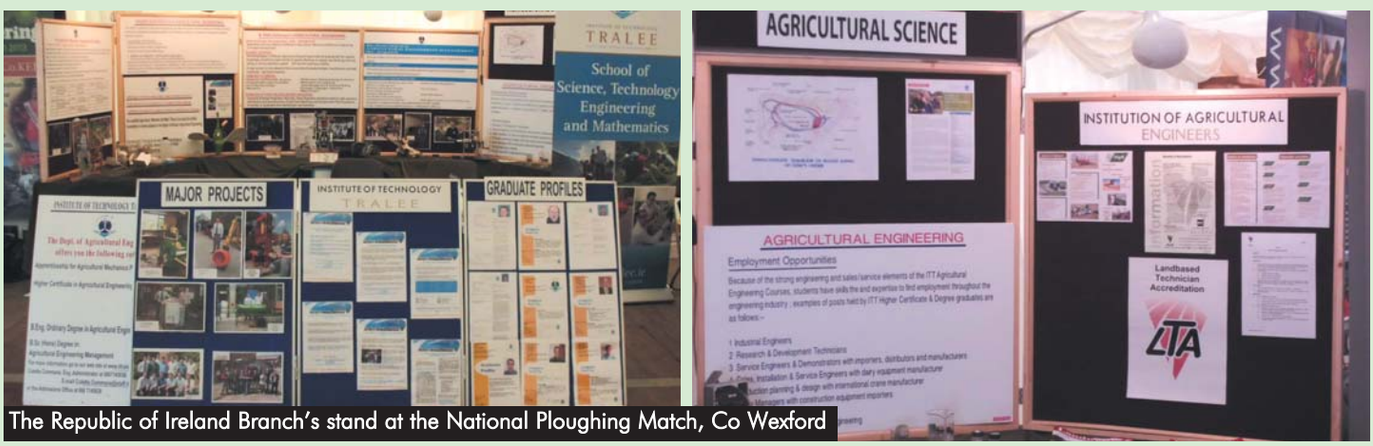
Attendance was down on the first day due to bad weather, but picked up considerably on the last two days.

Since we were in the 'Go Kerry' tent with a lot of other enterprises based in Co Kerry, a lot of people passed by the stand with a good interest in the College courses, past students and their major projects. We had the posters positioned so that an observer would start with the apprenticeship course and gradually work their way across the display to the final objective, namely job prospects and membership of the IAgrE.

There was not a lot of interest in membership, more in 'associate membership' from the farming community, all enquiries have been followed up by Michael.

The Branch would like to thank the Institution for assisting in sponsorship of the stand - it 'kept the flag flying!'

David Frizelle



The Republic of Ireland Branch's stand at the National Ploughing Match, Co Wexford

WESTERN BRANCH

'The Development of the BigX Forage Harvester' Krone UK, Lackham College, 10th October 2012

A VERY good turn out of 36 members and guests attended this lecture held for a change in the Agricultural Engineering Workshop at Lackham. This was so that two Big X machines could provide a suitable backdrop for the lecture.

The lecture started with Rodney Benson, South West Area sales manager for Krone UK who gave an overview of the history of the Krone company. Formed in 1906 in Spelle, Northern Germany by Berhard Krone, it is still a family business. Two main branches of the business exist - the commercial vehicle trailers and the agricultural machinery business.

Krone lorry trailers are well known and the plant at Werlte produces in the region of 40,000 trailers per year. The Krone group turned over 1.368m Euros in 2011/12 from which 863m Euros was the commercial vehicle division, the remainder was from the Agricultural machinery division. From this, 33% of the agricultural division sales are within Germany, 67% exported.

Agricultural products are very much focused on the forage handling sector and include mowers, tedders, rakes, round balers and forage wagons and harvesters. 17% of the Krone workforce are involved in R&D activities.

This was followed by Gary Bailey, Forager Specialist and Technical Manager for the Wales / Midlands area assisted by Darren Metcalf, SW area sales support. The history of the BigX started in the year 2000 when the company moved from producing tractor trailed forage harvesters into the self-propelled type. As the competition had been producing these for a number of years prior to this Krone decided not to build a copy but to start with a blank sheet of paper and in 2000 launched the first variant with a 600hp V8 followed in 2001 by a 780hp V12 powered variant.

These machines were groundbreaking and had the largest crop-flow in the industry, 40kph transport speed on the road, auto speed control in the field and were the only machines with rear suspension. They quickly became the No 1 machine in the United States but it wasn't until 2003 that they were launched in the UK. The first machines struggled to cope with British and Irish grass but in 2004 were improved.

In 2005 a smaller 500hp variant was launched along with the BigX 1000 with twin 500hp 6 cylinder engines capable of driving a 10.5m 14 row maize header.

Members of the Western Branch examine a Krone Big X

Product features which were not offered by the competition were an autoscan system to gauge crop ripeness where the shop length is automatically adjusted to suit ensuring the best ensiling in the clamp. Also a camless pickup mechanism in the grass header was developed. Twin engined machines drive into a common gearbox but each engine can be run at different power ratings or even only one engine depending on what the operation duty is.

In 2007 the previous models were replaced with the BigX 550, 650, 800 & 1000 models with either V8 or V12 Mercedes engines fitted. Both the transmission and feeder drive systems are hydrostatic. Again in 2010 due to Tier ratings the engines were changed to MAN 16.2litre V8 or 24.2litre V12 types on the BigX 700, 800 & 1100 models. The MAN engines offered improved fuel consumption and lower emissions over the previous Mercedes units. This allowed an operator switched power mode - Xpower & Ecopower depending on whether the machine is working in the field or travelling on the road.

The lecture was rounded off with a very lively Question and Answer session which was nearly as long as the lecture itself - always a sign of an interesting subject well presented. Topics discussed included the very high power ratings of the BigX and whether operators had experienced an increase in fuel consumption as machines with higher Tier rating engines replace older Tier ratings.

Thanks go to Simon Barnes of nearby Barnes Agri for arranging the two machines to be present. Thanks also to Michael O'Sullivan of Lackham College for providing the venue and refreshments.

Rupert Caplet

NEWS OF INTEREST TO MEMBERS

SIMA 2013

Paris show celebrates 75 years with new initiatives

SIMA-SIMAGENA which takes place 24-28 February 2013 at Parc des Expositions, Paris Nord, Villepinte says it is planning to make its 75th event even more international in 2013.

Dedicated to the theme of '*high-performance and sustainable world agriculture*', the organisers say international exhibitor registrations are up by an additional 12%, with over 41 countries already represented. Buoyed by positive market conditions, foreign visitor numbers are also on the rise, with people from more than 120 countries expected at the show.

The show will be organising several events to help drive exhibitor sales and exports. Designed to help companies gain a better understanding of the business potential of countries in which they're thinking of expanding, the events include country breakfasts focusing on Algeria, China and Kazakhstan whilst CLIMMAR (International Liaison Centre for Agricultural Machinery Dealers and Repairers) Meetings, will organise a series of customised encounters between exhibitors and European distribution networks. It will also provide an opportunity to exchange views on future challenges in the agricultural equipment sector.

A wide range of talks will be on offer at SIMA, focusing on themes such as agricultural waste management, safety at work, precision agriculture, and the challenges facing the agricultural equipment industry in the future.

For full details of the show visit *en.simaonline.com*

NEWS OF INTEREST TO MEMBERS

•A KRONE Comprima baler has beaten the existing world record for the number of round bales produced in an hour.

In a 35ha wheat stubble field in East Germany the baler produced a staggering 149 bales (28 tonnes of wheat straw), equivalent to 2.5 bales per minute. The achievement was witnessed by the German agricultural magazines *DLZ* and *agrarheute*.

In an attempt to break the world record, the Comprima was set to the highest density and applied three layers of net wrap to each of the 1.25m diameter bales.

Tractor operator Ewald Vehring (pictured) said, "When I first looked at the bale counter after half an hour, the count was already seven bales ahead of the existing record. This was when I knew that we were going to set a new world record."

Watch the world record video at *tinyurl.com/c5pbq68*.

ATV proposals defeated by MEPs

Would have made machines unsuitable for farm use

MEPs have defeated controversial EU proposals which could have rendered quad bikes useless on farms. The European Commission proposals for new speed limits and design features were meant to make All-Terrain Vehicles (ATVs) safer on the road, but the NFU argued the rules would remove the ability of ATVs to perform off-road - and for no worthwhile safety gain.

The NFU say it was a victory for common sense. The MEPs voted on their changes in Strasbourg at the end of November.

NFU regulatory affairs adviser Ben Ellis said, "Of course safety is our top priority for farmers using ATVs, but the proposed rules would have reduced the ability of ATVs to perform everyday functions.

"It isn't appropriate for these vehicles to be built to the same standards as vehicles used on the road. For example, one of the Commission's safety suggestions was for a reduction in ground clearance to increase stability on the road, but this would have been dangerous and unworkable off the road.

"There were other design requirements to meet strict controls on things like noise and emissions which would have added a huge and prohibitive cost - up to 60 per cent - to the vehicle. The design requirements would also add weight to the vehicle making it harder to carry out day to day tasks such as towing and climbing. Another particular worrying element was the proposal to limit speeds to 40km/h, making the on-farm use of ATVs almost impractical.

"We have long argued for ATVs for on-farm use to be classified in the 'T' agricultural and forestry category, and now that they will be, many of our initial concerns have been rectified. There is still much work to do in the coming months however, as the detail of the 'T' category is debated in Brussels."

Crop World poster competition

AT the recent Crop World exhibition there was a poster session competition which showcased the latest research initiatives coming out of leading academic institutions around the world - and two of the participants were IAgrE members.

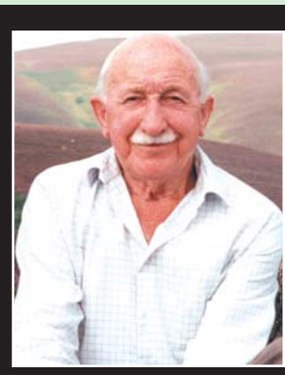
The first was **Joanna Niziolomski** who is doing a PHD in Soil and Water Management at Cranfield whilst the second was **Graham Halcro** who is studying Environmental Science and Technology at Cranfield.

Joanna Niziolomski's project is *Optimising Erosion And Runoff Control From UK Row Crops*. Her poster showed the results of field trials.

Graham Halcro's project is *Site Specific Land Management Of Cereal Crops Based On Management Zone Delineation By Proximal Soil Sensing*.

OBITUARY - Ian J Fleming, FIAgrE

Born London, 19 March 1915; died Edinburgh, 1 October 2012



IAN FLEMING was the oldest professional Agricultural Engineer in the country, a member of the Institution of Agricultural Engineers for well over sixty years.

He would like that his main legacy is to be found in the National Museum of Rural Life at Kittochside, near East Kilbride, in their collection of vintage agricultural machinery and the presentation there of agricultural heritage.

Ian's association with the land dated back to the mid-1920s, when he returned from school in London to spend holidays in Blairgowrie, where he quickly gravitated to one of the nearby farms. There was never enough money for him to become a farmer, but he achieved the next best thing, a career that was never far from the land.

In retirement, looking back over seventy years or more, Ian was conscious that he had seen and been part of the enormous social change in rural life, as advances in mechanisation, and in plant and animal breeding led to undreamt of increases in agricultural productivity. He had known farming from the 1920s, when it was worked exclusively by horse, with all the infrastructure and manpower that this entailed. Then, in the 1930s, he had seen the arrival of the first agricultural machines, including the first combine harvester to arrive in Scotland, now part of the Kittochside collection In post-war years, he had sold combines and other machines throughout Scotland.

With this lifelong connection with farming, he knew many of the farms in Scotland and their farmers, or their descendants, and where might be found this or that interesting machine tucked away in the corner of their steading. Ian felt that there was an important story here to be told, both in words, and through the machines that had made that story.

Ian also researched and published the stories of a number of ground-breaking Scottish engineering inventions. Sadly, these had in common that, although invented in Scotland, commercial ineptitude, excessive costs of defending intellectual property or the lack of development funding led to their being exploited elsewhere, with little if any economic benefit accruing to the original Scottish inventor. Bell's reaper in the 19th century was an early example, bringing little and only belated benefit to the Rev. Patrick Bell, who did not take out a patent but felt it should be for the benefit of mankind. Several Americans felt differently, and Bell's invention formed the basis for McCormick's and other reapers in the United States.

In the 20th century, single sleeve valve engines based on the Burt-McCollum patents were perfected in a number of radial aero piston engines used in World War II, but these never enriched the inventors. SSV engines powered Argyll cars made immediately before and just after the First World War, and Scotland's only indigenous tractor, the Glasgow tractor. Neither the Argyll nor the Glasgow companies survived the 1920s.

IAN FLEMING was born on 19 March 1915 in London, the only child of John ('Jack') Fleming and Kathleen Burns. Tragically, Jack contracted TB and died when Ian was only 18 months old, leaving Kathleen to bring Ian up on her own.

Ian went to University College School in Hampstead. Captain Scott-Lowe ran the boarding house, forever known as 'Scalleys'; Ian survived to be the last of the 'Scalleywags'. As boarder and housemaster, Ian and Scalley had a less than harmonious relationship, but, in the geography classroom, they developed considerable mutual respect.

He graduated from the University of Edinburgh in 1937 with a BSc in Agriculture. After graduating, he joined first the Institute of Animal Genetics, where he made a significant study of the life cycle of the sheep tick on a farm in Ettrick, then moved to the East of Scotland College of Agriculture to teach agricultural engineering. Though in a reserved occupation, he joined up in 1940, and the Army found the perfect place for him, first in RASC, then, after its formation, in Royal Electrical and Mechanical Engineers. Qualified as a Radio Mechanic and as an Armament Artificer, he spent much of his war around the Home Counties, preparing radio vans for Russia and tanks for the Normandy invasion.

Ian married Margaret Watson in Dundee on 22 May 1943. After receiving his commission in 1944, Ian was posted to India for the final year before VE-day. He returned home greatly smitten with this amazing country, his fascination evident from his detailed memoir of this posting, and from the letters to Margaret and to his mother that survive.

Ian was fortunate in being demobbed quickly, in late 1945. Back in Edinburgh, he picked up where he had left off, at the East of Scotland College. With a wife to look after and a family on the way, he quickly realised that there was no future there, and that he had to make a move. John was born in June 1946, followed by Isla in October 1949.

He joined Scottish Agricultural Industries, who were then going into the agricultural machinery business. Working at Rosehall outside Haddington, he secured the Scottish dealership for Claas combines, doubling his sales each year for the first three years. SAI moved him to take charge of William Reid in Forres, and a staff of about one hundred. Besides the machinery dealership (International Harvester in this case) and repairs, Reids supplied grain handling and dairy equipment, and also had a millwright's business catering to the distilleries of the Moray coast. Responding to the huge quantity of fallen timber after the gales of early 1953, William Reid designed an excellent portable sawmill, many of which were exported, and a few of which survive today.

Faced with the need in the late 1950s to replace their fertiliser plant in Leith, SAI decided to dispose of their machinery dealerships. Given the choice of staying with machinery or with SAI, Ian opted for the latter, which obliged a move to Aberdeen, followed quite quickly by a return to Edinburgh, where he took charge of an agricultural work-study service offered by SAI, and later, of their bulk fertiliser spreading service.

Unfortunately, the late change in career direction had left Ian in somewhat of a dead-end at SAI, and he left in 1970, still with a decade left to work. He spent his final ten years of work with as training adviser to the agricultural machinery trade, but this involved reporting to some unimaginative individuals, with whom he had little in common.

IAN was active in many bodies, contributing much to the four hundredth anniversary celebrations of the foundation of the University of Edinburgh in 1983, and to the centenary of the Scottish Philatelic Society in 1993, of which he was President in 1978. He was a co-author of *'Britain's First Chair of Agriculture at the University of Edinburgh - 1790-1990'*, produced for the celebrations of the bicentenary of the Chair of Agriculture in 1990.

Above all, though, he wanted to leave as his legacy a record of his story of farming as he had seen it evolve from the 1920s onwards. He was Joint Secretary of the Scottish Country Life Museum Trust, and also its Technical Adviser. When, in 2001, the National Museum of Rural Life at Kittochside opened, and absorbed the collection of the Scottish Country Life Museum, Ian became an enthusiastic contributor to the merged museum. He scoured the country for examples of agricultural machines of historic interest, and ensured that these could be acquired for the museum, and restored as closely as possible to their original condition.

He bought his first computer at the age of 86, and learned how to use it, though he was never totally sure of the difference between a folder and a file! His time at the keyboard only came to a halt when his hands stopped doing what the brain told them to. Unfortunately, he came just too late to personal computing to use the internet; who knows what he might have achieved with access to that resource?

In retirement, Ian and Margaret were fearless travellers, to India, returning to a place where he had spent a leave in 1945, Siberia, cruising down the River Yenesei, Russia, a canal cruise from St Petersburg to Moscow, Turkey, the wild east of Anatolia, China, Jamaica, and not least the USA, where he was so proud of his (unpaid) speeding ticket from the Montana Highway Patrol!

He revelled in the arrival of his four grandchildren and took a great interest in all their exploits and derived such pleasure from watching their growth into adulthood. When his great-grandchildren appeared, his sense of the continuity of the family gave him enormous satisfaction.

Encouragement of the young was not merely restricted to his own family; he was immensely hospitable and loved it when people dropped in unannounced. Since his death, many have written of doors opened or suggestions made which made a difference to their lives.

Ian's son and daughter, John and Isla, have drawn heavily on the computer files Ian generated for this obituary.

Membership changes

Admissions

A warm welcome to the following new members:

Member

Craig S G (Wiltshire)
Demmers T G M (Bedfordshire)
Gillingham D S H (Cheshire)
Groat T A (Perthshire)

Associate Member

Brewer G (Hampshire)
Burgess G (Leicestershire)
Coles S M (Northamptonshire)
Gault P W A (Northern Ireland)
Griffiths D R (Lincolnshire)
Stokes S P (Hampshire)

Associate

Bray S A (Devon)
Briggs H R (Oxfordshire)
Campisi A R (Australia)
Eyre A (Lincolnshire)
Kirkham I (Suffolk)
Miller S (Argyll)
Thompson E (Cheshire)
Vaughan R (Germany)

Student

Cranfield University

Chmura K
Cooke A
Jabtowska K A
Moore M D M
Patrone S L
Thatcher J A
Venkatesh Ranga Rao N

Easton College

Nobes T

Royal Agricultural College

Southgate N

SRUC

Donnelly M R
Graham A F
Jamieson M A
MacKenzie C
McBain A

Re-admissions

Associate member

Adlard F H (Lincolnshire)

Deaths

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

Mr John Gwyn Bumby (MIAgrE) (Gwynedd) - a member since 1976

Mr Peter Hubert Nunn (FIAgrE) (Suffolk) - a member since 1987

Mr Ian Johnston Fleming (FIAgrE) Scotland) - a member since 1948

Transfers

Associate member

Ives M R (Buckinghamshire)
Wilson W J (Kent)

Associate

Griffiths D R (Lincs)
Hill T D (Surrey)
Lloyd E (Lancashire)

Engineering Council

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

Registrations

EngTech

Cooper N A (Kent)
Groat T A (Perthshire)
Letts N (Co. Durham)
Murrell W (Kent)
Penrose D T W (Cornwall)
Wakely A J (Cornwall)
Wallond G (Kent)
Ward C (Devon)
Webber C D (Devon)

Long service certificates

Name	*Grade*	*Date of anniversay*
35 years		
Paul Francis **Hemingway**	CEng, FIAgrE	6 Oct 2012
Stephen John *Watson*	AMIAgrE	10 Oct 2012
Robert Edward William **Timmins**	CEng, MIAgrE	17 Oct 2012
Graham John **Barr**	AMIAgrE	30 Nov 2012
Walter John **Cracknell**	CEng, CEnv, MIAgrE	6 Dec 2012
25 years		
Richard Charles Philip **Green**	MIAgrE	3 Nov 2012
David Andrew **Clare**	AMIAgrE	3 Nov 2012
Benjamin Arthur **Kendall**	CEng, MIAgrE	17 Nov 2012
Alan Amadeus **Valentine**	CEnv, MIAgrE	24 Nov 2012
Alastair John **Taylor**	IEng CEnv, MIAgrE	26 Nov 2012

Academic members

Askham Bryan College
Askham Bryan
York
YO23 3FR

Barony College
Parkgate
Dumfries, DG1 3NE

Bicton College
East Budleigh
Budleigh Salterton
Devon
EX9 7BY

Bishop Burton College
York Road
Bishop Burton
Beverley
HU17 8QG

Brooksby Melton College
Asfordby Road
Melton Mowbray
Leics
LE13 0HJ

Coleg sir Gar
Pibwrlwyd Campus
Pibwrlwyd
Carmarthen
SA31 2NH

Cranfield University
Cranfield
Bedfordshire
MK43 0AL

Easton College
Easton
Norwich
Norfolk
NR9 5DX

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

Harper Adams University
College
Newport
Shropshire,
TF10 8NB

Institute of Technology Tralee
Clash, Tralee
Co Kerry, Ireland

Myerscough College
Myerscough Hall
Bilsborrow
Preston
Lancashire PR7 0RY

Oatridge Agricultural College
Ecclesmachan
Broxburn
West Lothian
EH52 6NH

Pallaskenry Agricultural
College
Co Limerick
Ireland

Plumpton College
Ditchling Road
Lewes
East Sussex
BN7 3AE

Reaseheath College
Reaseheath, Nantwich
Cheshire, CW5 6DF

Royal Agricultural College
Cirencester
Gloucester
GL7 6JS

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

Sparsholt College
Sparsholt
Winchester
Hampshire
SO21 2NF

Willowdene Training Ltd
Chorley
Bridgnorth
Shropshire
WV16 6PP

Wiltshire College - Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

Commercial members

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

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

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

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

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

Bomford Turner Limited
Salford Priors
Evesham
Worcestershire
WR11 5SW

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

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

FEC Services
Stoneleigh Park
Kenilworth Warwickshire CV8
2LS

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

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

John Deere Ltd
Harby Road
Langar
Nottinghamshire NG13 9HT

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

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

White Horse Contractors Ltd
Lodge Hill
Abingdon
Oxfordshire
OX14 2JD

EVENTS

IAgrE Branch Meetings and Events

South East Midlands Branch
Tuesday 11 December 2012, 19:30
BULK GRAIN DRYING - THE INSIDE STORY
Speaker: David Bartlett
Venue: Maulden Church Hall, Maulden, Beds MK45 2AU
For further details please contact Branch Secretary: John Stafford
Tel: 01525 402229 Email: John.stafford@silsoe-solutions.co.uk

West Midlands Branch
Tuesday 11 December 2012, 19:30
THE DEVELOPMENT OF GRAIN HARVEST EQUIPMENT
Speaker: Richard Trevarthen
Venue: Stoneleigh Village Hall, Birmingham Road, Nr Kenilworth
For further information please contact the Branch Secretary, Michael Sheldon
Tel: 01926 498900 Email: michaelcsheldon@yahoo.com

West Midlands Branch
Tuesday 15 January 2013, 19:30
GREENWATT ENERGY - A REVIEW OF RENEWABLE ENERGY SYSTEMS
Speaker: Mike Wollacott, Sustainable Technology Consultant
Venue: Friends Meeting House, Maidenhead Rd, Stratford upon Avon CV37 6XT
For further details please contact Branch Secretary: Mike Sheldon
Tel: 01926 498900 Email: michaelcsheldon@yahoo.com

Northern Ireland Branch
Wednesday 16 January 2013, 20:00
LUBRICATING OILS AND ADDITIVES
Speaker: Martyn Mann, Technical Department, Miller Oils
Venue: CAFRE, Greenmount
For further details please contact the Branch Secretary: Ian Duff
Tel: 028 8673 6977 Email: duffi@iagre.biz

South East Midlands Branch
Thursday 17 January 2013, 19:30
SOILS - IT'S ALL ABOUT THE STRUCTURE
Speaker: Sacha Mooney, University of Nottingham
Venue: Maulden Church Hall, Maulden, Beds MK45 2AU
The talk will discuss the importance of soil structure, how it has been traditionally measured, how latest imaging techniques are offering insights into the complexity and heterogeneity of soil structure and what use the information from these techniques can really have on soil management.
For further details please contact Branch Secretary: John Stafford
Tel: 01525 402229 Email: John.stafford@silsoe-solutions.co.uk

Wrekin Branch
Monday 21 January 2013, 18.00
VISIT TO CAT FINNING, CANNOCK, STAFFS
This visit will be limited to 25 attendees so please register your interest with either Melvin Johnson at Reaseheath College Email: melvinj@reaseheath.ac.uk Tel: 01270 625131 or the Branch Secretary.
For further information please contact the (acting) Branch Secretary: Jim Loynes.
Tel: 07836 602750 Email: jloynes@harper-adams.ac.uk

Western Branch
Wednesday 23 January 2013 (afternoon)
VISIT TO KEMBLE FARM BIO-DIGESTER
Speaker: tbc.
Visit to 700head dairy unit with bio digester
For further details please contact Rupert Caplat
Tel: 01235 522828 Email: Rupert.caplat@lindehydraulics.co.uk

Scottish Branch
Friday 25 January 2013, 7pm
BURNS SUPPER
Venue: Old Roslin Inn
Tickets £15 per person (members and guests). All welcome.
For further information and to register a place, please contact the Branch Secretary: Malcolm Cattermole or organiser Geoff Freedman geoff.freedman@gmail.com
Tel: 0131 445 8717
Email: malcolm.cattermole@forestry.gsi.gov.uk

East Midlands Branch
Tuesday 5 February 2013, 19.00
JOHN DEERE
Venue: John Deere Ltd, Harby Road, Langar, Nottinghamshire, NG13 9HT
For further details please contact Nigel Penlingson on Tel: 07749 855104/01159 680902 nigel.penlington@talktalk.net. Alternatively contact the Branch Secretary, Sandy Donald.
Tel: 07977 521231 Email: sandytd2000@tiscali.co.uk

Wrekin Branch
Monday 11 February 2013, 19:30
A RECIPE FOR INNOVATION AND REAL COLLABORATION BETWEEN ENGINEERS AND INDUSTRIAL DESIGNERS
Speaker: Lee Smith, Horton Design, Stafford
Venue: Harper Adams University College, Newport, Staffs TF10 8NB
For further information please contact the (acting) Branch Secretary: Jim Loynes.
Tel: 07836 602750 Email: jloynes@harper-adams.ac.uk

West Midlands Branch
Tuesday 12 February 2013
COMPUTER BASED SIMULATION TO DEVELOP ELECTRONIC STABILITY CONTROL
Speaker: Representative from Jaguar Land Rover
Venue: Stoneleigh Village Hall, Birmingham Road, Stoneleigh, Nr Kenilworth
For further information please contact the Branch Secretary, Michael Sheldon
Tel: 01926 498900 Email: michaelcsheldon@yahoo.com

Northern Ireland Branch
Thursday 14 February 2013, 20:00
GRASSLAND MACHINERY - THE CUTTING EDGE
Speaker: Henrik Feldman, Division Sales Manager, Krone
Venue: CAFRE, Greenmount
For further details please contact the Branch Secretary: Ian Duff
Tel: 028 8673 6977 Email: duffi@iagre.biz

South East Midlands Branch
Tuesday 19 February 2013, 19:00
STUDENT MEETING AND BRANCH AGM
Venue: Maulden Church Hall, Maulden, Beds MK34 2AU
For further information please contact the Branch Secretary, John Stafford.
Tel: 01525 402229 Email: john.stafford@silsoe-solutions.co.uk

Western Branch
Wednesday 20 February 2013, 19:00
FORESTRY INDUSTRY TECHNICAL LECTURE
Speaker: tbc
Venue: Wiltshire College Lackham, Lacock, Chippenham SN15 2NY

For further details contact the Branch Secretary, Rupert Caplat.
Tel: 01235 522828 Email: rupert.caplat@lindehydraulics.co.uk

East Midlands Branch
March 2013 - date to be confirmed
VISIT TO TRAILER MANUFACTURER
Venue: tbc
Discussion on Trailer Brakes and presentation from HSE.
For further details please contact Paul Skinner on Tel: 07941 604177 or 01205 353754 paulskinner57@btinternet.com.
Alternatively contact the Branch Secretary, Sandy Donald.
Tel: 07977 521231 Email: sandytd2000@tiscali.co.uk

South East Midlands Branch
Tuesday 05 March 2013
ROBOTICS SCIENCE FOR SMART CARS AND LIFELONG INFRASTRUCTURE-FREE NAVIGATION
Speaker: Paul Newman, The Mobile Robotics Group, Oxford University
Venue: Gold Lecture Room, Whittle Bldg (Bldg 52), Cranfield University, Cranfield, Beds MK33 0AL
What things must we do, what questions must we pose, to have a robot navigate precisely over days, weeks and hundreds of miles? How might a robot get better at doing that over time and in teams? Can we envision lifelong learning for a robot? What sensors and representations are apt? And of course - why might we want a robot to have such competencies? Could that be valuable? Of course it could . . . and it will end up looking car shaped.
For further information please contact the Branch Secretary, John Stafford.
Tel: 01525 402229 Email: john.stafford@silsoe-solutions.co.uk

Scottish Branch
Wednesday 6 March 2013, 1.30pm
FOREST RESEARCH NORTHERN RESEARCH STATION (ROSLIN) AND BRANCH AGM
Venue: NRS, Roslin, Midlothian EH25 9SY
A tour of facilities at NRS, Roslin with discussion on their current research projects, followed by the Branch AGM, all preceded by tea and sandwiches.
For further information and to register a place, please contact the Branch Secretary: Malcolm Cattermole;or organiser Dave Blackburn dblackburn62@hotmail.com
Tel: 0131 445 8717 Email: malcolm.cattermole@forestry.gsi.gov.uk

Wrekin Branch
Monday 11 March 2013, 18:30
ENERGY USE/CARBON FOOTPRINTING OF BERNARD MATTHEWS TURKEY FARMS + BRANCH AGM
Speaker: Phil Metcalfe, ADAS
Venue: Harper Adams University College, Newport, Staffs TF10 8NB
For further information please contact the (acting) Branch Secretary: Jim Loynes.
Tel: 07836 602750 Email: jloynes@harper-adams.ac.uk

West Midlands Branch
Tuesday 12 March 2013, 19:15
BRANCH AGM + PRESENTATION (TBC)
AGM starts at 19:15 followed by a presentation at 20:00.
For further information please contact the Branch Secretary, Michael Sheldon
Tel: 01926 498900 Email: michaelcsheldon@yahoo.com

Western Branch
Wednesday 13 March 2013, 18.30
TECHNICAL LECTURE + BRANCH AGM
Speaker: John Fox HonFIAgrE, Douglas Bomford Trust
Venue: Royal Agricultural College, Cirencester, Glos
Western Branch's contribution to IAgrE's 75th Anniversary.
For further details contact the Branch Secretary, Rupert Caplat.
Tel: 01235 522828 Email: rupert.caplat@lindehydraulics.co.uk

Northern Ireland Branch
Wednesday 20 March 2013, 20:00
WIND TURBINES - OPPORTUNITIES AND CONSTRAINTS
Venue: The Glenavon House Hotel, Cookstown
Speaker: Barry Meeke, Silverford Renewables
Venue: Glenavon House Hotel, Cookstown
For further details please contact the Branch Secretary: Ian Duff
Tel: 028 8673 6977 Email: duffi@iagre.biz

Other Events:

Wednesday & Thursday 16 - 17 January 2013
LAMMA SHOW 2013
Venue: Newark and Nottinghamshire Showground, Winthorpe, Newark, Notts NG24 2NY
UK's Leading Farm Equipment and Services Show
Tel: 0845 331 6123
Email: admin@lammashow.co.uk Web: www.lammashow.co.uk

Sunday 24 - Thursday 28 February 2013
SIMA 2014
Venue: Paris
International Agri-Business trade exhibition.Web: en.simaonline.com

Thursday 14 March 2013
IAgrE
LANDWARDS 2013: AGRICULTURAL ENGINEERING AND COMPLIANCE - THORN IN THE SIDE OR COMPETITIVE ADVANTAGE?
Venue: Queen Mother Hall, Harper Adams University College, Newport, Shropshire, TF10 8NB
In any business or organisation regulation is a given, but this conference (in association with AEA) will tackle the myths and enable you to be more efficient, competitive and professional.
Using case studies and examples, the programme has industry leading speakers focused on the duties of manufacturers, designers and end users, alongside practical and sensible ways to achieve compliance to best advantge for you.
Tel: 01234 750876 Email: conferences@iagre.org

Wednesday 20 March 2013
IAgrE
IAGRE YOUNG ENGINEERS COMPETITION
Venue: Aston Martin, Newport Pagnall, Bucks
Contact the IAgrE Secretariat to request your competition kit(s) and for further information about the competition.
Tel: 01234 750876 Email: secretary@iagre.org
Download: www.iagre.org/careers/devcareeryecomp

Thursday 21 March 2013 10.30
Horticultural Engineering Technical Group
VISIT TO BRITISH SUGAR
Venue: British Sugar, Wissington.
For further information please contact John Weir.
Email: putneyjohn@virgin.net

Monday & Tuesday 10-11 June 2013
IAgrE
MODELLING SPRAY DRIFT FROM GROUND-BASED APPLICATIONS - 2-DAY WORKSHOP
Venue: Cranfield University, Cranfield, Bedford MK43 0AL
a 2-day workshop for all with an interest in modelling spray drift. Further details will be available in due course together with on-line registration.
Tel: 01234 750876
Email: conferences@iagre.org

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

CONFERENCE 2013

14th March 2013,
Harper Adams University College

Landwards
Agriculture • Horticulture • Forestry • Environment • Amenity

75

Innovation, science and technology in Agriculture and the Rural Environment

Agricultural Engineering and Compliance -

Thorn in the side or competitive advantage?

PROGRAMME

10.00
Welcome and Introduction - **Andy Newbold**

10.10
Chairman's Opening - **Roger Bibbings**, RoSPA

10.15
Keynote: *Why agriculture continues to kill* - **Alan Plom**, former HSE principal inspector for Agriculture

11.00
The safe workplace - **Nicola Abbatt**, Compliance Manager, Newmac Limited,

11.25
Coffee

11.40
Causes of Accidents in the Land-Based Industries - The Human Factor - **Dr Mark Cooper**, The Health and Safety Practice

12.05
The manufacturer's view; what industry is doing - a representative from the **AEA** (Agricultural Engineers Association).

12.30
Awards ceremony and lunch.

2.00
Chair's opening of pm sessions **Alan Plom**

2.05
Safe Machines - case studies and discussion with **Mike Whiting** MIAgrE, Certification Engineer, Newmac Limited.

2.30
Agriculture's influence on occupational road risk. **Roger Bibbings**, RoSPA.

2.55
Afternoon discussion session with reflection on the day to identify and talk through the key issues faced by delegates

3.15
Small group presentation of findings.

3.30
Chair's summing up

3.45
Tea and close

The Role of the Agricultural Engineering Professional in Improving Safety in the Land-Based Industries

Agriculture and the land-based industries are the most hazardous in the UK.

Engineering and technical innovations have a role to play in improving matters.

This conference will examine professional practice and identify areas where positive improvements in health and safety can be made

Convenors
Dr Mark Cooper
and Andy Newbold
in association with
AEA





AGRICULTURE **FORESTRY** **ENVIRONMENT** **AMENITY** **HORTICULTURE**

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

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