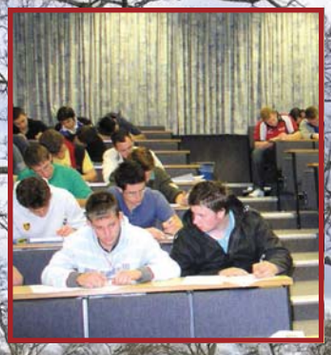
Landwards

Agriculture • Horticulture • Forestry • Environment • Amenity



STUDENT RECRUITMENT

Harper Adams students produce film and Dr Dan Mitchell on progress of recruitment project

LANDFILL REMEDIATION

Phil Amos on remedial work at a formerly designated contaminated landfill site near Glasgow

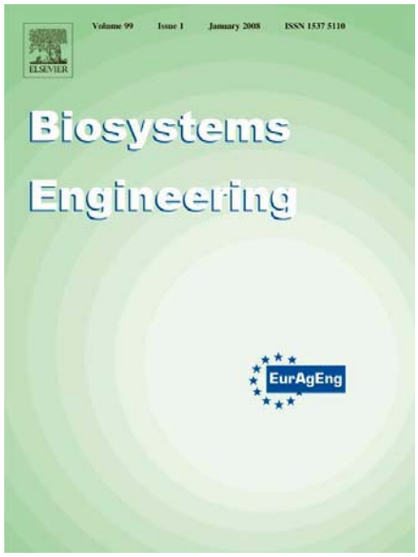
IAgrE ON THE MOVE

New headquarters for Institution at Cranfield University

IAgrE Professional Journal www.iagre.org Volume 65, Number 1 Spring 2010

Biosystems Engineering

***Biosystems Engineering*, owned by IAgrE, and the Official Scientific Journal of EurAgEng, is published monthly with occasional special issues.**



Reduced subscriptions are available to members of IAgrE.

To view the full article list of the current edition, visit

www.sciencedirect.com/science/journal/15375110

For further details of the depth and breadth of articles accepted for publication in *Biosystems Engineering*, visit

www.elsevier.com/wps/find/journalbibliographicinfo.cws_home/622795/description#bibliographicinfo

For details of the preferential rates for members for subscriptions to both the paper and electronic versions of *Biosystems Engineering*, visit the IAgrE website at

http://www.iagre.org/bioeng.shtml

IAgrE

EurAgEng

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 104, Issue 3, November 2009, Pages 308-317

Estimation of leaf area index in cereal crops using red-green images

Kristian Kirk, Hans Jørgen Andersen, Anton G. Thomsen, Johannes R. Jørgensen and Rasmus N. Jørgensen
Aalborg University, Niels Jernes Vej 14, 9220 Aalborg East, Denmark
University of Southern Denmark, Campusvej 55, 5230 Odense M, Denmark

The performance of the method was investigated in three field experiments during the period 2004-2006. The results showed that the method was capable of estimating LAI with a precision similar to that of LAI-2000. Correlations with LAI-values estimated by scanning harvested samples showed coefficient of determination (R2) values of 0.68 and 0.81 for the camera method, compared to 0.78 and 0.90 for the LAI-2000. However, an important feature of the proposed method was that it was able to estimate LAI at an early stage of growth whereas methods that look upwards through the canopy cannot be applied in this situation. The method is interesting because the colour information used by the method can be acquired by an ordinary inexpensive colour camera, and the sensor does not need to be colour-calibrated..

Volume 104, Issue 4, December 2009, Pages 545-551

A wireless accelerometer system with wavelet analysis for assessing lameness in cattle

M. Pastell, J. Tiusanen, M. Hakojärvi and L. Hänninen
University of Helsinki, Finland,

A wireless three-dimensional accelerometer system for measuring gait features in dairy cows has been designed and constructed. Eleven Ayrshire dairy cows were selected; based on their locomotion scores, 5 were sound and 6 lame. The four accelerometers were fitted to each limb of the cows proximal to the fetlock joints. The data were logged to a computer in real time via a receiver. The variance and wavelet variance for each axis and the total acceleration for each leg were calculated, and differences in the symmetry of variance of the hind legs of forward acceleration during the gait of lame and sound cows were determined from the accelerometer data. In addition, the wavelet variance of the lame cows showed differences associated with changes over a 40 ms time scale (i.e. mainly the stage when the leg hits the ground).

Volume 105, Issue 1, January 2010, Pages 2-12

Comparison between indirect and direct spray drift assessment methods

D. Nuyttens, M. De Schampheleire, P. Verboven and B. Sonck
Institute for Agricultural and Fisheries Research (ILVO), Merelbeke, Belgium
University Ghent, 9000 Ghent, Belgium
Catholic University of Leuven, Belgium

The drift characteristics of 10 different spray nozzles were tested using three contrasting drift risk assessment means namely; phase Doppler particle analyser (PDPA) laser measurements, wind tunnel measurements (both indirect drift risk assessments) and field drift experiments (direct drift risk assessments). The effect of nozzle size and nozzle type on droplet characteristics, drift potential and field drift were studied. Results showed that with the indirect risk assessments, driftability experiments can be made with different spraying systems under directly comparable and repeatable conditions and that both methods are suitable for relative assessments of drift risk. Measuring the proportion of the total volume of droplets smaller than 75 μm diameter was best suited to represent the drift reduction potential in the field with different nozzle-pressure combinations. It was possible to come to a realistic estimate of field drift data at a driving speed of 8 km h-1 and a boom height of 0.50 m.

The Professional Journal for Engineers, Scientists and Technologists in Agriculture, Horticulture, Forestry, Environment and Amenity

Landwards
Agriculture • Horticulture • Forestry • Environment • Amenity

VOLUME 65 Number 1 2010

THIS ISSUE

EDITORIAL

What's in a name?

I have to confess to remaining slightly uneasy about the generic terminology applied to our industry.

As an all-embracing description Land-based Engineering probably fits the bill and ticks the boxes for all other agencies and organisations who need neat cubby-holes in which to place different professions.

But does it really mean much to those outside our immediate sphere?

To the casual enquirer, people in our profession will surely be more specific to the question "What do you do?"

"I service tractors", or "I sell machinery to golf courses", are much more likely answers than "I'm a Land-Based Engineer".

The problem is that the world has moved on. The days of the self-evident career - butcher, baker, candlestick maker - have largely disappeared.

Work has evolved into something more complex - as have the descriptions of roles which have developed their own structure and jargons.

What was wrong with the personnel department? It did what it said on the tin. But no, large companies in the public and private sector now use the term Human Resources, or more likely HR, who themselves are dreaming up ever more whacky and unlikely titles.

All this has probably come about because titles have been thrust upon people to justify pay increases - or possibly in lieu of a pay rise to make the role of the person in question more important.

Adding the suffix 'officer' on the end of a title is probably the most common 'up-titling' - ticket collectors becoming revenue protection officers.

Let's face it, if we couldn't still understand what the "Head of Access and Enrichment" or "Person-Centred Transition Facilitator" actually did after five minutes of thought, what does that say?

But then again, who said it was easy and straightforward? Both IAgrE and AEA represent Agricultural Engineers in their title - but the scope of their activities is spread much, much wider.

ANOTHER era for IAgrE as it moves into new premises at Cranfield University thus breaking another industry link with Silsoe. It will have interesting and relevant co-tenants in the new HQ which is sure to have benefits.

CHRIS BIDDLE
Editor

PRODUCTION TEAM

EDITOR: Chris Biddle
Tel: 44 (0) 1722 429570 (direct line)
chris@nelsonpublishing.co.uk

SUB-EDITOR: Steve Gibbs
Tel: 44 (0) 1722 429573
steve@nelsonpublishing.co.uk

PRINTING: Broglia Press, Poole

Nelson Publishing Ltd
25A New Street, Salisbury, Wilts SP1 2PH
Tel: 44 (0) 1722 414245
Fax: 44 (0) 1722 414561
www.nelsonpublishing.co.uk

IAgrE
www.iagre.org

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

President
Richard E Robinson CEng FIAgrE
Chief Executive and Secretary
Christopher R Whetnall CEnv IEng FIAgrE MemASABE

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

Revised industry standards now available

A MAJOR review of the standards required for jobs in the land-based engineering industry took place throughout 2009, which gave employers the opportunity to play their part in ensuring their ways of working were accurately reflected. These standards are now available online from Lantra.

Lantra led the UK wide project, which created a new 'shopping list' of skills needed for staff in land-based engineering roles to be able to do their job properly. Lantra is now calling for the industry to take advantage of and use the standards to help support their workforce.

John Godden, Partnership Manager at Lantra, said, "The revised standards are a great tool to use in the workplace as they can be used to identify the skills needed, highlight best practice, develop training and recruitment plans, develop job descriptions and they also form the basis of qualifications. The review was a critical process for the sector as it determines what qualifications will look like for the next three years."

Many employers and industry representatives from across the UK worked on this review.

John Palmer, Training Manager for CLAAS UK Ltd, was one of the employers who got involved with the review and commented, "Due to the rapid technological and evolutionary changes taking place within land-based engineering, the National Occupational Standards used to underpin the industry's qualifications have required a significant review. The collaborative effort from industry, colleges and Lantra has produced a set of standards that truly reflect the needs of industry for today and tomorrow. In order to ensure that those involved with the industry have the necessary skills and understanding to keep pace with the technology, it's vital that the standards are put into practice as soon as possible."

For your free copy of the Land-based Engineering Operations National Occupational Standards, visit *www.lantra.co.uk/nos* or call 02476 858 424.

Environment Agency and Natural England given new enforcement powers

THE Environment Agency and Natural England, on February 3rd, became the first regulators to be given new civil powers that will give them greater flexibility to enforce environmental law, which they say will make the system more efficient and effective for both regulators and businesses.

The range of new civil powers - which have been welcomed by the NFU and EEF, the manufacturers' organisation - given under the Regulatory Enforcement and Sanctions Act 2008, will increase the options available to regulators and include fixed and variable monetary penalties and compliance notices.

The sanctions will provide an alternative to criminal prosecutions for regulators which is more proportionate and reflects the fact that the majority of non-compliance by businesses is unintentional.

Environment Secretary, Hilary Benn, said, "These new powers will help make the system fairer for the law-abiding majority of businesses and will give regulators a practical and effective alternative to prosecution. The Environment Agency and Natural England, the first bodies to be given these powers, will have access to flexible and proportionate sanctions that will strengthen the protection of the environment and human health when tackling businesses who break the law."

The powers, conceived by Professor Richard Macrory, were designed to create a modern and targeted system that will give regulators greater flexibility to impose more appropriate sanctions on non-compliant businesses. The Environment Agency and Natural England will be able for the first time to accept a voluntary commitment from a business to remedy non-compliance.

The existing system was considered to be too reliant on costly and time consuming criminal prosecutions. The new powers will not replace existing informal methods such as advice and guidance. Businesses and individuals will have access to an appeals process through an independent and impartial tribunal.

Andrew Clark, Head of Policy Services, the National Farmers' Union said, "We appreciate the work that Defra and its regulators have put in to develop a more flexible and proportionate approach to environmental enforcement, and for their having involved us in that work. The availability of sanctions other than just criminal prosecution in dealing with businesses which do not comply with the law is long overdue."

Farming and food production's future

Lincoln establishes new degrees

THE University of Lincoln has responded to national concerns about the future of the UK's food manufacture, farming and food security with the launch of two new degree programmes: BSc (Hons) Agriculture and Environmental Management and BSc (Hons) Food Manufacture.

The University say the BSc (Hons) in Agriculture and Environmental Management has been devised following recent Lantra studies which identified a significant skills gap in the sector due to the ageing workforce and increased demands of technology.

The aim of this programme is to provide graduates with a well-grounded understanding of the fundamental sciences of plants, animals, soils and global processes.

The new BSc in Food Manufacture, say Lincoln, is in response to the sector's acute difficulties in securing employees with the higher level skills required to ensure future competitiveness. Fifty per cent of the sector's workforce is over the age of 40 and one in four technologist posts are reported to be vacant due to the lack of skilled applicants.

The programmes are part of the faculty of Agriculture, Food and Animal Sciences. They will mainly be delivered at the University's Riseholme Campus.

For details about the courses contact David Stainton on 01522 895498 or send an email to *enquiries@lincoln.ac.uk*.

•*GRIMME and Brooksby Melton College (BMC) have launched a special apprenticeship programme to help train individuals on some of its most sophisticated and state-of-the-art potato machinery.*

As a result, Grimme has presented the college with a top of the range harvester to demonstrate its commitment to a dynamic working partnership.

"No other college in the country has one of these machines, and it's really exciting to see our first group of students progressing through the programme," says BMC principal Chris Ball.

The programme will be promoted throughout Grimme's dealer network as a means of providing them with first class technical support in the future.

Service technicians recognised at LAMMA show

John Deere's first LTA Masters

THE first six John Deere service technicians in the UK to achieve LTA4 Master Technician accreditation were presented with their certificates and registration cards on the John Deere stand at the LAMMA 2010 show at Newark in January.

Introduced as the top tier of the industry's Landbased Technician Accreditation (LTA) scheme, the Master Technician designation recognises individuals as having a proven and professionally assessed track record as the very best technicians, with the highest level of diagnostic skills and specialist product knowledge. The six John Deere service technicians are (*five of the six are pictured at LAMMA, as listed left to right*):

- **Robert Watson** - RBM Agricultural, Market Weighton, Yorkshire
- **Andrew Walker** - RBM Agricultural, Retford, Nottinghamshire
- **Robert Griffiths** - Agricultural Machinery (Nantwich), Cheshire
- **Dan Massey** - J E Buckle Engineers, Cromer, Hertfordshire
- **Tom Cooper** - Ben Burgess, Norwich, Norfolk (*not in photo*)
- **Kevin Drage** - J E Buckle Engineers, Cromer, Hertfordshire

"By employing an LTA accredited technician, or choosing a dealer with LTA registered technicians, customers can be secure in the knowledge that their equipment is being serviced by the best in the industry," says Christopher Whetnall, chief executive of IAgrE.

"With the ever increasing complexity and sophistication of agricultural machinery, it is vital to know that your equipment will be maintained by highly skilled professionals."

To achieve the full Master Technician qualification after being accredited at LTA3 level, individuals have to undergo additional training and assessment of their abilities in advanced diagnostic testing and product knowledge, as well as their customer and technical mentoring skills.

Technicians who reach LTA3 status are already registered with the Engineering Council as an engineering technician (EngTech), with the ability to display the technician's full qualifications on service vehicles. Currently John Deere's agricultural and turf dealers in the UK and Ireland have over 900 staff registered with the LTA scheme, including 454 at

LTA2 level, 25 at LTA3 and six at LTA4.

"The LTA scheme is designed to raise the profile of dealership technicians and underline their value to the industry," says John Deere's manager, customer support, Peter Leech.

New headquarters for IAgrE at Cranfield

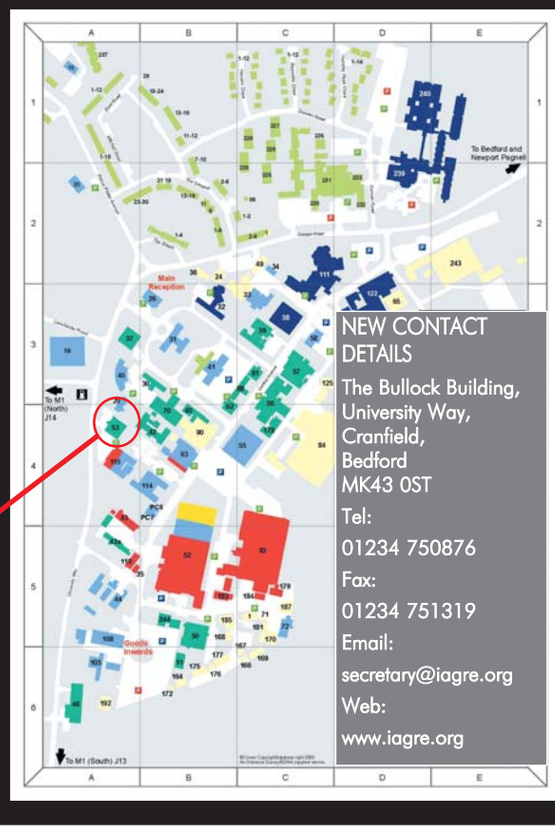
AFTER almost 35 years on the Silsoe campus of Cranfield University, IAgrE has moved into new offices on the main university campus at Cranfield, some 15 miles away.

The new home for the Institution will be The Bullock Building (Building 53) where it will share facilities with the Natural Resources Department (School of Applied Sciences) along with the Institute of Professional Soil Scientists, the British Society of Soil Science and the River Restoration Centre.

The lease for the new headquarters was signed at the end of February, with the move scheduled for the first days of March.

There was no chance for the staff to fully unpack as a Biosystems Engineering Committee meeting was scheduled to be held at the new offices on the day of the move!

IAgrE will be occupying a suite of offices comprising a general office, CEO office, Douglas Bomford Trust office doubling as a small interview room, database office and storeroom. There is also a meeting room which IAgrE will share, by agreement with the other organisations.



NEW CONTACT DETAILS

The Bullock Building,
University Way,
Cranfield,
Bedford
MK43 0ST

Tel:
01234 750876

Fax:
01234 751319

Email:
secretary@iagre.org

Web:
www.iagre.org

NAAC award for Sheltons

SHELTON Sportsturf Drainage Solutions have received an innovation award from the National Association of Agricultural Contractors in recognition of their 6 tonne Fast-flow gravel and sand placement hopper.

The six tonne capacity machine is mounted on wide low ground pressure tyres and coupled to a tractor of 60+ hp. It is capable of back filling trenches from 50mm wide upwards at forward speeds of 5-6 miles per hour. It enables one operator to place gravel, Lytag and sands with virtually no spillage.

Receiving the award at the NAAC conference at Stoneleigh, Mick Claxton (General Manager) said, "We listened to our customers who said they were looking to speed up their backfilling operations and as a result we designed the 6 tonne Fast-flow hopper. The feedback from users has been very positive and the innovation award is further endorsement of our product."

•NEW advice for farmers and advisers on farmland birds and pesticides has been published by The Voluntary Initiative (VI).

"The new advice explains how farmland birds can be indirectly affected by pesticides and recommends four steps farmers can take to help reverse the decline of these important native bird species," said the RSPB's Jim Densham, chair of the VI Biodiversity Sub-Group.

"Farmers need to ensure they follow integrated farm management practices, use pesticides responsibly, provide field margin habitats as well as in-field food and habitat options."

The new VI advice can be found at ***http://www.voluntaryinitiative.org.uk/_Attachments/Resources/1284_S4.pdf.***

Advanced Apprenticeship in Landbased Service Engineering

Graduates of the Claas of 2009

THE achievements of the latest students to complete the CLAAS Apprenticeship was recognised in a Graduation Ceremony held recently at the CLAAS UK headquarters at Saxham, Suffolk.

The seven graduates, who have all qualified with an Advanced Apprenticeship in Landbased Service Engineering (NVQ Level 3), in addition to achieving LTA2 status, received their graduation certificates from Clive Last, Chairman of CLAAS UK.

The successful students are: Daniel Plant (*Manns, Halesworth*); James Harrison and Wesley Stephens (*Kirby, Market Harborough*); Philip Winter (*Seward, Beverley*); Daniel Kjelstrup (*Southern Harvesters, Kent*); James Heath (*Vaughan, Frome*) and Shane Madley (*Vaughan, Dorchester*).

The group are the last to study at Writtle College, following the decision by the college to cease offering a service engineering course.

As a result the CLAAS apprenticeship scheme is now based at Reaseheath College in Cheshire, whilst for those in the north of England and Scotland, a similar course is based at Barony College, Dumfries, with a total of 22 new students enrolling on both courses this year.

During the four-year course, students have the opportunity to train at both the CLAAS Group headquarters at Harsewinkel in Germany and at the CLAAS UK headquarters at Saxham in Suffolk.

Having completed this first stage in their agricultural engineering education, the graduate students will have the opportunity to take their training a stage further by aiming for CLAAS Master Mechanic status for specific products, before potentially progressing to the higher Master Technician level.

On achieving these higher levels, this will also accord the technicians the relevant higher LTA3 and LTA4 accreditations

And new Claas scholar announced

THE CLAAS Group has also announced that Harper Adams student Jonathan Bradbeer is the winner of its fourth Scholarship for Agricultural Engineering.

Jonathan Bradbeer originates from Stroud in Gloucestershire and is in his second year at Harper Adams University College (HAUC) where he is studying MEng (Hons) Agricultural Engineering.

As the winner of the Scholarship Jonathan's fees for the second and fourth years of his studies will be covered, whilst in year three he will complete a 1-year sandwich placement at the CLAAS Group headquarters at Harsewinkel, Germany. As part of the Scholarship, Jonathan will also be offered a summer placement with CLAAS UK.

In selecting Jonathan the company not only took into consideration his academic background, but also his character, skills and enthusiasm for agricultural engineering.

Free 'Health for Work Adviceline' for small Ag businesses

SMALL businesses in the agricultural industry now have access to a new free adviceline offering professional occupational health advice to help with individual employee health issues.

The Department for Work and Pensions is piloting a 'Health for Work Adviceline' for small business (tel: 0800 077 8844 or visit *www.health4work.nhs.uk*) in seven locations in England. There are also national pilots operating across Scotland and Wales.

This initiative follows a recent Government report which identified a need to provide employers, particularly those in small firms with up to 250 people, with easy access to advice on workplace health issues.

Long-term health issues in the agricultural industry are often a concern, due to remoteness from medical or hospital services and the many demands on a manager or owner's time.

"A healthy workforce is key to a successful, healthy business," said Chief Executive of the Yorkshire Agricultural Society, Nigel Pulling.

Wind power blows across EU

39% of all new electricity-generating capacity installed in 2009

MORE new wind power capacity was installed in the EU in 2009 than any other electricity-generating technology, new statistics published recently by the European Wind Energy Association (EWEA) reveal.

39% of all new capacity installed in 2009 was wind power, followed by gas (26%) and solar photovoltaics (16%). Europe decommissioned more coal and nuclear capacity than it installed in 2009. Taken together, renewable energy technologies account for 61% of new power generating capacity in 2009.

Investment in new European wind farms in 2009 reached 13 billion Euros, including 1.5 billion Euros offshore. 10,163 MW of wind power capacity was installed across the European Union – a 23% increase compared to 2008 installations – made up of 9,581 MW onshore (up 21% from last year) and 582 MW offshore (up 56% from last year).

2009 is the second year running that more wind power capacity has been installed than any other electricity-generating technology, and wind's share of newly installed capacity increased from 35% in 2008 to 39% in 2009. It is also the second year running that renewable energies have accounted for the majority of new investments.

"It is a remarkable result in a difficult year," said Christian Kjaer, CEO of EWEA. "The figures, once again, confirm that wind power, together with other renewable energy technologies and a shift from coal to gas, are delivering massive European carbon reductions, while creating much needed economic activity and new jobs for Europe's citizens."

The countries with the biggest share of new capacity installed in 2009 were Spain (24% - 2459 MW), followed by Germany (19% - 1917 MW), Italy (11% - 1114 MW), France (11% - 1088 MW) and the UK (10% - 1077 MW).

Wind power's total capacity in the European Union has now reached 74,767 MW, up from 64,719 MW by the end of 2008 with Germany remaining the EU country with the largest installed capacity, followed by Spain, Italy, France and the UK.

Dealer's apprentice wins national award

James Marks of Cornwall Farmers honoured with Gold Medal

ONE of Cornwall Farmers' young engineering apprentices has scooped a major national student award in his second year at agricultural college.

James Marks has won the City & Guilds Gold Medal for his NVQ folder. The award is made to just one student each year from all of Britain's agricultural colleges.

James also claimed the Outstanding Achievement Award for Second Year at Brooksby College, Melton Mowbray, and the John Deere Year Two Student of the Year Award.

"Last year I won the John Deere Year One AgTech Student of The Year Award and this year I've managed to go even better so I'm delighted and very grateful for the support that I've been given throughout my apprenticeship, especially by the management team here at Cornwall Farmers," says James.

"This course is a mix of theory and practice and having got this far I'm now starting to go out on site with a qualified engineer and I can't wait until it's my turn to fix problems on my own," says James.

James Marks is based at Cornwall Farmers' Ludgvan Depot where the organisation's apprentice engineering scheme comes under the management of Graham Denning, Cornwall Farmers' Parts and Servicing Manager.

In addition to congratulating James on his achievements, Graham Denning is ever the realist and looking forward to James joining the ranks of his team of full engineers when he finishes the course in May. "James has been the model student for us and he'll be a great asset once he becomes a full engineer," he says.

"Quite frankly, the hours required in this job do put off some youngsters, as you do have to be ready to go to a farm at all hours, depending on what's required. James and the other lads we have here are undaunted by this so we have a really sound team in place to look after the needs of our customers right the way up from Lands End to Truro."

Trailed equipment braking safety urged

SEVEN major tractor manufacturers (AGCO, AgriArgo, Claas, CNH, JCB, John Deere and SDF) have come together to produce an informative document that highlights the importance of having correctly braked trailed equipment for today's high speed tractors.

Entitled '*Look Behind You – A guide to trailed equipment braking*', it has been prepared through the AEA's Service Manager Group with assistance and advice from BAGMA, the HSE and Scarlett Research.

The booklet points out that there is an industry-wide problem of 'under braked' trailed equipment being used. This is jeopardising public and operator safety as well as ensuring high tractor and trailer maintenance costs. This will inevitably lead to customer dissatisfaction and conflict with suppliers over reliability and repair costs.

To help resolve these issues, the relevant legislation is highlighted as is the available specs/speed ratings of trailed equipment.

This, says the booklet, will help to build a pro-active approach to investigating trailed equipment and help with the prevention of tractor brake failure. For the first time an owner operator will be able to satisfy his own business risk assessment. No longer will operators have to judge by the "seat of their pants" - their dealer can now quickly and economically test for correct tractor and trailer brake efficiency.

Subjects covered in some depth include the effect of speed and vehicle weight when braking, current UK agricultural vehicle braking legislation, trailer equipment specifications and, getting trailed equipment braking systems to 'stop their weight'.

The booklet has been prepared with a common text but will be illustrated with company proprietary material and will be issued through company distribution chains.

CEO VIEW

An important move

BY the time you read this, the IAgrE Secretariat will have moved from Cranfield University's Silsoe Campus to its new office suite on the Cranfield Campus. This is the culmination of discussions which commenced in 1999.

IAgrE is no stranger to moves this being the 12th move in the organisation's history.

There is no doubt however that this move is as important to the Institution as the original move to Silsoe in 1976 and will continue a strategic link for both organisations which dates back to the creation of the National College of Agricultural Engineering in 1962.

There have been so many changes in the profession and education over the years since the establishment of NCAE and subsequent IAgrE presence at Silsoe but key to it all, and perhaps the only constant, has been IAgrE.

With the pendulum of common sense swinging back to an understanding that both agriculture and engineering are important, the time may well be right to see somewhat of a renaissance in our sector. One can always hope.

The IAgrE Council have no doubts that Cranfield is the right place for IAgrE to be and we are grateful to the Cranfield University authorities for continuing the long relationship between IAgrE and the University's ag-engineering and related activities.

We can assure the University that IAgrE will be working hard to ensure, on its part, that the fruitful partnership continues.

May I at this time extend a warm welcome to all members to come and visit us in our new offices. Remember to leave a few extra minutes for parking if you are attending a meeting!

Christopher Whetnall

Carbon Brainprint

WILLIAM STEPHENS outlines how Cranfield University is helping other organisations reduce their carbon footprint

THE need for organisations to reduce their carbon footprint is now well accepted and Universities are no exception.

The Higher Education Funding Council for England (HEFCE) has recently published its policy requiring universities to target reductions of 34% and 80% by 2020 and 2050 respectively. Cranfield University is contributing strongly to this target by committing to a 50% reduction in carbon emissions over the next five years, compared to business as usual, the highest target set by a University so far.

This project is being led by me, William Stephens, FIAgrE CEnv and is being implemented by Cranfield's new Energy Manager, Gareth Ellis MIAgrE CEng CEnv.

Reducing Cranfield's carbon footprint, however, is only half of the story. Universities are expected to be at the forefront in developing solutions to the challenges of climate change.

Cranfield is no exception and much of our work at is aimed at helping other organisations to reduce their carbon footprints, both by providing existing or potential employees with the necessary knowledge and skills and, more directly, though research and consultancy projects. These reductions cannot be offset against the universities' footprint, but the intellectual contribution to reducing the carbon footprint of others, which we call our "Carbon Brainprint", is immensely valuable in meeting the challenge of global warming.

The novel aspect of the Carbon Brainprint concept is the prospect of assessing the global impact of research and teaching in the Higher Education sector in mitigating global warming. In developing the concept, some preliminary estimates have been conducted at Cranfield.

This pilot work suggests that the Brainprint can be calculated and is potentially substantial. However, these estimates have raised methodological issues that need to be resolved in order to develop robust, auditable procedures.

Examples of Cranfield's Carbon Brainprint activities across the University include:

- **The University's Centre for Resource Management and Efficiency jointly trained Environment Agency landfill gas inspectors to improve gas capture resulting in 7600 m³/hour reduction in landfill gas emissions, equivalent to a reduction of 400,000 tCO2e in the first year of the programme (25 times Cranfield University's own carbon footprint).**
- **The Surface Science and Engineering Centre has developed turbine blade coatings in collaboration with Rolls Royce PLC which, if deployed across an international airline fleet such as BA, would result in an annual fuel saving of ca £25 million. The potential saving in industrial turbines is many times this.**
- **Cranfield's Business Travel Research Centre, working with the Institute of Travel Management, developed a tool for corporate travel managers to reduce carbon emissions related to business travel through an accredited process.**
- **The Centre for Logistics and Supply Chain Management at Cranfield School of Management has developed an innovative vehicle routing model that selects the most fuel efficient route by using roads on which a vehicle can maintain the optimum speeds that minimise fuel consumption. Results show that that fuel consumption, and therefore CO2 emissions, can be reduced by over 5% if the most fuel efficient routes are used**

The carbon brainprint concept is an innovative way of assessing the global impact of Higher Education on climate change mitigation across sectors such as energy, technology, engineering, science and management.

The next stage is to move from individual examples to a workable methodology that can be used across the very wide variety of projects that the University undertakes. In natural resource management, for example, what is the carbon brainprint of better land use management, onions with better storage life or more efficient irrigation?

Overall, the answer is likely to be that Cranfield's impact in addressing the pressing problems of decarbonising society will far outweigh the carbon cost of doing the work.

William Stephens
Change Programme Director
Cranfield University

Awareness of Campaign for Farmed Enviroment high

Defra survey says 85% of farmers have heard of Campaign

FARMERS' awareness of the Campaign for the Farmed Environment is high according to a recent Defra survey.

Already 85 per cent of farmers have heard about the Campaign and many are managing land voluntarily.

Around 5,000 farmers and growers were questioned back in November, when the Campaign was officially launched, to get a benchmark for the level of voluntary, environmental activity already being carried out on farms, in addition to the then current level of awareness of the Campaign.

CFE partners have said the figures show the huge amount of work that farmers and growers are already doing and provides an encouraging starting point on which the Campaign can build. Results reveal 174,000 hectares of land are already managed for conservation outside agri-environment schemes and over 50 per cent of farmers have retained uncultivated land.

However the CFE partners believe it is vital that the interest in the Campaign is turned into action on the ground. They want farmers to:

- *Either enter ELS for the first time or check the expiration date of their ELS agreement. If it is this year then farmers can apply for their next ELS application pack and pick some Campaign options such as pollen and nectar mixes, wild bird seed mixtures or perhaps a 12 metre buffer strip to stop runoff into watercourses*
- *Retain their uncropped land and existing environmental management*
- *Take a look at the Campaign's 'Farmers Guide to the Voluntary Measures' and adopt at least one measure outside of an ELS agreement that can work with their farming business. This could even be on uncropped land.*

CAMPAIGN FOR THE FARMED ENVIRONMENT

CLA President William Worsley said, "The results are certainly encouraging and show the Campaign has generated a lot of interest among farmers and land managers. However, it is important we do not become complacent.

"We need to turn intention into action and this is something that every farmer, grower and land manager can do. If we do not succeed, then the alternative will be costly and could stifle the industry's ability to move forward for years to come."

Visit *www.cfeonline.org.uk* for further details.

Read more on the Campaign on page 20

New Technical Manager at BASIS

KARL Bahn has been appointed Technical Manager for the standard setting organisation, BASIS.

He joins BASIS from Masstock Arable where he has spent the past 10 years as an agronomist, providing advice to farmer customers in East Yorkshire.

BASIS qualified since 1998, Karl's appointment to this new position will strengthen the technical capability of the management team.

His responsibilities will include, amongst other things, overseeing the technical content of events qualifying for Continuing Professional Development (CPD) points, checking and updating BASIS syllabuses, keeping up to date with regulatory changes, particularly those concerned with transport and storage, setting and monitoring examinations as well as invigilating and chairing *vivas*.

Energy Technologies Institute launches more than £50m of projects in 2009

THE Energy Technologies Institute, the organisation tasked with developing the technologies and engineering approaches that will help the UK meet its 2050 carbon reduction targets, recently published a review of the projects it has funded in 2009.

In total, the ETI has provided in excess of £53m funding for 15 projects in offshore wind, marine, transport, carbon capture and storage, energy storage and distribution and distributed energy.

These include:

- An £11m Plug-in Vehicle Economics and Infrastructure project, including the world's most extensive evaluation of consumer's attitudes to plug-in vehicles enabling effective investment.
- An £8m project to accurately estimate the energy yield of major wave and tidal stream arrays.
- A £5.1m project to detect causes of faults and component failures in offshore wind turbines.
- A £3.8m project looking at developing the UK's first national database of geological storage capacity for CO^2.

The ETI also developed its unique Energy System Model to help identify those technologies capable of having the greatest impact through to 2050 under a range of different demand scenarios. The model will highlight the associated costs and risks of meeting those energy targets.

A full list of the ETI projects announced in 2009 can be found at *www.energytechnologies.co.uk/Home/Aboutus/Achievements.aspx.*

Rise in Engineering Council registrations

END of year registration statistics issued by the Engineering Council show a significant increase in the number of practising engineers recognising the value of gaining professional qualifications.

Engineering Council

During 2009 the number of new registrations for Chartered Engineer (CEng) was 9% higher than in 2008, while new Incorporated Engineer (IEng) registrations have grown by 10%. In addition, there has been a net increase in the total number of Engineering Technician (EngTech) registrants for the fifth consecutive year.

Andrew Ramsay, the Engineering Council's Chief Executive said, "We've noticed a surge in enquiries about registration over the past year, and are pleased that our figures show how many of these have been successfully registered. No doubt the results are in part due to the competitive job market, as well as industry recognition of both the added status and the importance of being professionally qualified.

"We have invested in spreading the word about how professional registration improves job security and career prospects, and is open to any competent practising engineer, with different pathways available."

The rise in women engineers achieving chartered status has continued too, with women accounting for over 11% of total new registrants for the third year running.

A new section of the register, for Information and Communications Technology Technicians (ICTTech), was opened at the beginning of 2009. So far 21 registrants have successfully completed the process, with many more following in their footsteps.

Despite the healthy increases in new registrations, the overall register declined by 1.7%. However, the average age of Chartered Engineers leaving the register was over 62, and the decline generally reflects an ageing population reaching retirement.

Roundhouse building wins IAgrE Ivel Award at LAMMA

Most positive impact on the environment

THE innovative Roundhouse livestock building has won the Agricultural Engineers (IAgrE) Ivel award for the product or innovation with the most positive impact on the environment at the LAMMA show (Lincolnshire Agricultural Machinery Manufacturers Association).

This award is the third environmental award the building has scooped, coming on top of two from The Green Organisation last year, which also recognised the building for having a positive environmental impact. In 2007 the building also won the Country Landowners Association's President's Award for the Best New Building in England and Wales, and won a Silver medal for innovation at the 2008 Royal Highland Show.

The unique shape of the building has significant environmental benefits on two fronts - from a human aesthetic environmental point of view when viewed at a distance, and internally from an animal environmental point of view in that the building arguably provides the best housed environment for farm animals.

"We initially designed the building from an animal perspective, in that we wanted superb air flow through the building to keep fresh air moving, and a very welfare friendly, easy to manage system that would provide a very stress free environment," says John Allinson, one of the building's designers from Roundhouse Building Solutions Ltd (RBSL), along with fellow business partner Geoff Simpson.

"At the same time, we wanted the building to look good, so that it blended in with the countryside. We think we have managed to achieve everything, and it seems that others agree with us. So far we have had no complaints about the building from farmers, or from planning officers."

One of the main reasons for the building's 'environmental aesthetics' is that it has no walls, and has a green umbrella shaped roof made from tensile PVC coated polyester fabric of incredibly high strength and durability, and which is commonly used on prestigious and complex architectural features. The rustic green colour of the roof blends well in most situations and, while unusual in shape, the building is only ever seen tangentially - significantly reducing the visual impact of the building.

One environmental option for the building is to install a rainwater harvesting system, and the feasibility of installing solar panels on the roof is also being investigated. At the end of its useful life - the roof is expected to last over 25 years - the whole of the building can be recycled. RBSL has also recently embarked on a research project with the University of Cumbria, to assess the performance of the animals within the building to try and reduce their carbon footprint.

The attractions of the building mean it is finding favour with all sectors of the livestock industry, with the Roundhouse having been sold into the beef, dairy, calf rearing, deer and pig sectors.

"We are delighted with the way the Roundhouse has been accepted by farmers, and industry alike. We are naturally pleased to have won the IAgrE's award at LAMMA, and are surprised that our building pipped some major multinational and innovative agricultural machinery manufacturers to this award. We thank the organisation and the judges for selecting us against what we imagine would have been stiff competition," says Mr Allinson.

Chris Whetnall, IAgrE's Chief Executive, said that the judges were impressed by the innovative thinking that has gone into the design of the Roundhouse.

"The design is imaginative and challenges conventional thinking on the benefits of a round building instead of the more traditional rectangular building for housing livestock. The building is more aesthetically pleasing than rectangular units and consequently faces less opposition during the planning process.

"Its green, matt-finished roof enables the building to blend extremely well into the countryside and when it comes to the end of its life the whole building is 100% recyclable."

MBE for pioneer in food and agricultural education

PROFESSOR Val Braybrooks, Dean and Associate Professor of the University of Lincoln's Faculty of Agriculture, Food and Animal Sciences, was awarded the MBE in the New Year's honours list.

Val was recognised for her services to further education, higher education and the food industry.

"I am proud and thrilled to receive this honour, and delighted that education in the food manufacturing and agricultural industries has been recognised in this way," she said.

Val's career in teaching and management for the food and agricultural industries spans 30 years and she is widely credited with revitalising and raising the standards of Lincolnshire's educational provision in these areas. She led the development of the National Centre for Food Manufacturing, a unique employer and public sector partnership which has seen the transformation of Holbeach Campus into a major national resource.

£2,500 apprenticeship grants for employers

LANTRA Sector Skills Council is encouraging employers to seize a £2500 funding opportunity to take on a new apprentice.

In a move to encourage more employers to take on an apprentice, the National Apprenticeship Service is now offering businesses in the environmental and land-based sector a £2500 grant they would be eligible for when they take on a 16 or 17 year old apprentice.

Peter Martin, Chief Executive of Lantra commented, "This is a tremendous opportunity for employers considering taking on apprentices. These grants are particularly aimed at small and medium sized businesses, so could be the extra help that is needed. Apprentices can be a great investment for businesses, as on the-job training can help employers ensure their workforce remains competitive."

For more information visit *www.lantra.co.uk/Apprenticeship-Week-2010* or call 0845 2707 8007.

Onwards and upwards

In his final musings as IAgrE President, RICHARD ROBINSON commends the work undertaken behind the scenes as the Institution moves home

I HAVE just officiated at my last Council meeting and will step down at the AGM in May, handing over to Peter Leech who, I am sure, will be far better at the Presidential role than I have been.

My heartfelt thanks go to our really brilliant head office team, Chris, Elizabeth, Sylvia, Wendy, Marion and Mike who continually amaze me with the quality, variety and accuracy of the work they do for us. My thanks must also go to the army of volunteer committee members who give their time and experience to the running of our organisation, with no reward except their pride in improving the quality and range of services available to our members.

Whilst at Cranfield we had the opportunity to view the construction and refurbishment of the Institution's new headquarters and, by the time you read this we will have moved. Our thanks must go not only to Chris who has negotiated so hard on our behalf, but to the University which has had to find the funds to offer us these excellent facilities in a time of severe financial constraints.

I know that all members will want to send our HQ team best wishes in their new home and, carpark problems notwithstanding, enjoy once again being in the heart of academia!

Council members had a close look at some of the really interesting research projects underway at the University, a huge amount of work has been done since we last had a tour and it restores one's faith in the ability of educational organisations to get the funds from industry to effect real improvements in the way we work.

Our AGM and conference will be at Cranfield and I am sure that you too will be equally impressed – so do make a date and come along.

OUR own business has seen a reasonable improvement in the last couple of months - thank goodness, but I still don't have the confidence to launch the build of our desperately needed new offices and paint shop.

Undoubtedly the greatest burden we have to bear is ever increasing and paradoxical legislation. As some of you will know, we make what we believe is the finest Cricket Roller in the world, but could someone please explain why we have to obtain its noise test results when it is on asphalt?

I do know a few games are played on such a hard surface, but rolling Tarmac probably won't improve the game! (unless I've misread the excellent Cranfield report now available on the ECB website).

THE last edition of *Landwards* included some really excellent material, particularly aimed at our LTA sourced members.

It is our intention to offer you all an appreciation of the benefits of belonging to IAgrE and make sure that you want to become more involved as time goes by. A number of you will be running your own businesses in the future and we want you to recommend our Institution to your employees, just as my boss John Patterson at New Holland did many many years ago.

I shall miss the honour of Presidency, but together with the many hard working members I have met, will continue to do my best for our excellent organisation.

> "I know that all members will wish our HQ team best wishes in their new home and enjoy once again being in the heart of academia"

Sustainable remediation of an asbestos impacted landfill

PHIL AMOS
Principal Geo-Environmental Engineer,
WYG Environment Ltd

INTRODUCTION

THE Kilbowie Road former landfill is located 0.5km north of Clydebank town centre in West Dunbartonshire, 14km north west of Glasgow.

The site, historically an area of low lying and unused marshy ground, was infilled with ash, demolition rubble and some domestic waste from around 1950 until 1983. Clydebank has a long association with asbestos fibre and asbestos containing materials though the ship building industry, and asbestos containing materials were known to be present in the waste deposits at the Kilbowie site.

In 2004 the site was formally designated as 'Contaminated Land' under Part IIa of the Environmental Protection Act 1990. This triggered a requirement for West Dunbartonshire Council to carry out remediation works.

This article describes design and execution of the remediation works and presents some of the techniques used to assess the sustainability of the works.

.

BACKGROUND

WYG Environment was commissioned in November 2007 to develop a remediation design and supervise the remediation works for the western part of the site, extending to 1.3ha.

These works were required to address obligations under Part IIa legislation, to cause minimal disruption to neighbours, and to be completed by the end of March 2008 within a fairly tight target budget of £400k. As an additional complication, the remediation design was to suit two possible end uses - either as a car park to serve a sustainable transport scheme (the subject of a planning application to be submitted in January 2008) or, in the event that the application was refused, open amenity space for use by local residents.

The site was also to be left with a seeded soil cover which could be removed at a later date if the planning application was successful.

The project was completed on time and budget in March 2008. It has since received commendations in the Brownfield Briefing Remediation Innovation Awards 2008 and the Ground Engineering Awards 2009.

REMEDIATION DESIGN

THE remediation design needed to address a number of issues:

- **Significant quantities of asbestos, in both free fibre and asbestos containing materials form, had been encountered at shallow depth during previous site investigations;**
- **Two stands of Japanese Knotweed were growing in the middle of the site;**
- **Sporadic peat pockets were known to underlie the waste deposits, the design needed to mitigate against potential settlement yet remain cost effective (i.e. piling solutions were ruled out); and,**
- **The design needed to suit both alternate end uses as best as possible whilst meeting the client budget.**

The preferred methodology for remediating the site was to prevent any site users (including construction workers) from coming into contact with asbestos deposits by placing a suitably thick layer of clean cover material, ideally without disturbing the asbestos containing soils.

Placement of geosynthetic Combigrid and recycled capping layer

However, the heavily vegetated topsoil had to be removed to provide a geotechnically suitable sub-grade upon which the tarmac car park could be built, and the existing site topography dictated that large quantities of stone (either quarried or recycled) would have to be used to level the site and form the sub-base upon which the tarmacadam surface of the car park could be built. Importing this volume of stone would have been prohibitively expensive.

It was therefore decided to re-grade the site using suitable site-won fill. This in turn would mean exposing and disturbing asbestos deposits, and it was thus desirable to keep re-grading activities to the absolute minimum.

3-D GROUND MODELLING

THREE-dimensional ground models of the existing topography and the proposed car park surface were developed using Autodesk Civil 3-d, these were compared within the software package to generate a thematic plan of cut and fill across the site.

Finished levels on the car park surface were then adjusted until cut and fill volumes balanced (after allowances for some off-site disposal of contaminated soils).

The thematic plan was then used to design a targeted supplemental site investigation to further delineate asbestos impacted soils. Trial pits were targeted in areas where excavation would be required, areas to receive fill did not require any further investigation.

The Contractors 'setting-out' information was drawn directly from the 3-d model at the click of a button. Accurate determinations of materials volumes for disposal off-site and for import were also drawn from the 3-d model, allowing accurate quantities draw-off, forecasting and monitoring of construction costs.

GEOSYNTHETIC REINFORCEMENT

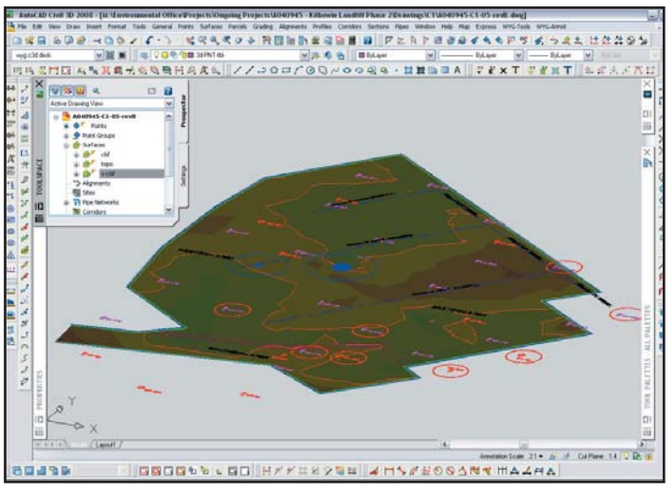
GROUND conditions at the site were variable and included pockets of peat up to 4-5m thick.

Conventionally, a capping layer of quarried stone placed up to 675mm thick would be used to form a suitably strong surface upon which the tarmac surfaces could be constructed. It was decided to include a combination geosynthetic separation layer and reinforcement geogrid in the capping layer - this comprises a polypropylene fleece layer bonded between two layers of horizontal polypropylene bars.

The bar layers are arranged perpendicular to each other, forming a grid with the continuous fleece layer sandwiched between.

This 'combigrid' offered a number of significant benefits:

- **The fleece layer acts as a separator to prevent the stone capping layer sinking into the softer underlying soil, improving the efficacy of the capping layer;**
- **The grid acts as framework to help contain lateral displacement of the stone, effectively strengthening the capping layer;**
- **The geosynthetic material allowed the thickness of stone required to form the capping layer to be reduced from 675mm to 300mm, equivalent to 4,750m³ or 475 lorry loads of material;**
- **The combigrid would provide a degree of load distribution and spanning over soft spots, reducing differential settlements and thus cracking of the tarmac surface; and,**
- **The geosynthetic layer would act as a barrier and warning layer for any future works - any future excavations encountering or extending beneath the combigrid could encounter asbestos impacted soils.**



3D ground model used to optimise cut and fill volumes. Brown areas denote excavation, green areas require fill.

RECYCLED AGGREGATES

THE construction contract was designed to allow and encourage the use of recycled aggregates in the place of virgin quarried materials.

A comprehensive chemical and geotechnical testing suite was designed and implemented to certify the contractor's proposed sources as being suitable for use, and validation samples were collected for testing as the material was imported to site.

JAPANESE KNOTWEED

TWO small stands of Japanese Knotweed were present on the site. This invasive weed is capable of growing through tarmac surfaces and is controlled under Wildlife and Countryside Act (1981).

The short timeframe for completion of the work precluded any chemical treatment methods, and the possible risk of encountering asbestos deposits within the extensive rooting zone indicated that disposal to landfill was the only viable option in this instance.

However supervision and inspection of the excavations by a WYG ecologist allowed excavation work to cease once it was certain that the excavated surfaces were clear of rhizomes. This gave a notable reduction in volumes of soil for disposal compared with the recommended guidelines for excavations.

continues over

. . . a comprehensive chemical and geotechnical testing suite was designed and implemented to certify the contractor's proposed sources as being suitable for use

. . . the application of sustainable design criteria has the potential to generate significant cost savings

Ecologist supervising Japanese Knotweed excavation in asbestos impacted soils - the orange / yellow rhizomes are clearly visible

TOPSOIL REUSE

IN the event that planning permission was not granted, the site would revert to amenity use by the local neighbourhood. This would require topsoiling and grass seeding.

A temporary soil cover was also required between completion of the remediation work and commencement of any future work on the car park.

The remediation designed included careful stripping of the existing topsoil and a chemical testing programme to determine suitability for re-use. A geotextile separation layer was placed over the completed subgrade capping layer and topsoil passing the chemical acceptance tests was replaced over the site.

ASBESTOS EXPOSURE CONTROL AND MONITORING

RISK assessment during preparation of the remediation design identified a high level of risk to site workers on account of the asbestos present in the waste deposits.

Therefore the specification was developed to require the presence of an asbestos specialist on-site during all operations that could encounter or expose asbestos. The asbestos specialist was to be responsible for controlling excavations, measuring and controlling site worker exposure using personal exposure monitors and measuring and controlling potential exposure at the site boundary using perimeter air monitoring stations.

Hazard identification and risk assessment were carried out at the beginning of the design stage and repeated at key stages in the evolution of the design to ensure health and safety was designed into the remediation scheme wherever possible.

Once the design was complete, the remaining hazards that could not be eliminated were listed on the Tender and Construction drawings so that anyone (including site workers) looking at the drawings would be alerted to these hazards.

All site staff and WYG supervising staff received a half-day asbestos awareness course at the commencement of the site works. Each staff member also underwent a 'face-fit' test to fit and check the personal issue half-face dust masks.

The site was split into 'clean' and 'dirty' sections with access via a decontamination unit. All staff wore blue disposable 'Tyvex' suits whilst in the dirty part of the site, suits were disposed to a locked asbestos skip after each use.

Drainage runs were installed into the waste deposits during the works. These would be required for the future car park and it was considered appropriate to carry out as much 'dirty' work (in the asbestos impacted soils) as possible in one hit.

The alternative would have required a second round of excavation and disposal when the car park is built, potentially re-exposing asbestos deposits. Carrying out pre-emptive installation of the drainage runs has virtually eliminated risk of future site workers coming into contact with the asbestos impacted soils.

All personal and perimeter asbestos monitoring results proved clean, i.e. no asbestos fibres were found in the personal / perimeter monitors, despite free fibres (of Crocidolite, Amosite and Chrysotile) being excavated during the works.

SUSTAINABILITY

THE words sustainability and landfill are not commonly associated. However, the asbestos content in conjunction with the project budget ruled out alternative methods for remediation and therefore best efforts were made to ensure the project could be as sustainable as possible.

Timescale requirements imposed by the client dictated that the outline remediation design, detailed design, tender documents and drawings all had to be produced within a three week period. Sustainability analyses needed to be transparent and concise so that a rapid assessment of the design details could be made to keep the design process on programme.

Sustainability assessment was carried out in three stages:

- ***Stage 1*: a subjective assessment of sustainability at outline design stage to establish the most likely sustainable aspects and design features,**
- ***Stage 2*: an objective assessment at detailed design stage of likely volumes of material diverted from use in the works or disposed to landfill by implementing the sustainable design features, and;**
- ***Stage 3*: an objective assessment upon completion of the remediation works to quantify the actual quantities of materials used, vehicle movements, material kilometres travelled and carbon dioxide emissions from road transport.**

Stage 1 subjective assessment

THE stage 1 assessment comprised a design optioneering review to brainstorm potentially sustainable options, establish the sustainable benefits on a

Perimeter monitoring station for airborne asbestos

Supervision of asbestos excavations - note disposable suits and half-face respirators

subject basis and consider how the particular aspects interact with or impact on other project aspects.

A good example was selection of the treatment methodology for Japanese Knotweed. Use of an ex-situ bunding and chemical treatment technique was considered, but this had the potential to have asbestos impacted soils present in the excavated material and thus pose risk of severe negative impacts on site workers and neighbouring public.

The method therefore was eliminated from further consideration.

The outcome of the stage 1 assessment was a series of sustainable design features including the 3-d ground modelling to refine car park levels and balance cut & fill volumes, use of geosynthetic reinforcement in the capping layer to reduce the thickness of the capping layer, use of recycled materials in the capping layer and use of an ecologist to certify and minimise knotweed excavations

Stage 2 objective assessment

THE features identified at stage 1 were progressed to detail design and assessments of the diverted volumes made.

Outcomes were as stated in Table 1 below left:

This gave clear evidence that sustainable benefits would be realised in the remediation design

Stage 3 objective assessment

ONCE sources of materials, disposal destinations and material quantities arising from the actual works were known, the stage 3 objective assessment was carried out to assess actual kilometres travelled, vehicle movements and CO2 emissions associated with the materials import / export.

The DEFRA Guidelines for Company Reporting on Greenhouse Gas Emissions were used to calculate CO2 emissions.

Results are summarised in Table 2 below right:

DISCUSSION

INCORPORATING sustainable elements into the design has reduced potential vehicle movements, total distance travelled and materials transport C^{o}2 emissions by 60%.

In addition, the sustainable elements have avoided the consumption of 2,375m^3 of landfill void space (against 780m^3 actually used) and reduced import material requirements by 8,125m^3 to 6,356m^3.

Of the 5,182m^3 of granular material used in the capping layer, 3,500m^3 (68%) was recycled crushed concrete (some virgin material was required when the recycled source ran out and insufficient time remained in the programme to carry out pre-acceptance testing on alternate sources).

Perhaps most importantly, the sustainable design elements also generated cost savings of £227,000 which allowed the remediation project to be completed within the client budget.

This clearly demonstrates that application of sustainable design criteria, even at a basic level to the most unlikely projects, has the potential to generate significant cost savings.

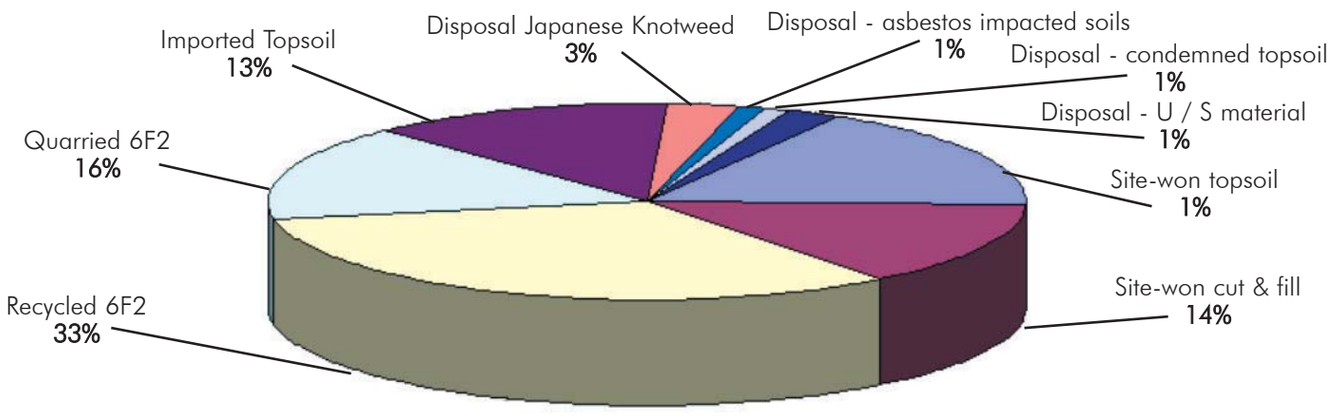
Sustainable design feature	Material	Volume diverted or not used as a result of the design feature	No vehicles diverted	No vehicle movements eliminated
3-d ground model to achieve cut & fill balance	Crushed rock imported to site	1,000m³	100	200
Geosynthetic reinforcement to capping layer	Crushed rock imported to site	4,750m³	475	950
Japanese Knotweed impacted soil disposal	Contaminated soil for disposal	575m³	58	115
Replacement fill to Japanese Knotweed excavation	Crushed rock imported to site	575m³	58	115
Disposal of topsoil to landfill	Contaminated soil for disposal	1,800m³	180	360
Replacement topsoil imported to site	Topsoil imported to site	1,800m³	180	360
Totals		8,125m³ (import) 2,375m³ (disposal)	1,050	2,100

Table 1

	Weight (t)	Volume (m³)	Vehicle movements	total km travelled	total CO_2 emissions (kg)	% of potential CO_2 emissions
Actual (import)	12,077	6,356	1,302	35,715	27,052	36%
Actual (disposal)	1,481	780	160	6,288	4,763	6%
Diverted (import)	15,438	8,125	1,626	37,853	28,671	38%
Diverted (disposal)	4,513	2,375	476	20,563	15,575	20%
Potential total	33,509	17,636	3,564	100,419	76,062	100%
Diversion as % of potential total	60%	60%	59%	58%	58%	

Table 2

Summary earthworks statistics (excludes diverted volumes)



EXHIBITION

Innovations & advances in technology

Harper Adams University College students' trip to Agritechnica, funded by the Douglas Bomford Trust

Christopher Vicary, James Child, Andrew Davies and Jack Mavin

AGRICULTURAL ENGINEERING, HARPER ADAMS UNIVERSITY COLLEGE

SUMMARY

This report gives a detailed insight into our trip to the Agritechnica Show in Hannover, Germany in November 2009. A group of 4 students from Harper Adams University College drove across via the Hull-Rotterdam ferry to Hannover. They spent two days at the show.

Main findings from the show indicate that most manufacturers are moving towards a common Isobus system to reference the implements to the tractor/machine, Biogas and manure digesters are becoming very popular and a key part to the energy market, Large advances in robotics for farming include automatic tractors and feeders, Auto-fit tractor loaders were also a key interest.

The group set out to learn about the new technologies in the agricultural engineering sector and to gather information which will aid them in group projects and dissertations during their final year at Harper Adams. The trip proved a success to this aim and all members of the group are fully up to date and aware of the new technology and advances in engineering.

ACKNOWLEDGEMENTS

We would like to formally thank the Douglas Bomford Trust for their kind generosity and help in helping with the funding to enable this trip to happen. It has proved to be of great help to our studies as we have now seen the latest developments in agriculture.

INTRODUCTION

THIS report details the findings and knowledge gained from the group's trip to Agritechnica, Germany. It gives a clear insight into the new technologies and advancements in the agricultural engineering sector.

The aim of the trip was to further our knowledge and understanding of engineering examples within the agricultural sector, keep the group updated on the very latest advances in technology and to source out vital information to aid in group projects and dissertations during the final year at Harper Adams University College.

It was decided that on day 1 at the show the group would stick together and try to look at the majority of the show so on the second day we could specialise on any sections that are relevant to our Final year or group projects.

Overall the itinerary worked well to enable the trip to be as short as possible yet allowing us to see everything that Agritechnica had to offer. This meant that very little lecture time was missed yet a very worthwhile trip was had by all involved.

ADVANCES IN TECHNOLOGY

- Auto Spout control on self propelled forage harvesters

TO increase efficiency during harvesting an automatic spout control system has been developed.

Figure 1: Claas AutoFill automatic spout control

This system automatically directs the spout to fill the trailer. This allows the driver to concentrate on other aspects of the machine's operation. Newly developed systems from Claas and New Holland were launched at Agritechnica.

The Claas system shown in **Figure 1** and the New Holland system shown in **Figure 2** use 3D vision systems to identify the edge of the trailer and the trajectory of the crop. The computer adjusts the spout to fill the trailer. New Holland claim that

Figure 2: New Holland Intellifill automatic spout control

. . . At the show many manufacturers were focusing on improving operational efficiencies

their system can deliver crop accurately to a distance of 20m.

DEVELOPMENTS IN THE AGRICULTURAL SECTOR

CHRIS Vicary is currently involved in a group project concerning the cleaning of potatoes:

"Agritechnica was particularly good for me as it gave me the opportunity to source out new information for the project, meet valuable clients and gather good links to information. Most of my contacts from the show would not have been found elsewhere as a few didn't have a website and others were from Eastern Europe and America and are difficult to find on the internet.

Aspects which stood out to me from the show are that there was a huge interest in the materials used. Especially in the star wheels for cleaning potatoes, dual core materials were being used to reduce wear and give a longer life expectancy in tougher conditions."

INNOVATIONS

ONE of the new tractors that was previewed at Agritechnica was the new Deutz XXL.

This tractor is currently a prototype but if brought into production will have 600hp and 8 wheels as pictured below in **Figure 3**. The group noted a number of problems with this tractor that made us think that this is not the way to go with tractors of the future.

During our time at Harper we have learnt that to increase traction it is better to have larger diameter wheels than wide wheels. As this machine has small diameter and quite narrow wheels it is believed that it will not perform as well as some other solutions to get power to the ground e.g tracks or the Fendt 'trisix'.

Figure 4: The Deutz XXL's rear spool valve

Also there were some features on the tractor that seemed very poorly designed e.g. the Spools on the back of the tractor had very poor labelling, see **Figure 4**. This is a simple design feature that could be improved with little or no increase in the cost per tractor i.e. having different colours for each SCV labelled as pressure / return.

FIGURE 5 shows the John Deere Isobus display.

At Agritechnica many manufacturers launched new and improved integrated screens in tractors. Many machinery manufacturers are also offering an Isobus control options. This allows the machine to be controlled and monitored by the tractors in-built systems.

At the show many manufacturers were focusing on

Figure 3: The Deutz XXL revealed at Agritechnica

Figure 5: John Deere's Greenstar II Isobus Display

improving operational efficiencies. The efficiency can be improved by having adaptive machinery that can adapt to the environment that it is working in. This can be achieved by using advanced in-cab control systems such as Isobus.

It is important to standardise the systems used so that the systems used by different manufacturers are fully compatible. This is the purpose of the international Isobus Standard.

THE New Holland emission free, hydrogen powered tractor was attracting a lot of interest at the show.

Figure 6: New Holland Hydrogen Powered Tractor

The current tractor can run for approximately 2 hours and can produce 106 horsepower. The tractor featured two electric motors, one for traction and one for power train and auxiliaries. Considering that there is no combustion engine the group felt that this tractor was very interesting and with further research and development (which is currently underway) could allow the tractor to run for longer and could become commonplace in fields in the future.

ANOTHER manufacturer involved in improving operator efficiency and making Isobus easier to use was the Agco brand.

In particular this screen is now offered by Fendt which allows four different screens to be seen at once, or one large screen. This would be particularly useful for an Isobus implement as from past experience it would have been very useful to be able to see at least 2 different run screens at the same time to be able to keep the tractor at its greatest efficiency.

Figure 7: Fendt Split 4 Information Screen

The above screen also allows inputs from cameras and also autoguidance, to cut down on the screens needed in the cab. This in turn should also make the tractor safer to drive as the full view out of all windows will not be impaired as all the screens will be adopted into one.

ANOTHER product to reduce input time was on show by Schuitemaker, a company generally associated with feeder wagons. The new innovation from Schuitemaker has the possibility of being revolutionary as it was the first fully automatic solution to feeding livestock.

The Innovardo has the ability to drive to the clamp to pick up feed, mix it, drive back to animals, unload in several different locations and then park up without a driver. The technology comprises of sensors, gyroscope and lasers to work out and travel the route. The

continues over


Figure 8: Sensors used to guide the vehicle


Figure 9: The feeder wagon emptying


Figure 10: Filling the mixer unit

sensors and lasers also protect the machine and others around the Innovardo by scanning the route ahead.

The social and economic advantages of not having to employ people to feed several times a day would be a big benefit for a dairy farmer. Also the Innovardo can be set up to feed a small amount and more often which Schuitemaker claimed has several advantages including better health of the cow leading to an improved milk yield and also more calmness in the barn.

AUTOMATIC tyre inflation was spotted on many stands around the show, mostly on larger machinery including self propelled forage harvesters (Claas), slurry tankers (Major) and tractors (Fendt).

This kind of technology will help with a reduced rolling resistance on the road leading to better fuel efficiency and reduced tyre wear. And in-field the ability to decrease the tyre pressure will lead to improved traction and reduced compaction.


Figure 11: Automatic tyre inflation

THERE were several new concepts for front loaders on show.

Quicke released a new design to automatically attach hydraulic hoses when using an attachment on the front loader, for example a shear-grab, to allow the operator to drop off and attach the attachment without leaving the seat of the tractor.

The most impressive concept concerning loaders was from Hydac, their new design was to attach the tractor to the loader without leaving the seat. This was achieved by using hydraulic rams rather than mechanical pins.

Also incorporated into the design were covers to stop debris getting in the connections when the loader was not attached. These were operated electrically and required no further input from the operator.

Figure 14: Automatic attaching loader from Quicke

CONCLUSION

OVERALL the trip to the Agritechnica show proved to be very successful and gave a very clear insight into the current innovations and advances in technology and also what is to be expected for the future.

The trip has already proved to be of use to the students involved as we have since had to complete assignments on 'Robotics in Agriculture' and without this trip we would have not have had such good background knowledge.

All of us used the trip as further research for our dissertations and also feel that being able to keep up with the industry's newest technological advances will further enhance our chances of being able to get successful employment within agricultural engineering once we have graduated.

BOOK REVIEW

The Farmer's and Groundsman's Workshop -
A Guide to Planning Vehicle and Machinery Maintenance

by Brian Cairns

Publisher: The Crowood Press
ISBN: 978 1 84797 110 4
Price: £25.00
Web: www.crowood.com

AS well as the planning aspects of Vehicle Maintenance, this book gives lots of very useful and interesting information on how tractors and implements work and are serviced.

It starts off with information on machinery maintenance schedules, Health & Safety and on setting up a Workshop, with some useful tips for dealers, farmers and vintage collectors.

The chapter on Machinery Evolution takes the reader briefly through the development of Farm Machinery.

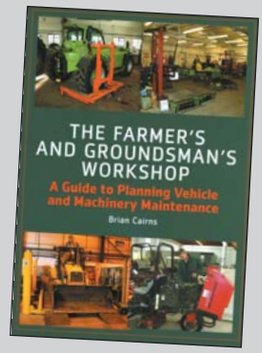
Particularly interesting are the chapters that explain how various vehicle systems work, both on older machinery and right up to the current day, dealing with subjects like Common Rail Diesel Injection, as many engineers will have been trained in pre-electronic control unit days, and so may have only a vague idea about common rail. The chapter on Hydraulics demystifies many things and explains the difference between open and closed centre systems.

The book is copiously illustrated with exploded diagrams that show examples in clarity that pure words never could, especially in the case of the more modern types of gearbox. Even if readers of this book were never to carry out their own maintenance on their equipment, they will still benefit from the insights it gives.

This book will appeal to students and lecturers in Agricultural Engineering, to machinery dealers, farmers with an interest in on-farm servicing and all tractor and implement enthusiasts.

The author started his working life as an apprentice agricultural mechanic at Rycotewood in 1977 and went on to obtain a degree in Agricultural Engineering at Writtle.

Brian is currently Director for Sustainable Built Environment and Land-based Industries at MOVE Life Long Learning Network in the East of England.



Donald Bowler
AMIAgrE, CEnv

Are you getting enough Government funding for your R&D?

No? Well try the TSB's Sustainable Agriculture & Food Innovation Platform

DAVE TINKER & ROGER LANE-NOTT

FUNDING R&D FOR THE UK AS A GLOBAL LEADER IN INNOVATION

THERE should be some excellent opportunities for professional agricultural engineers and agricultural engineering businesses to be partners in pre-competitive research and development with matched funding support from DEFRA, BBSRC and the Technology Strategy Board (TSB).

Over the next five years £75-90 million of matching funding will be provided for R&D in Sustainable Agriculture and Food (SAF). This will include four main areas:

- **Crop Productivity,**
- **Sustainable Livestock Production,**
- **Waste Reduction and**
- **GreenHouse Gas Reduction**

The first call, '*New Approaches to Crop Protection*', part of the Crop Productivity topic, has £13 million of matching funding on offer, but will have closed by the time you read this.

The R&D SAF competitions are to be run by the TSB, part of the Business, Innovation and Skills Department (old DTI). The TSB's aim is to assist UK businesses to grow through the opportunities being created by the Government's actions to address the various challenges facing society.

The funding is very much for businesses; proposals must be led by a business and there must be a credible route to market but researchers, whether from academia or businesses, will partner proposals.

TSB has been running other 'Innovation Platforms' for some while, including one on Low Carbon Vehicles. At a recent IMechE-IAgrE meeting Mike Richardson, Head of the Jaguar Land Rover Hybrid Vehicle Research Centre, said, "TSB has really helped push JLR research along, it is an excellent example of a public-private partnership". There is a selection of 'Results' under 'Case Studies' on the website *www.innovateuk.org* describing some of the funded projects.

TSB will provide funding to match, typically, the 'in-kind' funding provided by the businesses. The TSB funds will then be used by the partners undertaking the research or by subcontractors providing a service. It is somewhat like LINK but there are significant differences

The challenges for Sustainable Agriculture and Food are those of population growth, 15% in the UK and 24% worldwide by 2030, leading to the need for more food from less land with environmental factors and legislation also constraining production.

TSB considers that the UK has the capability to continue to make an impact in this sector with widespread business strength in the Agriculture and Food sector, amounting to £129 billion, employing 3.7 million and providing 7% of the GDP. TSB also consider that there are deep scientific, technology and academic strengths. There is a huge global market with UK exports in the sector amounting to £13 billion in 2008.

Obviously the climate change concerns mean that we should act now and have technological solutions in place for when legislation is implemented such as the Water Framework and EU Pesticide Directive regulations.

AEA AND LERP

THE Agricultural Engineers Association is keen to see its members become involved in pre-competitive R&D and, along with the Douglas Bomford Trust, it has initiated the Land Engineering Research Partnership, LERP.

This initiative includes many experienced agricultural-engineering researchers who are willing to join consortia for pre-competitive research calls such as these.

The LERP academic partners include Cranfield University, Harper Adams University College, The Arable Group and several research groups, formerly at Silsoe Research Institute or elsewhere, that have expertise and facilities ideally suited to these upcoming research calls.

To get a better idea of how the TSB calls work take a look at the website *www.innovateuk.org/ourstrategy/innovationplatforms/sustainableagricultureandfood.ashx* and follow links through to the New Approaches to Crop Protection Competition page and 'Download the Brief' and 'Optional Briefing Event Presentation'. If these links have gone then contact Dave Tinker (details below) for a copy.

For the first call agricultural engineers with expertise in a whole range of topics such as precision agriculture, chemical (spray) application equipment, robotics, weed patch determination etc could be involved alongside researchers in agronomy and pathology, weed science and novel pest control techniques.

The first call happened at quite short notice and some consortia, or partners, have not been able to climb on board quick enough. Can we suggest that agricultural engineers, whether from business or research, talk to their managers, colleagues, customers, end-users and, possibly even, competitors, to decide what topics, hot or cold, need some R&D input to develop innovative solutions?

If there is some preliminary discussion we'd hope that as the calls are released there will be businesses who have a good idea of what R&D should be funded from this £75-90 million pot and can sort out a proposal and a consortium within a few weeks.

If we, as a profession, don't go for this pot then others will mop it up!

CONTACT

DAVID Tinker is the first point of contact for more information, brokering and ideas on proposal preparation.

Please contact David via email: ***tinkerd@iagre.biz***

A CFE launch event in Warwickshire

Voluntary measures

The Campaign for the Farmed Environment aims to encourage farmers and growers to adopt land management practices voluntarily, without the threat of regulation

by CORRINA GIBBS - CFE Project Coordinator

A RANGE of measures have been identified to keep participation in the Campaign for the Farmed Environment as flexible as possible. This is achieved through a combination of voluntary measures which have been specifically developed for the Campaign, alongside existing Entry Level Stewardship (ELS) options from a targeted list (*see table*) and retention of uncropped land.

Around 5,000 farmers and growers were questioned back in November, when the Campaign was officially launched to get a benchmark for the level of voluntary, environmental activity already being carried out on farm, in addition to the then current level of awareness of the Campaign.

Already 85 per cent of farmers surveyed had heard about the Campaign and many are managing land voluntarily. These high levels of awareness show that the Campaign has already made an impression and has the potential to have a huge impact.

The survey shows that 174,000 hectares of land are already managed for conservation outside agri-environment schemes and over 50 per cent of farmers have retained uncultivated land. These figures demonstrate the huge amount of work that farmers are already doing and this provides an encouraging starting point on which the Campaign can build.

It is vital that the interest in the Campaign is turned into action on the ground. Campaign partners are encouraging farmers to:

- **Either enter ELS for the first time or check the expiration date of their ELS agreement. If it is this year then they should apply for their next ELS application pack and pick some Campaign options such as pollen and nectar mixes, wild bird seed mixtures or perhaps a 12 metre buffer strip to stop runoff into watercourses**
- **Retain their uncropped land and existing environmental management**
- **Take a look at the Campaign's '*Farmers Guide to the Voluntary Measures*' and adopt at least one measure outside of an ELS agreement that can work with their farming business. This could even be on their uncropped land.**

So what support is available to farmers that want to take part in the Campaign?

The Campaign has developed a range of materials including leaflets and a guide to the voluntary measures to explain how farmers can take part in the Campaign and record what they are doing in terms of voluntary management.

In key arable counties there are Local Campaign Coordinators to provide targeted advice about voluntary management and outside of these counties, the Campaign partners will actively promote and develop activities to increase engagement in the initiative.

Further information can be found on the website *www.cfeonline.org.uk* where there is more information about the Campaign tools, key target counties, contact details for coordinators and events on Beacon Farms to demonstrate the Campaign working in practice.

Management options	Option title	Resource Protection	Farmland birds	Farm wildlife
C1/EJ9	Grass buffers alongside temporary and permanent water courses	✓		✓
C2/EJ5	Grass area to prevent erosion and run off	✓		
EF1	Management of field corners	✓		✓
C3a/b	Reverted arable areas / optional scrub management	✓		✓
C4/EF8	Skylark plots		✓	
C5/EF13	Fallow plots / Uncropped, cultivated areas for ground nesting birds on arable land		✓	✓
C6	Overwinter stubble followed by spring / summer fallow		✓	✓
C7a	Overwintered stubbles		✓	✓
C7b	Overwintered stubbles - optional for vulverable soils	✓		✓
EJ13	Winter cover crops	✓		
EF15	Reduced herbicide ceral crop preceding over-wintered stubble		✓	✓
C8/EF11	Uncropped, cultivated margins		✓	✓
C9/EF2/EG2	Wild bird seed mixture (arable / grassland areas)		✓	✓
C10	Game strips		✓	
C11/EF10	GWCT Un-harvested ceral headlands		✓	✓
EF9	Unfertilised cereal headlands within arable fields		✓	✓
C12a/EF4/EG3	Pollen & nectar mixtures for arable / grassland areas		✓	✓
C12b	Pollen & nectar mixtures for horticultural crops		✓	✓
C13	Sown wildflower headlands	✓	✓	✓
EF7	Beetle banks			✓
C14	Selective use of spring herbicides		✓	✓
C15	Enhanced management of Short Rotation Coppice (willow or poplar only		✓	✓

Harper Adams students produce industry film - for students

A GROUP of students at Harper Adams University College in Shropshire have produced a 13-minute video promoting the land-based engineering industry to students seeking career opportunities - called *Is it Your Field?*

The video was commissioned by the Land Based Industry Careers Project Committee, which is funded by both manufacturers and dealers, who gave the student group the brief in September 2009.

The film focuses on five sectors of the Land Based Industry, Agricultural Machinery, Grounds Care Equipment, Construction Equipment, Forestry and Environmental Equipment.

Six final year students were involved, five from engineering and one from agricultural mechanisation. They were Simon Yardley, Guy Brunt, George Pople, Greig Farmer, Gavin Daly and Sandy Gray.

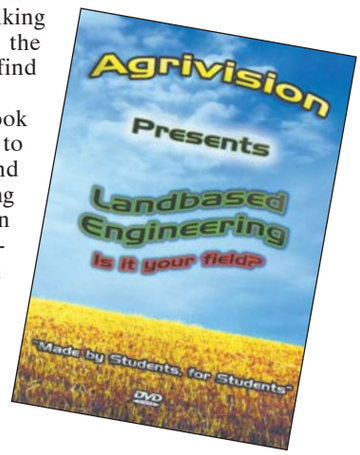
As well as an overview of the different fields, the video also contains two pop quizzes designed to highlight the technology used in agricultural engineering.

John Deere Training Manager, Neil Macer is featured in the film talking about the aspects of the industry which he find most enjoyable.

The project took around 1000 hours to complete, cost around £2500 after final editing with the final version being edited and produced by a professional company, ACT based locally at Bridgnorth.

Prior to final production, the video, which is aimed at 14-16 year olds, was tested on the relevant age group for content, interest level, attention level and reaction.

The result is a first-class effort for a small team of students, none of whom had been involved in a similar project before



Copies of the film are available from BAGMA (Telephone 01295 713344) at a cost of £2.25 per cased copy plus postage.
Website: www.careertrack.info
or www.careertrack.org.uk

Scenes from the film

A selection of stills from the student video, including pop quiz and Neil Macer of John Deere (right)


Neil Macer - Training Manager for John Deere UK and Ireland

Sixty five first year Harper students signing up for student membership in 2008

Student Recruitment Project 2001 - 2010

Dr DAN MITCHELL offers a progress report: with the Project ongoing, over 2,000 students have been recruited so far and still counting!

BEFORE I took over as your President, I was deeply concerned that we were declining in membership and had no strategy for growth.

The total membership when I was President Elect was 1,658 (now in 2010 over 2400 including student members) and looking at the membership breakdown we had only 12 student members. Without a strong student membership, any Engineering Institution is building in its own decline.

A key part of my strategy as President was to recruit students (and Eminent members) and the project has been funded and supported throughout by the Douglas Bomford Trust (DBT).

I have benefited from Membership of IAgrE throughout my career, from Student onwards and without it on my CV and the contacts made, life could have been very different

The idea for the project started from visits to the Engineering Departments of leading Universities with our two sons, Colin and David who wanted to enroll for accredited Mechanical Engineering and Computer and Electrical Engineering degree courses respectively. In total, we visited 8 universities and in the entrance of each Engineering department, there was a poster for free student membership of I.Mech E or for Colin's course I.E.E (now IET) throughout their courses.

So why did we not offer free membership of IAgrE for Agricultural Engineering students at all levels ?

Clearly this project would need financial support as there was no way that I would want members to subsidise it so an application was made to The Douglas Bomford Trust (DBT).

When the application for funds was made, I was a DBT Trustee and only Clive Last of CLAAS - a fellow Trustee at the time - supported the project After some discussion, Clive said in frustration, "For goodness sake they are only asking for £2,000 (later increased to £3,000)per year".

Thank you Clive for giving this project the kick-start it needed! The DBT Chairman at the time also said that I would be lucky to find 50 students, so obviously the first year's target was 75 students and this was achieved!

Funds were required from DBT for free membership throughout a student's course and if they progressed from Further Education (FE) to Higher Education (HE) then the membership would still be free.

I must stress that at no time have the members of IAgrE subsidised this project and I give thanks to DBT for their continuous support.

In the first year 75 students were recruited by initially recruiting the Agricultural Engineering students at Writtle College and Harper Adams University College.

Barony College's tractor simulator with Drew Easton Head of Ag Eng on the right demonstrating it to Will Turner lecturer at Harper Adams

SUMMARY OF PROGRESS TO DATE

1. 75 students were recruited in year one and as word spread, more colleges asked to be included so the year two target was 150 students. 150 students were recruited in year two and as more Colleges joined the project, approx. 300 students were recruited each year for the next 6 years with over 400 in 2008 - 2009. A total of over 2,000 students have now been recruited over the last nine year and 10 % retained as members. (This is a higher retention rate than the larger Institutions but still not good enough) Over 2,000 young engineers now know that we exist and from experience with our own sons in both IMechE and IET, who dropped out after graduation then rejoined later, others may decide to return further on in their careers. If nothing else, the project has made over 2,000 students and many lecturers aware that we exist and the benefits of membership - 'warts and all'!
2. 17 Colleges have been visited on a regular basis and contacts between colleges and the Institution strengthened. Contacts between Colleges and several manu-

facturers and dealers have also developed.

3 I have been asked by six lecturers for mentoring through to IEng and CEng level and they have all reached these levels.

4 18 students have been individually mentored to progress from FE to HE.

5 The number of Colleges, which are academic members of IAgrE has increased from 7 to 17, with 8 College open days having been supported.

6 In most of the Colleges, the lecturers were not members of IAgrE and a surprising number were not aware of our role, so over fifteen have been recruited. It has been strange in some Colleges to recruit students in front of lecturers, who supported the project but were not members themselves!

7 6 College Principals have also been recruited in key colleges as Eminent (now called President's Invitation route) members to increase their awareness and knowledge of Ag Eng. As a consequence of involvement with us, they have taken Ag. Eng more seriously within their colleges and appreciated the involvement with the Institution.

8 Recently we tried writing to another 10 lecturers, who were not members and another 3 more have been recruited.

9 One College wants to raise the Professional standing of its staff and now pays the IAgrE membership fees for its staff. I would like to see this approach grow across the Colleges.

10 In 2008 - thanks to an initiative by David Morris - the scheme was extended to give free membership during the first year of a student's career and the cost has again been covered by the DBT.

11 8 IAgrE members now recruit students at their local colleges and have taken ownership of the project locally, which is excellent as it will ensure its sustainability in the long term.

I would particularly like to thank the following for volunteering to work with me and for recruiting in their respective colleges:-

- **David Morris**, Greenmount College and two more Colleges in Northern Ireland
- **Steve Peirson**, Askham Bryan College
- **Geoffrey Wakeham**, Harper Adams University College (one year)
- **Phil Amos**, Oatridge College (for two years)
- **Graham Higginson**, Reaseheath College
- **Chris Jaworski**, Bicton College
- **Phil Spencer**, Brooksby College
- **David Frizelle**, Tralee ITT (one year)

More volunteers are required to ensure that all colleges are covered by local members!

12 The project takes approx 20 days of my time per year. There is preparation before each visit and talk. Time is taken to answer enquiries from both students and staff. Annual mentoring sessions have been requested at several Colleges. I also aim to respond to enquiries within 24 hours of the visit.

Early on it was clear that, as an Institution, we needed a mentoring service and this was established with a good range of skills across those mentoring. Thank you to all who have volunteered to be IAgrE Mentors all of whom are listed on our website.

13 DBT has also supported two disadvantaged students that I found during the College visits and 12 trips by students to manufacturers in Ireland and Europe. DBT has also supported student visits to Harper Adams when FE students have wanted to consider progressing to HE.

Coleg sir Gar year 2 student members in 2007 with their lecturer John Hancock presenting details of their DBT funded trip to Southern Ireland

NEGATIVES

I list a few for those of you, who have a glass half empty rather than half full view, before members write in!

1 1,800 students have been members and initially have dropped out. Why? Due to cost or benefits found of membership and frankly because we are still seen as a secret society. We have failed to answer their enquiries, be friendly or could not be bothered to mentor them. I am amazed how many members have said that they did not have free student membership in their day so why should today's students have this benefit? The world has moved on! If it benefits the larger Institutions then we need to be in line. Why should Ag.Eng students be at a disadvantage?

Some, like both of our sons will rejoin later in their careers. For instance, our son David rejoined because he is determined to become a CEng via I.MechE and has an I.MechE mentor.

2 This is a big challenge for all of us. If you simply do not like student engineers, then please do not get involved. We need folk, who are both positive about the Institution and positive in nature. The project also needs members who believe in mentoring young people. Members, who also have sons who are Engineers, have been particularly supportive.

3 Several people who are not involved directly with this project have written about it and have sadly published inaccurate data . Simply let me see your draft material and we can then be all singing from the same hymn sheet!

4 There are a lot of Colleges that we have not yet been able to visit. I get messages from members who have spent maybe a day in a College to tell me that the staff and students are not yet members. I ask why they have not recruited them as they have the both contacts and opportunities !?

TO finish on a positive note there are several Colleges that wish to join the scheme and we still have not recruited any Horticultural, Forestry or Farm and Land management students.

If you want to volunteer then please get in touch and tell me clearly how you have benefited from your membership of IAgrE, we need enthusiasm first and foremost !

Finally I would like to thank all the College Principals and staff who have allowed and encouraged me to recruit their students and also all the students for listening and firing excellent questions

There have been many very lively discussions across the Colleges in the last nine years!

. . . If nothing else the project has made over 2,000 students and many lecturers aware that we exist and the benefits of membership - 'warts and all'!

Is it Size or is it the management?

GEOFFREY WAKEHAM considers whether thirty-five really is the magic number for the optimum amount of staff for a business

OVER the years I have often wondered what makes the difference between success and mediocrity or even failure.

I have worked with a large international manufacturing company with more history than most can only dream of, a small organisation primarily interested in selling copies of others intellectual endeavours, an organisation that comprised me, him and his wife, on my own as an agent for others and for a relatively small higher education establishment.

Of course one of the major factors that determine success is the business climate. When the government is throwing money at higher education it is easy to ride the wave, the crunch comes when the expanded organisation finds funding squeezed. It is then that the true foundations are tested. Does the organisation continue to thrive?

It was easy in the middle of the last century to sell engineering products. I remember having years worth of outstanding orders for products and a lively product development programme but when overseas competition was re-established everything started to fall apart.

The spurious spares industry has great advantages, others provide the product design and market, overprice their products and during good times fail to maintain adequate stock. In difficult times the customer seeks cheaper alternatives. If the cheap alternative matches the original the customer congratulate themselves, if it fails to last as long the customer is not surprised.

My venture into the micro end of the business world demonstrated my lack of suitability but taught me some useful lessons that came in handy later in my career.

In the early years of my career though, success was easy. The company structure of clearly differentiated Product Divisions headed up by three powerful managers responsible for design, production and marketing ensured tight control and rapid decision making.

Decline came with aggressive competition coinciding with the retirement of too many senior staff, the introduction of management by committee and what seemed like annual major restructuring. Later financial decisions that were out of sync with the economic cycle may have led to the same impact as did the collapse of communist states on many of their state managed industries.

During my time with the small spares marketing organisation growth was a given, management was tight, particularly of costs, response to problems was immediate and staff were highly motivated by generous bonuses and riotous nights at the pub each time a new record was achieved.

One of the guiding principles was that the ideal size of a commercial unit should be no more than thirty or forty people. Where this figure came from I am not sure and at the time seemed to have no logical foundation. This organisation seemed however, to demonstrate the truth of the maxim.

I am unwilling to comment in detail on my time at Harper Adams as this is still in the recent past. Harper Adams has been successful and continues to be so, almost the last survivor in its core business.

One thing that impressed me was the dedication of the staff to the students and the students' involvement with their chosen career paths. The college was small enough to have groups of staff who knew each other well and adjusted to each others needs and could get easy access to 'management'. Decision making for an educational establishment was quick I am told.

IT would seem that small, well focused teams with tight management by identifiable people can contribute in a large way to success, but how big is small?

> “It would seem that small, well focused teams with tight management by identifiable people can contribute in a large way to success”

Is there any validity to the figures of thirty to forty?

It would seem obvious to me that the final decision maker should be an identifiable individual and that access should be reasonably available. It is generally accepted that an individual can have intimate control of a group of seven to ten people. Larger groups tend to fragment and petty rivalries become entrenched.

When a group hits a problem beyond their responsibility or competence then an answer is needed quickly, in some cases immediately So we have groups of seven to eight able to get to a senior decision maker within minutes or at worst a day. This implies no more than two steps from top to bottom, one head honcho, six to seven section heads controlling six or seven staff each and a maximum size of a self managing unit of fifty.

So that magic figure of thirty-five (ish) would seem to have some justification. Knock the office staff down to four people and get the boss to double up as head of one of the sections, sales, design, or manufacture depending on the core activity and a figure of forty-five is indicated.

The immediate cry is that it can not work, financial clout is needed, there are not enough experienced members of staff to manage lots of small units, etc. etc. There is no reason why a much larger organisation can not divide its activities into small self managing units with a high level of autonomy.

The next layer of management should see themselves as Mentors and not Directors and be chosen from the self contained groups. On a day to day basis they would work as designers, technical sales engineers, accountants and only formally meet to decide on major policy matters once or twice a year. A matrix management structure can cope with such a set up, healthy tensions between groups ensure continuous improvement and a least two champions for each area of interest.

Shortage of experience is oft quoted but the military has demonstrated on many occasions that people in their twenties and early thirties can manage similar sized units of men and machines in the middle of a desert, under attack in the Atlantic or flying over enemy territory.

Many students, in their early twenties, while out for their ‘Sandwich Training’ take on major projects and demonstrate leadership and decision making skills often lacking in managers twice their age. All most of them need, is a guardian angel to give guidance to what the job is, who are the critical contacts and what are the on-going limitations/problems. So often I was thrown in the deep end and had to learn to swim all over again.

I have run out of space but commend to you the figure of 35, try it and be convinced. Step back and let your staff amaze you.

PROFILE:
Chartered Professional

Phil Amos is a Principal Geo-environmental Engineer for WYG Environment, consultants to the built and natural environment. He gained an Honours Degree in Agricultural Engineering at Newcastle University in 1994 and a Masters in Environmental Engineering in 1999, also at Newcastle University.

His career has included tractor development for New Holland, land reclamation and biosolids recycling, agricultural waste management consultancy and mechanisation lecturing and design and construction of landfill cell linings and containments, landfill caps and restoration as well as gas and leachate management systems. His current role encompasses desktop and physical investigation of brownfield land, earthworks and remediation design for clients including National Grid Property, Network Rail and Defence Estates.

Outside work, he is a keen mountaineer and has made successful first ascents of 6,000m+ peaks in Bolivia and Pakistan and attempts at other unclimbed peaks in Nepal and Tibet.

Q&A

Why did you choose to become a Chartered Professional?

I saw it as the next logical step to becoming a qualified engineer - a scrutiny and validation of my theoretical training and practical experience by an independent body whose role is to maintain the standard of engineers. There are a number of clients who require staff to be professionally qualified before they can be allocated a particular level of responsibility, and similarly some construction contract conditions require a Chartered Engineer to oversee the contract.

I wouldn't be comfortable going to an unqualified dentist, would my clients have the same comfort in using a consultant without professional qualifications?

How do you feel that being professionally registered helps you in your career?

The status of professional registration gives employers a clear guide on an individual's ability and skill against benchmarks recognised across the industry. Gaining a new or higher level of registration helps progression on the career ladder because it is not an employer-specific assessment.

As a consultant, I am employed by my clients to assess their problem projects and provide solutions. When engaging my services, they need to have confidence in my ability to understand the problem and design a successful solution. My professional status as a CEng and a CEnv provides clients with that instant mark of recognition as to my training, experience and ability.

What discipline areas have you worked in and which discipline area are you now working in?

After graduating, I worked on development of pre-production tractors into production versions. However, I wanted to get out into the mountains at weekends and be able to work outside so I moved my career towards a more environmental direction. Agricultural waste management consultancy was good because it got me out and about around rural Scotland, visiting farmers with waste management issues and designing solutions that not only addressed the waste management problems but also made their working lives easier or more manageable, particularly for smaller businesses using traditional byres or stone buildings.

My masters degree opened the door into civil and geo-environmental engineering. I spent seven years designing and supervising construction of landfill cells, caps and landfill restoration. The combination of engineering, geotechnics, soil science and environmental systems are unique to agricultural engineers and ideally suited to site restoration schemes.

My current role is a broader geo-environmental one - essentially anything to do with the geotechnical and environmental condition of land. The key disciplines are geology, geotechnics, land contamination and engineering, chemistry and biology also feature. Hydrogeology is also very important and if any site works are required then engineering and ground investigation contracts also come into play.

What makes your work important?

I think the benefits of sustainable regeneration and development on brownfield land are clear - we shouldn't squander resources whether they are minerals, water, energy or land.

On a personal level, the variety of my day to day work is important. WYG act as ground investigation contractors as well as consultants, and so any day could see me preparing a site investigation design as a consultant, planning the work, pricing, supervising, sampling and logging the soils, interpreting the data against (ever changing) current guidance and developing a remediation design which could run from tens of thousands to millions of pounds. Add in issues such as legislation and guidance (for land contamination generally as well as construction site health and safety) and construction contract management, and you have a busy week!

What have been your main achievements?

Professionally to date - becoming a Chartered Engineer. I have kept a copy of *The Times* that announced my registration, first name on the page!

Work - I am always pleased with any major site project that is delivered on time and budget - there is so much that can go wrong when you're digging holes into the unknown! One of my recent projects won commendations in the Brownfield Briefing Remediation Innovation Awards 2008 and in the Ground Engineering Awards 2009.

My best project would be design of a permeable reactive barrier for treating highly acidic leachate from a colliery spoil tip in Northumberland. The barrier was the first of its kind in the UK and used a mixture of cattle manure, compost and limestone chips (all mixed

Name
Phil Amos

Name
Principal Geo-environmental Engineer, WYG Environment

Current Assignment:
Ground condition assessments for developments on various Defence Estates properties.Design of a remediation scheme to address ground contamination in a large, below ground former gas holder.

Academic Career:
- BEng Hons Agricultural Engineering, Newcastle University 1991-4
- MSc Environmental Engineering, Newcastle University 1998-9

Areas of Expertise:
Brownfield assessment and redevelopment, site investigation design and contracting services, earthworks design and construction, contaminated land remediation and reclamation design and construction, construction supervision and management, earthworks construction quality assurance, three - dimensional ground modelling and design.

in a agricultural diet feed paddle mixer!) to treat gross elevations of acidity, iron and sulphate and to raise pH, all using passive technologies and minimal land take.

Outside work - attempts on unclimbed 6,000m peaks in the furthest corners of Nepal and Tibet. The Nepal trip involved a two week walk to base camp with nearly sixty porters, and we turned back only 150m from the summit when snow conditions became dangerous.

The attempts on Tibetan peaks were also compromised by brutal weather, and you learn to consider how success is defined - for me it was exploring unfrequented mountain ranges and coming home with ten fingers and ten toes. I also learnt a lot about risk assessment and decision making!

How do you see your work developing in the future?

It's difficult to predict at the moment. Brownfield redevelopment is typically driven by the residential or commercial property market, the credit crunch and knock-on effects have virtually stalled new projects coming on-line and requirements for the 'up-front' services such as ground investigation and remediation are beginning to pick up.

Local Authorities have some requirements to address contaminated land, although these tend to be occasional and fiercely competitive. Framework agreements with major clients are providing our main work focus for the next year.

Technologies and techniques for assessing and interpreting ground conditions, and for carrying out remediation, are always improving and we now have some great tools to collate site investigation data, present borehole logs and populate 3-d ground models. From there, we're just a few clicks away from producing plans of contamination plumes and earthworks remediation volumes.

This helps us manage the large quantities of data that can be generated in a complex brownfield site and gives us a better understanding of ground conditions, which in turn reduces project and contract risk for the client.

Any tips for those newly qualifying?

You can always learn through other peoples' experience. I have found a really good way is through listening to their presentations at evening meetings and conferences and having an interest in the wider engineering / professional world.

The best solutions are based on experience and if you don't have the experience it can be a time consuming process to arrive at the correct solution. A quick call to a mentor or IAgrE colleague can be enough to get you on the right track.

For example, unsurfaced site access roads within a landfill complex are comparable to forestry access roads in terms of use, lorry movements and underlying ground conditions. A quick chat with a forestry engineer gave me a quick pointer as to what basic principals are used for designing and developing forestry roads, and all I needed to do were a few amendments and tweaks to suit a landfill application.

Follow your interests and you will get benefits from it. The worst piece of advice I received was from a schools careers advisor. When I told him I was planning a gap year before starting my degree, he replied 'Don't be ridiculous, Amos! What's an engineer going to do with a year off - sit on his backside on a beach in the south of France?'

I went anyway, developed an interest for travel and exploration, and that in turn took me to the tops of mountains where no-one has ever stood before. It's worth listening to other peoples ideas, no matter how preposterous the idea or their background is.

The IAgrE Scottish Branch had a presentation by a Captain in the Royal Engineers, who talked of a Territorial Army chef posted on Operation Telic. Seeing two engineers sweating over fixing a broken tank in the desert sun, he offered some advice which was promptly refused in less than polite terms. A day later and at their wits end, the engineers tried the chef's advice, which worked. They tracked the chef down to find out how he knew about the fix, and discovered his day job was working in the factory that manufactured the tanks!

Landwards 2010 Conference - May 11th, Cranfield University

Natural Turf for Sport - Engineering safe and sustainable surfaces

THE 2010 IAgrE Conference on Tuesday 11 May 2010 at Cranfield University focuses this year on Natural Turf for Sport.

The conference features a full programme covering the effects of grass surfaces on the human foot and ankle, developments in machinery for sports surfaces and irrigation systems. The event is being held in association with The Institute of Groundsmanship (IOG), Cranfield University and is sponsored by Ransomes and Autoguide Equipment and supported by Turf Professional magazine.

IAgrE CEO, Christopher Whetnell said, "The subject - *Natural Turf for Sport - Engineering Safe and Sustainable Surfaces*, will be of interest to all those with the responsibility for establishing and maintaining sports turf. With the high costs associated with sporting injuries both human and equine, getting the sports surface right is in everyone's interest.

"Uniquely, this conference will include not only speakers who are practitioners in turf establishment and maintenance, but also specialists in human and equine musculo-skeletal biomechanics."

The conference will place particular emphasis on the interaction between participants of sport (both human and equine) and sports surfaces.

Roger Lane-Nott (Chief Executive of the AEA) will chair the conference.

The morning session will commence with a paper delivered by **Mr James Calder** – Consultant Orthopaedic Surgeon and Honorary Clinical Senior Lecturer at Imperial College London. He will talk on the effects of sports surfaces on the human foot and ankle.

Dr Iain James (Cranfield University) will examine 'How sports surfaces work: A mechanical exploration'. He will look at the mechanical behaviour of sports surfaces using various studies from the field and labs including both human sports performance and machinery-surface interactions.

Dr Richard Earl (TGMS Ltd) will complete the morning session with a paper on pitch design and construction.

Dr Sian Lawson (William Leech Senior Lecturer in Bio-Medical Engineering at Newcastle University) a Prinicipal Investigator in musculo-skeletal bio-mechanics will start the afternoon session with a presentation on equine gait analysis in the context of sports turf.

Mike Maher (TurfTrax Course Services Ltd) will talk about the development of the "going stick" for the monitoring of sports surfaces.

To book your place call the IAgrE Secretariat on 01234 750876 or visit *www.iagre.org*.

MEMBERSHIP ENQUIRIES
IAgrE
Barton Road
Silsoe, Bedford MK45 4FH
Telephone 44 (0) 1525 861096
Fax: 44 (0) 1525 861660
e-mail: secretary@iagre.org
www.iagre.org

Issue 65 Number 1 Spring 2010
MEMBERSHIP MATTERS

BRANCH REPORTS

NORTHERN IRELAND BRANCH

New Holland Tractors - Past, Present and Future

BRIAN Magee, Area Sales Manager for New Holland was the guest speaker on the subject of '*New Holland Tractors - Past, Present and Future*' at a well attended meeting of the Northern Ireland Branch of IAgrE in November 2009 at the Bannville House Hotel, Banbridge.

Proud history

BRIAN described the separate origins of both the Fiat and Ford brands 90 years ago and how they developed their first tractors for their respective markets.

Ford's tractor venture, developed from success in the US car industry. Full production began in 1917 and carried the Fordson brand for 50 years. Tractors were manufactured at Cork from 1919 to 1922 and again from 1928 to 1932 before the operation moved to Dagenham.

Post World War II production included the E27N followed by the new Major and smaller Dexta. Tractor manufacturing moved to Basildon in 1964 just before the introduction of the worldwide Ford series, with 4 models (2000 to 5000). The trend setting and more powerful 7000 model, the first turbocharged tractor from a major manufacturer here, was added in 1971.

The last Basildon built tractors carrying the Ford badge were the 40 series of which 100,000 were made. Ford acquired New Holland (famous for its combine harvesters, forage harvesters and balers) in 1986 to become Ford New Holland.

Fiat was also well established in the automotive industry when it introduced its first tractor in Italy in 1918. It went on to produce a range of models including crawlers, 4 wheel-drive tractors, harvesting machinery and construction equipment for world markets. This side of the business was branded Fiatagri in 1984. Their 80 series and 90 series tractor models were popular here from the 1970s onwards. The 100-90 model had a long production run from 1984 to 2003. The 94 and Winner F100 tractors were the most recent tractors sold here carrying the Fiatagri badge.

Fiat took over Ford New Holland in 1991and merged it with Fiatagri to form New Holland. During the next few years both the Ford and Fiatagri tractor ranges were merged under the New Holland Agriculture brand.

The Fiat Group also acquired Case in 1999 and combined it with New Holland to form Case New Holland (CNH) making it one of the largest combined agricultural machinery manufacturers in the world.

The present range

CURRENT New Holland tractor models cover a wide range from small compacts to 300hp+ arable types. In summary these are:-

T4000 series- Compact tractors weighing around 3 tonnes and up to 97hp. Some are specialist versions for use in orchards.

T5000 series - Conventional lightweight tractors around 4 tonnes and up to 115 hp.

The Basildon built T6000 and T7000 ranges cover the main power size sector for agricultural tractor sales in the UK.

The T6000 series has a basic weight around 5 tonnes and replaces the popular previous TS range. The T6010 to T6080 models span 101hp to 155hp and come in a range of specifications from the basic Delta with manual transmission and minimal use of electronics, through Plus to Elite versions with more advanced technical features.

There is a choice of traditional mechanical fuel injection engines (2 valves per cylinder) or the latest high pressure common rail injection (4 valves per cylinder) versions with power boost and other engine management options for increased output and flexibility.

An example is the T6040 Elite model which represents New Holland's part in a rapidly developing market sector for compact yet powerful tractors. Its 4.5l 4cyl common rail, turbo charged, intercooled engine is rated at 121hp but under certain operational conditions for pto and transport work is automatically boosted to 151 hp. Previously this level of performance in a tractor would have involved a 6 cylinder engine of much larger capacity.

Some unique optional features on New Holland tractors include the Super Steer front axle with its 65degree steering angle and Fast Steer for which a centre ring on the steering wheel is pressed to act like a joystick for fast lock to lock steering during headland turns or loader work.

The T7000 series models (T7030 to T7070) are the next size up, weighing less than 7 tonnes, and have rated powers from 167hp to 225hp. All have 6.7 litre 6 cylinder common rail engines with power boost and have the Power Command power shift transmission or the Auto Command continuously variable stepless transmission.


L-R: Terence Chambers (Branch member), Brian Magee (guest speaker from New Holland Agriculture) and Gary Connolly (Branch Chairman)

The Auto Command joystick (based on NH experience with its FR9000 forage harvesters) not only controls the travel speeds but also carries push-button controls for the rear linkage, spool valves and headland turn sequencing (HTS). When programmed, this function automatically controls the lifting / lowering sequence of front and rear mounted implements during a headland turn and will stop/start PTO drives and adjust engine speed. It is first on the market to incorporate the auto steer activation button as an integral part of the tractor. There is also the facility of momentarily reversing the cooling fan to clear accumulated debris from the radiators during the turn.

The Intelliview touch display screen shows the performance details and has a USB port to upload software for field applications. It can also display the picture from a rear view camera on implements.

Touch controls for other services are prominently located on the Side Winder keypad panel in the cab.

New Holland transmissions explained

DEPENDING on model and specification, there is a wide choice of transmission for New Holland tractors including:-

Synchro Command - Manual shift between gears with a mechanical forward / reverse shuttle.

Dual Command - Manual shift with the addition of a clutchless splitter doubling the number of gears and a power shuttle.

Electro Command - A semi-powershift system in which half of the ratios can be changed without using the clutch.

Range Command - Six powershift speeds

across each of 3 ranges with power shuttle.

Power Command - Full powershift across all 19 power shift forward ratios and with power shuttle. Many of the powershift transmission options offer automatic changes during field and transport work.

Auto Command -The latest and most advanced transmission, built by New Holland in Antwerp, is a joystick controlled continuously variable stepless system permitting any chosen ratio across the full travel speed range.

It is designed for ease of servicing and is based on a compound planetary gear system along with a hydrostatic unit. An animated virtual presentation was shown at the meeting demonstrating how the system smoothly shares hydrostatic drive in varying degrees with mechanical gear drives to optimise efficiency.

A unique feature is Active Stop. This automatically locks up the transmission, if the tractor stops moving, by the hydrostat spinning the ring gear in an opposite direction to hold a zero forward speed. If the tractor sits in this state for more than 45 seconds it automatically applies the park brake.

The New Holland tractor range also includes the US built rigid frame T8000 range, which weighs around 9 tonnes and has engine powers up to 325hp (358hp with power boost), and the T9000 range of artic-steer prairie sized tractors up to 395 hp, running on double wheels and weighing up to 24 tonnes.

L-R: Paul Orr (R Kennedy and Co), Wilbert Murdoch and Harry Burke (both Burkes of Cornascriebe), Brian Magee (New Holland Agriculture), Alan Scott (R Kennedy and Co) and Keith McRoberts (Agricultural Contractor)

New Holland is also well known across the world for its combine harvesters of all sizes, self propelled forage harvesters and balers as well as a range of telehandlers. Details of all the present New Holland Agriculture and New Holland Construction products can be viewed on their website at *www.newholland.com*

The future

RECENTLY, New Holland showed its NH 2 concept fuel cell tractor. It is based on a T 6000 series tractor with a fuel cell replacing the conventional engine and transmission.

This compact electrochemical conversion device, with no moving parts or combustion, consumes hydrogen gas and oxygen from the air to generate electricity and steam. An electric motor (the simplest possible CVT transmission) drives the wheels directly. A second motor will drive the pto and hydraulics. It will also be possible to transfer power directly by cable to electric motors on implements.

Although the fuel cell is still a very high cost device (much more than the price of a present large conventional tractor), and there are questions about the true energy cost of producing bulk hydrogen gas, New Holland believes that there are places in the world where farmers will be able to generate their own electricity cheaply from wind, water, biogas or solar power and use it in the electrolysis process to separate hydrogen gas from water.

A 140hp fuel cell tractor is due for evaluation in France during 2010. The NH 2 tractor and associated information can be viewed on *www.newholland.com* and *www.youtube.com/newhollandAG*

A lively question and answer session including amongst other things:-

The features of the Start / Stop system

- How Auto Command compared with other tractor transmissions - past and present
- Fuel consumption comparisons for modern tractors.
- Technical training for NH service personnel and customers

Mr Magee was thanked for his presentation which all present agreed was most interesting, informative and enjoyable.

Terence Chambers

NORTHERN IRELAND BRANCH

Trailer brakes - Are they up to the job?

Dr.ANDY Scarlett of Scarlett Research Ltd was the guest speaker at the January 2010 meeting of the IAgrE Northern Ireland branch.

He recently completed the research report '*In Service Assessment of Agricultural Trailer Braking System Performance- Agricultural Trailer Braking Study*'. It was sponsored by the Health and Safety Executive, The Department of Transport and the Agricultural Engineers Association. The latter trade body was co-ordinating the support from 6 tractor manufacturers namely AGCO (Massey Ferguson, Fendt and Valtra), CNH (Case and New Holland), Claas, JCB, John Deere and McCormick.

The research is significant because agricultural tractor / trailer combinations now carry heavier loads and travel faster than when the current braking standards were established.

History

DURING the 1970s the travel speed of most tractors did not exceed 20mph and 4 to 6 tonne trailers were common. The typical trailer at that time had mechanical brakes operated by a hand lever. Since then, tractor size has steadily increased and drivers sit within enclosed cabs.

Modern transmissions and front axle suspension facilitate faster road speeds. There is also a corresponding increase in the size and weight of trailers and tankers.

The original standard for power braking on agricultural trailers was set up during the 1980s. It was based on the then current maximum road speed of 20mph (32 kph) and a basic single line hydraulic braking system was accepted. This is still the case although most of the new tractors sold during the last 10 years are capable of 25 mph (40kph) and tend to be driven at that speed on the road. The 32kph speed limit still applies in the UK but in practice it is rarely enforced. 50kph transmissions are now an option on some of the latest tractors. The JCB Fastrac is designed for 65kph (40mph) road travel by having suspension on both axles, air over hydraulic ABS service brakes and dual line air brakes for the trailer.

If towed at these higher speeds the trailer must meet commercial vehicle specification with suspended axles, ABS and at least 50% braking efficiency. The same standard applies to agricultural trailers when towed faster than 32kph.

L-R: Padraig O'Kane (IAgrE member and meeting organiser)' Dr Andy Scarlett (guest speaker) and Gary Connolly (IAgrE branch chairman)

The braking efficiency of a typical new 4wd tractor is in the 55% to 65% range so it

continues over

has no problem stopping itself. However, towing of a heavy trailer at 40kph with brakes only designed for 32kph often poses unreasonable demand on the tractor brakes resulting in excessive wear. This is a concern for manufacturers who report that tractor brake warranty claims for the UK and Ireland are the highest in Europe.

Typically 75% of the trailer load is carried on its wheels so efficient brakes are vital for safety. The amount of energy which must be absorbed by the brakes increases with both load and travel speed.

If the load is increased by 50%, but the travel speed remains constant, the braking force also increases by 50%. The effect of increasing speed is more dramatic. The squared relationship means that if the load is unchanged but the travel speed increases from 30kph to 40kph the energy to be absorbed during braking is almost doubled. Going from 30kph to 50kph would increase the energy almost threefold.

L-R: Colin Kane, Noel Kane and Padraig O'Kane

The research study

Dr SCARLETT carried out his study on commercial farms using typical working farm trailers, a 2000 gallon tanker and a big square baler.

The trailers ranged in size from 12 to 16 tonnes and ages from 30 years to almost new. They were ballasted and tested during 4 braking runs in as-found, on-farm condition to determine how they compared with the basic 25% braking efficiency requirement for 32kph road travel. 90% of them failed to meet this standard.

After the trailers were then given a full professional service and retested their braking performances improved but 60% still failed to meet the standard.

Parking brakes performed badly with none meeting the required standard apart from the single axle baler which was almost new. The following main points emerged from the research work.

Adjustment

ONE of the main problems was the trailer brakes being out of adjustment rather than being excessively worn.

The very basic specification of some of the brake systems did not encourage users to carry out the necessary regular maintenance adjustments. For example, it was often necessary to partly disassemble and reposition components to compensate for wear.

The higher specification axles have much more convenient and precise screw adjusters. In some cases these can be retrofitted. Automatic adjustment systems are now common on heavy goods vehicle type axles

Braking action

THE basic agricultural specification brakes use flat cams to push the shoes against the drum. Their shape makes them much more difficult to apply gradually when compared with the much preferable S shaped cams in the higher specification versions.

Some drum sizes were inadequate to achieve the required braking performance and other associated components such as the rams and supply hoses were often too small to transmit enough pressure. Higher specification commercial type axles are recommended if a trailer is to be towed at 40kph.

Pneumatic v hydraulic

AIR actuated braking systems, as used on commercial vehicles, are relatively simple to maintain. They provide high efficiencies and have fail-safe back up. Many modern agricultural tractors have the option of air brakes and this is now popular for regular heavy trailer work.

Hydraulic braking is also capable of high efficiency so long as the brake sizes are adequately specified for the size of trailer. Accumulators can be fitted on trailers to hold reserve pressure for emergency back-up use. Some trailers are fitted with both air and hydraulic braking systems so that any tractor can use them.

Load sensing and ABS

THE trailer braking system can achieve its best efficiency when applied in association with a load sensing valve. It limits supply pressure when the trailer is unladen thus preventing skidding / premature tyre wear and is available for both air and hydraulic versions.

Anti lock braking is required on trailers travelling faster than 32 kph and is much more effective when used in conjunction with load sensing.

The economic argument

IT is essential to maintain the trailer brakes. It makes sense to choose higher specification braking axles on new trailers.

As well as keeping things legal the additional cost is equivalent to replacement of just one set of worn tractor brakes. As trailers tend to have a long service life it may also make sense to upgrade the braking systems on some existing trailers.

L-R: Kenneth Finlay, Denis Stirling, Bob Armitage

Discussion

THE audience represented a wide range of experience in trailer use, maintenance and manufacturing.

An enjoyable in-depth technical discussion followed with aspects discussed including:

- The use of restraint and emergency breakaway devices.
- The role of ABS and why it is not a substitute for load sensing.
- The performance of load sensing valves.
- The merits of air systems versus hydraulics.
- Brake line hydraulic pressure variation between different tractors.
- Discussion around some major tractor brands not offering integral front axle braking whilst others do.

Dr Scarlett was thanked for his very professional and informative presentation

More information.

THE entire research report '*In Service Assessment of Agricultural Trailer Braking System Performance - Agricultural Trailer Braking Study. RR 697*' may be downloaded from *www.hse.gov.uk/research/rrhtm/rr697/htm*

The well illustrated and detailed report covers both the scientific and practical aspects including a full technical description for each of the selected trailers along with the test results and specific recommendations for further improvement.

The Agricultural Engineers Association has also produced colour guidance booklets, based on the same report, for each of its participating tractor manufacturers.

Terence Chambers

SOUTH-EAST MIDLANDS BRANCH

Engineering sports turf surfaces for imporved environemntal performance

TO start the New Year, South-East Midlands Branch were treated to a stimulating presentation on '*Engineering sports turf surfaces for improved environmental performance*' by Mark Bartlett.

Mark leads the Sustainable Sports Surfaces programme in the Centre for Sports Surface Technology at Cranfield University and gave an interesting overview of their programmes of work, from re-engineering biological systems to delivering improved environmental function, assessments of soil carbon modelling in turf grass farming and sports facilities, and the quantification of the playing quality of natural turf sports surfaces.

These extend from local sports grounds and golf courses to the largest national stadia and racing venues, etc. Sports turf surfaces account for approximately 0.6% of the total UK land mass and provide significant ecological benefit. They are often the predominant photosynthetically active surfaces in urban environments and occupy areas of high monetary land value.

Sports facility provision is a highly technical/high value/high quality industry, which is expanding and increasingly subject to political interest in the build up to the 2012 Olympics. The commitment for the 2012 Games to be 'carbon neutral' is a significant Government objective.

This topic will be covered in detail at this year's Landwards Conference - '*Natural Turf For Sport - Engineering Safe and Sustainable Surfaces*'. See feature on page 27 and this month's back cover for details of how to book your place

Mark compared current systems in this country with those he observed during his study tour to Florida and Pennsylvania - from where turf is shipped to Egypt! The high energy inputs to prepare playing surfaces was also notable (e.g some cricket pitches are rolled up to 600 times per season), so measures are needed to save fuel and other inputs.

The tremendous cost of reinstating new surfaces was also highlighted, e.g £1.25mill at Lords was quoted. When it is considered that Wembley was re-turfed ten times in the past 3 years, the considerable potential cost (and energy) saving that could be achieved by extending the duration of natural playing surfaces and reducing inputs to maintain them is self-evident.

Previous research has looked at the physical characteristics of soils and the interface between machinery and soil type. A 'Whole System Approach' is needed. Opportunities for developing 'managed ecosystems' and future areas of interest includes the development of 'green' or 'living roofs'.

Also, many LAs are desperate to achieve 'Green Flag' status to obtain EU funding/support. This will encourage LAs to be more proactive, to reduce their carbon footprint. This will need contractors operations to be managed and monitored better, eg through using satellite tracking and remote sensing to calculate energy inputs, ie adopting precision farming technology.

This led into a debate on the role of GMOs and the perception and concerns of the public. However, here there is a paradox: whereas farming is about increasing yields relative to inputs, more (sports) grass means more to mow!

It was suggested that GM turfgrass could make a significant contribution, as the environmental risk is reduced, because it is not being introduced into the food chain. However, more effort will be needed to dispel the public's concerns.

In conclusion, breeding of turfgrass, alongside an improved understanding of the engineering of soils and water usage in turn creates opportunities for agricultural engineers, in terms of development and use of machinery, e.g in improving aeration equipment.

Although the almost inevitable conclusion of any researcher is that more work is needed, further basic information and data is required to improve our ability to design and manage sports turf in order to reduce inputs and the carbon footprint for our expanding health and leisure industry. It is perhaps reasonable to conclude that in this case, less truly means more.

Alan Plom

WEST MIDLANDS BRANCH

PICTURED above is Alice Herring with members of the West Midlands Branch at their recent committee meeting on 19 January

Alice is Caretaker of the Stratford upon Avon, Friends Meeting House where the branch holds most of its branch and committee meetings. She was invited along by the branch to the meeting in order to accept a special cake on the occasion of her 90th birthday. Congratulations Alice!

Membership changes

Admissions

A warm welcome to the following new members:

Fellow

Turner A L (Warwickshire)

Member

Arrand P (South Yorkshire)

Associate Member

Daffern I C (Leicestershire)
Drabble D (North Yorkshire)
Drage K (Hertfordshire)
Godfrey W (Berkshire)
Hutchinson P W (Lincolnshire)
Jones R C (Herefordshire)
Silvester A (Lincolnshire)
Stansfield J (Oxfordshire)
Thomson G (Cambridgeshire)
Thrupp E M (Cambridgeshire)
Walker A (Nottinghamshire)
Watson R (Yorkshire)
Wentworth A (Herefordshire)
Whitehead I D (Nottinghamshire)
Woodhouse S (Norfolk)

Associate

Suckley R N (Shropshire)

Student

Harper Adams

Allison S K
Bourne A G H
Bristow D R G
Bromley C M
Carlyon S W
Chapman J W
Chell D T E
Chester R C
Crump M
Davidson S J
Ebsary G
Etchell B R
Evans E W
Evans T O M
Falkingham J
Fleming D
Follows D J R
Fraser T
Graham T J
Hutchinson J
Kent S
Last M
Lund J
McCullagh T
McCusker M
Mc Gee P
Mc Keever D W
McKenna E W
Malpass G P C
Martin O J
Meadows J
Metcalfe M W J
Moore D
Mortime O R Wr
Pickering J
Pittams J
Richmond K W M
Sansom A H
Skittery W A
Smail D J
Southall J C
Stirrat D A
Taylor M
Thompson S P
Tomkinson C
Turner W
Venables J R P
Watson G P
Whitfield C
Williams G J

University of Lincoln - Riseholme College

Banton O J
Brocklesby C
Dewey S A
Dixon E T
Jackson C
Kay G
Kennett I A G
Luke B
Mitchell S
Moore P
Reeve A
Smith A
Smith R A
Spencer T
Surfleet A
Taylor J
Trafford S
Wright S

Writtle College

Potton S

Scottish Agricultural College

Constable R
Dalgarno A
Dalziel K
Duffos K
Fyffe D
Gray R C
Keir S
McCulloch M
Rushton B P
Watson A

Institute of Technology, Tralee

Brennon D
Deacon R
Gubbins P
Murphy P
Ryan S

Deaths

Pratt W J (West Yorkshire)

Transfers

Associate Member

Bateman M (Essex)
Pullen G C (Wilts)
Shipton P (Beds)
Thomas H W (Gwynedd)
Collins E T D (Yorks)

Associate

Anderson R H (Ayrshire)
Burgess G (Yorkshire)
Day S T (Norfolk)
Gould L J (Norfolk)
Helmick LL (Carmarthenshire)
Martin O J (Carmarthenshire)
Pitcher R (Norfolk)
Ralph J (Somerset)

Engineering Council

Congratulations to the following members who have qualified as Engineering Technician and Chartered Engineer entitling them to use the designatory letters EngTech and CEng after their names.

Registrations

EngTech

Bateman M (Essex)
Daffern I C (Leics)
Drabble D (Yorks)
Drage K (Hertfordshire)
Godfrey W R (Berks)
Hutchinson P W (Lincs)
Jones R C (Herefordshire)
Pullen G C (Wilts)
Silvester A (Lincs)
Stansfield J N (Oxon)
Thomson G (Cambs)
Thrupp E M (Cambs)
Walker A (Notts)
Watson R (Yorks)
Wentworth A (Herefordshire)
Whitehead I D (Notts)
Woodhouse S (Norfolk)

CEng

Handy N J (Wiltshire)
Nyongo C T (Cameroon)

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

Brooksby Melton College
Asfordby Road
Melton Mowbray
Leics
LE13 0HJ

Cranfield University
Cranfield
Bedfordshire
MK43 0AL

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

Long service certificates

Name	*Grade*	*Date of anniversay*
50 years		
Geoffrey Frank Derek **Wakeham**	CEng, MIAgrE	8 March 2010
35 years		
Simon Janes Peter **Evans**	CEng, MIAgrE	22 Jan 2010
Richard Peter **Marks**	AIAgrE	22 Jan 2010
Ian Kingsley **Smout**	MIAgrE	10 Feb 2010
David Brennand **Williams**	CEng, MIAgrE	10 Feb 2010
David John **Wilks**	AIAgrE	15 Feb 2010
Michael Anthony **Stephenson**	AIAgrE	14 Mar 2010
25 years		
Andrew Robert **Kneeshaw**	CEng MIAgrE	1 Jan 2010
Mohidin Bin Hj **Daud**	IEng, MIAgrE	7 Jan 2010
Dennis Hughes **Jordan**	CEng FIAgrE	10 Jan 2010
Philip James **Baumber**	AMIAgrE	1 Feb 2010
Benjamin Simon **Blackmore**	CEng, FIAgrE	1 Feb 2010
Michael Alan **Brown**	AMIAgrE	1 Feb 2010
Andrew James **Scarlett**	MIAgrE	1 Feb 2010
Graham Patrick **Howling**	FIAgrE	28 Feb 2010
Keith Miles **Elliot**	CEng, MIAgrE	7 Mar 2010
Christopher Frank **Hockenhull**	AMIAgrE	29 Mar 2010
Alun Ross **Scott**	AIAgrE	29 Mar 2010
Judith Louise **Smith**	AMIAgrE	29 Mar 2010

Academic members continued

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
Shropsiire
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

British Agricultural & Garden Machinery Association (BAGMA)
Entrance B, Level B
Salamander Quay West,
Park Lane, Harefield
Middlesex, UB9 6NZ

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
Barton Road
Silsoe, Bedford
MK45 4FH

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

Law-Denis Engineering Ltd
Millstream Works
Station Road
Wickwar
Wotton-under-Edge
Gloucestershire GL12 8NB

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

Landwards
Agriculture • Horticulture • Forestry • Environment • Amenity

We want to hear from members.

Send branch reports or correspondence to the Editor at 25A New Street, Salisbury, Wiltshire, SP1 2PH.
Email: *chris@nelsonpublishing.co.uk*

Or the IAgrE Communications Officer Marion King on *comms@iagre.org*

EVENTS

IAgrE Branch Meetings and Events

East Midlands Branch
Thursday 18 March 2010 starting 1900
IAGRE YOUNG ENGINEERS COMPETITION 2010
Speaker: Brooksby Team
Venue: Brooksby College Campus (Brooksby M1 in the machinery area)
Students having been given a set of standards wheels, a battery and maximum dimensions, will have created a remote or radio controlled vehicle with the aim of producing the best performance on a standard test track. Team Brooksby approach to the competition both in previous years and the 2010 competition For further details please contact the Branch Secretary: Paul Skinner.
Tel: 01205 480431 Email: paulskinner57@btinternet.com

East Midlands Branch
Tuesday 23 March 2010 starting 1900
BRANCH AGM AND TECHNICAL MEETING 'IS MILKING YOUR COWS WITH ROBOTS THE FUTURE?'
Venue: Brackenhurst, Southwell, Notts
Presentation by Lely. For further details please contact the Branch Secretary: Paul Skinner
Tel: 01205 480431 E-mail: paulskinner57@btinternet.com

South East Midlands Branch
Monday 01 April 2010 starting 19.30
HYBRID & ELECTRIC VEHICLE RESEARCH AT JAGUAR-LAND ROVER (JOINT WITH IME)
Speaker: Mike Richardson
Venue: University of Hertfordshire, Lindop Building
The development of vehicles to meet the challenge of climate change and the work of Jaguar and Land Rover in this area. For further information contact the Branch Secretary: John Stafford
Tel: 01525 402229 E-mail: john.stafford@silsoe-solutions.co.uk

West Midlands Branch
Tuesday 13 April 2010
TBA
Venue: tba
For further details please contact Branch Secretary: Michael Sheldon
Tel: 01926 498900 E-mail: michaelcsheldon@yahoo.com

Scottish Branch
Weds 28 April 2010 starting tbc
BRANCH AGM AND TECHNICAL TALK: GIS/GPS IN AGRICULTURE AND FORESTRY (TBC)
Speaker: tbc
Venue: Barony College, Dumfries
For further information please contact Branch Secretary: Phil Amos
Tel: 07799 372652 E-mail: filamos@btinternet.com

Wrekin Branch
May - Date to be confirmed
VISIT TO ACTON SCOTT HISTORIC WORKING FARM
Venue: Acton Scott Historic Working Farm, Acton Scott, Church Stretton SY6 6QQ
The farm was the venue for the popular Victorian Farm TV series.
For further details contact the Branch Secretary: Graham Higginson
Tel: 01242 870458 E-mail: wrekin@iagre.biz

East Midlands Branch
Thursday 27 May 2010 starting 1900
ONE STOP WASTE MANAGEMENT
Speaker: Steve Tooley, Oakwood Environmental
Venue: Oakwood Environmental Services, Brailwood Road, Bilsthorpe, Newark, NG22 8UA
Oakwood Environmental is determined to recycle wherever possible and therefore the majority of the waste brought back to the Bilsthorpe site goes through a cleaning or recycling process. The company are currently working on organic methods to safely dispose of waste products, to minimize the number of materials that require land filling. For further details please contact the Branch Secretary: Paul Skinner.
Tel: 01205 480431 E-mail: paulskinner57@btinternet.com

South East Midlands Branch
Wednesday 02 June 10 starting 1400
FIELD TRIP TO G'S OF ELY - VEGETABLE PRODUCERS - FOLLOWED BY BBQ
Venue: G's of Ely
Members and spouses are invited to this Branch event.

Southern Branch
Wednesday 07 July 2010 - tbc
SOUTHERN BRANCH SUMMER VISIT
Contact: Denis Welstead.
E-mail: djwelstead@btinternet.com

Other Events:

16 March 2010
AFAG Treevolution & Brudi & Partner TreeConsult
EVALUATION OF CURRENT RIGGING AND DISMANTLING PRACTICES USED IN ARBORICULTURE - PRACTICAL WORKSHOP
Venue: Canolfan Deilen Las, Craflwyn Hall, Beddgelert
This workshop is aimed at those in the industry who will be able to take the research findings forward. If you would like further information contact Liam McKeown.
Email: liam@treevolution.co.uk Web: www.craflwyn.org

19 March 2010
Birkbeck College, University of London
SOIL -A BASIS FOR LIFE ON EARTH : THE UNSEEN MAJORITY:SOIL BIODIVERSITY AND ECOSYSTEM NUTRIENT CYCLING
Speaker: Prof R Bardgett, Prof of Ecology, Lancaster University
Venue: Lecture Theatre B01, Clore Mngmt Centre, Birkbeck Coll, Torrington Sq, WC1E 7HX
A series of six free public lectures exploring the diversity of soil types derived from varying geology, topography, climate and organic material and their importance to the continuance of life on earth. Also looking at the role of micro and macro organisms of the soil; the function of the soil as a medium for plant growth in natural habitats and modificaitons to soil fertility necessary for agriculture and horticulture. For further details please visit the Birkbeck website.
Web: www/bbk.ac.uk/environment/prospective/ecss

24 March 2010 to 25 March 2010
Aqua Enviro
WATER QUALITY STANDARDS OR CARBON REDUCTION - IS THERE A BALANCE?
Venue: The Mary Ward Conference & Exhibition Centre, London
Sessions on Policy overview; policy implementation and case studies. Q&A sessions. Speakers representing University of Amsterdam; OFWAT; Mouchel; RSPB; Scottish Water; Environment Agency; Severn Trent Water; WYG; WRc plc; Metoc; ENTEC; MWH Global; CDM; Northumbrian Water; Mott MacDonald; Black & Veatch. Delegate rate £390 (+VAT). For full details and to register on line visit website Sarah Hickinson, Aqua Enviro Technology Transfer.
Tel: 01924 257891 Fax: 01924 257455
Email: sarahhickinson@aquaenviro.co.uk
Web: www.aquaenviro.com

07 April 2010 to 09 April 2010
British Society of Soil Science
LAND REMEDIATION AND RECLAMATION
Venue: Reading University
BSSS Spring Conference For further information please contact Dr Kathryn Allton.
Tel: 01234 752983 Web: www.soils.org.uk

21 April 2010 to 24 April 2010
IMechE
ESSENTIAL MANAGEMENT SKILLS FOR ENGINEERS
Venue: Keele University, Staffordshire
This four-day conference enables delegates to develop the skills to further their careers through a combination of: keynote lectures; interactive skills workshops; business management exercise; technical visits. IAgrE are co-sponsoring this event and discounted rates (at IMechE member rates) apply. For further information please contact Diane Lorenzelli, Events Executive, IMechE.
Tel: 020 7304 6837 Fax: 020 7222 9881
Email: d_lorenzelli@imeche.org
Web: www.iagre.org/files/yecompletter.pdf

21 April 2010 to 22 April 2010
Informa Life Sciences
17TH INTERNATIONAL CONFERENCE ON: REGISTRATION OF AGROCHEMICALS IN EUROPE
Venue: Hotel Le Plaza, Brussels, Belgium
Gain a head start in preparing for the implementation of the new regulation and the transition period. Resolve outstanding queries by tapping into the regulatory know-how of an expert panel of speakers.
Tel: 020 7017 7481 Fax: 020 7017 7823
Email: registrations@informa-ls.com Web: www.informa-ls.com/agrochemicals

Tuesday 11 May 2010
IAgrE
LANDWARDS 2010:NATURAL TURF FOR SPORT: ENGINEERING SAFE AND SUSTAINABLE SURFACES
Venue: Cranfield University, Cranfield, Bedfordshire
The construction and maintenance of safe and sustainable sports surfaces is a fundamental prerequisite for the safety and enjoyment of participants in sport. Natural turf still remains the yardstick by which synthetic alternatives are measured. Engineering disciplines such as drainage, irrigation, soil mechanics, soil physics, agronomy and mechanisation underpin the construction and maintenance of natural sports surfaces. This conference will emphasise the interaction between participants of sport (human and equine) and sports surfaces. You can register on-line now.
Tel: 01525 861096 Email: secretary@iagre.org
Web: www.iagre.org/lwconf2010.shtml

Tuesday 11 May 10
AEA
SCOTGRASS 2010
Venue: Acrehead Farm, SAC Dairy Research Unit, Crichton Royal, Dumfries. For further information please contact Duncan Russell.
Tel: 01733 207607 Email: services@aea.uk.com

Thursday 20 May 2010 starting 9.30
IAgrE
YOUNG ENGINEER'S COMPETITION
Venue: Coventry Transport Museum
Students, having been given a set of standard wheels, a battery and maximum dimensions, will have created a remote or radio controlled vehicle with the aim of producing the best performance on a standard test track. For more information on this event visit the web address or contact the Secretariat.
Tel: 01525 861096 Email: www.iagre.org/files/yecompletter.pdf

June 2010 - Tuesday 21st & September 2010 - tbc
ICE in collab with Oxfam GB and WaterAid
INTEGRATED WATER RESOURCES MANAGEMENT: MOVING FROM THEORY TO PRACTICE (EVENTS 3 OF 4 AND 4 OF 4)
Venue: Institute of Civil Engineers One Great George Street London SW1P 3AA
The aim of these Integrated Water Resources Management (IWRM) events is to highlight current and future risk to regional and local water resources. They will demonstrate how WASH agencies can operationalise water resource and land management and engage in a practical mannner. Contact: Daphne Guthrie.
Email: daphne.guthrie@ice.org.uk
Web: www.ice.org.uk/conferences_events/newsevents_events.asp

06 September 2010 to 08 September 2010
EurAgEng
AGENG 2010 - TOWARDS ENVIRONMENTAL TECHNOLOGIES INTERNATIONAL CONFERENCE ON AGRICULTURAL ENGINEERING
Venue: Clermont-Ferrand, France
Invited speakers will present some public policies impacting EurAgEng: Rural Development policy, CAP, ETAP and state of art on hot topics. AgEng2010 CF will be preceded by 2 technical symposiums organised in parallel on 3&4 Sept: Symposium ECOTECHS 2010 "Eco-design and Develop of methodologies for Eco-assessment and Eco-innovation of Spreading Equip". Symposium "Robotics and Agri/Environ" with support from Int'l Advanced Robotics Prog (IARP) Cost: 480 Euro. for early registration and EurAgEng members 530 Euro for non-members. 1st Announcement available to download at:
Web: www.ageng2010.org

If anyone is interested in car sharing to any of these events you can liaise with fellow members by using the discussion forum in the Members Only section of the IAgrE website - www.iagre.org/memaccess.php

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

2010 IAgrE Conference

Natural Turf for Sport

Engineering safe and sustainable surfaces

Convened by

IAgrE

Landwards

Agriculture • Horticulture • Forestry • Environment • Amenity

May 11th 2010
Cranfield University

Speakers include

JAMES CALDER
Consultant Orthopaedic Surgeon and Honorary Clinical Senior Lecturer at Imperial College London. He will talk on the effects of sports surfaces on the human foot and ankle.

DR IAIN JAMES
Cranfield University. He will examine *'How sports surfaces work:* and will look at the mechanical behaviour of sports surfaces using various studies from the field and labs.

RICHARD EARL
He will complete the morning session with a paper on pitch design and construction.

DR SIAN LAWSON
William Leech Senior Lecturer in Bio-Medical Engineering at Newcastle University. A Prinicipal Investigator in musculo-skeletal bio-mechanics, Dr Lawson will talk on equine gait analysis in the context of sports turf.

MIKE MAHER
TurfTrax Course Services Ltd. He will talk about the development of the 'going stick' for the monitoring of sports surfaces.

DAVID SHELTON
Shelton Sportsturf Drainage Solutions LLP. He will talk about developments in machinery for sports surface drainage.

ROGER DAVEY
Irritech. He will explain some of the criteria used when designing irrigation systems for sports surfaces.

In association with:

RANSOMES JACOBSEN A Textron Company

TURF PROFESSIONAL

AUTOGUIDE EQUIPMENT

IOG The Institute of groundsmanship

Cranfield UNIVERSITY

For further information please contact:

IAgrE Secretariat:
conferences@iagre.org
01234 750876

For online booking please visit:
www.iagre.org
The professional body for engineers, scientists, technologists and managers in agricultural and allied industries including amenity, food, forestry and biological systems

IAgrE is a licensed body of the **Engineering Council** and a founding constituent body of the **Society for the Environment**