Landwards

Agriculture • Horticulture • Forestry • Environment • Amenity

Ramping up the tension

Young engineers competition at Jaguar Cars demonstrates a depth of talent

Fast Track

Mann's Jon Gowing talks about reaching LTA4 level in just four years

2009 Conference

Full report and pictures of the IAgrE Conference on Land Use held at the Royal Agricultural College, Cirencester

IAgrE Professional Journal www.iagre.org Volume 64, Number 2 Summer 2009

Biosystems Engineering

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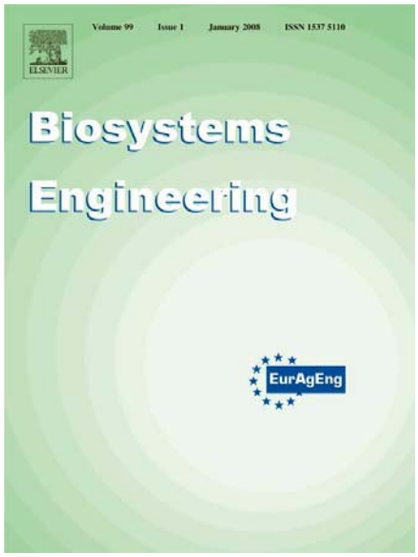

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The Managing Editor of ***Biosystems Engineering***, ***Dr Steve Parkin***, has kindly summarised some of the papers published in the last three issues which he thinks may be of interest to IAgrE members

Biosystems Engineering
Volume 102, Issue 2, February 2009, Pages 180-189

Will additional straw bedding in buildings housing cattle and pigs reduce ammonia emissions?

S.L. Gilhespy, J. Webb, D.R. Chadwick, T.H. Misselbrook, R. Kay, V. Camp, A.L. Retter and A. Bason

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ADAS Business Management, Wergs Road, Wolverhampton WV6 8TQ, UK

Buildings housing livestock are the second largest source of ammonia (NH3) emissions from UK agriculture. In the UK c. 42% of NH3 emissions from buildings are from those in which cattle and pigs are bedded on straw. Additional straw may reduce NH3 emission by reducing airflow across surfaces soiled by urine, and by immobilization of ammonium-N. This study quantified the effects of increasing straw use on NH3 emission from buildings housing cattle or pigs. The extra straw was applied in increments of up to 100%, either over the entire floor or targeted to the areas where most excreta were deposited. An increase of 33% straw, broadcast over the entire floor, reduced NH3 emission from cattle by 50%, but greater addition did not give any further significant reduction. However, for pigs only the broadcast addition of 100% more straw reduced NH3 emission and then by only c. 20%. Targeted use of an additional 33% straw reduced emission from cattle by 22%, compared with broadcasting the same quantity of straw, but further additions of targeted straw use did not increase abatement. When the straw was targeted in the pig buildings there was no benefit from using additional straw.

Volume 102, Issue 3, March 2009, Pages 251-264

Automatic extraction of lean-tissue contours for beef quality grading

Le Ngoc Huan, Sun Choi, Seong-In Cho, Moo-Ha Lee and Heon Hwang

Faculty of Life Science & Technology, Sungkyunkwan University, Republic of Korea
College of Agriculture and Life Sciences, Seoul National University, Republic of Korea

In evaluating beef quality, proper extraction of the boundary of lean-tissue from the section of beef rib is the crucial first step. In this research, image-processing algorithms have been developed to automatically extract the boundary of the lean-tissue in a robust way as human expert does. Algorithms include automatic threshold determination using Rényi entropy for beef-cut segmentation and contour modification, along with binary morphological approaches. The algorithms were applied to 36 beef-cut samples and successfully demonstrated contour extraction with average percentage error of 2.63% and average pixel distance error of 2.51 pixels when compared to results from a human expert. The algorithms developed were applied to the mobile processing unit as a supplementary grading device.

Volume 102, Issue 4, April 2009, Pages 392-405

Discrete element simulations of the influence of fertiliser physical properties on the spread pattern from spinning disc spreaders

P. Van Liedekerke, E. Tijskens, and H. Ramon

Department BIOSYST, K.U.Leuven, Kasteelpark Arenberg 30, B-3001 Leuven, Belgium

This paper describes a sensitivity study of the flow of granular fertiliser particles on a spinning disc using a discrete element model. The aim was to get a qualitative insight in the influences of individual physical properties of the particles (such as friction coefficient, restitution, and shape) as well as their bulk behaviour on the resulting spread pattern. The results show that certain particle properties, particularly friction coefficients, have a large influence on the spread pattern, and hence should examined carefully in the process of producing granular fertilisers, perhaps by particle coating, or taken into account when applying the fertiliser in the field. Other properties, such as particle stiffness hardly affect the results. Furthermore, it was shown that the friction coefficient and shape of a particle strongly interfere in their particular influence on the spread pattern. Overall, the discrete element model could provide a powerful instrument for the manufacturers in the development of new kinds of spreaders and fertilisers.

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EDITORIAL

Looking outwards

THIS month's issue of *Landwards* is packed with the best of IAgrE.

From a fascinating and lively conference, our prestigious Awards, the exuberance of the Young Engineers competition, the achievements of those who have reached the highest level in the Landbased Technician Accreditation scheme (LTA) and the determination of Nathan Morris to beat a funding crisis and gain a doctorate in new farming technology.

The question is, how do you bottle that positive news and present it to the outside world?

It would be good if we could take a leaf (no pun intended) out of farming initiatives such as Open Farm Sunday, but where do we start?

There is little doubt that the role of the countryside today is being portrayed in a much more pro-active manner.

Whilst TV programmes hosted by Jimmy Doherty or the recent Blood, Sweat and Tractors may only the scratch the surface, they present a snap-shot of the industry in an easily digestible manner to a public who are showing greater interest in where and how their food is produced.

It is an education role that is long overdue. Ian Pigott, former City Commodity trader turned farmer, who is the driving force behind the Open Farm Sunday which saw over 400 farms fling open their gates this month says, "In the UK, people are on average five generations removed from anyone who has worked on the land. They have become distanced from farming and are curious what we get up to and what we are really like."

The support role that the agricultural machinery sector plays in farming today is absolutely essential as farmers strive to eke every efficiency they can out of the timely production of food - at the same time ensuring that the countryside is environmentally and aesthetically managed to the benefit of all.

Nobody is suggesting that we necessarily open up our workshops, but we do need to ensure that get over a consistent, positive and interesting contribution in support of the story that British agriculture is increasingly telling in the 21st century.

CHRIS BIDDLE
Editor

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

FEG elects new chairman

AT the recent Annual General Meeting of the Forestry Engineering Group, a specialist group of the Institution of Agricultural Engineers, a new Chairman and Vice-Chairman were elected.

Jim Christie, Forestry Machine Consultant, was appointed Chairman in succession to John Lyons of Coillte, with David Sulman, Executive Director of the UK Forest Products Association, appointed Vice-Chairman.

In other news from The Forestry Engineering Group, their 2009 Symposium will be held on Wednesday 9 September at the University of Cumbria, Newton Rigg Campus at Penrith. The programme for this year's event is now being finalised and will include presentations on the potential forestry contribution to renewable energy from biomass, stump harvesting, wind and hydro-power.

Other papers on end-of-life issues for forestry machines, steep ground working, cross-laminated timber, and the COMFOR approach to the improvement of the health and well-being of forest machine operators, and stump harvesting will be presented.

For further information, contact Bruce Hamilton at FEG on *bruce.hamilton@forestry.gsi.gov.uk*

FEG would also like it to be known that over the years, the FEG Annual Symposia have addressed a very wide range of forestry and forestry engineering topics. Copies of papers from 2001-2008 can now be downloaded from the Institution's website at *www.iagre.org*.


FEG Special Items

IAgrE to offer new Awards

New safety and student awards to be included in annual round

THE IAgrE Awards Panel has agreed that a number of new categories should be included in the annual round of IAgrE Awards.

These awards, to be presented at the annual *Landwards* Conference, include one specifically related to safety and one, the IAgrE Student project Award, similar to the *Johnson New Holland Award* but related to the FE sector.

The **IAgrE Safety Award** has been developed to encourage and recognise innovation in safe design or operation of equipment or processes by students of Agricultural Engineering or subjects related to the application of engineering and technology to the land based sector.

Aimed at individuals or groups of students studying for courses leading to an ND, HND, Foundation Degree or First Degree in Agricultural Engineering (or subject related to the application of engineering to the land based sector), this award has been developed in consultation with the Health and Safety Executive.

Whilst projects can be nominated specifically for the IAgrE Safety Award, suitable projects submitted for other award categories (e.g. The Johnson New Holland Trophy Award) may also be considered.

Meanwhile, the object of the **IAgrE Student Project Award** is to encourage and recognise innovation by students of Agricultural Engineering, Landbased Technology or related subjects. Nominations for the Award will be accepted from individuals or groups of students studying for courses leading to a National Diploma or Foundation Degree in Agricultural Engineering, Landbased Technology or related subjects.

The nominations will be considered on the merits of the practical project work undertaken by students as part of their courses. The project work, which should show innovative features with some prospect of commercial exploitation, will be judged on the basis of a written report illustrated by diagrams, drawings and/or photographs. Illustration by films, videos and similar electronic techniques may be used only as supporting material.

Full details of these awards will be available on the IAgrE website *www.iagre.org*.

NFU backs EA's water supply report

40 year strategy which sets out challenges and pressures

THE NFU has given its support to the Environment Agency's 40-year water resources strategy which sets out the challenges and pressures on securing water supplies to 2050.

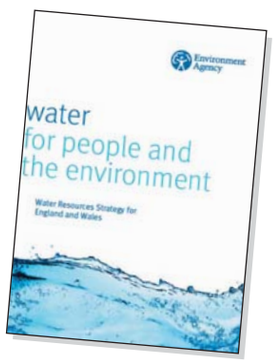
The agency strategy, '*Water for people and the environment*', recommends a series of actions and measures to ensure that all parts of society have continued access to water against a backdrop of predicted climate change, more housing and a higher UK population.

The strategy recognises the reliance of agriculture on water for production, a reliance that can only increase if hotter drier summers become more frequent, and highlights the importance of working with, and understanding, the needs of farm businesses. It identifies the NFU as central to promoting responsible use.

Among the strategy's aims are:

- *Supporting the development of small scale reservoirs for agriculture and calls for their continued funding;*
- *Setting out that the agency will continue to promote the setting up of abstractor groups for agriculture to promote water efficiency;*
- *Supporting catchment management type approaches where changes to land management practices can protect and improve water quality and water resources;*
- *Promoting 'slow water' systems to reduce the problems of flooding following heavy rain, especially from new development;*
- *Continued investment in vital new science-based research and innovation, including developing new technologies for water use and understanding better how changes in society and catchment affect water resources.*

NFU director of policy Martin Haworth said, "This report highlights the critical role water plays in agriculture and horticulture and how this impacts on the production of the nation's food, both now and in the future.



"The droughts and increased flooding we have experienced in recent years clearly demonstrate that water resources, and how we manage them, are becoming increasingly important for everyone."

Availability of engineering apprenticeships set to increase with launch of National Apprenticeship Service

You're hired!

THE increase in availability of engineering apprenticeships, which will be created by the Government's recent launch of the National Apprenticeship Service (NAS), has been welcomed by the Engineering Council UK (ECUK).

Andrew Ramsay, Chief Executive Officer of ECUK says, "We see the introduction of the NAS as a very positive step, which will undoubtedly open the door for more people of all ages to enter the engineering profession. Apprenticeships have always played an important role in engineering."

The integrated training and experience provided by a large number of engineering-based Advanced Apprenticeships can offer a direct route to Engineering Technician (EngTech) registration, providing the individual with most or all of the necessary competence.

In addition, many of those joining the profession as apprentices have gone on to achieve a high status in engineering, becoming Incorporated Engineers (IEng) or Chartered Engineers (CEng). And several Presidents of Professional Engineering Institutions are themselves former apprentices.

"NAS provides the necessary safeguards to ensure the quality of engineering apprenticeships throughout the UK," says Andrew Ramsay. "It will play an invaluable role in helping to spread the word to employers as well as potential apprentices.

"In particular, it will make sure that the essential experience of developing competence through work in real industrial, construction or business environments remains central to, and a highly valued aspect of, the concept of apprenticeship."

FWAG asks 'Do one thing for wildlife!'

"FARMERS already make a significant contribution to the UK's wildlife conservation but a special push for 2009 could see all the difference" is the message of the Farming and Wildlife Advisory Groups (FWAG) 40th anniversary campaign '*Do One Thing for Wildlife!*'

FWAG's special birthday initiative is urging farmers and landowners and anyone who appreciates the countryside to "Do one thing for wildlife!" - an on-farm conservation activity additional to those already being implemented that will celebrate FWAG's 40th year and also make a meaningful contribution to wildlife conservation. Suggested actions include ideas for habitat establishment or improvement through restoration or creation of new on-farm features.

The FWAG website - *www.fwag.org.uk* - has a special 'pledge' page that lists possible conservation activities and allows farmers and landowners to register their own particular pledge. The campaign also gives non-farming members of the public the opportunity to make a donation towards the activities of FWAG and make the pledges become a reality.

CEO VIEW

The Government needs to go further

SOMETIMES it takes a day away from the normal routine of office work and trying make sense of the latest utterings of this or that quango, to provide a boost to one's self-belief that there is much to admire in today's society. Particularly when comes to the spirit of young people.

If the media of today is to be believed we live in an age of dishonest politicians and inept bankers, and in a country where danger lies round every street corner.

But that is nothing like the whole story, beneath the surface are countless expressions of talent, resourcefulness, skills and enthusiasm which shine through despite the mire being created by the politicians and bankers.

If anything proved the point, it was the recent Young Engineers competition, held at Jaguar Cars and reported elsewhere in this issue.

What a great bunch of young people we have in our industry!

They are a credit to themselves, their schools and colleges, their employers - not forgetting their parents who have given them the opportunity.

But perhaps they are the lucky ones.

Too many young people are simply not being given the opportunity to gain the kind of skills demonstrated at Jaguar that day.

It is a shocking statistic to learn that half the people unemployed in Wales are under the age of 25.

The Rowntree Trust which commissioned the report said, "All they want is the opportunity to gain experience and build skills. This dreadful statistic is largely down to the fiasco surrounding the insufficient funding for further education".

The LSC has been in melt-down recently leaving many, many colleges in limbo after projects were approved then funding withdrawn.

It is natural that Government should focus on the unemployed created by the present economic down-turn, but that simply must not be at the expense of training tomorrow's generation of skilled people.

Fortunately it appears that the message is getting home, at least to the opposition parties who have rounded on the present administration for its abject failure to support further education.

Liberal Democrat leader, Nick Clegg has been active in highlighting the shabby treatment of the FE sector with visit after visit to colleges including Sparsholt recently.

With the political landscape in something of a turmoil at present, politicians of all colours simply must demonstrate an unequivocal commitment to building the skills needed for the future.

Christopher Whetnall

Businesses unprepared for emisssions Bill

MOST businesses are totally unprepared for the forthcoming Carbon Reduction Commitment (CRC) regulation, according to leading independent specialist environmental consultancy Envos.

The draft legislation which is currently under consultation will mean a group of around 5,000 businesses will soon have to pay a total of approximately £660m a year for their greenhouse gas emissions, but Envos says that 90% of businesses are well behind the curve on improving their energy efficiency.

The CRC will oblige all organisations with an annual electricity usage of more than 6000 MWh to buy carbon credits at a price of £12 per tonne of the CO2 they emit, starting from April 2010. The energy usage cuts these companies make will then govern their place in a league table. After three years the money paid will be reallocated with a bonus or penalty depending on the company's position in the league table.

Envos says that UK businesses are losing nearly £50 million a week due to poor energy efficiency, and yet 90% of the businesses they speak to still haven't taken simple steps such as obtaining an Energy Performance Certificate (EPC), which is now obligatory for any commercial property before it is marketed for rent or sale.

Wade Barker, Managing Director of Envos, said, "Judging by the level of preparedness we have seen among UK businesses, a lot of the organisations affected by this legislation will be caught unaware. We applaud what the CRC is trying to achieve and we have been calling on the Government to incentivise energy-efficiency improvements among businesses for some time. These organisations should make an assessment of their energy usage as soon as possible and implement energy-efficiency improvements before they get stung in the pocket by the forthcoming regulations."

Case IH launch competition for young farmers

Ideas wanted to improve efficiency and potential of agriculture

Case IH has launched a competition especially aimed at young farmers throughout Europe.

Agri-Future 2020 wants to hear participants' ideas and visions to improve efficiency and boost the potential of agriculture by the year 2020. Any farming theme can be chosen, from agricultural technology to plant science, farming crops or rearing livestock.

This is the first time that Case IH has hosted the Agri-Future 2020 competition, which was officially launched at the SIMA show in Paris. Prospective participants will find comprehensive information and application details on a dedicated competition website: www.agri-future-2020.eu

Competition entrants can easily take part using the form provided on the site and can even support their idea with photos and videos. The only requirement for entering the competition is that participants must be between 18 and 25 and be currently attending, or have completed a course, at an agricultural college. Individuals or teams with up to three participants can enter.

The winners will be invited to the European 'Agri-Future 2020 Camp' organised by CASE IH, to be held on 12 and 13 November 2009 in Berlin. The programme includes a wide variety of excursions and visits to farming-related businesses, including a day at Agritechnica 2009 in Hanover. The closing date for the competition is 15 September 2009.

Further information from *www.agri-future-2020.eu*.

ACRE welcomes government recognition of rural needs

ACRE (Action with Communities in Rural England) say they are pleased to note Government recognition of differing rural needs across the country which require targeted responses at local level developed in conjunction with local people.

An ACRE statement said, "Across the country, our network delivers a crucial brokerage role between local communities and local government through rural housing enabling and community led planning. We would encourage Local Planning Authorities to use the results of this work to ensure communities' diverse needs are recognised.

"We also hope that the Government's Empowerment Fund will prove effective in enabling communities to be involved in a range of activities, including rural affordable housing delivery."

ACRE say they are also pleased that the Government will be looking again at the Homes and Communities Agency (HCA) target for delivering rural affordable housing and considering ways to increase the delivery of new rural homes.

Responding to the Government response Sylvia Brown, ACRE's Chief Executive said, "We welcome the initiative during this coming summer to bring together the HCA with key national, regional and local policy and delivery partners. We would encourage the inclusion of Rural Housing Enablers (RHEs) as key independent agents working with local communities, landowners, housing associations and councils in this process."

•*A BRITISH company has created what they describe as the ultimate virtuous circle - converting plastic waste into an efficient land drainage system.*

Aquadyne is converted from virtually any form of plastic into easily installed blocks of macro and micro porous cells that drain surface water from agricultural fields, sports pitches, golf courses and domestic gardens.

"Newcastle University conducted a life cycle assessment, which concluded that every 200 panels of Aquadyne saves more than two tonnes of carbon emissions," says James Arrowsmith of Aquadyne Sales & Marketing. "The product is simple to install with minimal disturbance to the grass surface and will effectively drain up to 20 litres of water per second."

Further information from www.aquadyne.co.uk

CIRIA brings together leading infrastructure asset owners

Cross-sector collaboration on floods

THE flood incidents of summer 2007, when the loss of essential services, such as electricity, water, and communications provoked socio-economic disruption, proved once again that in major emergencies the effects of critical infrastructure failure can be severe, having a direct impact on incident management and recovery.

Following the Pitt Review recommendations in 2008, CIRIA started a new research project - *Flood resilience and resistance for critical infrastructure (RP913)* - funded by and in collaboration with the Environment Agency and other leading infrastructure asset owners to increase the resilience of the UK's critical infrastructure assets to flood risk.

The project highlights that increased cross-sector collaboration is vital in order to identify interdependencies between "critical" assets. The cooperation of the transport, energy, water and telecoms sectors,

with regulators, local resilience forums, and local authorities will reduce potential health and safety risks, facilitate improved preparedness for floods, improve flood incident management and reduce the time and resources required for recovery.

The project team of CIRIA and Arup say they have been recently involved in an extensive consultation phase of the project , having sought engagement from all those involved in the management of infrastructure assets in relation to mitigation and adaptation to flood risk.

The responses from this questionnaire will be harnessed to develop a project report, to be published in Autumn 2009, outlining current practice and highlighting measures to improve the resilience of 'critical' assets.

'Hard hitting' CLA report published

THE CLA (Country Land & Business Association) have published a ground-breaking report defining its vision for the forests and woods of England and Wales.

'Seeing the Wood for the Trees: CLA Forestry and Woodland Vision and Policy' calls on the Government to give the kiss of life to forestry management.

In the report, the rural economy experts say the Government must:

- *Value* the huge contribution woods and forests make to the landscape, biodiversity and water and carbon management,
- *Understand* that tree planting and effective woodland management are legitimate ways of carbon-offsetting, and
- *Accept* that growing trees is an industry and needs to be financially viable

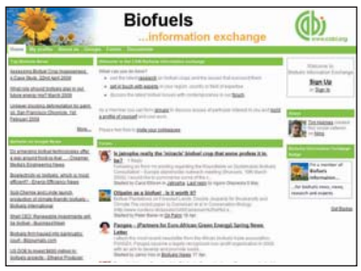
To read the report visit *www.cla.org.uk*.

CABI launch biofuel website

TO help explore the issues surrounding the merits of biofuels, CABI have recently launched a website aimed at facilitating informed debate amongst experts in the field.

The site has been established in response to requests from CABI's member country representatives and in recognition of the need for a place where experts in this field can discuss their research, experiences and findings.

The site is free to join and offers both information resources and online discussion facilities. The information resources include more than 35,000 research records pertinent to biofuels from the world renowned CAB Abstracts database, CABI commissioned review papers on issues in biofuels, and links to third party biofuels reports and books. And the latest biofuels news is fed to the site by Google hour by hour.



Members of the site can also use the discussion facilities to chat with other members of the site.

Carol Ellison, the Biofuels Information Exchange site manager said, "Biofuels are playing a huge role in global energy policies right now and it is vital that countries have access to information and debate to help in their decision making - that is what we hope the Biofuels Information Exchange can offer its members."

Visit *www.cabi.org/biofuels*.

Red Tractor seeks new Chairman

ASSURED Food Standards (AFS) Chairman, Colin Smith (pictured), will stand down later this year as he reaches the end of his six-year term of office, the maximum period allowed by the company's constitution.

During his time at AFS, Colin Smith has steered the organisation through a period of substantial growth with the Red Tractor logo now appearing on over £8billion worth of product, a rise of about 60% in the past 3 years.

The Red Tractor logo is underpinned by robust technical assurance standards and is increasingly used by leading brands and food service operators to demonstrate their commitment to sourcing quality food produced to high standards of safety and animal welfare.

Colin Smith's tenure began with a major restructuring of the organisation into a company limited by guarantee and owned by the UK food chain consolidating the various product sector assurance schemes into a single body. The current momentum is underscored by the announcement in January 2009 that the new levy board AHDB would (subject to State Aid approval) seek to rationalise its promotions behind a single logo, the Red Tractor, and provide resources to AFS to support this.

Kevin Roberts, Chief Executive of ADHB says, "Assuming we get State Aid approval for the proposal, this is an extremely exciting time for new chairman and Red Tractor with the opportunity to more effectively communicate the standards of production operated by British farmers and growers."

These developments will bring an interesting new set of challenges for the Chairman to take forward. AFS is about to start the recruitment process to find a high calibre candidate as Chairman to take over from Colin Smith in the autumn.

Interested candidates should contact AFS on 020 7630 3320 or *www.redtractor.org.uk*.

Research into use of lupins for feed

FIELDS of white, yellow and blue could become a common sight on UK farms if a project aimed at increasing the amount of home-grown animal feed is successful.

Researchers from the livestock and arable sectors have co-operated on a five-year LINK project sponsored by DEFRA, Lupins in Sustainable Agriculture (LISA), to investigate whether lupins could become a viable source of home-grown protein for incorporation into feed. Such a move, say those behind the project, would avoid the need to import hundreds of thousands of tonnes of soya to the UK each year.

Feeding trials from a variety of sources have concluded that lupins may be used as a direct replacement for soya meal, thanks to high crude protein (CP) levels of 30-40%. But the crop is also relatively low input and could provide UK farmers with a valuable alternative break crop with a defined end market.

""One of the most important areas we've looked at is the crop's agronomy – what nutrients it needs, how to keep it weed-free and how it grows in the field," said Ron Stobart, research projects manager for project partner The Arable Group. We now understand much better how it fits into a rotation – and what benefits it can bring to following crops.

"We've also looked at growing it in organic systems, given the opportunity that lupins present to those looking for GM-free protein source."

For more information on the project visit *www.lupins.ibers.aber.ac.uk*.

LTA togetherness at Cereals

Competitive manufacturers fly the flag for the industry

WITH millions of pounds worth of sophisticated machinery on display at Cereals 09, the industry took the opportunity to raise the profile of the key dealership support function for modern farming technology; the service technicians.

The photograph, which was taken at the Cereals site on June 9th, shows examples of technicians who are registered under the established LTA (Landbased Technicians Accreditation) scheme. This is an industry wide collaboration which sees competitive manufacturers working together in unison.

LTA is an independently accredited scheme with regular skills updating and testing, designed to raise the profile of dealership technicians and underline their value to the industry. The scheme is supported by IAgrE, AEA, BAGMA and Lantra

"The LTA scheme recognises an individual's competence and experience as a skilled professional, with the ability to maintain and improve the performance of modern agricultural equipment," said Chris Whetnall.

Scottish company recognised as a wind turbine world leader

EAST Kilbride based Proven Energy has been recognised as one of the world's largest manufacturers in the small wind turbine industry by the American Wind Energy Association.

With over 5,800 kilowatts of wind turbine energy capacity sold worldwide in 2008, Proven Energy say their wind turbines are making significant contributions to carbon reductions, clean air improvements and overall environmental benefits.

The company manufactures 2.5kW, 6kW and 15kW sized wind turbines. Over 2,000 small units produced by themselves are in operation worldwide.

According to the American Wind Energy Association's most recent small wind turbine global market study, at least 219 companies manufacture, or plan to manufacture, small wind turbines in the world. The US market for small wind turbines - those with capacities of 100 kW and under - grew 78% in 2008 with an additional 17,300kW of installed capacity.

Ten percent of the turbines Proven Energy sold last year were in the United States, a key area for market development for the growing company.

•A new partnership between charities LEAF (Linking Environment And Farming) and The Sensory Trust is designed to connect disengaged groups and individuals with nature and the countryside, through food and farming.

The three and a half year project has been awarded £960,000 by Access to Nature, an open grants programme run by Natural England with £25 million funding from Big Lottery Fund's Changing Spaces programme.

The project will involve a programme of activities and events throughout England, aimed at getting young people, disabled groups and older people out onto farms, nature reserves, education centres and city farms, to experience everyday nature and the countryside in their everyday life.

Activities will be based around regional networks that will be established throughout England.

For more information visit www.leafuk.org.

Sustainable engineering

ECUK stage House of Commons launch for their guides for the profession

DR Brian Iddon MP, member of the Innovation, Universities, Science and Skills Select Committee, hosted the launch at the House of Commons on May 20th, of the Engineering Council UK's (ECUK) important new '*Guidance on Sustainability for the Engineering Profession*'.

Described as a 'key milestone in the development of the profession', the guidance provides coherent direction for engineers, and provides a public declaration of the profession's commitment to sustainability through engineering. The launch was attended by over 100 people from across the engineering profession.

The ECUK guidelines describe engineers' leadership role in sustainability and list six simple, but inspirational, principles to guide and motivate them to bring about sustainable development through their work (*see box*). Each of the interdependent principles is of equal importance, with economic and social aspects included as well as those related to the environment.


Prof Kel Fidler, Chairman ECUK

The Council sau they are highly relevant for today's professionals and the current challenges they face, whilst also taking account of the needs of future generations. Professor Kel Fidler, Chairman of ECUK said, "Professional engineers have a significant role to play in sustainability and should be the providers of options and solutions to maximise social value and minimise environmental impact. These principles will guide engineers in meeting their professional obligations to promote sustainability, and ensure that it is integrated into all their engineering activity."

'*Guidance on Sustainability for the Engineering Profession*' has been produced in response to indications from Professional Engineering Institutions (PEIs) that they would welcome such guidelines, and is designed to complement information on aspects of sustainability already published by some PEIs.

"I am very excited to be involved in the launch of this important guidance," said Professor David Bogle, who chaired the working group that produced the guidelines. "It is the product of bringing together representatives from across the profession, who between them possess considerable experience in a wide range of engineering disciplines, as well as sustainability expertise. A number of PEIs were also instrumental in its development, either directly as part of the group or through the provision of materials."


Prof David Bogle with the Principles for Sustainability card

Dr Brian Iddon MP said, "Engineering can play a major part in solving global problems such as climate change, food and water supply, energy security and economic stability. These six principles will help the public to understand how important engineering is in securing our future."

The new publication replaces and updates the code of practice '*Engineers and the Environment*' published by the Engineering Council in 1993.

Principles to guide engineers

1. Contribute to building a sustainable society, present and future.
2. Apply professional and responsible judgement and take a leadership role.
3. Do more than just comply with legislation & codes.
4. Use resources efficiently and effectively.
5. Seek multiple views to solve sustainability challenges.
6. Manage risk to minimise adverse impact to people or the environment.

Professor Geoff Simm appointed SAC's Academic Director

PROFESSOR Geoff Simm has a new role in SAC (Scottish Agricultural College).

He has been appointed Academic Director, and will be the strategic leader of all of SAC's research and educational activities. It is a new, Board level appointment, with a focus on ensuring SAC's research and education activities continue to compliment each other and provide a fully integrated resource for Research funders & students.

Well known for his work as a livestock scientist, with a particular interest in genetics Geoff Simm presently manages SAC's Sustainable Livestock Systems group. They have internationally recognised expertise in farm animal welfare, new breeding technologies and meat eating quality amongst others.

His new role will be much wider and involve building strong relationships with the Scottish Further & Higher Education Funding Council, Scottish Government and other research and education institutions across the UK and beyond.

In welcoming Professor Simm to his new post SAC Chairman , Lord Jamie Lindsay said, "Geoff Simm has made an enormous contribution to agricultural science and rural affairs at national and international level. I am sure that in his new role he will play a major part in reinforcing SAC's reputation for research and learning going forward."


Prof Geoff Simm

LETTERS to the Editor

SOMETHING ON YOUR MIND?
Write to the Editor at:
Landwards, 25A New Street, Salisbury, Wiltshire, SP1 2PH
or email chris@nelsonpublishing.co.uk

It's all in the soil - response

AS the senior author and editor of FAO's 2006 book *No-Tillage Seeding in Conservation Agriculture*, I am moved to comment on the excellent letter by Brain Sims under the heading *It's all in the soil* in Volume 64 of *Landwards*.

Brian is correct in much of what he said but I believe he is too hard on the UK and his advice that UK farmers should follow the South American model, in my opinion is misguided. Most Latin American soils are very kind and many are quite friable. Sadly, that has allowed their farmers to get away with some sub-standard practices and the use of machines that simply do not function well in heavier more difficult soils.

The UK did, indeed invent low-disturbance no-tillage. To be more precise, Imperial Chemical Industries Ltd (ICI) invented what they called "direct drilling" to complement the release of their non-residual herbicide, Paraquat in the 1960s. Since no machinery company seemed interested in developing a specialist direct drill, ICI developed its own, based on three discs (a vertical front disc followed by two vertically-angled discs that wedge a V-shaped slot in the soil). This became known as the triple disc opener and was later simplified into a double disc opener by other people that nonetheless still wedged the soil aside to form a V-shaped seed slot.

But the machine did far too many things wrong in heavy (and often wet) UK soils. Its shortcomings are outlined in scientific terms in our book that summarises research undertaken in New Zealand and elsewhere specifically to identify and rectify why direct drilling or no-tillage had failed so often. Meantime, the failed machines resulted in widespread dissatisfaction with direct drilling in the UK after an initial flurry of excitement. Farmers soon resorted to minimum tillage techniques which loosened the soil (albeit to a shallower depth than ploughing) thereby overcoming most of the seeding problems of triple disc or double disc openers. But in the process, the true conservation value of low-disturbance no-tillage was lost. Most of Western Europe followed the UK lead probably believing that if the UK could not make it work, no-one could. Sadly, that was a big mistake, because others have since made the technique work superbly.

South American farmers found that triple disc and double disc openers worked fine in their kind (and often friable) soils. So the technique has flourished there with almost exactly the same machinery as failed in the UK. My point is that if the UK now copies what the South Americans are currently doing, based largely on triple disc or double disc openers, the UK will simply repeat history and fail all over again. Further, it is doubtful if much of South American no-tillage actually achieves low disturbance status, which defines true conservation agriculture. Indeed the very Brazilian photograph that accompanied Brian's letter in the journal would be classed as only borderline as far as 'low-disturbance' (and therefore true no-tillage) is concerned.

But all is not lost. Since the 1960s other non-South America countries have perfected different, truly low disturbance no-tillage opener designs that work very well in a wide range of soil types, including in the UK. If the UK wants to re-embrace low-disturbance no-tillage (which I would applaud) those are the technologies it should be focusing on.

Dr John Baker
PO Box 181
Feilding,
New Zealand

SRI RIP

AS an ex-Director of Silsoe Research Institute (SRI) / AFRC Engineering / NIAE I have, of course, felt deeply disappointed - even bereaved - at its demise.

When I re-read the optimistic forecasts, which my successor, Brian Legg, and I were able to to write in the 1980s and 1990s, I am even more at a loss to understand the closure. As someone who has been both geographically and functionally distant from the Institute, I have generally felt it better to leave judgment and comments to others who are 'near to the action'.

However on receipt of the recent (excellent) edition of *Landwards* together with the enclosures, my sense of disgust with the decision to close SRI has built to the point where I must share it with more active members.

Firstly I read in the EurAgEng Newsletter of the major AgEng 2009 Conference in Hanover. I realised that without SRI and with little contribution from Cranfield, Newcastle and Scotland, the UK participation is likely to be akin to that of a minor European state rather than on par with Germany, France or Italy as in the past.

As far as I can see, the international network of engineers in agriculture is as active as ever - and problems and opportunities exist in plenty - but the UK is virtually unrepresented. Who is right, UK or the rest of the world?

Secondly, in the same newsletter I read about the BBSRC Sustainable Bioenergy Centre. Even more than fuel crops, Biofuel sources present major research opportunities in their handling and processing. SRI would surely have been at the centre of this initiative which, as an Industry / University programme, appears rather unfocussed.

The other pamphlet with the Journal is a 'glossy' publicising the BBSRC work on crops, featuring mainly Rothamsted and the John Innes Centre. With 40% of the cost of crops being for labour and machinery, the UK has surely only a partial approach to cropping efficiency!

Finally as a fellow of the Ergonomics Society, I have in the Society's newsletter received information of a proposal by BBSRC to set up a "Healthy Ageing Research and Technology Club". BBSRC has apparently identified major economic and social gains from increased R&D investment in the area. Clearly ergonomics is an important component of the potential activity.

Who had the ergonomists? Silsoe Research Institute! The IAgrE recognised the subject and featured it well in its activities.

My conclusion is that engineering, including applied physics, IT and ergonomics is now greatly under represented in the sectors where biology is seen as the 'lead science' - agriculture, food, environment and health.

What can be done about it is less clear, but the Institution surely needs to initiate some attempts to recover the UK position if it accepts my concerns.

Professor John Matthews
CBE, DEng, Hon FIAgrE
Cardigan
Ceredigion

A first class event

IAgrE President, RICHARD ROBINSON looks back on a very successful conference and warns new businesses over increasing legislation

AFTER one year in office I am beginning to understand the respect in which our Institution is held.

Our Conference at Cirencester was undoubtedly a first class event and put a number of other events I have attended firmly into the shade. We owe a huge debt of gratitude to organisers and speakers alike.

On a more prosaic note a number of, shall we say more senior, members of the Institution visited the Bar at the College, purely in the interests of research, and marvelled at the free thinking spirits of the students assembled there. We can't wait until they start using our machinery!

Given the current hole that many of our politicians seem to be digging with spades undoubtedly provided from the public purse, I am delighted to say that no officer of our Institution can have committed similar crimes against the membership! Our head office is run with fearsome attention to cost saving where both staff and volunteers work extremely hard for the members.

A PAST president, Theo Sherwen, developed the pick up hitch for Harry Ferguson in a great hurry as the original design did not work, despite GKN having some 2500 trailers made ready to use it.

Theo's brief was to use as many of the existing parts as possible and to have everything in production within six weeks. It is interesting to note how often tractors feature in any refugee crisis, with trailers being hauled by the successors of the 'Little Grey Fergie'.

We reckoned that more people have been relocated using tractors and trailers than any other politically motivated method, and if you use your tractor you may well be able to support yourself in the new location, with the power to cultivate and transport.

The recent Young Engineers Competition, held at Jaguar was another success and the tour of the XK production line really interesting.

Whilst we understand why Ford had to sell Jaguar Land Rover, their production engineering commitment to the Castle Bromwich plant is there for all to see.

Because production of these models is running at about 50% we had time to study the manufacturing methods in some detail and could only wonder how Jaguar, with their rivetted and glued Aluminium Construction could be competitive with spot welded steel.

Against that, the vast numbers of Robots don't need healthcare, maternity leave (as far as I know, but some were getting awfully close) or pension plans!

THAT brings me to my final observation for this issue, ever increasing legislation

To any of you looking to start a new business, it might make sense to buy an existing one (provided it is sound!) and change it into one that meets your needs. Whilst we have bought a couple of operations and incorporated them into our own, either could have been an excellent starting point.

These businesses need not be profitable (why else would you want to sell cheaply?) but with careful scrutiny they should have the one important ingredient - HISTORY.

This helps get trade credit, insurance and a bank account, whilst maintaining VAT registration and lots of other relationships that will only use up valuable time and energy when you are just starting.

Look for conservative family run businesses with no obvious succession - they might just be the ones to talk to, and the might be a source of really good experience.

> "We owe a huge debt of gratitude to organisers and speakers alike"

2009 LANDWARDS **CONFERENCE REPORT**

Land use
the choices & challenges

Royal Agricultural College
Cirencester
Gloucestershire

7 May 2009

THERE was common consensus over the issues, *writes Landwards editor Chris Biddle*, but little agreement on the solutions for farmers tasked with the challenges of increasing food production, whilst meeting ever more stringent environmental controls, from a strong line-up of speakers at the Landwards 2009 Conference staged by IAgrE at the Royal Agricultural College on 7 May 2009.

It was a stimulating event, full of reasoned and often provocative argument from learned and highly qualified speakers representing a myriad of land-based organisations. Each had a slightly different slant on the future. Most agreed on the challenges but the route-maps they offered were slightly different and that made the conference such an enjoyable experience.

The content was worthy of any major farming or land use conference, and the IAgrE team should be congratulated on assembling the line-up of eminent speakers - it is just a pity that the event does not attract a larger audience.

Moving towards a Policy for Food and Environmental Security

PROFESSOR ALLAN BUCKWELL, Policy Director, Country Land and Business Association

EVERYONE was - or should have been - alarmed at the suddenness and scale of the food price spike which took place last year, said Allan Buckwell.

It signalled how precarious the world food supply is. Yet the EU is patently well-fed, and already supports and protects its farmers.

So what are the lessons of the food crisis - and the financial crisis - for Europe's food and agricultural policy? I argue that there is no clear model emerging, which is why we offer the concept of Food and Environmental Security as a new basis for the CAP as it evolves after 2013.

One of the major problems we face is coping with fluctuations in oil prices. If they rise consistently to over $100 a barrel, there will be greater pressure to focus on the production of bio-fuels, if they remain low then I see that the trend we forecast now will continue.

> . . the credit squeeze has had little impact on food production

Everyone involved in the management of land-use, in food production will be aware of the rising cost of managing environmental costs - and you have to ask whether Government, any Government, is ready for this?

Looking at the present, it seems that the credit-squeeze has had little impact on food production, however, the pressures are coming from the food chain.

Looking at recently issued results, there is little doubt that Tesco has not suffered from the recession.

And this trend will continue to squeeze producers as competition in the food chain intensifies.

Where the squeeze has come is in the discretionary spend on food in the middle market, that has appeared to have suffered in recent months.

We in the Western world, in Europe, are blessed with ample food supply, the problem however facing poorer countries, those that need to import food, will get worse.

Research and development by richer nations like ours has slid to an almost stand-still and that not only is a tragedy, but

has to change if we are to meet the needs of those less fortunate.

I still have to wonder whether the Single Market can be fully functional, if push comes to shove and food production is threatened across Europe, could we absolutely guarantee that France or Italy would act in the wider interest - or indeed would we?

Land Use for ever, for everyone

A National Trust Perspective

DAVID RIDDLE, Land Use Director, The National Trust

Land and the National Trust

THE National Trust's purpose is the promotion of the preservation of places of historic interest or natural beauty, in perpetuity, for the benefit of the nation.

We are undoubtedly best known for the wondrous array of historic houses, collections, monuments and gardens in our care, but our responsibility for land surpasses that of any other landowner in England, Wales and Northern Ireland, other than the state.

Our total landholding stands at 252,000 ha (622,000 acres) (Jan 2009) and includes some of the nations' most treasured countryside - large areas of upland, traditional lowland estates, more than 1,100 km of coastline, nature reserves and many iconic landscapes.

Our challenge as an organisation is to look after these special places (including their environment) for ever, for everyone. Sustainability is fundamental to our purpose and for our land management to be sustainable we must aim to meet the needs of current generations without compromising the ability of future generations to meet their own needs.

We are a conservation organisation but our land management is not just about landscape, wildlife and public access; it involves the care of a working environment producing essential goods and services upon which many people depend to make their living.

Eighty percent of our land is farmed or dependent on farming in some way. Most is let to tenant farmers under nearly 2,000 separate agreements. Around 25,000 ha is woodland, most of which we manage directly.

> Sustainability is fundamental to our purpose

What is land for?

LAND is a finite resource and the demands we make on it continue to grow.

World population is increasing fast, resulting in more demand for food, wood, energy and clean water; yet the area of productive land from which they can come is being steadily eroded by development, degradation, climate change and sea level rise.

This means that the remaining land is going to be under

increased pressure to meet multiple objectives - for growing food and timber, storage of water and flood control, sinking and storage of carbon, providing space for people to live, maintaining functioning ecosystems, and providing recreational space for mental and physical health.

continues over

Some of these demands may be compatible, others not so. We need to be clear how our estate can maintain land capability and multi-functionality while still being practical and affordable.

We recognise that all land is multifunctional however we choose to use it, and we have highlighted six basic functions of land that need to be considered in all our management decision making:

- **Production** - food, timber, fibre, materials
- **Water cycling** - catchment, filtration, flood control, coastal processes
- **Carbon storage** - sinks and emissions from peatland, soils, vegetation
- **Biodiversity** - habitats, species, genetic diversity
- **Landscape and cultural history** - scenic beauty, historic landscapes, archaeology
- **Recreation and inspiration** - physical exercise, discovery, contact with nature

These different functions face a range of demands and pressures and we will need to adopt a flexible and far sighted approach to land management to address them.

The big challenges

WE have carefully considered which aspects of our land management are least sustainable and we have identified five major challenges where we believe we will need to change and where we feel we can make most difference.

- **Reduce our impact on water** - protect water resources and manage water as a precious commodity
- **Build carbon in our soils** - to reduce net green house gas emissions from land, build natural fertility and restore soil organisms at the base of the natural food chain
- **Reduce our reliance on fossil fuel products** - to build the resilience of our food production systems to future oil price volatility
- **Maintain and enhance biodiversity** - as an indicator of the health of our environment
- **Reconnect people with land** - to promote understanding of the importance of land and develop a land ethic, deliver public benefit from our land and generate support for its care

WE know the types of things that will help to address each of these challenges but even within the National Trust we cannot wave a magic wand and will need to work closely with the people who make the decisions on how our land is managed - our property staff and tenants.

With them we will identify what is achievable, affordable and practical and use to their creativity and imagination to find solutions that will help to safeguard our natural resources and land capability for future generations.

Sustainable food production

What is it, how do we get it and can we afford it?

PROFESSOR CHRIS POLLOCK, Aberystwyth University

THE latter quarter of the 20th Century was notable for a sustained decline in the global price of agricultural commodities.

There were two main reasons for this. Production rose faster than demand because of technological advances and increased area of cultivation, and some countries 'mined' their food production capacity in order to earn foreign currency.

This fed the UK Government vision of a post-Industrial economy that can be caricatured as 'Singapore North'. Here, successful economic activity provides the leverage to buy, now and into the future, all the food and raw materials that are not being generated from within.

I have grave doubts as to the long-term applicability of this policy in a world that will be increasingly resource-limited. UK land use is, in my view, at a cusp in its development.

CAP reform and the Curry report offered the prospect of liberating the farming community from the dead hand of protectionist dogma. However, the innate conservatism of the industry, coupled with a somewhat dysfunctional relationship with its wider beneficiaries, has meant that Curry's vision of multifunctional land use is a long way from realisation.

Nevertheless, it remains a wholly laudable objective. The size of the market wholly controlled by farmers may be small in relation to the stranglehold exercised by the big retailers and processors, but it is growing and it has an excellent public image when compared to commodity production (particularly of animal products).

In my view, the Industry needs to recognise the impetus that niche, high quality, high value systems give the sector as a whole and represent this in its political and commercial lobbying

The major driver for change will be increasing world commodity prices. Global population is forecast to peak at 9 Bn, an increase of 2 Bn from today. This will be at a time when climate change will be adversely affecting yields at lower latitudes, when there will be increasing competition for both land and water for energy production and for urban development and when an increasing demand for animal products will require an extra 300 Mt of cereals by 2050.

Currently Northern Europe enjoys cheap, safe and reliable food supplies. By the middle of this century I believe we will have to decide which two of these three we really want. If it ends up by being safety and reliability, then the increase in food costs could favour Northern European producers. There will be consequences for such changes and it will set producers, policy makers and researchers specific challenges.

Britain will want local food produced safely and in sympathy with the environment. At that time, we will need committed, economically successful farmers to grow it, a quality-oriented food chain to process and market it and a much better-engaged R&D effort to sustain it.

We can maintain our capacity to deliver such an outcome, but I am by no means certain that we will.

. . the vision of multifunctional land use is a long way from realisation

Farming's place in the Bio Economy

PAUL TEMPLE, NFU

NFU's recent vice-president Paul Temple offered a view of the bio-economy by comparing and contrasting a country such as Brazil with the European market.

"I think we have a lot to learn," he said, "as I believe that Brazil will be the future powerhouse of the bio-economy, if it isn't already. For a start, today, agriculture represents 24% of Brazil's GDP and accounts for 36% of its total exports.

Yet, agriculture receives only 4% in government support, compared with 27% in the EU. And Brazil is an urban country, 80% of the population live in cities, but it has an agricultural sector that is both robust and commercial.

Regretfully as a contrast, agriculture barely features in the UK's GDP. Yet here we have some of the finest brains to help poorer countries develop their agricultural infrastructure. That is expertise that we should be using to grow the agri-economy in countries such as Turkey, Ukraine and the like.

Farming is too fragmented, there are too many groups serving too many narrow interests. The place of science and R&D is undeniable, we should be challenging young people to come up with the solutions of feeding the world over the coming years.

Fortunately, there are some encouraging signs. President Obama is actively pushing the importance of a bio-economy - and we must all ensure that that we continue to see the wider picture.

Developing Tools to Meet the Demand for Sustainable Forestry

STEFANIA PIZZIRANI,
Project Manager, Forest Research

UK forests face increasing challenges due to a broad set of factors ranging from complex forest management demands to shifts in consumer patterns.

Consequently, there is a growing need for a comprehensive analysis of sustainability throughout the forestry-wood chain. However, current analysis methods such as life cycle evaluation or multi-criteria analysis do not encompass all aspects of sustainability. The Eforwood project was developed to address this issue for all parts of the forestry-wood chain.

The objective of the Eforwood project is to enhance our understanding of how global changes impact the European forest sector, and to model the sustainability of different forestry-wood chains (FWC). To do this, Eforwood is developing a software package, Tool for Sustainability Impact Assessment (ToSIA). ToSIA enables users to simulate and compare the impacts

of various decisions on the performance of the FWC as measured against key environmental, social and economic indicators.

The aggregated results from ToSIA are then compared using multi-criteria analysis which allows the identification of sustainability issues and facilitates discussion. Through the use of tools such as ToSIA, it will be possible for the forest sector to improve efficiency and maximise its potential to deliver a range of benefits and thus become more dynamic and responsive in a changing world.

Mixed farming at Leckford Estate - back to the future

Dr. MALCOLM CRABTREE, M.D. Leckford Estate

ALL land managers and farmers have to balance the priorities set for them in managing land.

At Leckford the priorities are set by the Estate Management Committee in a five year business plan and encompass several objectives, two of which are:

- Running a profitable business
- Farming in harmony with the environment (an objective included in the employment contracts of successive managing directors of the Estate which has ensured that it has been run with a mixed farming system providing a sound basis for conservation and biodiversity.)

However generating a profit is regarded as a very important use of the land on the Estate. Within this context Estate land is used for the following purposes.

- Producing food for Waitrose stores.
- Conservation and environment enhancement.
- Amenity, leisure and education.
- Producing energy.

- Producing industrial crops.
- Water management.
- Contributing to rural infrastructure

Dr. Malcolm Crabtree discussed and expanded on these issues and the decision making process which has lead to their incorporation in the operation of Leckford Estate which has been owned by the John Lewis Partnership since 1928.

Do agricultural engineers have some of the answers?

PETER REDMAN, Douglas Bomford Trust

We have a problem!

LAND contains and supports our fundamental resources of soil, water, habitation, habitats and landscape. These provide for food, drink, fuel, fibre, specialist chemicals, recreation and biodiversity.

Forecasters generally agree that the combined effects of climate change, population growth, life style changes and the exhaustion of raw materials presents a potentially overwhelming challenge for mankind. Some are less pessimistic, anticipating that reductions in the rate of population growth will be more than matched by potential improvements in food productivity. In any event there is a challenge.

The values ascribed to this challenge vary but all are huge, other than for the time available to effect the massive response required. Some suggest that there are now only decades. Whilst not ignoring the fact that most of the sun's energy falls on the oceans the greatest impact of this challenge will be on the use of land and its associated water.

At the global scale the unavailability of food and water appears set to outstrip population growth across swathes of mankind. Other communities will seek more 'land demanding' diets. The quest for sustainable energy sources is already competing with food in the use of natural resources. Biodiversity seems to be an inevitable, if amoral, casualty.

But do WE have a problem?

BUT that is the big picture. Is there any cause for concern closer to home?

Taken as one set of indicators of the demand for land UK farm incomes remain modest, food prices have been kept relatively low and animal based foods are still thrust upon us. Never the less the signs of the emerging pressures on land use are at hand. Recent swings in grain prices and the level of global reserves imply that food security is fragile. Reductions in bird species and numbers, a key biodiversity indicator, are causing concern. The reluctance to allow freedom to roam over some less productive land, legislation aimed at improving water quality the need for designations to protect more of our landscapes, urban expansion and the use of land for flood control are further signs of converging pressures.

We should at least - Prepare to have a problem soon!

Opportunities, options or imperatives

ASSUMING that there is little prospect of creating land in significant quantities, as was the case with the draining of the fens - facilitated by engineering- attention must now turn to a combination of;

- *Maintaining and enhancing the core resources of soil, water and habitat.*
- *Optimising efficiency across the chain of production and use*
- *Facilitating shared use of land*
- *Minimising any negative consequences of change, particularly environmental and social impacts.*

These must be addressed by multidisciplinary activity working across all scales from cell to landscape and identifying and accounting for all consequences.

How can agricultural engineering contribute?

ENGINEERING invariably provides both the means for change and the application of other technologies.

It enables power to be applied raising both capacity and capability, enables repetitive or hazardous tasks to be sustained, facilitates the acquisition of information that supports better decisions, and achieves precision and control to minimise waste and pollution. When applied in an informed manner these can improve efficiency, conserve resource, maintain quality and make core resources available to other users.

Peter Redman was also made an Honorary Fellow at the Conference

But power can be abused either wilfully or inadvertently. Fragile soils can be further destabilised leading to soil loss and water pollution by use of the wrong cultivation systems, habitats can be decimated beyond recovery through deforestation and the wholesale removal of hedgerows for example, and some rare species rich meadows, in the uplands have been 'sanitised' through the use of the now ubiquitous, big bale silage.

Keeping soil productive

MAINTAINING a sound structure is fundamental to the performance of the soil's biological, nutrient and water systems that support plant growth. It is also a key factor in preventing soil loss through erosion that goes on to contaminate water courses.

Engineers contribute through the design of implements and cultivation systems that optimise disturbance, work rates and power requirements.

This is combined with the development of traction/traffic systems that minimise the risks of compaction inherent in heavier, high capacity machines. The so called 'min till' cultivation systems, better tine design, controlled traffic systems, low ground pressure tyres and high speed tracks are examples of such developments. All underpinned by effective drainage systems.

Improving capacity and efficiency

LARGE machines with high work rates epitomise modern farm mechanisation.

These are aimed at more than labour reduction per se. Timely operations, matched to weather and soil conditions aid crop performance, improve the effectiveness of pest control, reduce harvest losses and lead to higher quality crops. Trends towards higher levels of automation in the dairy sector in particular, release time from repetitive tasks, simplify routines and provide essential management information.

Other ways to contribute

- *Making better use of water*
- *Preventing pollution and optimising production*
- *Avoiding waste through the chain*
- *Making better decisions*
- *Helping shared use*

THERE is an array of fascinating and urgent problems ahead to be solved for the benefit of mankind and nature. This will require the interaction of many forms of expertise and knowledge.

Only the best brains, working together, will do.

engineering provides the means for change

Michael Dwyer Memorial Prize for his role at manufacturer

Deere's Richard Johnson receives top award


Richard Johnson

RICHARD JOHNSON, managing director of John Deere Ltd, was presented with the Michael Dwyer Memorial Prize at the Conference.

The Award was in recognition of his continuing role establishing John Deere as one of the UK's agricultural and groundscare suppliers. A one-company man, Richard, was one of the first to benefit from a Work Placement Scheme when he joined John Deere from Harper Adams in 1987. Since then he has held prominent positions within the company, culminating in being appointed Managing Director in 2006.


Bob Pringle

Four experienced and long-standing members of the agricultural machinery industry were honoured with IAgrE Awards. They were **Bob Pringle**, for his work in the field of potato storage and systems; **Don Macmillan**, who was John Deere's first UK dealer and who has since written several best-selling books on the history of the brand; **Frank Moore**, former sales director of Rotary Hoes Ltd who went on to design the Moore Mower, and **Philip Wright**, former technical director of Simba International who won a host of awards for his design of cultivation equipment.

Long standing stalwart of ADAS (Agricultural Development and Advisory Service), **Brian Finney** was awarded the IAgrE Award of Merit for 2009, whilst **Peter Redman**, the Technical Consultant to the Douglas Bomford Trust was awarded with an IAgrE Honorary Fellowship..


Brian Finney

Former Harper Adams student, **Llion Wyn Davies**, who has since returned to work on the family farm near Cardigan, was awarded the Johnson New Holland Trophy for his college project relating to reducing the in-field turning circle of a JCB tractor, whilst **Professor Dick Godwin** and **Dirk Ansorge** of Claas were Douglas Bomford Award winners for their research papers on the effect of tyres and tracks at high axle loads on soil compaction.


Llion Wyn Davies


Dirk Ansorge & John Fox

Finally the IAgrE Branch Meritorious Award went to **David Wilks** of the East Midland Branch.


Don Macmillan with Richard Robinson


Frank Moore


Philip Wright

Award winners in full

BRANCH MERITORIOUS AWARDS

David Wilks
(*East Midlands Branch*)

JOHNSON NEW HOLLAND TROPHY AWARD

Llion Wyn Davies,
(*Harper Adams University College*)

DOUGLAS BOMFORD PAPER AWARD

RJ Godwin and
D Ansorge
(*BE*)

MICHAEL DWYER MEMORIAL PRIZE

Richard Johnson
(*John Deere*)

IAgrE AWARD FOR CONTRIBUTION TO THE LAND BASED INDUSTRIES SECTOR

Bob Pringle
Don Macmillan
Frank Moore
Philip Wright

HONORARY FELLOW

Peter Redman

AWARD OF MERIT

Brian Finney

Award winner, **Philip Wright** on his 'great honour'

I WRITE to thank you, and your colleagues within the IAgrE for the '*Contribution to the Land Based Sector Award 2009*', which was both a surprise and a great honour to receive.

I feel that these awards are received on behalf of many colleagues within the industry, as without their collective help and encouragement the contributions made would probably not have been possible, and certainly would have been much harder to achieve. Looking over the list of achievements cited it is clear that many have been as a result of such collective efforts; indeed, much of the pleasure in being part of our industry is the ability to share ideas and combine skills with others. In many cases, such multi-disciplinary approaches are needed in order to provide solutions to the varied, often interrelated, and complex issues which are ever present in the Industry as a whole.

As we look forward to the increasing challenges presented by the current and future economic and environmental climates it is clear that the role of the Agricultural Engineer is highly significant. It is also key that we maintain and improve the levels of younger engineers entering our industry, as the issues we are facing both nationally and internationally can only be solved in the long term. The combination of youth and experience is vital as we move forward to ensure the efforts made are directed energetically to the right areas, and are sufficiently innovative to cope with the challenges we face.

I have been extremely fortunate to be involved in an industry and have a career which I totally enjoy; hard work becomes easier, and long hours shorter when this is the case. When allied to the support from colleagues, friends and family, it goes to show that many things become possible!

Strawberry fields forever

Silsoe Technology Ltd recently undertook a project to research and develop an automatic make up system for placing or removing soft fruit or mushrooms into or out of a punnet.

by
JOHN REED, SILSOE TECHNOLOGY LTD

1 INTRODUCTION, AIMS AND OBJECTIVES

SOFT fruit and mushrooms are generally picked directly into their final containers then transported to a packing line to be check weighed, sealed and dispatched.

Check weighing currently involves manual operators interpreting a weigh cell indicator then deciding on whether, and how much, product needs to be added or taken away. Manual make up is currently the only economically viable method available to growers. Off-the-shelf robots are too expensive and generally over-specified to justify their use in an automatic make up system for horticulture.

This project aims to research and develop a system that can automatically top-up or remove products from a punnet. The key component of the proposed system will be a device (end-effector) that can attach itself to multiple products then release all but one (or 2) using a simple (non-vision) sensing method. Initially the technique will be applied to handling strawberries and mushrooms, however, the technique could be expected to work for other products.

Automating the check weighing process has the potential to reduce both the cost of production and amount of product give-away and therefore contribute to improving the efficiency and competitiveness of the UK horticultural industry. This report summarises the research undertaken by Silsoe Technology Ltd (STL) to conceive, research and develop a technique for multiple pick-up and selective release of delicate products (primarily strawberries).

2 RESEARCH

2.1 Product characteristics

STRAWBERRY samples were obtained and characterised with respect to size, weight, geometry, surface properties and punnet fill.

For extended product testing a large number of artificial strawberries were obtained that had similar dimensions to the measured samples, these were filled with silicone to provide a representative weight.

2.2 Vacuum Pickup

A VACUUM test rig was constructed incorporating a high flow vacuum inducer (Schmaltz) and transducers to record the supply pressure and suction cup vacuum levels.

A range of proprietary suction cups were obtained and tested individually for their ability to suck onto strawberries. Experiments were conducted with both real and artificial strawberries. Tests revealed that although most types of cup were capable of lifting a strawberry they all needed to be well aligned with the curved top surface of the strawberry in order to create the necessary vacuum seal.

Proprietary vacuum cups did not possess the flexibility required to attach themselves onto a curved surface if presented off centre. Such cups would therefore not meet the basic requirement of the proposed handling concept i.e. the ability to blindly attach to randomly presented objects. In order to achieve good attachment, following a blind approach, it was found necessary to conceive, design and construct a new type of highly-compliant, vacuum device. The potential for patenting this device is being investigated.

Samples of fresh strawberries were subjected to a range of vacuum levels and durations using the novel vacuum device. The samples were then stored in a chilled environment. The samples were observed daily post treatment for signs of damage or bruising. Little or

The technique is scaleable and may have uses for other products within the food or other industries

no bruising was observed.

These tests indicated what level of vacuum was needed to avoid product damage. Further tests may be required, in due course, to establish the maximum handling vacuum for other varieties.

2.3 Vacuum sensing

THE system relies on picking multiple products then releasing those not required. The method chosen to detect the presence of a product was to sense vacuum level in each supply line.

A number of vacuum transducers were considered and an appropriate unit sourced from SMC Pneumatics. This provides a switch signal when the vacuum device sucks onto the strawberry surface. The positioning of the transducer relative to the vacuum device and sizing of the vacuum tube were optimised to provide reliable switching and effective suction.

2.4 Demonstrator system

A DEMONSTRATOR system was constructed to investigate the automatic removal of a single strawberry from a punnet (takeaway) or placement of a strawberry into a punnet (makeup).

In commercial use the punnet would be automatically pre-weighed on a conveyor check weigher resulting in one of three actions, no change (correct weight), makeup (underweight) or takeaway (overweight). The end-effector for picking consists of an array of 4 vacuum devices mounted on vertical pneumatic cylinders which allows them to be raised or lowered into a punnet. The end-effector is mounted on a horizontal linear actuator positioned across the top of a servo controlled punnet conveyor.

Each vacuum device is serviced by its own suction inducer and vacuum sensor. A central control unit controls the conveyor drive and the solenoid valves to actuate the vacuum units, cross slide and vertical end-effector cylinders. A buffer trough was constructed and mounted alongside the conveyor to act as a deposit area during take away or as a buffer supply of strawberries for makeup.

To perform a takeaway the conveyor is indexed until a punnet is positioned under the end-effector. Vacuum is turned on and the end effector lowered into the punnet. Vacuum sensors on each device detect whether a strawberry has attached. The control program then selectively switches off all but one of the successful contacts.

The end-effector is then raised and moved horizontally over to the side trough where the strawberry is released. The end-effector then returns back over the conveyor ready to pick from the next punnet. If no strawberries are detected at the first attempt then the machine will perform a second pick from the punnet.

Punnet makeup is achieved by removing a strawberry from the side trough and transferring it into a waiting punnet. Pickup from the side trough is the same action as picking from a punnet.

Extensive trials were conducted with both real and artificial strawberries to optimise the picking success and cycle time.

3 CONCLUSIONS AND RECOMMENDATIONS

THE research phase of this project has successfully demonstrated the feasibility of blind makeup or takeaway from a strawberry punnet at a commercially acceptable speed.

A novel compliant vacuum device has been conceived and a patent application is being considered. The use of multiple vacuum devices ensures a high pick success rate when operated blind. For make up a buffer trough is used as a supply. As with the punnets the requirement for a successful pick is that there is sufficient product within reach of the end-effector.

The system has also been successfully used to perform the makeup task with mushrooms. The technique is scaleable and may have uses for other products within the food or other industries.

The system was successfully demonstrated to Douglas Bomford Trust's Peter Redman and Dick Godwin in December 2008. Developing the demonstrator to its current performance level has incurred costs above the original budget (50%), these have been absorbed by Silsoe Technology.

The next stage in the project is to estimate the cost of a full prototype, fully investigate the market and identify a potential first customer. Patenting the device will then be pursued. Trials with the current demonstrator will then be carried out on-site in conjunction with Marco Weighing Systems prior to a final decision on proceeding commercially.

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National Centre for Food Manufacturing opens

SIR Stuart Rose, Executive Chairman of Marks & Spencer, has officially opened the National Centre for Food Manufacturing at the University of Lincoln's Holbeach campus.

The new £3.5 million Centre is a state-of-the-art food packaging and processing training factory for food sector employees and is located at the heart of the UK's food manufacturing industry in southern Lincolnshire. The Centre will also support the University's developing agenda for research and innovation in food packaging and automation for the sector.

The training factory provides a 'real-life' environment and top-of-the-range industry-standard equipment including: a £1.5 million fully-automated production line for 'ready meals'; gas analysis equipment for modified atmosphere packing; packaging coding and dating equipment; a sauce depositor; ultra-violet technology; fork lift truck.

The project was funded by Lincolnshire County Council with support from the European Regional Development Fund (ERDF) Lincolnshire Enterprise, East Midlands Development Agency (emda) and the University of Lincoln.

David Wallace, Director of Innovation at East Midlands Development Agency (emda) which supported the development of the Centre, said, "This new facility will be a great asset, not just to food manufacturing businesses in Lincolnshire, but also to businesses operating throughout the East Midlands. . It also reflects our commitment to support innovation in the food sector, which we are doing through the region's Food and Drink iNet, led by a consortium that includes the University of Lincoln."

Jon Gowing of Manns has reached LTA4 status in record time and talks to Landwards editor Chris Biddle

Onwards and upwards for Jon

GROWING up on the family farm at Bungay in Suffolk, Jon Gowing rarely thought beyond trying to find a job working with agricultural machinery.

As soon as he left school, he applied for a job with a leading dealership in the region - but was turned down because his academic grades were not good enough.

Undeterred, he joined a local contract farming company, David Baker Farms Ltd where he gained all round experience operating and looking after a wide variety of tractors and machinery.

One day, when a Swather went into the local branch of Manns for repair, he was sent in to help out with the work in order to save on labour charges.

That was in 2001 - and Jon has not left!

He asked Manns whether he could come and work for them, was taken on and is now the workshop foreman of the Halesworth branch - and has become one of the first people to have gained the prestigious LTA 4 qualification, following the introduction of the formal Landbased Technician Accreditation scheme just under two years ago.

Jon was largely through his 4-year Apprenticeship with Manns when the LTA scheme was introduced but he is in no doubt that an industry-wide scheme will enhance the standing of technicians throughout the whole industry.

It's a view supported by John Palmer, Training Manager at CLAAS UK.

"As things have turned out, the launch of the LTA initiative has worked out fine," he says. "If you look back two years, we were struggling to find enough skilled technicians, but then came the credit crunch which hit the automotive and construction industries very hard, so we are finding some migration from those sectors.

"By having an industry-wide scheme in place which identifies very clearly a career path for new entrants, it is easier to ensure that we retain them".

That said, the CLAAS experience is that almost 25% of apprentices drop out of the course for various reasons.

John Palmer says, "They leave for a variety of reasons, usually because they feel they are not suited to the rigours and unsocial hours that can go with the job".

It's a view supported by Jon Gowing who is now looking after the new entrants at Manns. "You soon know whether or not they are going to make it," he says.

"The thing is, this is a job which demands so much of your time and commitment.

"Working rules mean that you now do get agreed free-time, even in harvest, but when I started I sometimes worked a near 23-hour day on occasions.

"You have to be adaptable and flexible, and that often means working all hours in all conditions. But if this is a life you enjoy - as I do - then there is no better career".

And there considerable perks attached to some of the apprenticeship schemes on offer.

As with all apprentices on the CLAAS four-year programme, Jon had a spell working in Germany, then several months at Landpower Pty, the CLAAS distributor in New Zealand.

"That was a terrific experience," he says. "Apart from the obvious boost it gave someone like me who had hardly left home before, it also taught me that UK students were regarded very highly for their work-ethic and desire to get on and finish the job in hand".

Jon has the distinction of being the fastest to reach the coveted LTA4 qualification. Barely 8 years after coming through the door with that Swather in need of repair, he has completed the CLAAS four-year apprenticeship and has risen to workshop foreman.

He is still a valuable member of the service team, dividing his time roughly 70% to chargeable service work and 30% on admin in the service office.

"Although it often feels like 70/70!" he says.

He has reached this stage at the age of 25, and there is little doubt that Jon will progress onwards and upwards over the coming years.

> "I think my workload as foreman is probably 70/70!" Jon Gowing

CLIMBING THE LTA LADDER

LTA 1 Self registration on-line. Entries on this register would be categorised as either Apprentices (on recognised programmes) or more skilled/mature entrants not yet otherwise assessed and categorised. There is currently no charge to register.

LTA 2 Newly qualified apprentices or assessed skilled technician meeting the required criteria.

LTA 3 A skilled & experienced technician who has successfully attended a series of assessed course programmes - may be a product specialist.

LTA 4 - A professional technician having a proven and assessed track record. Additional assessment criteria are included to demonstrate exceptional diagnostic and technical ability together with customer and technical mentoring skills.

www.iagre.org/LTA

CLAAS in new partnership with Reaseheath

CLAAS After sales manager Alastair Tulloch (far left back row), Training Manager John Palmer (far right back row) with past and present CLAAS technicians at Reaseheath

Manufacturer moves apprentice training to Cheshire after Writtle cancels future engineering courses

CLAAS UK has finalised a new apprentice training agreement with Reaseheath College in Cheshire following the withdrawal of funding for further engineering courses at Writtle College last November.

"We had to move quickly after the news about Writtle," says Alastair Tulloch, After Sales Manager for CLAAS UK.

"We drew up a short-list of eight or nine colleges whom we were considering at the outset, but the fact that Reaseheath has such outstanding facilities and that it already is the preferred training provider to both Case New-Holland and JCB meant that we were joining other leading manufacturers which has benefits to the industry as a whole".

Reaseheath Engineering currently has 166 full time students studying agricultural engineering, plus a further 30 who are studying management at degree level.

An additional 143 pupils from local schools are working towards their Diploma in Engineering or on the Land Rover Young Apprenticeship Scheme based at Reaseheath.

In total, there are over 600 engineering students at Reaseheath who are taught by a staff of 29.

Reaseheath's Head of Engineering Melvin Johnson said, "CLAAS is a very forward thinking and inspirational organisation. It has similar values to Reaseheath in that it provides top-class service, priding itself on quality and excellence".

John Palmer, Training Manager for CLAAS UK said "We chose to enter into this new partnership because Reaseheath Engineering is regarded as one of the most respected land-based training centres in the UK.

"We were impressed because the engineering department already offers a similar training service to CNH and JCB and we are keen to collaborate with all parties so that we get a common standard which benefits the industry as a whole."

The company will also use Barony College for Scottish students.

There are currently 42 students on the CLAAS Apprenticeship Scheme. Nine are in their final year and will remain at Writtle, whilst the rest will be moving to Reaseheath for their block-release.

"CLAAS is a forward thinking and inspirational organisation with similar values to Reaseheath"

Melvin Johnson
Head of Engineering
Reaseheath College

REASEHEATH COLLEGE

www.reaseheath.ac.uk

Reaseheath College is the leading landbased College in the UK. Based near Nantwich in Cheshire the College has an enviable setting amongst 500 acres of farms, parklands, lake, woodland and sports facilities, including its own golf course. It has 1500 students in full-time education, 400 in higher education and over 4000 part-time.

The College runs a commercial farm, a licensed food factory, has a new Equine Indoor Riding Arena, on-site accommodation for 400 students - and leases 6 hectares of its land to Crewe Alexandra Football Club

FUNDING

in the spearhead of strip tillage

John Deere's 2510S Strip-Till Residue Master Applicator

In spring 2004 Nathan Morris had a diploma, was forecast to earn a first class degree, and had the ambition to earn a PhD - but no studentship and no funding. Today he has his doctorate and has secured his first post with The Arable Group (TAG), both in the vanguard of an exciting new technology called strip tillage.

ANNE CHAMBERLAIN charts his progress.

DESPITE being from a non-farming background, Nathan Morris was drawn to a career in agriculture.

He went on from school to Hartpury College, part of the University of the West of England and, undecided after that, he took a year out and then went back to Hartpury to take a degree in agriculture and land management.

In March 2004 Nathan saw an invitation in the *New Scientist* to apply to Reading University and TAG for a studentship (PhD) in strip tillage. TAG is the UK's leading independent crop research and consultancy organisation offering impartial agronomic information to farmers on the entire range of crop types, cultivations, spray technology, environmental schemes and agronomic inputs.

"Preparing the ground and drilling (sowing) a crop uses a lot of energy," explains Jim Orson, Research and Technical Director of TAG and one of Nathan's supervisors. "It is about how much soil you move, and how often. Ploughing turns over every inch of soil to a considerable depth. Add harrowing or discing, drilling and rolling and you are using a lot of diesel.

"I had seen strip tillage, where just the band of soil along which the seed will be drilled is cultivated, in Minnesota. A row of tines mounted on a tractor-drawn frame cuts out slots in the ground, the seed is dropped in and pairs of following discs close the slots - all in one or two passes of the tractor.

"It would have been a huge help for there to have been a directory of funding sources"

Nathan Morris

"This technique is best suited to wide row crops. Where the rows are closer together, for example in wheat, it does not offer the same advantages. As strip tillage does not turn over the soil and expose bare earth, it also had potential to reduce erosion by wind and moisture and to leave the stubble in place for over wintering birds. Another reduced energy option we are looking at is shallow tillage, where only a very thin layer is cultivated," he said.

Reading University, working with TAG and two charities, The Morley Agricultural Foundation and the Chadacre Agricultural Trust, offered the studentship in strip cultivation. Nathan and other applicants were interviewed by Dr Bob Froud-Williams, a weed control specialist in Reading University's School of Biological Science, Professor Paul Miller (then at Silsoe Research Institute, which specialised in applying engineering to biosystems and now with TAG), and Jim Orson (who all were later to supervise Nathan) together with Christine Hill from The Morley Agricultural Foundation.

Nathan was awarded the studentship, based in the first year at Silsoe and for his last two years at the TAG's Morley site in Norfolk. The funding covered his University fees and stipend, paid quarterly.

Mentoring

"THIS all sounds quite straightforward now," says Nathan. "But I would have valued more sources of information and an experienced mentor to help me with my career decisions at that early stage. I thought I wanted to be an agronomist, but doubted that I had the 'pushy' selling skills needed. I knew little of organisations or charities which might fund a PhD."

Nathan expected to begin his PhD by reviewing literature and getting a grounding on research methods, but was rather more surprised by the first practical challenge. As there were no strip tillage machines in the UK - he had to locate one in the USA, get it shipped over in kit form and assemble it before he could start on the project. All this involved what he calls "several hiccups" and quite a bit of time.

Funding for Nathan to visit Indiana and Minnesota to see the method on the ground came from a third charity, The Roger Harrison Trust, and to purchase the Yetter strip tiller from a fourth, The Douglas Bomford Trust. Nathan's studentship was supervised by the three people, all of whom he met regularly and, he says, contributed to the development of the project.

Nathan is typically modest about his PhD work, completed in January 2008; "I would say that the trials in plots and field strips showed that slot cultivation could achieve yields similar to that achieved with the plough for both sugar beet and oilseed rape. I was very pleased to be offered a permanent post as a research and development agronomist with TAG, which allowed me to continue with this project and others," he said.

Jim Orson is excited about the potential of strip tillage; "I believe it can reduce diesel required to establish a crop by 50%, at least. We have more funding now from the British Beet Research Organisation to develop further the technique. Now that we have precision guidance technology, we can follow the six row tiller with a twelve row seeder and put the seed in exactly the right place.

Nathan points to the star wheels for removing crop residue and fluted disc coulter for initial soil cultivation. "In the US farmers sometimes use a strip tilling machine that completes cultivation/drilling in one operation, particularly for maize on lighter soil. In the UK, particularly for sugar beet, we will more likely be looking at a machine that cultivates earlier in the year e.g. late autumn and then following with the drill in the spring when sugar beet is drilled," he said

"In Nathan we have taken on a very practical guy to work on projects which bring together engineering and agronomy - which probably did not happen enough in the past," he said.

AFCP -

charities working together to fund more and better education and research

NATHAN Morris' PhD studies, travel to the United States and strip tillage equipment purchase were funded by:

- The Morley Agricultural Foundation
- The Chadacre Agricultural Trust
- The Roger Harrison Trust and
- The Douglas Bomford Trust

As such it is an excellent example of charities working together, and flexibly.

These four charities and 30-40 more are involved in the new initiative, The AgriFood Charities Partnership (AFCP), whose aim is to 'Maximise charitable support for science and education in UK food and farming'. They include funding charities specialising in sectors from arable, through dairy and top fruit, to horticulture; as well as travel, advanced business management, MBAs at Cranfield University and specific geographical regions.

One stop website

AFCP's one stop web site includes the first, and rapidly growing, directory of food, farming and land-based charities offering funding for education and research.

Applicants can quickly identify charities which might support their projects. The directory also enables the charities, some of which have modest resources, to locate partner charities and pool resources to increase the scale, number and quality of projects they can support.

"Eventually I was fortunate to win a studentship which was already funded, but when I started looking, it would have been a huge help for there to have been a directory of funding sources like that AFCP now offers," says Nathan.

Launched in 2007, AFCP this year initiated a project to develop and share best practice on funding among its member charities - including application, candidate assessment, supervision and communicating the results of the research.

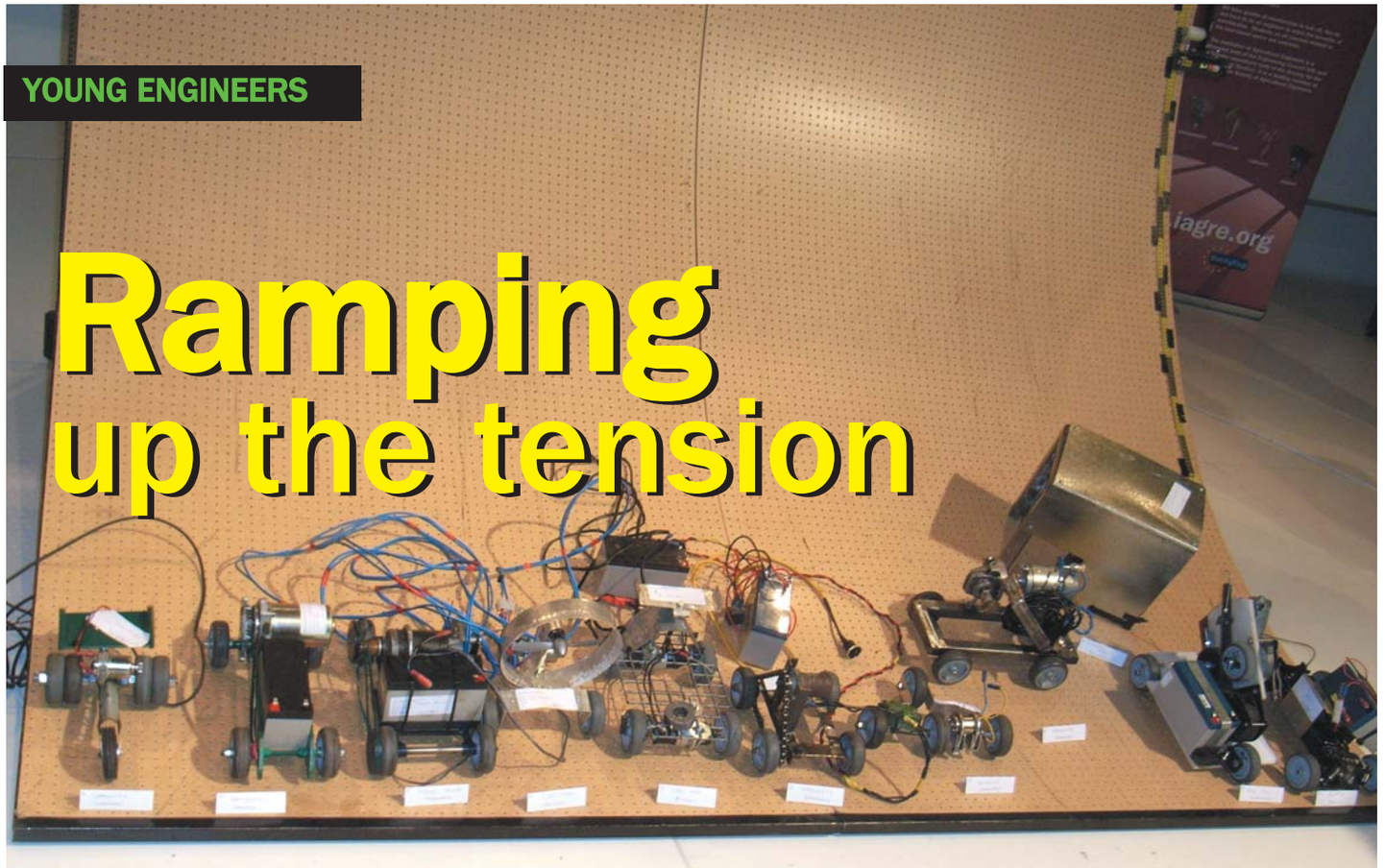
AFCP is also making progress on developing an inside track and influence on research and education policy, priorities and strategy in food, farming and related fields.

AFCP

AFCP Ltd is a not-for-profit company, established and administered by representatives from charities serving the industry.

Its web site is at **www.afcp.co.uk.**

Ramping up the tension



OCCASION: 5TH YOUNG ENGINEERS
VENUE: JAGUAR CARS CASTLE BROMWICH
DATE: 14TH MAY 2009
WORDS: CHRIS WHETNALL

The test ramp with all the vehicles

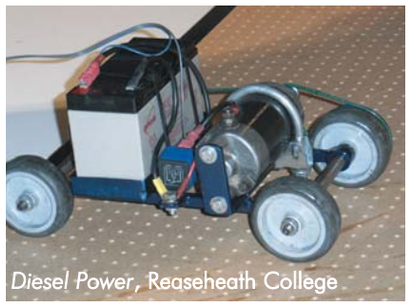
SYLVIA (Harris) and I have braved the M1 and M6 in rush hour and are running a little late.

Nervous that we are going to arrive after the students, we keep referring to Beryl (the satnav) to see whether our eta is receding even further into the distance. Beryl is kind to us and confirms that indeed we may be a little later than we had planned but still ahead of the hoards (we hope).

We arrive to find that IAgrE President Richard Robinson (Autoguide) and Rob Robinson, Engineer from Autoguide (who, possibly uniquely in our Institution, has his Membership Certificate signed by his father) have been there for a while - long enough to erect the test ramp that forms a key part of these events. Also there are Craig Grant and Sean Kilgallen, our colleagues and generous sponsors from Bosch Rextroth (or is it Rexroth Bosch?). They are now stalwarts of these occasions and prove to be a great help in the running of the event on the day assisting with scrutineering judging and prize awards.

I now survey the scene and a sense of mild panic becomes evident - beautiful Jaguar Theatre with bright white paint and pristine white seats and an impending hoard of students with who-knows-what tricks up their sleeves to ensure victory at all costs. Previous events bring to mind pyrotechnics (now banned) and projectiles powered by air from pressure vessels (also now banned) all of which do little to calm the nerves of the IAgrE CEO. Needn't have worried though, all students and,unusually, staff (could be something to do with Richard Trevarthen being absent this year) behave impeccably and seem to have a good time. They are a credit to their colleges - and in some cases -parents!

L-R: The judges, Rob Robinson and Richard Robinson, with Peter Leech and Sylvia Harris



Diesel Power, Reaseheath College

The students and staff have now all arrived and in good time too. With representation from Brooksby, Reaseheath, Plumpton and Myerscough, we have eleven machines entered, plenty to provide some good competition.

IAgrE President Elect Peter Leech (John Deere) has also now arrived. This is his first YE Competition and he immediately gets in to the swing of things.

SCRUTINEERING commences and immediately we are confronted by a dilemma.

Do we include a device (with wheels that does not use its wheels to move) in Class 1 (those that meet the rules) or Class 2 (those that do not meet the rules)?

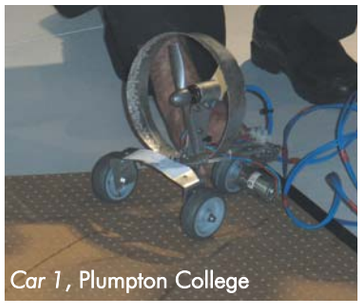
The entrant is adamant that it should be in Class 1 and a debate about the precise meaning of "traction" ensues. Indeed said entrant has brought along a dictionary definition of "traction" to argue his case. It transpires that he is married to a legal secretary and has been taking lessons in legal argument. Meal times must be interesting in that household!

Nonetheless, the scrutineers win the day by forcefully reminding all contestants that the Judges decisions are final (and, most likely, arbitrary).

Scrutineering over, battle commences. The competition is much like the high jump with contestants choosing an initial height to challenge and then ever increasing heights until failure.

There are some interesting ideas in this year's machines. A couple of tricycles are in evidence and the usual mix of one, two, three and four wheel drives.

As usual, machines have been named for the event (some with remarkably unimaginative names *Car 1* and *Car 2* from Plumpton) and others more imaginative names (and sometimes - spelling) such as *Kamikazie* (sic) and *Germinator* from Brooksby, *Foreigners* from Reaseheath.


Car 1, Plumpton College

Some contestants use the direct drive spinning wheels high velocity uncontrolled approach and others a more sedate well geared (down) gentle approach A variety of transmissions are evident with starter motors, angle grinder motors and other assorted devices. One innovation this year is a propeller assisted device.

The Class 1 battle ends up with a duel (or should that be truel?) between *Diesel Power*, *Kamikazie* (sic) and *Car 1* with the result being in that order. *Diesel Power*, slow speed 4WD (from belts driven by a starter motor) beat *Kamikazie* (sic) with the combination of traction (that word again) and the propeller being successful taking a close third. These three are followed closely by *Car 2* and *Germinator*.

Numerous running repairs are made and some lessons learnt, particularly about reverse polarity (and its propensity to send motors in reverse!) and the vulnerability of flat belts at high rotational speeds.


Ask Jim, Reaseheath College, (extended and hooked)

CLASS 2 produces two very different machines.

Sleeping Beauty from Reaseheath is perhaps the most interesting of these entries (and perhaps one of the most aptly named). With the sound of high speed whirring emanating from the 'box' but no visual signs of any activity. one of the supplied wheels is suddenly ejected from its (spinning) shaft and emerges rotating at a high (unknown rpm) from an opening in the front of the 'box' spinning its way up the ramp.

Indeed on one run, the wheel, having broken the laser beam, rolls back down the ramp, regains traction and, using kinetic energy, returns back up the ramp to break the beam yet again. Quite impressive and quite uncontrolled. The wheel disappears off the side of the stage at one point but luckily is found in time to take part in the final.

Remember the closet lawyer? Well his entry (*Ask Jim*) uses the provided wheels to extend a steel tape, fitted with a substantial fish hook, to the top of the ramp where it (the hook) latches on to the ramp. Reversing the machine then reels in the tape thereby lifting the body of the machine up the ramp until the laser beam is broken. Ingenuity (and rule breaking) at its best. Just what we want.

Both winners of Class 2 succeeded in reaching the maximum possible height

SO to summarise:

The winner in Class 1 (*Diesel Power* from Reaseheath) used a more agricultural and relaxed approach gracefully climbing the ramp, the advantages of four wheel drive and (round) belt drive to the wheels being evident.

Class 2 victory goes equally to Reaseheath for their frenetic kinetic device (*Sleeping Beauty*) and *Ask Jim*'s more relaxed fishing approach. A clean sweep for Reaseheath then with good efforts also from Plumpton and Brooksby.

Congratulations to all the winners and thanks to all those who took part.

Thanks also to Jaguar Cars and in particular Stuart Martin of Jaguar Land Rover for arranging the venue, the sponsors, Autoguide, Bosch Rexroth (prizes), Steatite (batteries) Brammer (Wheels) and Sylvia Harris of IAgrE for herding the cats.

See you next year.


All the competitors and helpers

Results

Class One

1st: Reaseheath College, with their vehicle '*Diesel Power*' - Philip Shaw and David Perry (Prize £150 + Bosch Tools).

2nd: Brooksby Melton College with their vehicle '*Kamikazie*' - David Peirson, Peter Lattimore and Douglas McBurney (Prize £125 + Bosch Tools).

3rd: Plumpton College, with their vehicle '*Car 1*' - Philip Elliston, Damian Jones, Joe Limbachia and Ben Watts (Prize £100 + Bosch Tools).

4th: Brooksby , '*Germinator*' - Ben Stanford and Henry Harvey

4th: Plumpton, '*Car 2*' - Craig Wall and Gary Goldsmith.

6th Reaseheath '*Sprockets*' - John Battye and Stuart Cox

7th: Brooksby, '*Quickie*' - Phil Winfindale, Leeroy Brown and Matt Inchley

8th: Reaseheath, '*Foreigners*' - Patrick Foley and Jonathan Henderson

Class Two

1st prize shared between two teams from Reaseheath.

'*Sleeping Beauty*' - Henry Dakin and Tom Molloy

'*Ask Jim*' - Christopher Gardener and Matthew Wardell

3rd: Myerscough '*MTW*' - James Bentley

Lecturers present

Phil Spencer - Brooksby Melton College

Mike Gurney and Alan Pitt - Plumpton College

Peter Short - Myerscough

Neil Jewell and Rupert Harris - Reaseheath

Also present were sponsors Craig Grant and Sean Kilgallen from Bosch Rexroth.

Student union

Harper Adams students with group tutor Sarah Pickthall

GEOFFREY WAKEHAM argues that if the Institution is to continue to prosper, the needs of students and engineers during their early years must be addressed

MY local paper carried a story recently in which residents were having their lives made hell by the action of young adults. The justification of these youths for their actions was that they were bored and there was nothing better to do.

The local free magazine for the area contains a series of entries for local social organisations and these run to some one hundred and fifty groups or organised activities (excluding those targeted at the other end of the age range) excluding local commercial organisations such as cinemas, bowling alleys, ice rinks and ski slopes.

Many, many years ago, I went to the AGM of my local IAgrE and was less than excited by the evening, all was cut and dried and discussion was not expected. The annual programme was usually in the next-door county to where I worked. The programme may have been interesting but lack of transport restricted my attendance.

To overcome the problem some of us formed a local sub branch and put on a programme locally.

When I moved to Devon in the 1970's, still young and keen, no one made any direct attempt to get me to attend local meetings. I did try but failed to locate meetings so gave up. There were plenty of far more exciting things to do.

Some little time ago, I represented the President at the AGM of a branch where one would expect all the sharpest brains and dynamic new members to be present. The meeting was cut and dried and no discussion was anticipated.

When I had finished my presentation, I removed my president's hat and my Harper Adams' hat and talked with enthusiasm about the need to galvanise the Institution, attract young members and present a far more dynamic face to the world. This was greeted in glum silence.

After the meeting the secretary informed me they did have some young members and another member informed me in no uncertain terms, "They were happy as they were thank you very much". In 2008, I attended the AGM of the Institution. All was cut and dried; no debate or dissent was expected.

IN my opinion AGM's should be designed to extract ideas and uncover problems from the membership.

It should be the main forum for young members to pass on their concerns and expectations to those that can influence the direction of the Institution. Every effort should be made to get young members to attend and contribute ideas for the future.

When I first joined the IAgrE, I tried to get more young people into running branches and the Institution as a whole. It has taken me nearly fifty years to achieve my aim; many of the active membership are now younger than I am.

At a recent committee meeting of the Wrekin Branch the matter of retention of graduates was raised. This was in part prompted by the fact that Harper Adams Engineering courses are now accredited by the IMechE and more and more students are expected to retain their IMechE when they graduate in preference to the IAgrE. None of the student committee members were in attendance.

So what am I trying to say? Young people are not natural joiners of old peoples clubs, the IAgrE is not good at targeting young members and does not naturally seek dissent or discussion. Paying for students' membership does not get them to attend meetings nor become involved in the running of the Institution.

The evidence is there, if the industry works together then real progress can be achieved. The prime example of this is the Landbased Technician Scheme and the Institution can be justly proud of its major contribution to setting wheels in motion and now being responsible for regulation and administration.

A further positive development last autumn was the

“. . if the industry works together then real progress can be achieved”

meeting held at Reasheath to debate Agricultural Engineering education. This was attended by a wide range of representatives but too few young members for them to feel confident in expressing their views. It was good to see this meeting reported in *Landwards*. We eagerly await action with respect to recruitment to the industry and retention when students take up employment.

This meeting prompted me to seek the views of a group of six final year students and their tutors as to the relevance of the Institution to their studies and future employment. The students had just completed a project to look into recruitment into the industry.

So what did I discover? One tutor thought that most students' main hope was to be tempted by at least three of the seven deadly sins but once saved, they might seek technical input to their studies from the IAgrE and later, if pushed by their employers seek help with professional development and registration. It was suggested that to retain free membership they need to demonstrate active involvement.

When the students were asked about their use of IAgrE services four said they had made no use at all, one said he had attended one or two branch meetings and one made mention of *Landwards*. Not very encouraging.

When asked what services they would like as students they mentioned career guidance and professional development, links to industry with reference to Sandwich Placement and the access to technical data that supported their studies. This last point was also suggested by staff. “The IAgrE website should be a one stop shop for all relevant enquiries of members”.

Should students have a card sent to them each year reminding them of the service already available? Do we need to build up a bank of data relating to crop characteristics, soil properties, tractor sales etc as well as the standard engineering data such as steel properties, dynamics equations and material costs?

When in employment they expect guidance in developing their careers and the possibility of gaining professional status. Here the Institution needs to win their hearts before they decide if they should joint the IMechE rather than the IAgrE.

This is also true of staff teaching engineering beyond agricultural engineering. Only one of the six was certain to join when it came to paying for the privileges of membership.

The matter of locating industry relevant data was raised again as was help with finding employment.

Advantages of membership were seen as being able to network with industry leaders and an assumption they would be kept up to date with developments within the industry.

If the Institution is to continue to prosper we need to address the needs of students and engineers during their early years. The IAgrE needs to be their natural source of information and their links to expertise.

For this to happen they need to be kept informed of services already available and regularly asked what further support might be provided during those early critical years.

My thanks go to staff at Harper Adams and the following students:
- Simon Yardley, *Agricultural Engineering*
- George Pople, *Agricultural Engineering*
- Sandy Gray, *Agriculture with Mechanisation*
- Greig Farmer, *Off Road Vehicle Design*
- Gavin Daly, *Agricultural Engineering*
- Guy Brunt, *Off Road Vehicle Design*

Barony College scraps fees for English, Welsh, NI students

BARONY College in south west Scotland has scrapped tuition fees for new applicants to all its full time National Certificate courses in response to the recession.

Students from England, Wales and Northern Ireland normally pay £1,080 course fees per year for training in land based and animal care education at the specialist college.

Barony College Principal Russell Marchant said the decision to scrap fees was made as the college prepares to launch its new prospectus, highlighting the good job prospects within traditional rural industries. “We work very closely with industry and we know that sectors like forestry, fisheries, agriculture, horticulture and engineering are crying out for young people with good skills. There has never been a more important time to equip people with the right skills to meet the needs of industry and I would urge schools and careers advisors to encourage their students to educate themselves out of economic vulnerability during this recession.”

Barony College near Dumfries specialises in vocational training for the land based and animal care industries, with subject areas including agriculture, animal care, engineering, equine studies, fisheries studies, forestry and arboriculture, horticulture and veterinary nursing. The 228 hectare campus includes dairy, beef, sheep, cereals, trout, red deer, forestry and horticulture commercial activities, which give students hands on training in real working environments.

Differences in the way college fees are funded in Scotland and the rest of the UK means that full time students from England, Wales and Northern Ireland are unlikely to secure grant funding for their course fees. Barony College is believed to be the first college in Scotland to remove course fees in this way.

Russell Marchant added, “The decision to scrap all fees for National Certificate courses was taken for two reasons. First of all we know that course fees are a barrier to many people, particularly prospective students from the north of England, and especially for young people seeking to develop their skills and return to work on the family farm. Many families simply can't afford up-front lump sums at the moment and since we have the resources we thought it was appropriate to stop asking for these fees for 2009/10.

Dairy Technology Centre at Barony College

“Secondly, and perhaps more importantly, I want to raise awareness of the opportunities that vocational colleges offer to school leavers, especially to young people who haven't thought about further education before. With dole queues lengthening and job opportunities for school leavers drying up, vocational, skills-led learning offers a real opportunity for young people to develop the skills that industry needs today and tomorrow.”

Book reviews

A round-up of some recent titles of interest to members

Corrosion Engineering

by Pierre Roberge

Publisher: McGraw-Hill Professional
ISBN: 9780071482431
Price: £63.99
Web: www.mcgraw-hill.co.uk

CORROSION Engineering offers expert coverage of the theory and current practices needed to understand water, atmospheric, and high-temperature corrosion processes. This comprehensive resource explains step-by-step how to prevent and control corrosion in all types of metallic materials and applications-from steel and aluminium structures to pipelines.

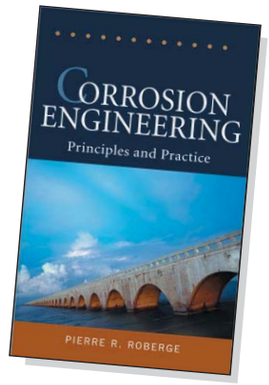
Filled with 300 illustrations, this skills-building guide shows how to utilise advanced inspection and monitoring methods for corrosion problems in infrastructure, process and food industries, manufacturing, and military industries.

Authoritative and complete, *Corrosion Engineering* features:

- Expert guidance on corrosion prevention and control techniques
- Hands-on methods for inspection and monitoring of corrosion problems
- New methods for dealing with corrosion
- A review of current practice, with numerous examples and calculations

Science and Technology (CEST) journal said, "The author Pierre Roberge and the publisher McGraw-Hill should be congratulated on their titanic compilation of updated knowledge and practice. This is a well written, well organised volume, rich in valid information, and easy to follow.

"Corrosion practitioners and consultants; plant operators and maintenance engineers and technicians; metallurgists, material scientists and researchers; chemists and electrochemists; designers and manufacturers of equipment and structures installed and operating in corrosion prone areas; aviation, navy and army military personnel; marine, industrial, civil, mechanical, materials, minerals, chemical, electrical and electronic engineers should read and use this



fabulous book, for their professional advancement and continuous improvement."

Potatoes Postharvest

by R T Pringle, C F H Bishop & R C Clayton

Publisher: CABI
ISBN: 978 0 85199 502 1
Price: £85.00
Web: www.cabi.org

A WIDER understanding of potato practices postharvest is needed so that the individual actions of growers, agronomists, pathologists and store managers are consistent and follow agreed principles of good harvesting, storage and packaging practice.

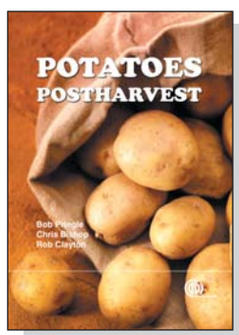
The authors provide a comprehensive overview of international potato harvesting and storage, together with the underlying science behind these practices and the influences that can affect final quality.

Chapters describe potato physiology, harvesting techniques and loading procedures as well as optimum storage conditions and store management. Aspects such as store and packhouse design, ventilation and environmental control, seed storage, grading equipment and quality assurance are considered in detail.

The authors say the potential audience for the book is professionals, academics and advanced students interested in potato production.

The contents of the publication are:

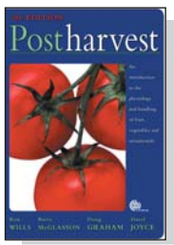
- Physiology
- Harvesting and Store Loading Systems
- Store Climate
- Disease Control in Store
- Store Design and Structure
- Store Ventilation
- Store Refrigeration
- Store Environment Monitoring and Control
- Store Management
- Seed Grading and Preparation for Planting
- Packhouse and Processing Facilities
- Quality Assurance
- Marketing and Costs



Postharvest -

An introduction to the physiology and handling of fruit, vegetables and ornamentals, 5th edition

Publisher: CABI
ISBN: 978 1 84593 227 5
Price: £29.50
Web: www.cabi.org



by R Wills, B McGlasson, D Graham & D Joyce

EFFECTIVE postharvest handling is critical in maintaining the quality and freshness of crops from the time when they are harvested to when they are sold to the consumer.

Presented in a new larger format with an expanded colour section, this broad-based introductory level textbook covers the key concepts and practical technologies to slow the inevitable deterioration of harvested produce, including handling, packaging, transport, temperature management and the control of pests and diseases.

The 5th edition is updated with current industry developments and practices.

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MEMBERSHIP MATTERS

BRANCH REPORTS

WEST MIDLAND TECHNICAL AWARD

JUDGING of the West Midland Award took place on Thursday, 12th March 2009 at the Warwickshire College main site in Leamington Spa. The Branch Chairman Ian Moore and Treasurer Bob Voss did the judging.

The Students were on a Maintenance and Repair of Agricultural Machinery course. This course runs from mid-October until mid-March.

As part of their course, the students have to design and fabricate a piece of equipment of their own choice to take home with them. This year there were nine projects to examine.

Each student was asked to talk the judges through his machine, and explain where the idea came from and what the intended use was for. Technical drawings also had to be provided.

The winning front press with pigtail spring tines for the front of a 220hp tractor

The winner was Jack Pantall of Kilkington Manor, Staunton-on-Wye Herefordshire, HR4 7LW, who works on his father's 300-acre farm. The project he made is a front press with pigtail spring tines to go the front of a 220hp tractor the farm were planning to purchase. The tractor would have a drill on the back with the press on the front. The linkage on the implement was floating and steerable. It is hoped this outfit would save a cultivation pass.

Drawings were of a very high standard, having been done on a computer.

The total weight of the machine is 1.6T and cost £4500.

Although there is only one award, Matt Royle was second with a bale grab and Richard Bowen third with a loader bucket.

Bob Voss

EAST MIDLANDS BRANCH

Visit to J H Rundle, New Bolingbroke

THE night we went to the fair . . . well almost!

The name of Rundles is well known in Lincolnshire farming and engineering circles but few really know of its long association with engineering involved with fairground equipment. So the last East Midlands Branch evening visit opened many people's eyes to what such a company does as well as savouring the varied and complex skills involved with building, refurbishing and inspection of a wide range of fairground rides and equipment.

On arrival it was easy to locate the site for there are not many helter skelters in rural Lincolnshire and immediately there was the welcoming aroma of a steam engine idling gently over after testing that day. Tearing ourselves away we entered the first Aladdin's cave of the evening, the main workshop where David Wilkinson gave the introductory presentation on the history of company since 1913.

We were then enthralled by a talk on fairground equipment history given by Neil Watson. He described early developments from a shooting gallery to a first human powered circular bicycle 'merry go round' and early mobile boat carousels which were well illustrated by very early engineering drawings to set the scene.

Digitisation is a marvel allowing us all to share history through an excellent PowerPoint presentation by Neil Watson and his son Mark. The group also were treated to a premier; a restored film from 1957. This illustrated that the Boston Charter Fair was originally combined with an Agricultural Show by local dealers with many tractors and implements lining the streets.

After a sandwich buffet we all decamped guided by David Wilkinson and Paul Skinner (EM members who work for Rundles) to a series of eye popping sheds and hangers holding a range of business enterprises which make up the Rundles empire. We saw the main machine shop, electric control panel construction, then over to a store of 3000 electric motors (the largest availability in the East Midlands), a massive range of machine shop tools and equipment for sale and then back to the fairground issues.

To be immersed in the practical engineering of wood for the decking and cockerels and horses on the carousels and waltzer cars alongside the need for close inspection of safety needs of all components left everyone gasping at each turn of the eye.

High on one wall was a mercury rectifier, not seen before by many, then within the barn a wonderful fairground showman's van used by the Aspland family, owners of the equipment referred to by Neil Watson and by Alan Rundle.

continues over

Rebuilding a waltzer - E M members and guests wondering where do you start?

A mercury rectifier - imagination ran riot as to the design and blowing process

Then, as if this was normality, the group wandered off into the night to the other end of the 'town' which is New Bolingbroke. We visited the Rundles museum there where steam engines, vintage equipment, road milestones (casting services offered by Rundles), oil and petrol cans in large numbers etc . .etc . . filled the space and probably beyond.

Then like a group of over excited schoolboys we had to go home but not before a fascinating description of the fairground equipment inspection process from our Secretary Paul Skinner who is one of the inspectors for Rundles.

The visit was a huge success and brought to mind many of the engineering skills known by many but rarely seen in practice these days. It is probably an understatement that all felt admiration of J H Rundle to maintain such a diverse and successful business, but that probably is the secret, diversity and flexibility.

Check out *www.rundles.co.uk*

Bill Basford

Sadness as we had to leave!

NORTHERN IRELAND BRANCH

POWER FROM THE SEA

THE most recent meeting of the Northern Ireland branch of the Institution of Agricultural Engineers was an illustrated talk at AFBI Hillsborough by Mr Colm de Burca who is Ocean Energy Manager with ESBI.

ESB is well known as the Electricity Supply Board in Ireland and its international engineering division ESBI provides a wide range of electrical and civil engineering services both at home and overseas. The increases in energy costs last year across all industries were another reminder of oil and gas being finite resources. Ireland imports 90% of its energy needs so the case is strong to develop local systems which exploit renewable energy sources. Hence Colm de Burca, as a mechanical engineer, is responsible for the evaluation and development of both wave and tidal power around Ireland.

There is a lot of active cooperation between commercial and public interests in the development of this technology throughout the EU and beyond. The current available technology is summarised as follows:

Wave energy

A WAVE energy map has been compiled and the theoretical electrical generation potential from wave power on the West coast is huge at up to 28 TWh / year.

This is 12% more than Ireland's current energy use. Wave energy potential depends on the weather. It is best in deeper water and where waves are generated across large areas of ocean as is the case for the Atlantic rolling in to the West coast of Ireland.

It should be possible to capture up to 10,000 GWh / year from wave power on the coast of Ireland and ESBI have included it within its ambitious target of generating 35% of its needs from renewable sources (and reducing carbon dioxide by 50%) by 2020. A quarter size test site has been set

(L-R) -Peter Frost (AFBI and Branch member), Colm De Burca (guest speaker from ESBI) and Gary Connolly (Branch Vice Chairman)

up at Galway Bay and a larger site (jointly with Sustainable Energy Ireland) is due by 2020.

The engineering challenges are substantial as the forces imposed on the equipment are potentially very high and much of the testing and development design work will centre on the practical implications of scaling up from relatively small systems. The main types of wave power systems are:

- *The point absorber* where mechanical energy is captured by a stretching actuator held between a moving float on the surface and a secured point on the sea floor. One of these units is to be installed off Galway.
- *Surface following* consisting of a ribbon of interconnected buoyancy tanks floating parallel to the waves. Power is generated from the movement of hydraulic rams in the joints between the tanks as they rise and fall relative to each other. A Scottish company already has its Pelamis 750kW version in operation.
- *Overtopping* where mechanical energy is captured as the wave breaks over a fixed barrier and a turbine is driven by the water as it falls back to sea level. A Danish firm has developed the Wave Dragon where the waves are channelled up a ramp and through louvres to the turbines. They plan to build units which generate 4 -7 MW.
- *Oscillating water column* where wave motion pushes up a column of water to compress air that powers a turbine generator. Cork based Ocean Energy are working on this system.

Tidal energy

Based on the reliability of 2 tides each day, it can be exploited where tidal streams are concentrated between land masses such as in the Irish Sea. Given the cubed relationship between turbine flow and power output, water speed is important in achieving high power outputs.

The main types of tidal flow generators are:

- *Axial tube* where tidal flow is directed through a submersed housing that contains a bladed rotor connected to a generator. The 250 kW experimental Open Hydro unit at Orkney was the first to supply power to the UK grid. Open Hydro is a Dublin based company.
- *Cross flow* where a bladed rotor is immersed in the tidal stream. Some describe this design as an 'underwater windmill'.

The best known local example is the Sea Gen (by Bristol based Marine Current Turbines Ltd) which is currently installed and being evaluated in the fast tidal stream at the Strangford Lough Narrows.

This project is a significant milestone in the development of this technology as it is the only commercial sized device of its type to be installed anywhere in the world. It also is an example of professional cooperation with its development being supported by the UK Department of Trade and Industry and the power being purchased by ESB through its grid links with NIE.

The chosen site of very strong tides is likely to be a severe test for the equipment which has been made in the EU. The 1000 tonne tower, which sits on the sea bed, and the associated equipment was assembled by Harland and Wolff in Belfast and taken by barge to the site.

Two 16 metre diameter bladed rotors rotate below the surface in the tidal stream and they can be raised on the tower for maintenance and repair. Its designed output of 1.2 MW can power up to 1000 homes.

Initial output has been good although tidal forces have caused damage to the blades on one of the rotors. The installation is in an area of special environmental status and its retention depends on a successful result to a prolonged period of round the clock environmental monitoring. If the trial is successful the aim is to develop groups of similar installations for other tidal areas.


The audience at the Northern Ireland branch meeting

It is interesting to note that Strangford Lough was also the site for tidal power innovation back in 619 AD when water, at the Nendrum Monastic Settlement, was captured behind a dam at high tide and released later to power corn-grinding mill wheels.

An interesting and enjoyable question and answer session followed with the discussion of related further technical, operational and environmental issues. Obviously this developing subject has a lot to offer in our energy future.

Terence Chambers

Innovation at the heart of our nation

Goodyear are on the search for the UK's most innovattive farmer once again

AFTER the success of Goodyear's 2008 search for the UK's most innovative farmer, the leading tyre expert is on the search again.

The 2008 campaign saw Patrick Bowden Smith from Fife win £3500 worth of Goodyear farm tyres and the Goodyear Farming Innovation Award for his renewable energy innovation, a solar and wind powered stock drinker and electric fencer.

The 2009 campaign is asking for farmers from across the UK to submit their innovative farming ideas for the chance to win the 2009 Goodyear Farming Innovation Award and £3500 worth of Goodyear farm tyres.

To align the competition with current farming developments, Goodyear have teamed together with Harper Adams University College to help with the selection of the most innovative farmer.

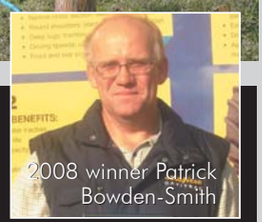
Goodyear say they are continually developing new innovations across all sectors, in particular with their new BioTred2 tyre for the agricultural market. BioTred2 is a fully functioning prototype Goodyear Optitrac radial farm tyre in 650/65R38 in which the processing of the different rubber components uses vegetal oil rather than crude oil.

Crude oil derivatives such as chemicals, carbon black and processing oils are traditionally used in the tyre industry. Crude oil is a finite resource and in addition its volatile pricing in the last year has presented major challenges to the tyre industry and accelerated research into alternative solutions.

Phil Stanton, Goodyear Farm and OTR Manager said, "The BioTred2 innovation has provided us with valuable new information which will be used in the development of other new tyre materials and processing technologies in the future.

"We hope that by highlighting our latest innovation we can inspire others to come forward with their farming innovations. We had an array of innovations enter the competition last year and hope to see the same again this year" Phil concluded.

To enter the competition visit *www.mygoodyear.co.uk* or visit the Goodyear farm team who will be at a number of popular farming shows throughout the year including Royal Cornwall, Royal Welsh, Royal Highland and Cereals and will be taking submissions on their stand.



2008 winner Patrick Bowden-Smith

ECO DRINKERS & FENCERS

Pictured above is 2008's winning entry. The stock drinkers and electric fencer are powered by solar and wind power, creating a sustainable mobile power plant and drinker combination. The innovation helps the farm under the agri-environmental scheme whereby streams and water courses have to be fenced off from livestock. The machine can be towed into place and can draw the water from the stream, feeding the remote drinker in a field away from the banks. The electric fence stops the stock getting into the water.

A small alternative power plant has been developed for running permanent electric fences and even with minimum light exposure more than sufficient energies are produced. This saves hundreds of pounds and, as it's in use on a remote Scottish farm, the use of alternative energy has been reliable and useful.

Membership changes

Admissions

A warm welcome to the following new members:

Member

Davies A G (Lincoln)
Le Geyt A P (East Sussex)
Maida J H A (Malawi)
Wallace G (Northern Ireland)

Associate

James S M (Pembs)

Student

Brooksby Melton College

Bailey J
Cawley P D
Clarke S J
Denness A
Dodwell S P
Drury J
Edwards R
Fountain S
Francis G P J
Greaves W M
Hermiston C
Hoare J
Johansen D
Johnstone R R
Joseph R
Keeling A
Kirk S
Longland J
Marks J H
Mason C
Melbourne A R
Perks S
Powell J
Redden D
Reeves M I
Sharp J
Stephens M
Stuart G R
Tipple B C
Webber E
Williams M
Wyatt C A

Cranfield University

Caple M C J

ColegSirGar

Bound J W
Davies E W
Ellis Jones R
Golden C J
Griffiths O R
Harris J
Hughes J M
James G
Jones A H
Jones G H W
Jones R H
Morgans D
Morris G A
Rees W J
Roberts E
Smorthit B
Webster B J
Williams G D
Williams G J O

Greenmount College

Crawford K R
Dixon S J
Gardiner G
Gibson M
Graham M R J
Noble T R
Richmond J
Spence J
Tener F M
Thompson B
Wilkinson C
Wilson E V
Brennan A W
Campbell J
Hamilton C
Hutchinson T J
Jordan S D
Kelly N
McIlroy J C
McShane M
O'Neill R
Rankin A D C
Scott L J
Smyth D
Vance D T
Walsh A
Walton McGovern M

University of Reading

Sloman-Brown R

Re-admissions

Member

Adams A J (Suffolk)

Associate member

Puddifoot J C (Georgia)

Transfers

Member

Puddifoot J C (Georgia)

Student

Simpson J M (Brooksby)

Engineering Council

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

Registrations

EngTech

Adams J E (IoA)
German J (Leics)
Jacques C M (Cheshire)
Wilby N J (Norfolk)
Wright J M (Norfolk)

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

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

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

Cranfield University
Cranfield
Bedfordshire
MK43 0AL

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

Long service certificates

Name	*Grade*	*Date of anniversay*
50 years		
John William **Roberts**	AIAgrE	9 Jun 2009
Dennis John **Watson**	AMIAgrE	9 Jun 2009
35 years		
Humphrey Sidney Guy **Cholmeley**	MIAgrE	5 Jun 2009
25 years		
John Michael **Bunting**	Eur In CEng FIAgrE	9 Apr 2009
David Murray **Bruce**	MIAgrE	9 Apr 2009
Robert Gordon **Williamson**	AIAgrE	10 Apr 2009
Simon Winser **Wilcox**	IEng, MIAgrE	28 Apr 2009
Michael John **Elliott**	IEng, MIAgrE	19 May 2009
Richard Aubon **Landen**	AMIAgrE	25 May 2009
Anthony James **Hopkinson**	CEng, MIAgrE	25 May 2009
Peter James **Gervais**	AMIAgrE	28 Jun 2009
William Alexander **Jeffrey**	CEng, MIAgrE	29 Jun 2009

Academic members continued

Harper Adams University College
Newport
Shropshire
TF10 8NB

Institute of Technology Tralee
Clash
Tralee
Co Kerry
Ireland

Myerscough College
Myerscough Hall
Bilsborrow
Preston
Lancashire PR7 0RY

Oatridge Agricultural College
Ecclesmachan
Broxburn
West Lothian
EH52 6NH

Pallaskenry Agricultural College
Co Limerick
Ireland

Plumpton College
Ditchling Road
Lewes
East Sussex
BN7 3AE

Reaseheath College
Reaseheath
Nantwich
Cheshire
CW5 6DF

Royal Agricultural College
Cirencester
Gloucester
GL7 6JS

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

Sparsholt College
Sparsholt
Winchester
Hampshire
SO21 2NF

Willowdene Training Ltd
Chorley
Bridgnorth
Shropshire
WV16 6PP

Wiltshire College - Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

NEWS FOR MEMBERS

Vacancy

SocEng auditor

AFTER five years of stalwart service, for which we are most grateful, IAgrE Fellow, Dr Mark Cooper, is standing down as our nominated SocEnv auditor.

IAgrE is obliged to provide two auditors under its licence agreement with SocEnv. These auditors will be part of a team of some 20 to 30 who visit and audit the procedures of other Soc Env Constituent Bodies.

Both IAgrE posts are now vacant. If you have some auditing experience and could offer us some of your time we would be delighted to hear from you. The time commitment is not too intrusive with probably two site visits a year plus a day's training. So with attending pre-planning meetings and dealing with reports, it's probably 3-4 days per year at most.

If you are interested, please contact the Secretariat on secretary@iagre.org asap.

Women's Engineering Society

The Karen Burt Award

AIMS

To commemorate the life of Dr Karen Burt, to encourage women to take up chartered status and to promote the professions of engineering, applied science and the IT profession.

CITATION

To be presented annually to a high calibre newly-chartered female engineer, applied scientist or IT professional, who has demonstrated a commitment to the promotion of her profession. The chosen candidate should have been awarded chartered status within 12 months of the forthcoming 1 July.

IN the current tough economic climate, engineers and scientists need to do all they can to make themselves stand out from their peers – achieving chartered status with their professional body is a sure way for them to mark themselves out as competent professionals with leadership capabilities.

Recession brings challenges for professional bodies too; encouraging graduates into membership has never been more vital.

The Karen Burt Award made annually by the Women's Engineering Society (WES) to the most outstanding newly chartered female engineer gives engineering organizations a high profile way to confirm their commitment to diversity and to highlight the importance of chartered qualifications.

"All your institution needs to do to nominate your most outstanding female candidate for chartered status" is how the WES is promoting the award.

They are asking anyone to contact them if they wish to make a nomination. The deadline for completed applications to be submitted to the WES is 1st July.

Visit **www.wes.org.uk** for further details or call them on 01438 765506. Post to The Women's Engineering Society, c/o The IET, Michael Faraday House, Six Hills Way, Stevenage, Hertfordshire, SG1 2AY.

EVENTS

IAgrE Branch Meetings and Events

Southern Branch
Wednesday 01 July 09
SUMMER VISIT IN THE SOUTH
Venue: a.m.: Sparsholt College Winchester p.m.: Army Air Museum, Middle Wallop.
10am for 1030 start: Sparsholt College near Winchester - guided tour of College Transport visiting engineering workshops, horticultural department and farm. 1pm: Buffet lunch at Sparsholt 2.30pm: Museum of Army Flying, Army Aviation Centre, Middle Wallop - party rate fee £4.50 per person payable on admission. Any queries please contact Denis Welstead
Tel: 01962 880696 Email: djwelstead@btinternet.com

Northern Ireland Branch
September - tba
STUDY TOUR
Venue: Various, Dublin, Co. Carlow
Programme not yet finalised. Possible venues: Synergen Power Station, Dublin; Keenans manufacturing facility Borris, Co. Carlow; Teagasc Research Centre, Oak Park, Co. Carlow; Michael Hoey, Lusk, Co Dublin Accommodation: still to be finalised but likely to be 3-star hotel, B&B, c£50 per person/night. If you are interested please contact Hon Sec: Ian Duff asap as numbers need to be finalised asap to ensure that there is sufficient interest for this to go ahead.
Tel: 028 867 36977 E-mail: duffi@iagre.biz

West Midlands Branch
Tuesday 29 September 09 starting 1900
VISIT TO JAGUAR LAND ROVER ACADEMY, NEW WARWICK FACILITY
For further details please contact Branch Secretary: Michael Sheldon.
Tel: 01926 498900 E-mail: michaelcsheldon@yahoo.com

West Midlands Branch
Tuesday 06 October 09 starting 1930
ARM REEDBED SPECIALIST, RUGELEY
Speaker: David Cooper
Venue: FMH Stratford
For further details please contact Branch Secretary: Michael Sheldon.
Tel: 01926 498900 E-mail: michaelcsheldon@yahoo.com

West Midlands Branch
Tuesday 03 November 09 starting 1915
GREENMECH CHIPPERS ENGINEERING FOR A GREENER ENVIRONMENT
Speaker: Tony and Jonathan Turner
Venue: GreenMech Ltd, Kings Coughton, Alcester
For further details please contact Branch Secretary: Michael Sheldon.
Tel: 01926 498900 E-mail: michaelcsheldon@yahoo.com

West Midlands Branch
Tuesday 01 December 09 starting 1930
VEHICLE DYNAMICS, TRACTION
Speaker: David Clare
Venue: FMH Stratford
For further details contact Branch Secretary: Michael Sheldon.
Tel: 01926 498900 E-mail: michaelcsheldon@yahoo.com

Other Events:

Monday 22 June 09 to Tuesday 23 June 09
CTF EUROPE
Venue: Denmark
Includes a visit to an island in the Kattegat.
For more information visit http://agrotech.dk/en/ctf-solutions-for-intensive-vegetable-production

Wednesday 24 June 09
CONFERENCE: FARMERS' GUIDE TO ANAEROBIC DIGESTION
Venue: Stoneleigh Park Conference Centre, Warwickshire
This conference is designed to provide information on the set up and care of an on-farm AD system for anyone seriously looking at this subject. For more information and to download a registration form, please visit:
http://www.rase.org.uk/what-we-do/publications/RWW-Farmers-09-WEB.pdf

Monday 29 June 09
CTF
Venue: Pepperdale Farm Lincolnshire
Most of the 650ha farm was converted to CTF in 2005. Present crops: winter wheat, red spring wheat, winter and spring oilseed rape, spring beans and spring oats. Most established with little or no cultivation and with either the John Dale All Till Drill or the Zero Till Drill For further details contact Tim Chamen.
Tel: 01525 405121 Email: tim.chamen@btclick.com
Web: www.daledrills.com

Thursday 02 July 09
Aqua Enviro
OPTIMISING THE POTENTIAL OF BIOGAS
Venue: The Hilton, Leeds
Contact: Sally Wright
Tel: 01924 257891 Email: sallywright@aquaenviro.co.uk

Wednesday 15 Jul 09
Cranfield University
ENVIRONMENT EVENING LECTURE
Keynote speaker: Prof Wynne Jones, Harper Adams University College Principal
Venue: Cranfield University
The event includes a buffet dinner followed by the keynote address by Prof Jones, a Cranfield Honorary Graduate, who has a long established reputation in agricultural education and in sustainable food, farming and rural strategies both for the UK and internationally. The event will include an exhibition of key environmental organisations including SocEnv and CIWEM, and is open to alumni, current and prospective students and other interested parties. Free of charge but places limited so please reserve your place asap. To book for the event please visit Cranfield University website.
Web: www.cranfield.ac.uk/alumni/events/page39194.jsp

Wednesday 15 July 09 starting pm
Cranfield University
SCHOOL OF APPLIED SCIENCES OPEN DAY
Venue: Cranfield University
Opportunity for potential students to find out more about Cranfield University's environmental research and teaching. Potential students will have the opportunity to meet course directors, current students and alumni. If you would like to be involved the Open Day

please contact Lara Walsh
Tel: 01234 758056 Email: events@cranfield.ac.uk

Wednesday 09 September 09
Forestry Engineering Technical Group
FEG SYMPOSIUM 2009
Venue: Newton Rigg College, Penrith, Cumbria
Details to be confirmed.
Tel: 0131 464 0500 Email: bruce.hamilton@forestry.gsi.gov.uk

Tuesday 22 September 09 to Wednesday 23 September 09
Aqua Enviro
3RD EUROPEAN WATER & WASTEWATER MANAGEMENT CONFERENCE
Venue: ThinkTank, Birmingham, UK
For further information please contact Sally Wright
Email: sallywright@aquaenviro.co.uk

Wednesday 21 October 09
Inter-Disciplinary Ethics Applied
PROFESSIONAL ETHICS FOR PROFESSIONAL ENGINEERS - DECISION MAKING SKILLS FOR A COMPLEX WORLD.
Venue: London
This one day training course will help you: make confident judgements about ethical questions; justify your judgements to colleagues, superiors and regulators; balance competing obligations. It will help you address ethical issues that arise in professional engineering. Same one day course being held on 11/6 and 25/11. Prices start at £195. for more information and to book your place please visit website or contact Alex Buckley.
Tel: 0113 343 8230 Email: a.j.buckley@leeds.ac.uk
Web: www.idea.leeds.ac.uk/proeng

Sunday 25 October 09 to Sunday 01 November 09
FWAG
BULGARIA RURAL TOUR
Venue: Bulgaria
The programme for this tour is not yet finalised. Previous tours can be viewed on www.freewebs.com/ruraltoursbulgria and www.freewebs.com/ruraltoursbulgaria/recommendations.htm. The programme will be tailored to suit the delegates. Cost for each week- long trip is c£350pp. This includes minibus transport, local guide/interpreter, organising fees and accommodation (rooms in private houses - simple and basic, but clean and comfortable). Food & drink extra. Flight not included by c£130-£200. Contact: Phil Lyth.
Tel: 0771 3333 170 Email: phil.lyth@fwag.org.uk

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

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