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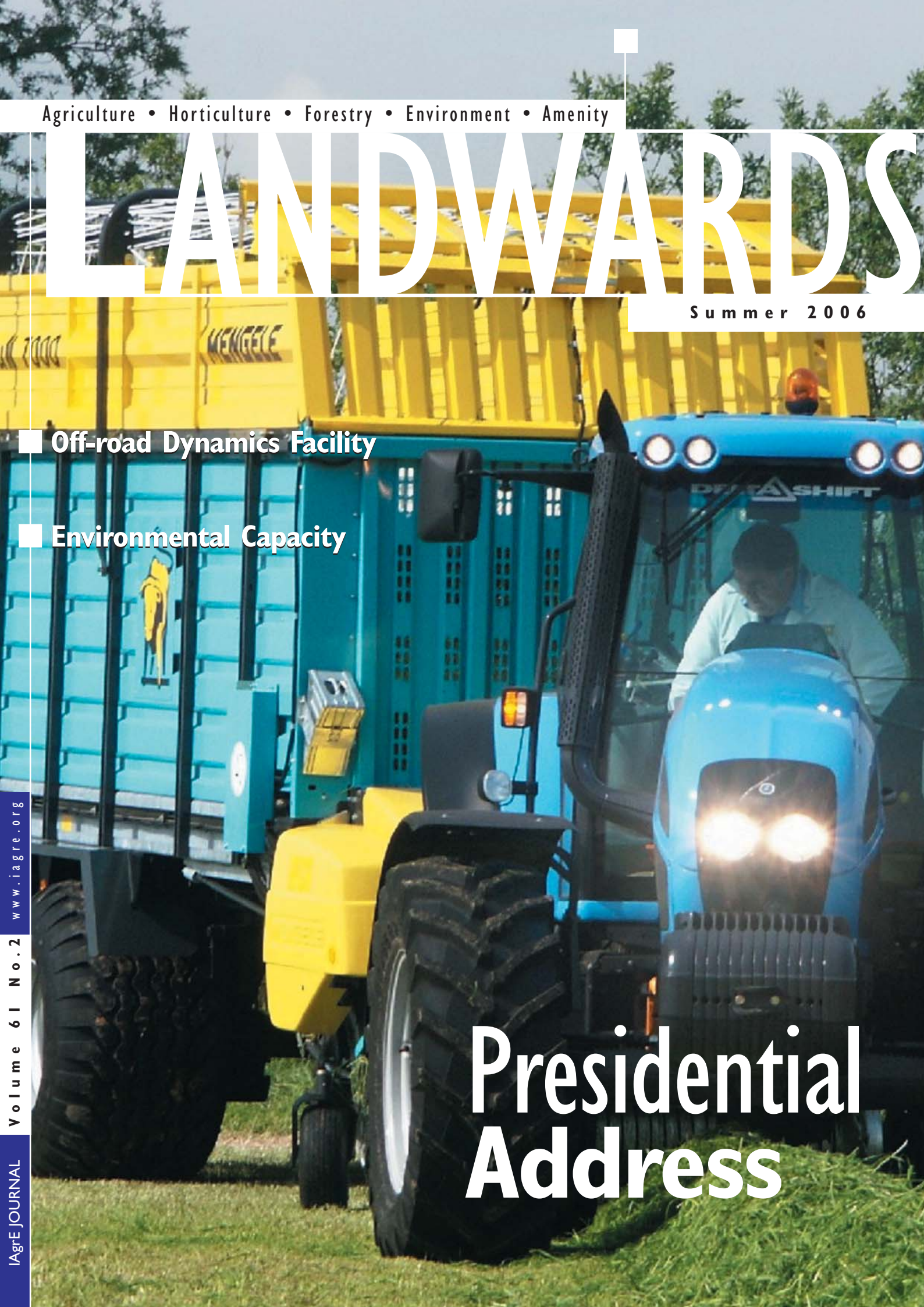
LANDWARDS

Summer 2006

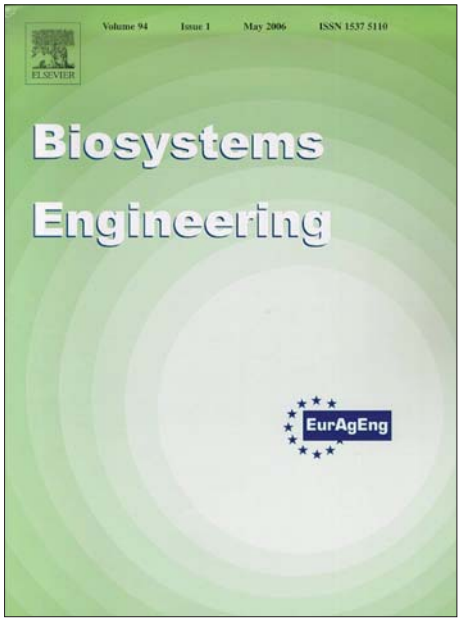


- Off-road Dynamics Facility
- Environmental Capacity

Presidential Address

IAgrE JOURNAL Volume 61 No.2 www.iagre.org

IAgrE acquires *Biosystems Engineering*



"I am pleased to announce that IAgrE has taken over the ownership of the pre-eminent research journal, *Biosystems Engineering*", said Peter Redman, IAgrE President at the time of the agreement. Outgoing Director of Silsoe Research Institute (SRI), Professor Bill Day said: "Ahead of the closure of the Institute, the SRI trustees decided that IAgrE would be the best home for *Biosystems Engineering*."

"This is good news for IAgrE, *Biosystems Engineering* and the worldwide research community who contribute to and use this publication in their day to day work. The acquisition will ensure the continuation of an unbroken tradition of over 50 years of research paper publication from Silsoe. As current President of EurAgEng, I am also very pleased that *Biosystems Engineering* will continue as our official learned journal."

Editor and Chairman of the Editorial Board of *Biosystems Engineering* since April 1998, and a past President of both IAgrE and EurAgEng, Professor Brian Witney of Land Technology Ltd said: "This is a signal occasion for the Institution to augment its publication portfolio and ideally complement its professional journal, *Landwards*. I welcome the opportunity of continuing to foster the fruitful scientific exchange between aspiring authors and respected referees, and enhancing the research documentation for publication on behalf of the IAgrE by Elsevier Ltd."

Peter Redman further added: "This acquisition by IAgrE will help the Institution in its important role in connecting people and information worldwide and in the promotion of professionalism through the dissemination of research data both to, and beyond its members."

For further details, contact the IAgrE Secretariat by e-mailing secretary@iagre.org or call +44 (0)1525 861096

Biosystems Engineering

Established in 1956 as the *Journal of Agricultural Engineering Research*, the publication was rebranded as *Biosystems Engineering* in 2002 and now celebrates its Golden Jubilee in 2006. *Biosystems Engineering* is a leading international research journal which is published monthly and comprises four issues in three volumes per year. Each research article is evaluated for scientific merit and novel content by peer review and, after author revision and editorial refinement, only those which combine a substantial technical contribution, originality, a high standard of English and scientific presentation, and high resolution graphics are accepted for publication. On average over the past three years, some 150 articles have been published annually, and the latest volume registers the start of a further increase in size of 20% to provide an annualised page budget of nearly 2000 pages. Indeed, the Journal has doubled in size over the past decade. Contributions are submitted from around the world with roughly half from geographical Europe.

Professor Brian Witney, Editor of Biosystems Engineering

The remit for the Journal is: *Research in the physical sciences and engineering to understand, model, process or enhance biological systems for sustainable developments in agriculture, food, land use and the environment.*

A classification system has been introduced for the journal contents, based on nine interest field identifiers (IFI), each article being allocated to a *single* interest field:

- *Automation and Emerging Technologies (AE)*
- *Information Technology and the Human Interface (IT)*
- *Precision Agriculture (PA)*
- *Power and Machinery (PM)*
- *Postharvest Technology (PH)*
- *Structures and Environment (SE)*
- *Animal Production Technology (AP)*
- *Soil and Water (SW)*
- *Rural Development (RD)*

Colour graphics are available where colour enhances the scientific interpretation of content, such as in yield maps. Each article is allocated a unique digital object identifier for online searches of all the articles published over the past fifty years in the Journal. The contents of each issue appear on the back cover, an index is included of the contents appearing in each volume in the last issue and the *Information and Instructions for Authors* appears in the first issue of each volume.

For more information online on author submissions, see the Land Technology website **www.landtec.co.uk** , with links to the Elsevier Science website for downloading a portable document file on the *Biosystems Engineering guide for authors* and to obtain more information on the ScienceDirect alert for current contents of each issue.

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LANDWARDS

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

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Front cover: *Mengele's Rotobull forage wagon from RECO (Photo: Ruston Engineering Co Ltd)*

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PRESIDENTIAL ASPIRATIONS 2006-2008

Paul Miller was inducted as President of the Institution of Agricultural Engineers at the Annual General Meeting on 16th May 2006

I feel very honoured to be taking over the presidency of the Institution of Agricultural Engineers from Peter Redman at a time when the hard work put in by a large number of people is yielding real, positive results.

I am very grateful to all those involved in the work of the Institution both at local branch and national levels whose efforts have put us where we are today. It is always dangerous to mention people by name when there are so many involved with the successful running of the Institution but I would wish to record my thanks to my presidential predecessors, as well as to Chris Whetnall and all the staff in the headquarters office at Silsoe for the effort they have put in and the achievements won in recent years.

Background

My current assessment of our Institution is that it is in really good heart. I can evidence this by looking at the presentation prepared to accompany the President's address to branch annual general meetings held this spring and notes that Peter Redman prepared looking back over the period of his presidency. In summary these show the following main developments over the past year:

- an increasing membership for the Institution with both student numbers and our 'core' membership increasing during the year (encouraging that initiatives associated with the technician community and The Society for the Environment are adding important new dimensions to our activities);
- a better financial position than was originally predicted with a smaller than planned deficit over the year thus avoiding the need to draw on our capital investments;
- a new five year licence secured following an audit by the Engineering Council (well done and thanks to all those involved in the audit) giving the Institution the authority to award CEng, IEng, and EngTech professional qualifications;
- future security with a new 50 year lease (see more below); and
- a good level of activity in meetings at national level, technical groups and local branches.

Thanks to IAgrE's commitment to SocEnv from the outset, 170 members are now registered as Chartered Environmentalist, a new opportunity that brought in 30 new members in addition to a number of upgrades. Student recruitment now exceeds 1000, with retention rates exceeding 10% as a result of Dan Mitchell's sustained liaison work with the Colleges, supported by funding from the Douglas Bomford Trust.

EngTech recruitment continues with support from industry partners such as John Deere, CNH and Claas. During 2006, IAgrE will maintain a leading role in promoting professionalism across the industry.

International membership increased by 3% and is now 18.5% of the non student membership. A new form of 'electronic' based service for international members in low income, lower-middle and upper-middle income economies was introduced during the year in an attempt to keep contact with the many qualified professionals in developing nations.

I am aware that getting a good turn out to meetings is difficult and that there is concern about our apparently aging population if assessed by the attendance at some branch meetings. However, having attended three branch AGM's this spring, I have been heartened by the activities taking place and planned for the future. It is vitally important that The Institution engages with its membership to deliver what they require and I believe some activity at branch level will be needed in the foreseeable future.

Policy and aspirations

I do believe that now is not the time for the Institution to take on new initiatives but rather to consolidate the directions that are now set. We will need all of our energies and resources to be focussed to progress and deliver all of the plans that are in place. We must continue to engage the membership wherever possible and seek to address their needs in an effective way. I believe the Institution has a vital role to

play and that it has now been placed on a platform that will enable it to deliver real benefits to all members of its stakeholder community.

Plans already made and being implemented will mean changes in the future. The Institution has recently moved into new offices on the Silsoe site with the existing 'Portacabin' building due to be demolished as part of the redevelopment of the Cranfield University site at Silsoe. The University has announced that it is planning to move the activities currently conducted on the Silsoe site to its main campus in Cranfield. This is likely to happen over an extended period. Negotiations with the University have secured a 50 year lease for the Institution and we may therefore be operating from offices in Cranfield in the next few years.

Agreement has also been reached by which the Institution takes over the publication of the journal *Biosystems Engineering* from Silsoe Research Institute following the closure of SRI. This provides exciting opportunities and challenges for the Institution both technically and financially and I believe sets an important background to our communications with members using *Landwards* and the newsletter. We will be reviewing these publications with the aim of improving the link with members' interests and I would welcome any suggestions regarding content and layout that might improve the way that this is achieved.

The industries that the Institution is working with continue to experience significant change and I have seen at first hand how some of these changes (e.g. the closure of Silsoe Research Institute) will influence the stakeholder community that we are working with. There is no sign that this rate of change will, in the next two years, slow down. I am committed to working with the Institution to implement existing plans, review our directions over the next two years and ensure that we are responding to changing circumstances. I fear that I will personally run out of resources to do this and am already grateful to both Peter Redman and Chris Whetnall for their offers of help to enable me to function in the role of President. Without these offers of help I would have found it very difficult to accept the role, given other commitments that I am now faced with.

I look forward to working with you all to ensure the continued success of our Institution.

Paul Miller
President

Peter Redman - signing off

Paul has captured above a snapshot of important activities that are now coming to fruition for the Institution. I believe these developments augur well for the future of IAgrE. However, none could have been achieved without the commitment and initiative of the team at Headquarters and I would wish to thank them all: Chris Whetnall - Chief Executive; Elizabeth Stephens - Assistant Secretary and Finance Officer; Patricia Gage - Database and Records Administrator; Wendy Hickman - Membership Secretary; and Rachel Mulvanerty - Conference/Branch/Group Administrative Secretary. This has been a particularly busy year for them and will continue to be so.

In addition, the host of volunteers, who devote time and thought to supporting the many Headquarters, Branch and Technical Committees and initiatives, deserve the gratitude of all the members, whether active or otherwise. Without the work of these volunteers there would be no Institution.

So as I sign off from my term as President I thank you all for your support and for affording me the privilege of serving an institution that is moving forward and will continue to play an increasingly important role in supporting the technical professionals of society's most important industry.

I wish Paul Miller every success during his term as President of IAgrE.

Peter Redman
Immediate Past President

SMALL BUSINESS SUPPORT

New business & intellectual property centre

The Chartered Institute of Patent Attorneys (CIPA) and the Institute of Trade Mark Attorneys (ITMA) have combined forces to welcome the opening of a new Business & Intellectual Property Centre at the British Library. The centre has been designed specifically to support entrepreneurs and small to medium sized enterprises (SMEs). Users have free access to market research reports, industry journals, government statistics, on-line databases and the Library's vast patent collection. Funding for the project was provided by London Development Agency who awarded the British Library £1 million in June 2005 to develop the Centre.

In a joint statement the Presidents of both Institutes (Michael Harrison – CIPA and Stephen James – ITMA) said "We are confident that this will prove to be a most valuable resource for budding entrepreneurs and innovators. Intellectual property in its various aspects of patents, trade marks, designs and copyright forms an important and often neglected asset for many companies. We are delighted to be working with the British Library in opening the Centre and urge all businesses whatever their size to take full advantage of its excellent facilities. This is an initiative that deserves to succeed"

The Institutes have undertaken to supply the Centre with a full range of explanatory leaflets covering all aspects of intellectual property.

MORE INFORMATION

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NEW OFF-ROAD DYNAMICS FACILITY AT CRANFIELD UNIVERSITY

James Brighton, Richard Godwin, Kim Blackburn, Terence Richards

Abstract

This paper describes a new off road dynamics facility developed by the staff of Cranfield University at Silsoe for the evaluation and test of a wide variety of machines that interface with off-road environments. It has been specifically designed to support research related to machinery and land systems engineering, including terramechanics, soil-implement dynamics and the environmental effects of vehicular movement.

The facility comprises a laboratory within which the research apparatus is currently being completed. The equipment comprises: a 45 m long, 5 m wide soil lane within which the soil moisture and water table levels can be controlled; a single wheel test apparatus for both dynamic and quasi-static tyre performance studies; a 'smart winch' to provide a dynamically controlled load for whole vehicle performance studies; a tyre and track test device for compaction studies; and a whole vehicle articulation rig.

This facility will meet the needs of a range of applications including agriculture, automotive, construction, military, motor sport and telecommunications for the provision of previously unavailable tyre, vehicle and machine performance data.

Fig.1 Traction control system evaluation for the Land Rover Discovery in the existing 1.75 m wide x 20 m long soil bin (in desert sand)

Introduction

The recent growth in size and performance requirements of off-road vehicles places ever increasing demands on off-road vehicle performance quantification, modelling and machine design. Validation of numerical models of off-road tyre performance and environmental impact will become a critical component of off-road vehicle research and development as models are used to accelerate the design process. Such models give an insight and understanding of the terramechanics and soil dynamics underlying a machine's performance but often rely upon empirical data.

The existing soil dynamics facility at the Silsoe Campus of Cranfield University, such as the existing soil bin, has good control standards for soil strength but has limited length (20 m), width (1.75 m) and depth (0.8 m). While this is ideal for machine component studies, it restricts the ability to undertake work for a number of larger and heavier applications. These include the performance of whole (full size) vehicles (see Fig. 1) and studies involving aircraft landing gear or harvester support systems. In addition to size limitations, the current facility does not have the capability for moisture content and/or water level control at moisture contents above the friable range.

Hence a new facility has been constructed to extend this capability and provide a unique resource for academic and industrial research.

General description

The new facility comprises a suite of novel research apparatus housed in a new purpose designed building. A major feature of the new building is the soil lane, similar to the existing soil bin, but 5 m wide by 45 m long and 0.75 to 1.5 m deep which is set into the floor of the building so that vehicles can drive from the surrounding concrete apron into the soil (Fig. 2 and Fig. 3).

The water level within the soil can be controlled to simulate a range of conditions from friable agricultural soil for tractors and tillage tools, loose dry sands for the

BIO NOTE

A tour of the Off-road Dynamics Facility at Cranfield University was included in the programme for the IAgrE 61st Annual General Meeting on 16th May 2006.

Professor Dick Godwin FEng HonFIAgrE is Head of Engineering at the National Soil Resources Institute, Cranfield University at Silsoe, Silsoe, Bedford MK45 4DT, UK.

Dr James L. Brighton is a lecturer and was the principal architect of the Off-road Dynamics Facility, its construction and management. He specialises in off-road vehicle dynamics and agricultural engineering. E-mail of corresponding author: j.l.brighton@cranfield.ac.uk

Dr Terence Richards is a senior research officer and specialises in the design and instrumentation of 'one-off' test rigs and harvesting machines. He was responsible for the articulation rig design and construction.

Dr Kim Blackburn AMIAgrE is a research engineer with a mechanical/agricultural engineering background, specialising in applied control systems and novel measurement techniques. He was responsible for the single wheel test rig design and control systems

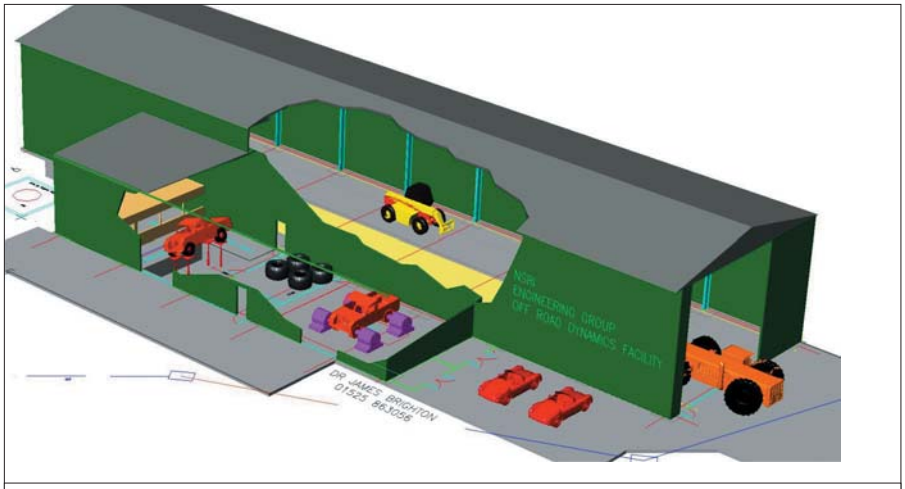

Fig. 2 Computer aided design (CAD) Image of the off-road dynamics facility

performance of sports utility vehicles in desert conditions, dense compact soils to support aircraft landing gear, to submerged saturated sands for sub-sea telecommunications cable laying.

A sophisticated, single-wheel test apparatus, designed to accurately control the torque or slip of a single test wheel in any environment accessible by the machine, will measure tyre performance and the effectiveness of different traction control techniques, while a variable plane four-wheel articulation apparatus can simulate undulating ground surfaces to determine the dynamic changes in wheel loads. One of our long-term research aims is to create a precise simulation or indeed virtual environment for the evaluation of any machine or vehicle configuration in a controlled manner. This will improve the accuracy, repeatability and cost-effectiveness of tyre and vehicle dynamics research for off-road vehicles and equipment.

The construction of the laboratory building started in April 2005 and was completed in October of that year (see Fig. 3), the soil preparation and the initial specialist apparatus is nearing completion and will be commissioned during the summer of 2006.

Soil preparation equipment

To enable the soil to be controlled to the level required for accurate experimentation, a soil processor is being built to create a uniform condition both across and along the soil lane, in a highly repeatable manner. The equipment operates from the side rails (Fig. 3) which provide a reference surface to within +/- 10 mm over the 45 m length and negates the need to drive on the soil surface while performing the soil preparation. The provision of uniform soil density conditions with depth, as provided by the existing soil bin, whilst desirable, is of less concern in this application. Hence a 'one pass' soil processing system shown in Fig. 4 has been designed to enable efficient repeatable soil preparation of the entire soil mass. The design consists of a soil processor unit which is operated by an extended Case New Holland power unit. The machine is mounted on 1 m diameter 'slick' tyres selected to overcome the tread induced vibration problems of conventional tractor tyres and to be inflated to 7 bar to reduce carcass deformation under load.

Fig.3 New 45 m long, 5 m wide soil lane (shown empty prior to soil fill)

The soil processor close coupled to the prime mover, consists of a series of hydraulically operated masts that control the depth of winged deep loosening tines, press rings to compact between 100 and 200 mm of the surface, a scraper for surface levelling and a roller to finally prepare a smooth level finish. The deep loosening tines have been designed to operate to a depth of 1.3 m.

Single wheel test apparatus

The single wheel test apparatus, a computer aided design (CAD) layout of which is shown in Fig. 5, is designed to expand the evaluation and test envelope for single driven wheels on off-road surfaces. Existing off-road test rigs have limited control performance of torque and vertical load and hence an accurate representation of the sink/slip relationship has been hard to quantify. The emphasis for this design has therefore been to provide precise, rapid control of vertical load at the contact patch and torque at the wheel hub. The rig can accommodate tyres of 0.25 m to 0.7 m rolling radius with a minimum wheel diameter of 0.33 m. The test wheel is mounted on a lightweight hub connected to the frame by a double-wishbone suspension and may be steered by up to 20^{o} in either direction.

Vertical load (max 20 kN continuous) is applied to the hub via a 30 kN servo-hydraulic actuator of 400 mm stroke. This system has a control bandwidth of 20 Hz at up to 20 mm displacement amplitude. Accelerometers are used to measure both rig and hub movement so that the load applied at the contact patch may be controlled directly, independent of hub, wheel and tyre mass. Rotational drive (forwards, reverse and braking) at up to

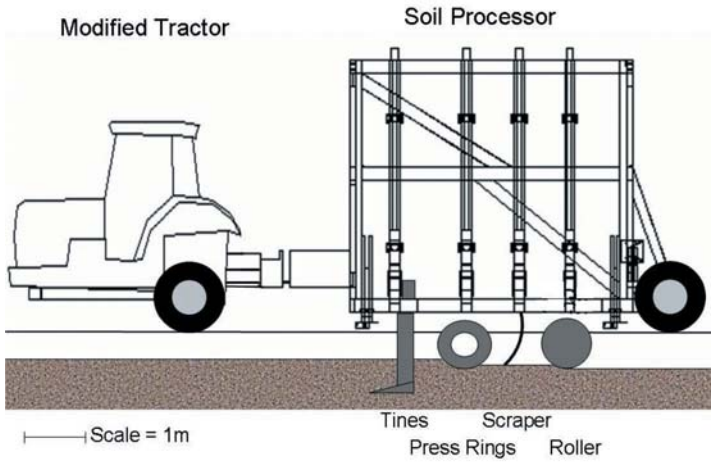

Fig.4 Schematic of soil processing equipment

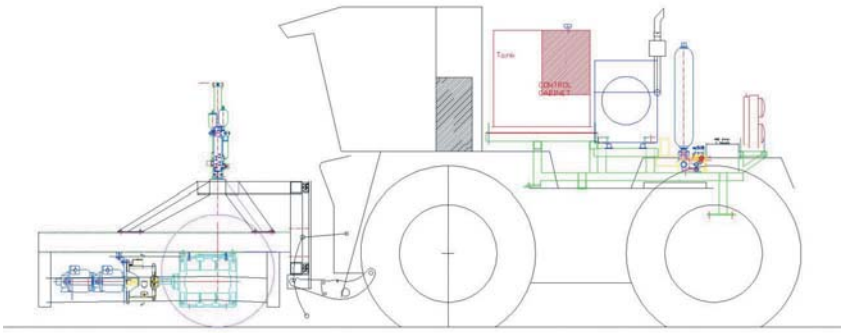

Fig.5 Layout of Advanced Single Wheel Test apparatus

1000 rpm is provided in two ranges (0 - 11 kNm and 0 - 3.5 kNm) from an actively controlled hydraulic drive circuit of 170 kW. Torque, load, slip and speed measurement are fully integrated into the control device

The system controller runs at 1 - 4 kHz, and is able to follow a pre-set torque or speed profile, relate wheel speed to true ground speed (slip control or slip control varied with time/distance) and maintain vertical load independently of the wheels vertical movement. In addition software models may be run to control the wheel in real time, an example being the simulation of a vehicle corner - applying spring rate, damping and body mass parameters to the measured motion of the wheel to control the position or applied vertical load at every instant in time. Many model types are possible which extends the application of the equipment from the scientific study of the underlying variables through to the proof of concept for novel vehicle torque and load control systems. The system has been designed to operate both in the soil dynamics laboratory and in field conditions at any accessible location.

Claas GmbH has supplied a Xerion prime mover which provides 240 kW of power through an electronically controlled continuously variable transmission system. The rear platform has space for the hydraulic power pack of 170 kW. The front lift capability places the single test wheel on virgin ground in clear view of the operator. Applications include tyre design optimisation, surface characterisation and data acquisition for drive train and braking system development.

Whole vehicle performance

The difficulties in obtaining uniform conditions to evaluate whole vehicles in off-road environments are documented in Brighton (2004), and it has been our experience and that of both tyre and vehicle manufacturers that selecting portions of test surfaces that appear to be uniform to the eye rarely are when the soil profile is excavated. Hence the ability to evaluate vehicles under controlled conditions has been a vital requirement in the design of this facility. As a result, the layout and size of the new facility was designed for vehicles to drive into the soil lane which is sufficiently large to test whole vehicle performance of a wide range of vehicle types, as shown in Fig. 6. Having a lined and fully sealed concrete floor, throughout the building, allows the accurate replication of desert soil conditions albeit at lower temperatures.

Vehicles can be operated, independently of the driver, using given predetermined throttle positions and gearbox settings to ensure that each test is an exact replicate of the treatment under investigation. A key issue during vehicle testing is the provision of a controlled force to restrain or assist the vehicle under test. Experience shows that using a second vehicle to either brake or assist the test vehicle is difficult to replicate at the accuracy required for most traction system and tyre performance studies and is ultimately limited by the capability of the slave vehicle to achieve mobility or appropriate levels of traction on the test surface.

To address these issues, the new facility includes a 'smart winch' capability. This provides restraint or drive via a winch device from a stationary point. The winch is mounted on the single wheel testing platform, making use of the high performance hydraulic drive and control system. It has a capacity of 50 kN over a pull length of 50 m using a single line pull or 100 kN over 25 m using a pulley block. High performance Dyneema line is used with 1/8th of the mass of equivalent steel rope. This reduces system inertia and improves control response. The control software can operate in vehicle speed, position or load control modes, with set points being adjustable over a run, for example to gradually increase applied load with forward distance to simulate an increased surface slope. The control system also allows for aspects such as rope stretch to be compensated for using continuous measurements of rope tension and active length.

As the system is fully powered it can act as a brake or as a conventional winch depending on the application. Being based

Fig.6 Controlled evaluation of a Range Rover in simulated desert sand conditions

on the 'single wheel test' apparatus it is fully mobile to any location within the facility or at an external test environment and having a mass of 18,000 kg will provide a stable anchor base for most applications; although for highly dynamic work within the soil lane the unit may be attached to anchor points designed into the floor of the building.

Whole vehicle articulation rig

The articulation rig, a CAD model of which is shown in Fig. 7, consists of four vertical hydraulic cylinders each fitted with a contact pad containing transducers which measure the vertical and horizontal force components independently on each pad. The four cylinders are designed to provide large amplitude low frequency displacements. Each pad has three axes of movement, to change the orientation of the vehicle in the longitudinal, lateral and vertical planes. Once the test vehicle has been placed onto the pads, the measurement of static thrust and wheel load relative to axle articulation and vehicle attitude can be determined. This is achieved using an extended octagonal ring transducer under each of the four load pads. Each cylinder is controlled independently so that a combination of pitch and roll angles can be achieved. It is also possible to subject the vehicle to various degrees of 'cross axle' variation. Applications include vehicle chassis/body-shell stiffness evaluation, ground clearance measurement, the load transmitted via the suspension system and tyre contact patch measurement. Vehicle weights up to 5000 kg can be accommodated with a maximum single wheel load of 3000 kg, vehicles exceeding these parameters can be evaluated but with restricted capability. The maximum longitudinal angle is 30° at 3485 mm wheelbase and 45° at 2540 mm wheelbase, with a maximum lateral tilt angle of 45°.

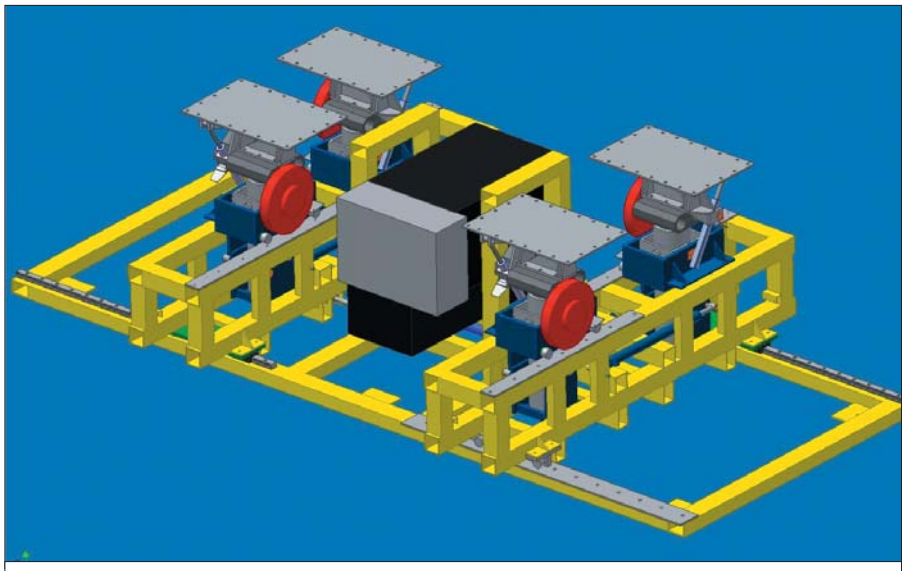

Fig.7 CAD model of the whole vehicle articulation apparatus

Conclusion

The results of this initiative have provided a versatile off-road dynamics facility that comprises of a 45 m long, 5 m wide soil lane with the capability to control soil moisture, together with advanced single wheel test apparatus for both dynamic and quasi-static tyre performance studies, a smart winch to control the load for 'slip-pull' studies of whole vehicles, tyre and track test apparatus for compaction studies and a whole vehicle articulation rig. This will enable research into the terramechanics of off road vehicles and single tyres/tracks, and the soil-machine dynamics of tillage and earthmoving equipment to be undertaken to a greater level of accuracy than was previously possible. This capability has been designed to meet the needs of a range of applications including agriculture, automotive, construction, defence, motor sport and telecommunications for the provision of previously unavailable tyre, vehicle, machine and systems performance data.

We are now engaged with a number of multi national companies interested in commissioning both fundamental studies (often through doctoral research programmes) and near market product design and development.

Acknowledgements

The majority of the capital requirement to build the facility was obtained via the Science Research Infrastructure Fund from the Higher Education Funding Council of England and Jaguar/Land Rover. We have also had generous donations of equipment from a number of our collaborators and clients, principally Land Rover, Claas, Case New Holland and Deutz which has made this venture possible and to whom we are *extremely* grateful.

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BIO FUEL TRIAL

Out of the frying pan and into the fuel tank

If you think you can smell a chip shop next time a Forestry Commission van passes, it might have nothing to do with a logger's lunch. Instead, it might be because the van is running on the cooking oil that fried your last meal of fish and chips. That's because waste cooking oil is being used as motor fuel in the Forestry Commission's continuing drive to brew up more sustainable, environmentally friendly ways of caring for the nation's forests.

The Commission has 160 vehicles using 'biodiesel', which is a diesel-like fuel that is refined from vegetable oil, including used cooking oil, and mixed with the usual mineral diesel. And in the case of one forestry van being used in a trial in northern Scotland, ordinary diesel has indeed had its chips – it's sizzling along nicely on 100 per cent used cooking oil that hasn't even been refined into biodiesel first! And another one in Scotland is doing well in a trial using 100 per cent biodiesel.

As a government department, the Commission is committed to meeting the European Union's targets for use of carbon-neutral biological fuels, or 'bio-fuels' – and it is already well ahead of the target. The target for the use of renewable road fuels derived from organic sources is 2% by the end of 2005, and 5.75% by the end of 2010. However, biodiesel already comprises about 15% of the total road fuel bought by the Commission in southern Scotland, 8% over the whole of Scotland, and 5% over the whole of Great Britain.

Kay Bisset and John Spittal from Forestry Commission Scotland's Tay district office in Inver, Perthshire, fuel up with biodiesel refined from vegetable oil.

In fact, says Richard Earle, the sustainability development officer with the Commission's Business Units, which include its Mechanical Engineering Services, things have been ticking over "'oil right" so far: "So far, so good," Mr Earle reports. "All our biodiesel-powered vehicles are running well, with no sign of it doing any harm to our engines, and we're delighted to be making this contribution to the 'Greening Government' programme.

"Vegetable oils are a sustainable fuel because they can continually be replaced by growing more of the plants that we get them from, such as oilseed rape. We can't do that with fossil fuels such as mineral oil. And for the same reason, they are 'carbon-neutral'. In other words, they don't increase the amount of carbon dioxide in the atmosphere. That's because this year's crop of oil-producing plants reabsorbs the same amount of carbon from the atmosphere as last year's crop released, in a perpetual, carbon-neutral cycle – just as our forests do when we replant them after harvesting.

"They are also more environmentally friendly, because they release fewer particulates (minute particles of soot), unburned hydrocarbons, oxides of sulphur and carbon monoxide into the air. And by using waste oil as a fuel we solve the problem of disposing of it after it's been used for cooking."

The vegetable oil used in biodiesel comes from both 'virgin' (fresh-from-the-plant) sources and used cooking oil. The used cooking oil is supplied to bulk distributors by restaurants, chip shops and large industrial cooking establishments, such as those that make microwave-ready chips. The bulk distributors refine it into bio-diesel and sell it on to customers such as the Forestry Commission.

Most of the Commission's biodiesel-powered vehicles run on a blend of 95% of the usual ultra-low-sulphur mineral diesel and 5% biodiesel. However, car-maker Citroen, which supplies many of the Commission's small vehicles, recently turned up the heat on mineral fuels when it agreed to honour its warranties on Commission vehicles if blends containing up to 30% biodiesel are used, and the Commission is now trialling 23 vehicles in Perthshire on a 25% biodiesel blend, with no problems being experienced.

The Commission receives its biodiesel supplies from RIX Petroleum in Scotland and Petroplus in England.

Bio-diesel production has recently been given a further boost with the acquisition of a new bio-diesel production factory in Norfolk, with the capacity to produce 100 million litres of bio-diesel per year. With this and the new factory in Hull, with a capacity to produce 250 million litres a year, Global Commodities will become the biggest independent producer of bio-diesel in the world, an achievement funded entirely by entrepreneur Dennis Thouless, Chairman and Co-Founder of the company.

There is currently 20 pence per litre less fuel duty payable on biodiesel than on mineral diesel but this cost advantage is usually almost cancelled out by the costs of delivery to fuelling points. Dennis Thouless asks: "Why is duty on bio-fuels in the UK 27 pence per litre, when in Germany they pay nothing? We desperately need government backing now to secure investor confidence in the UK bio-diesel industry, to achieve better economies of scale and to become a real competitor to fossil fuels.

Looking ahead, the Forestry Commission is considering trying biodiesel blends in other applications, such as in tractors at its tree nurseries, in heating fuel at buildings that use gas oil, and in its forestry machines, such as harvesters and forwarders.

MORE INFORMATION

For further information about the biodiesel industry, contact Rory Clarke, Rix Petroleum. Tel: +44 (0)1482 224422. Terry Waldron, Petroplus. Tel: +44 (0)1642 212385.
Greening Government programme. Web: www.sustainable-development.gov.uk/delivery/integrating/estate/estate.htm
Global Commodities. Website: www.globeco.co.uk

REPORT

£1.5m study into composting practices reports findings

The UK's biggest ever study into composting practices has reported its findings. The Integrated Composting programme (ICP) is a series of seven projects, analysing different aspects of the composting chain including: methods of collecting organic waste, setting up different types of composting facilities and investigating potential end-markets for compost. One of the most exciting projects could revolutionise the way green waste is collected at the kerbside following a successful trial of 300 households in the London Borough of Bexley. The ICP was made possible with funding of £1.5m from SITA Trust, through the Landfill Tax Credit Scheme. Key findings from each of the studies were as follows:

Composting

- The most cost effective and productive way to collect organic waste from households through kerbside collection was found to be using compacting rear end loading vehicles with two person crews. The ICP trialled an innovative system using specially designed aerobic bins with biodegradable removable bags, which householders filled with household organic waste. The system has proven to be a great success with up to 5.2 kg/household/week of organic waste diverted from the residual waste stream
- Separating organic waste from retail outlets was shown to be difficult because of the high turnover of staff. Regular training was needed to reduce contamination of organic waste with other waste types.

Establishing composting facilities

- Constructing a high quality compost site was shown to be possible in as little as eight months from outline proposal to completion for a site consisting of a concrete pad, push-up walls and leachate management.
- Setting up composting schemes on farms and using the product as a soil improver proved to be successful and this was demonstrated to be a large potential market for compost.
- A scheme in Gateshead demonstrated the procedures involved in establishing a composting scheme that meets BSI PAS100 quality standards for compost.

End-markets for compost

- A scheme in Scotland, which enabled local people to deposit green waste at a council facility and receive free bags of compost in return, proved there was a market for the 500 tonnes per annum produced from the local waste stream. The scheme also demonstrated ways to encourage local community participation in recycling schemes.
- A project demonstrating the benefits of compost use in the establishment of wildflower meadows proved that there were increased yields in the flower species sown and greater diversity in flower species overall where compost was applied.
- John Leaver from SITA Trust said: "The ICP report is essential reading for anyone setting up or running a composting scheme. Each of the projects was set up from scratch, which means many lessons could be learned and the report provides detailed information about the costs and approach to setting up each of the schemes."

CONTACT

Dr Matt Hill, Senior Project Manager, Maslen Environmental Ltd. Tel: +44 (0)1274 714269. Anthony Durston, SITA Trust. Tel: +44 (0)1454 262910.

The Report is available for download. Website: www.integratedcomposting.org

CAPACITY FOR CHANGE

Sarah Hamley and David Vose

BIO NOTE

This paper was presented at the IAgrE Landwards 2006 Conference entitled 'Land and Change: Engineering the Future' and held at Cranfield University at Silsoe, on 15th March 2006.

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Introduction

The catalyst for this article is the growing realisation of the function information can and should play in developing regional spatial strategies, with particular reference to the concept of 'Environmental Capacity'.

Tony Blair, in his introduction to the Government's sustainable development strategy 'Securing the Future' published last year, calls for all of us to make the right choices in order that "we can all live within our environmental limits". Over the winter months, a major Examination in Public (EiP) was undertaken of planning proposals to meet development needs in the East of England. Proposals include the construction of half a million new homes and major transport proposals. English Nature and the Countryside Agency presented joint evidence throughout the EiP which focussed on the need for a good understanding of the region's 'environmental limits' across a whole range of factors and ecosystem services.

We await with considerable interest the 'Inspector's Report', expected in the summer; however in the meantime the East of England Environment Forum (EEEF) has given further consideration to the concept of environmental limits.

Environmental capacity

The EEEF has produced a scoping paper which draws on the concept of 'Environmental Capacity' posited in an earlier work undertaken for the Campaign to Protect Rural England (CPRE) by Michael Jacobs, a member of the Council of Economic Advisers at HM Treasury, entitled 'Making Sense of the Environment'. Copies of the EEEF paper, written by Jeremy Owen of Landuse Consultants, can be obtained via the following website (www.eastspace.net/eeef).

This paper highlights the dangers of attempting to consider the environment in terms of absolute inviolable constraints, which are specific and quantifiable and determined solely by scientific understanding in an effort to set a maximum permissible level of development. In reality definitions of 'limits' of human activity always require a social judgement of the value of the environment. Hence, it is more useful to think in terms of 'capacity' rather than 'limits': in other words, the capacity of the environment to accommodate specific change, be it a new settlement, wind turbines, a second runway, or whatever.

While there is no denying that life support aspects of capacity do indeed have an objective scientific basis, much of our present decision-making is not concerned with life support *in extremis*, but with more qualitative aspects of how we relate to the environment. Therefore, political and societal choice is at the heart of the concept of environmental capacity.

Environmental issues

The EEEF paper also examines a range of individual environmental issues relevant to the East of England region, such as water and air quality, waste and CO_2 emissions and whether or not targets exist.

It is interesting to note that some key areas, although measurable, such as water resources and flood risk, have no national targets. Others meanwhile, cannot be so easily interpreted at a regional scale, or are not specifically quantifiable, for example landscape.

A brief consideration of landscape highlights the inherent challenges in apportioning any rigid definitions to ascertain environmental capacity. Landscape in its simplest form is the visual or aesthetic appearance of the land. Increasingly, however, landscape is taken to include the functional value of the land in biological, historical, cultural, social and economic terms. Landscape is typically synonymous with countryside but landscape is everywhere and may comprise everything from rural and urban landscapes, biodiversity, to townscapes, seascapes and the urban fringe. It thus has the capacity to integrate a number of often qualitative aspects of

the environment.

The need for a more rigorous understanding of environmental capacity became apparent during our involvement at the Examination in Public (EiP), Regional Spatial Strategies (RSS) are statutory planning documents that set out planning and transport policy for each region for a 15 - 20 year period. The East of England is the first region to be tested through the EiP process and the eventual RSS will provide a framework for preparing both local development documents' and local transport plans. The EiP was led by an independently appointed panel and held to debate and test the draft revisions to the Regional Spatial Strategy (RSS) for the East of England.

Planning Policy Statements

The Government also provides guidance for the delivery of sustainable development through the planning system via a series of Planning Policy Statements (PPS). The overarching PPS1, 'Planning for Sustainable Development', states that sustainable development is pursued in an integrated manner, in line with the principles set out in the UK sustainable development strategy.

To achieve these aims PPS1 requires plan policy and planning decisions to be based on:

- up-to-date information on an area's environmental characteristics;
- the potential impacts, positive as well as negative, on the environment of development proposals; and
- recognition of the limits of the environment to accept further development without irreversible change.

The other PPS contain little more information to further develop these concepts.

At the EiP, the Countryside Agency made joint representations with English Nature and a cornerstone of our approach was to lobby for the strengthening of the treatment of the environment within the finalised spatial strategy.

Elements of environmental capacity

So what kinds of information might be useful in strategic planning to help the Inspector in his report on the RSS with regard to environmental capacity? In order for environmental capacity to play a key role in this decision-making, we need to improve our usage of information. In particular, we need to develop integrated techniques that capture both the quantitative and more subjective qualitative elements of capacity, such as landscape character and sensitivity as well as broader quality of life issues which also pay regard to the views of local people.

English Nature and the Countryside Agency have produced a number of tools that will help to meet these aims. The first three of those listed below, are already in use and relevant to regional/sub-regional planning and the fourth would offer positive benefits.

Landscape sensitivity analysis

An evaluation of the potential capacity of specific areas to accommodate different forms and scales of development. Landscape principles and guidelines for specific development can be produced, for example, for major housing or industrial development. This approach has been taken for the area to the north of Luton, for example.

Biodiversity network map

A regional scale, comprehensive strategic map has been produced which identifies the opportunities for conserving and enhancing existing biodiversity and restoring and re-creating priority habitats to deliver the East of England Regional Biodiversity Targets. It provides a spatial representation that we would expect to see included in the approved version of the plan as a guide for more specific treatment locally.

Green infrastructure planning

This refers to a network of protested sites, nature reserves, green spaces and green linkages. Such areas tend to have multifunctional uses and operate at all spatial scales. We are assisting the production of such plans in all the major Growth Areas (as defined by the Office of the Deputy Prime Minister - ODPM) in the region, such as at Harlow and Peterborough.

Cumulative risk mapping

A map based approach identifying areas where pressures exist and setting the criteria to decide whether or not to permit development, and what mitigation would be included. The outputs could include a set of cumulative risk maps showing areas most at risk from cumulative impact.

We have every expectation that Natural England - a new statutory body which will incorporate English Nature, the Countryside Agency and the Rural Development Service - will continue to develop and promote good practice tools and techniques, once it is established later this year.

Future outcome

So what will the Inspector's report say about the Environmental Capacity in the East of England? Will the information currently available allow him to make informed decisions about the scale and location of major development and infrastructure? Will his decision be based on environmental capacity and will the approved East of England Plan allow for environmental enhancement as well as growth?

We await this report, with considerable interest, and in the knowledge that there are, in reality, very few absolutes and plenty of decisions requiring societal and political choice. Whatever the outcome of the EiP, we hope that key partners in the East of England explore how such tools as 'Cumulative Risk Mapping' might be used in practice to help ensure that the decisions we make work to achieve both the Government's and all of our own aspirations for the environment.

AWARD

Student picks up prestigious award

A determined student from Harper Adams University College has picked up a unique scholarship from an international company. John Butterly, a first-year BEng Agricultural Engineering student, has been awarded the Claas Scholarship for Agricultural Engineering. John, from Drogheda, Ireland, is the first student to have been selected for the award, which was established by the company to show commitment to training the agricultural engineers of the future.

The Claas Scholarship is awarded to one Engineering student studying Agricultural Engineering or Agricultural Engineering Marketing and Management. The scholarship will include a payment to John of £2,000 per year during years 1, 2, and 4 of the course.

CROP YIELD TRIALS

Myconate® successful test results

Novel Myconate technology, from Plant Health Care plc (PHC), helps crops to develop larger root mass, through the stimulation of mycorrhizal fungi, so they can prosper under stressful conditions. Myconate works by triggering the colonisation of beneficial micro-organisms called mycorrhizal fungi and enabling each plant to draw more nutrients and moisture out of the soil. More nutrients make for healthier plants, and significantly greater overall yields. For example average yield increases of 9% for maize and 13% for soya bean, were recorded.

The safety and ease of application of Myconate means that management practices need not be overhauled. The procedure is a straightforward blending process, either tank mixing the Myconate with the fertilizer during planting, or applying the Myconate to the seed before planting.

Tests were performed in numerous countries in the Americas, Europe and Africa, in different soil and climate conditions; and were conducted on many different crops, using a range of application methods.

PHC is currently evaluating the various routes to commercialise Myconate, including both developing its own distribution channels and partnering with one or more of the major agrichemical or seed companies. Whilst these routes are not mutually exclusive, it is not likely that an attractive partnering deal would be achieved until after a further period of trials. Based on the trial successes, all of the major chemical and seed companies with which the Group currently partners have elected to take the trials to the next phase of testing in 2006. The next phase of testing is expected to be completed by the first quarter of 2007.

MORE INFORMATION

Plant Health Care plc. John Brady, CEO. Tel: +1 603 525 3702. Website: www.planthealthcare.com The full document of results is available from the Plant Health Care website.

SOIL TREATMENT

Revolutionary soil treatment technology offers better crop yield potential

Increasingly agriculture and horticulture face severe crop damage often caused by soil-borne nematodes. Products like tomato, potato, squash, lettuce, strawberry, chrysanthemum and lily are just a small selection of crops which suffer from nematode infestations. Traditional methods to suppress nematode populations are restricted (metam sodium), recently banned (methyl bromide) or have little economic feasibility (soil steaming). Amidst these problems, growing crops economically and friendly to the environment is a real challenge.

The VDL Groep has taken the lead with the introduction of the Cultivit concept, a patented high quality soil treatment tool, having proved to increase yields from infested soils without applying any chemicals. The Cultivit concept is a unique combination of innovativeness, industrial know-how and global relevance, confirming the leading position of the Netherlands in horticulture and floriculture.

Several years of research and development paved the way for a commercially viable and successful soil treatment tool. The Cultivit concept consists of a track-driven rotary spader, self propelled and equipped with global positioning system (GPS), spading the soil and intensively exposing the soil particles to ultra-heated air. Tests have been conducted internationally by Applied Plant Research (PPO-AGV), part of the Dutch Wageningen Agricultural University, and the results are phenomenal. For instance, in nematode infested Mediterranean sand and clay soils, Cultivit treatments improved yields of squash by respectively 90% and 150% when compared to untreated fields. Traditional metam sodium treatments were simply outpaced by Cultivit, showing a 55% higher yield.

According Oscar Mensen, manager of VDL Cultivit B.V., the Cultivit concept is the grower's perfect ally in the world-wide struggle against nematodes in vegetable, fruit and flower cultures. From now on proper yields are achievable again from infected soils, uninhibited by restrictions of traditional techniques such as inundation (water waste), solarisation (varying effectiveness) or steaming (energy waste). The Cultivit concept requires only 10% of the energy needed for steaming of soil, which is a relief with current energy prices.

Additionally, tests have shown plants developing stronger and larger root systems and weed growth retarded after Cultivit soil treatments. As a result, plants more effectively convert water and nutrients into harvestable crop meanwhile requiring lesser herbicides. Because of its wide scope of advantages the Cultivit concept has a large potential in many different crops and climates, in open fields as well as in greenhouses. To further develop this potential globally, the VDL Groep aims to co-operate with local partners in developing sales and applications of this world-wide patented concept.

MORE INFORMATION

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Quarterly SUMMER 61(2)

MEMBERSHIP MATTERS

THE NEWSLETTER OF THE INSTITUTION OF AGRICULTURAL ENGINEERS

Award of Merit 2006

Geoffrey Freedman FIAgrE

Geoff trained with Consulting Engineers, Blyth & Blyth in Edinburgh and at Heriot Watt University where he gained his BSc. He then worked in contracting and design-and-build through the late 1960s and 1970s and became a Chartered Civil Engineer in 1975. Since then he has worked with the Forestry Commission in a Forestry Engineering capacity designing and developing new bridge and road solutions for the industry. He is now Head of Structures, Research and Contracts.

Geoff is both a manager and a designer and works as part of a Civil Engineering Business Unit serving the Forestry Commission. Primarily involved in designing bridge and road solutions for the forestry industry, he is also involved in applied research in that industry.

He is particularly known as a leader in the development of sustainable rural structures to improve access to the countryside at appropriate cost – a reputation built up over 25 years – and for innovation in design. Projects of note include:

- the design of a unique network of engineering workshops throughout the UK to service, maintain and modify major forestry machinery;
- applied research into cost effective testing of road subgrades;
- the construction of low cost heavy duty roads;
- the design of a range of rural road bridges to take construction and use vehicles (many hundreds have been built and at a fraction of the cost of equivalent public road bridges); and
- the design of a range of footbridges (one for which he is a joint patent holder).

As Chairman of InTeC (comprising the Building Research Establishment and Timber Research and Development Association) Geoff led a Department of Trade and Industry (DTI) International Technology Service (ITS) mission to Sweden and Norway to look at public roads with no bitumen surfacing with a view to the introduction of the concept to the UK. This arose from his research into new low cost road construction for public roads. This is under consideration for implementation by the Minister for Transport in the Scottish Executive. He is also working on a 5-year research programme to utilise low quality home grown timber for buildings, bridges and all countryside structures.

In 2001, Geoff was an adviser to the Royal Academy of Engineering at a global convocation of Royal Academies in Helsinki on 'World Forests and Technologies'.

In addition to his design work for the Forestry Commission, his projects have included a maritime pier in Argyll, a major recreation scheme funded by the National Lottery, windfarms and recreational community woodlands.

He is responsible for developing Forestry Civil Engineering's work in the private sector for internal professional training and the introduction of EFQM – a European Foundation Quality Management system.

In recent years he has pioneered the use of stress laminated timber arches and now has many completed structures and has produced many technical papers on the subject. He is currently completing a PhD in timber engineering at Napier University.

AWARDS

Awards for Contributions to the Land Based Industries Sector 2006

Tim Chamen FIAgrE
John Kilgour FIAgrE
Geoffrey Wakeham MIAgrE

Tim Chamen completed his degree in Agricultural Engineering at the National College of Agricultural Engineering, Silsoe in July 1971 after which he started working at the National Institute of Agricultural Engineering in the Cultivations Department with David Paterson. Tim's early career saw him working on a range of tillage and cultivations research projects ranging from studies into the energy use and efficiency of alternative tillage systems through to the initiation and development of novel tillage implements.

His work moved from the implement to the overall tractor/cultivation system to encompass the benefits of zero traffic and gantry systems. The latter unfortunately never received the practical acclaim it deserved in the UK. Albeit, this pioneering work helped many international researchers develop alternatives. For example the adoption of 3 m wide controlled traffic systems in New South Wales, South and Western Australia owes much to Tim's early work. However, it took many years before the major companies would guarantee their tractors with increased wheel track width. This restriction was first lifted by John Deere in the summer of 2003.

Tim might have 'retired' from Wrest Park in 1996 but he did not retire from his love of soil management. He has stalwartly persevered with the controlled traffic systems in running a major experiment with Unilever at Colworth House, near Bedford and is the principal driver for the Controlled Traffic Farming group and is currently registered for a PhD degree at Cranfield University at Silsoe entitled 'The impact and control of soil compaction in cropping systems'.

During his busy professional life, Tim constantly supported the Institution of Agricultural Engineers through work for the South East Midlands Branch where he has held almost all the possible offices.

He has also been Secretary of the Soil & Water Specialist Group since its inception.

This is arguably one of the most active groups and owes much of its success to 'Tim'll Fix It'.

In all of these endeavours, Tim has given his all to the Profession and is most deserving of the Lifetime Contribution Award – albeit, there is still a lot of life still to come.

John Kilgour graduated from Reading University in 1959 with a degree in Agriculture, however, this did not satisfy his engineering desires and upon graduation he took up postgraduate studies in Agricultural Engineering at Kings College, University of Durham (now University of Newcastle-upon-Tyne). One of his great mentors was Alan Reece whose 'never say never' philosophy found fertile ground in John's imagination. Together they had great fun determining the impact forces on tractors and tillage implements when hitting immoveable objects for John's MSc thesis. After graduating from Newcastle, John took up a Graduate Apprenticeship with the Ford Tractor Company in Basildon where he gained a wide experience in design and manufacturing processes.

The formation of the National College of Agricultural Engineering at Silsoe in the early 1960s gave John the opportunity to transfer his design skills, enthusiasm and energy to the next generations of undergraduate and postgraduate students and he took up a Lectureship post at Silsoe in 1963. This saw the start of a 36 year long career in both teaching and research and development.

John's positive attitude fired the imagination of hundreds of would be agricultural engineers from all over the globe – helping Silsoe to be the best known English village in Africa after Ambridge! John's approach to design was one of practicality – 'will it work?' came first; 'stress and theoretical analyses' always came second. His research and development activity saw improvements to rice, tea and date harvesters; developments in low cost traction devices for Africa in terms of the 'Snail' and 'Spyder' concepts on which he worked with Peter Crossley and Barny Muckle, and in the development of a tractor test load car for Bhopal in India.

Of all of these, many would rate the date harvester as the most memorable. It was a 4-wheel drive, 4-wheel steer stabilised platform that could negotiate the rough terrain of the Saudi Arabian date palm plantations and raise a boom 12+ m high into the canopy to pollinate, prune and pick the crop. Several staff at Silsoe were brave enough to go up with John on the platform – but even more were not!

John played a significant role in the 1960s and 1970s with the South East Midlands Branch of the Institution of Agricultural Engineers and has always been a great supporter of the Institution working away behind the scenes to make things happen. For all he has done for the discipline, he is a most deserving candidate for a Lifetime Contribution Award.

John Kilgour (right) receiving his award from the President, Peter Redman

Geoffrey Wakeham joined the lecturing staff at Harper Adams Agricultural College (as it was known in those days, it did not become a University College until a few years later), would you believe, on 1st April 1981. Not a date that conjures up the image of Geoff that we have all learnt to know and 'love' over the years, but certainly a date that may have made him determined to prove that he was, and is, no one's fool and doesn't suffer them gladly! It was still very early days in the development of the Engineering Department and courses at Harper Adams and Geoff's role was to be instrumental in shaping the future direction and make up of these courses, really to what they are now.

Geoff developed his interest in Engineering over a number of years. He gained an HNC in Engineering (1959) whilst working for Ransomes, Simms and Jefferies (1958 to 1973), where he was employed as Chief Development Engineer. He was awarded a National Diploma in Agricultural Engineering in 1961 and became a Chartered Engineer in 1968 (IMechE). From Ransomes he moved to Sparex (1973 to 1978) as a Director and then joined Exmouth Garden Products (to 1980) as a Partner. In 1988 he gained a Masters in Engineering.

Whilst at Harper Adams, Geoff developed his lecturing skills and, as Course Manager, developed the engineering courses. In the 1980s, he was a prime mover in the development of the Agricultural Engineering with Marketing and Management course (AEMM) and, in the late 1990s, was instigative in the development of the Off Road Vehicle Design course, which also enjoys great support from JCB, and supported the development of the Engineering Design and Development course.

Whilst at Harper Adams Geoff was, and still is, an active member of the Wrekin Branch and its committee and did a stint as Chairman. He is currently a member of the Branch committee and is officially our Information Officer, a role that he has conducted with his usual gusto and enthusiasm.

Geoff officially retired from his post as Principal Lecturer in 2004 and left a big hole in the teaching team at Harper Adams. As it took nearly a year to find a replacement, and as he only lives 5 minutes walk from the campus, he was back delivering some of his old modules as a Visiting Lecturer soon after retiring. He is a great believer in educating young engineers and used regularly to give lectures to potential students at the Higher Education Choices Conference each year and many other school visits. Due to a timetabling problem this year he is back again delivering the module, Farm Engineering, to Access students (17 to 18 years olds) and Harper have seen some of the largest expressions of interest in 'doing' an engineering course as a result.

From the Wrekin Branch point of view we hold Geoff in high regard and truly value his contribution to engineering education, in particular whilst he was at Harper Adams.

Geoffrey has contributed significantly to IAgrE at a national level serving on the Membership Committee for several years where he has been a stalwart guardian of standards.

Geoffrey Wakeham (right) being congratulated by the President, Peter Redman

Douglas Bomford Trust Award

The Douglas Bomford Paper Award is presented to the author(s), at least one of whom is an Institution member, who demonstrates originality and technical excellence in a scientific paper published during the previous year in either the Institution Journal *Landwards* or in *Biosystems Engineering*. Assessment criteria include: engineering content; potential for a practical and commercial use; relevance to the current problems and needs of industry; as well as quality of presentation and the authors' authority in the subject material. There are two award winners this year.

Geoffrey Freedman (left) and Trevor Cumby (right) with their respective awards for the two groups of authors

Geoffrey Freedman FIAgrE, along with co-author A Kermani, for their paper on 'Forest Engineering Structures' which is a substantial, topical and interesting contribution at a popular technical level, whilst soundly based on novel engineering design. The paper was published in *Landwards*, **60**(5), 2-10.

Trevor Cumby MIAgrE and **Ian Scotford** MIAgrE from Silsoe Research Institute, who co-authored three papers with a Norwegian author, J Bjerkholt, on 'Energy Saving by Air Injection into Pipeline Transport Systems for Farm Slurry'. *Biosystems Engineering*, **91**(1), 77-85; **91**(2), 201-217; **91**(3), 361-368. Besides having the potential to reduce energy requirements for slurry transport, this research has substantial practical relevance because air injection in pipelines also provides an opportunity to promote aerobic biological treatment, and the mass transfer effect can be enhanced because oxygen solubility increases with pressure.

AWARDS

Branch Meritorious Awards 2005

The Awards are made to members who have consistently rendered outstanding service to a Branch of the Institution over a number of years.

David Howat MIAgrE – Scottish Branch
Gwilyn Owen MIAgrE– Scottish Branch
David White FIAgrE – Wrekin Branch
Jonathan Whiteley MIAgrE – South Western Branch

David Howat studied for a Scottish Diploma in Agriculture in Aberdeen and then a National Diploma in Agricultural Engineering at what was the West of Scotland Agricultural College (WSAC, now SAC Auchincruive). After a short spell on a mixed dairy / arable farm in Fife he joined the staff of the WSAC as an Assistant Lecturer in Agricultural Engineering. A year after this he became the specialist Mechanisation Adviser for the Stirling area of the WSAC Advisory Service, and was based in the Stirling office until 1984.

Reorganisation of the WSAC Advisory Service brought him back to Auchincruive in 1984 for the remainder of his career. Further reorganisation of the West, East and North of Scotland Colleges into SAC led to him heading up the advisory section of the Engineering Department at Auchincruive. He provided agricultural engineering support and consultancy for farmers, clients and colleagues from Stranraer to Stirling, whilst still finding time for teaching waste management and pollution control to students and delivering sprayer operator and sheep dip training courses.

He retired from SAC in 2002 after 35 years of service to SAC and its predecessors, and became even busier operating as an independent consultant.

His career has covered almost everything that an agricultural engineer can put his hand to. Whilst the emphasis is on livestock engineering and waste management, he has also worked in grain drying, machinery safety, agrochemicals, drainage, fencing and as an expert witness.

Dave is an immensely respected figure within the Scottish farming community. It is fair to say that he is probably one of very few people to have taught or advised three generations of farmers from the same family, and is equally respected by clients, colleagues and students alike. He has nurtured the careers of several members of the Scottish branch and has recruited many more to the IAgrE.

A review of Institution records shows that Dave has held posts almost continually since 1984 as Information Officer, Hon Treasurer, Hon Secretary, Vice Chairman, a four year stint as Chairman and then (after an uncharacteristic 'year out') another stint as Hon Secretary. He has been a permanent feature and pillar of the Branch committee and his unflagging support to the Institution and the Scottish Branch is both a model and an inspiration to other branch members.

The IAgrE Scottish Branch wish to record their appreciation and remember David for his immense, unending and faithful support through this posthumous Branch Meritorious Award.

Behind every successful individual or organisation is an unsung hero who quietly propels the body forwards with enthusiasm, efficiency and without fuss. **Gwilym Owen** is one such person.

Brought up on a Welsh hill farm, he trained at Wrexham Technical College and then worked on fast patrol boats for Saunders Roe in North Wales. He took up a post with the Scottish Machinery Testing Station near Livingston during the 1960s and stayed with this body through its evolution into the Scottish Institute of Agricultural Engineering in the 1970s and its ultimate assimilation into the Scottish Agricultural College (SAC) in the 1990s as the Scottish Centre of Agricultural Engineering.

After a period working on potato harvester design, he moved onto a project looking at machinery stability issues on hillsides and steep ground. He developed methods for assessing and predicting stability using both portable weigh pads for on-site assessment and a full scale tilt table at the Bush Estate, Penicuik. Using the information generated by this project, he helped draft the British Standard for stability measurement of agricultural machinery.

He also investigated skidding on grass surfaces and produced a method for allowing vehicle operators to assess grass surface conditions on-site in a safe area before venturing onto steeper slopes.

He became Honorary Secretary to the Scottish Branch in 1995 and eventually retired in 2005, at least three years later than he had intended due to the lack of candidates willing to take over his role. During this period he has tirelessly managed the Scottish Branch, co-ordinating evening meetings, visits, members' nights, social evenings, conferences, student skills competitions and AGMs. His organisation is a credit to the Scottish Branch without which Branch life would have been far more complicated.

Much of the Institution life is based on the activities of the branches and Gwilym has, by

his personal example, helped recruit new members, encouraged those of a more advanced age and increased knowledge of the organisation throughout the engineering community.

We are greatly indebted to him for his time, effort and stewardship. Enthusiasm aplenty has been displayed by him in our cause; he has worked tirelessly, well beyond the normal limits to promote the IAgrE in Scotland.

We wish to reward him for his effort by commending him for a Branch Meritorious Award.

David White (top image) and Jonathan Whiteley (bottom image) receiving their Branch Meritorious Awards from the President, Peter Redman

David White has been for many years, and still is, an active member of the Wrekin Branch and in particular the Branch committee since joining the Engineering Department at Harper Adams University College in 1989.

He has a background in Mechanical Engineering and gained an MSc at Silsoe College, Cranfield. Fortunately this means that he has an enquiring mind and is ideally suited to his role as a lecturer as well as being an invaluable asset to the Branch. He always comes up with names and topics or suggestions for meetings that are up-to-the-minute, knowing full well that he may then have to follow these up and get a meeting organised, which he invariably does without question, and then goes on to organise the venue, actually publicises it around Harper Adams, and attends the meeting!

David consistently puts himself out for the Branch and, as a Chartered Engineer and a Chartered Environmentalist, he is regularly mentoring new members and young engineers. In his capacity as visiting tutor to the Harper Adams Engineering students on the JCB Scholarship, he is now effectively mentoring well over 20 students, a time consuming job which he has tackled in his inimitable fashion and has even produced proformas and guidance notes for them to follow. If you can keep it simple for the students, then they are likely to follow his lead and it might be easier for him to manage.

David is extremely professional in his approach to work and extremely supportive of the Institution. He is hard working and always willing, and the Wrekin Branch is very pleased to be able to acknowledge his contribution to both the Institution and the Branch at this time.

Jonathan Whiteley has been a member of the IAgrE for over 24 years and maintains a professional registration through the Institution.

Jonathan has been a member of the South Western Branch committee since mid 1985 and the secretary and treasurer for 16 years that have included some of the busiest and most successful periods in the Branch history. South Western Branch meetings and events attended by several dozen people were not unusual and Jonathan was a key member of the committee assisting with the organisation during this very successful period. He remains a member of the Branch committee, always willing to provide advice and support to Branch activities.

During latter years when participation in Branch activities has declined, Jonathan has continued to ensure the Branch maintained activity and a presence within the South West region. He ensured meetings took place and the Branch continued to function often with limited support from the wider membership. His thorough understanding of procedure, courtesy, diplomacy and willingness to chair meetings in the absence of a Chairman with demanding work commitments has been widely appreciated.

Jonathan has been instrumental in encouraging people to join the IAgrE, in welcoming new members to participate in the Branch and maintaining contact with existing members including those whose ill health prevents their active participation. He has worked at developing links and joint meetings with, among others, the local branches of IMechE and IEE. Many people including the Branch chairmen and committee members readily acknowledge that, for a significant period, Jonathan Whiteley has been a significant representative of the IAgrE in the South West.

We are not aware that Jonathan has received any formal recognition for his contribution to the IAgrE and would therefore propose his enduring service to the IAgrE in the South West and its aims and standing are formally recognised by a Branch Meritorious Award.

Support for a proposed Branch meritorious award to Jonathan has been unanimous among the current Branch committee and other members consulted. In particular those longer serving members of the Branch who are most able to appreciate his sustained contribution have been particularly active in proposing his award.

AWARD

Michael Dwyer Memorial Prize 2006

This prize is to a mid-career engineer who has made outstanding progress in the agricultural engineering industry.

Trevor Tyrrell

Whilst many IAgrE members may recognise many similarities between Trevor's background and their own, few would question that his subsequent progress has indeed been outstanding.

Trevor was brought up on a 64 hectare mixed farm, 40 miles west of Dublin. Having completed his secondary education in that city, he ventured to Silsoe, graduating with a 1st Class Honours Degree from the new 4-year Agricultural Technology and Management course in July 1989. This was one of the first programmes at Silsoe College to incorporate an industrial experience year. Trevor's record of activity during that 15 month period does much to describe the drive and enthusiasm of this (then) young man. Some 3 months in Kenya undertaking voluntary engineering work were followed by 6 months at the Ag. Eng. Department of the University of Illinois. Trevor then still found time to assist the Ministry of Agriculture, Fisheries and Food (MAFF) in their Reading Office and to travel to Germany with the Amazone summer demonstration programme. This is an admirable, if exhausting, record.

Trevor Tyrell receiving the Michael Dwyer Memorial Prize from Mrs Brenda Dwyer during the Awards Ceremony at the Annual Conference

Immediately after graduation in July 1989, Trevor began his professional career as a Trainee Product Manager with Claas UK at Saxham. Never slow to learn, he was appointed Product Manager for Green Harvest Machinery in 1991, moving to develop a new Claas Forage Centre in the West Country in 1995. Trevor returned to Suffolk in 1998, to become Head of Product Marketing, ascending to the position of General Manager, Sales and Marketing in 2000. It is some measure of the esteem in which this (still) young man is held, that he became a Director of Claas UK in 2004. Today he is widely recognised as one of the most knowledgeable individuals within the Industry, with a public persona which effortlessly mixes agricultural and engineering knowledge with an appropriate amount of Irish humour.

Whilst appearing meteoric, Trevor's career development has been based upon personal hard work and a genuine fascination with agriculture and the engineering technology it requires. Having undoubtedly focused upon the marketing and field support of agricultural engineering products, Trevor has, unlike many, always recognised the need for any new piece of agricultural machinery or associated technology to generate an economic benefit for the Customer. He has used his agricultural engineering knowledge, and that of others, to identify and (wherever possible) quantify that benefit. The success of this approach is reflected in the success of Claas UK. By his (once) own admission, "Not bad for a bunch of guys from Suffolk led by an Irishman".

OBITUARY

Douglas Ian McLaren

27 March 1917 – 20 April 2006

Douglas Ian McLaren, known as 'Mac' or 'Ian', died on 20 April 2006 at the age of 89. He was an active member of IAgrE for over 56 years and had a long and distinguished career devoted to agricultural engineering.

After qualifying at Durham University in 1934, he worked in the Agricultural Faculty and then in 1943 joined the staff at the National Institute of Agricultural Engineering (NIAE) at Askham Bryan, after attending a training course there for Machinery Officers. His first task was to assist in the running of subsequent training courses and this laid the foundations for his main interests throughout his career of training and machinery testing. As Head of Education Department, he moved with NIAE to Silsoe. Throughout the 1950s and 1960s, he played an increasingly important role in education within the Institution of Agricultural Engineers as a member of both the Education & Training Committee and the Examination Board. He was instrumental in establishing the National Diploma in Agricultural Engineering as a qualification of pass degree standard enabling an academic route to corporate status to be created for over 500 non-university candidates from the 1950s to the 1970s.

Under his leadership as Head of the Agricultural Testing Department, the NIAE testing service was developed into a highly efficient organisation with a worldwide reputation for which NIAE was best known and probably most respected. Subsequently, he was Head of the Mechanisation Department Division and Farm Buildings and Information Division. In all these endeavours, he gave his all, always with a cheerful smile and always offering advice and assistance no matter who sought it. He was much admired as a well-organised, kindly and modest man. He had no enemies but many friends by whom he will be sadly missed. He will be remembered as a loyal servant to both the Institute and IAgrE, and as a notable contributor to the development of agricultural research.

News of Members

Simon Wilcox MIAgrE has been appointed as the new General Manager at the Henstridge base of Wessex Grain. A graduate of Harper Adams University College with an HND in Mechanical Engineering (Agriculture), Simon joined P J Parmiter & Sons in 1984. Appointed Managing Director in 1997, he managed the company through the Foot and Mouth crisis in 2001 before moving to Bass Enterprises Ltd in 2005. Simon is a former winner of the Michael Dwyer Memorial Prize, which he was awarded in 1999 by the Institution of Agricultural Engineers for showing exceptional progress.

Gareth Jones joins the inventive design team of Spearhead Machinery, based at Salford Priors, Worcestershire. Gareth, gained a BSc Honours in Agricultural Engineering from Harper Adams University College. He is an Associate Member of IAgrE and will be working on his professional development to Chartered Engineer status.

Long service certificates

Name	*Grade*	*Date of Anniversary*
50 Years		
Abdullah **Arar**	CEng FIAgrE	24 Apr 2006
Peter Alfred **Cowell**	CEng FIAgrE	24 Apr 2006
John Hubert **Neville**	CEng HonFIAgrE	24 Apr 2006
35 years		
David Edward Huntley **Pullen**	CEng MIAgrE	15 Apr 2006
Christopher Edwin Lister **Morgan**	EngTech MIAgrE	29 Apr 2006
Allan **Langley**	MIAgrE	29 Apr 2006
Robert Malcolm **Hobbs**	IEng MIAgrE	29 Apr 2006
Eric Anthony **Forrester**	AIAgrE	17 Jun 2006
25 years		
Anthony David **Leonard**	EngTech MIAgrE	4 May 2006
Richard John **Hirst**	IEng MIAgrE	4 May 2006
Kenneth James **Gordon**	CEng MIAgrE	17 May 2006
Stephen John **Temple**	Eur Ing CEng FIAgrE	3 Jun 2006
Andrew **Roycroft**	AMIAgrE	4 Jun 2006
Richard David **Gascoyne-Cecil**	CEng MIAgrE	11 Jun 2006
Jonathan Alan Charles **Whiteley**	IEng MIAgrE	11 Jun 2006
Christopher Gower **Brown**	Eur Ing CEng MIAgrE	21 Jun 2006
Mark John **Cooper**	CEng FIAgrE	29 Jun 2006
Richard Walter **Taylor**	AIAgrE	30 Jun 2006

COMMERCIAL MEMBERS

Autoguide Equipment Ltd
Stockley Road
Heddington
Calne
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SN11 0PS

Douglas Bomford Trust
Springhill House
Salters Lane
Lower Moor
Pershore
Worcestershire
WR10 2PE

Bomford Turner Limited
Salford Priors
Evesham
Worcestershire
WR11 5SW

John Deere Ltd
Harby Road
Langar
Nottinghamshire
NG13 9HT

FEC Services
NAC
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2LS

G C Professional Services
for land-based and related industries
Highdown Cottage
Compton Down
Winchester
Hampshire
SO21 2AP

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

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

Shelbourne Reynolds
Shepherds Grove
Industrial Estate
Stanton
Bury St Edmunds
Suffolk
IP31 2AR

White Horse Contractors Ltd
Lodge Hill
Abingdon
Oxfordshire
OX14 2JD

Membership Changes

Admissions

A warm welcome to the following new members

Fellow
P A Kendall (Warwickshire)

Member
R Barrass (Devon)
S Omoaka (London)
M O Taiwo (Nigeria)

Associate Member
R Beer (Devon)
A Cowe (Roxburghshire)
E C Croft (South Yorkshire)
P D Darkins (Shropshire)
A J Franklin (Lincolnshire)
M Harrison (North Yorkshire)
N A Jewell (Cheshire)
O Morgan (Dyfed)
B Sharp (North Yorkshire)
M Stagg (Devon)
M Willner (Shropshire)

Associate
S Armstrong (Edinburgh)
S Claydon (Cambridgeshire)
A I Dickerson (Northumberland)
C Fulton (Kirkcudbrightshire)
B Hartley (Cheshire)
A Hibbert (Fife)
M Jolley (Hertfordshire)
N W Stevens (Somerset)
W P Warr (Cornwall)

Student
Barony College:
H Taylor
D Wood

Coleg Sir Gar:
D H Morgan
D Skedgell
A H Williams
G O Williams

Cranfield University:
D L Antille
M Arab Hosseini
J Chidanti-Malunga
M Davies
M Gahagan
A Haskell
T R Lacey
J Moore
P C Nalivata

Reaseheath College:
N Aked-Slack
M I I Akery
I Ascroft
J Bailey
P R Baldini
R Beard
M T Bickley
S Callwood
R Cornes
P Denaro
A Donaldson
M J Evans
D Fletcher
G D W Gordon
R Gore
A R E Goulding
R J Hamlett
G Hitchen
P Hough
A Houghton
P Jennings
J T Jones
L J Kilcourse
J Lawley
C Lee
M F Lee
E R Leith
D J Lloyd
E W Lomas
M D McIlroy
A B Mitchell
J Murby
A Murphy
N Pedroza
M Philbin
J Purseglove
S Ramsay
S Ridgway
J Robinson
T G Rook
S Rowley
T Sanders
L Sargeant
L J Sellwood
R S Sockett
D Speakman
M Tomkinson
S Treglia
B Trickett
W R Turner
T B Wild
M J Woods
L D Wylie

Salesian Agricultural College Pallaskenry:
K Broe
B Cronin
J Donaghy
P T Driver
M Foran
M Hannon
D McKeown
J Murphy
J J O'Connell
K D O'Connor
W Walsh

Institute of Technology Tralee:
P B Brennan
J M Browne
M P Condon
P J Curran
T Daly
A P Dennehy
W C McAuliffe
J McCarthy
D McMahon
D D O'Shea
G E Rooney
N P Whyte

Ulster College Dublin:
N McGrath

University of Central Lancashire:
P Shilcock

Readmission

Member
G P Wardle (Derbyshire)

Transfers

Congratulations to members achieving a further phase of their professional development

Fellow
R T Weerasinghe (Middlesex)

Member
I J Booth (Buckinghamshire)
I T James (Bedford)

Associate Member
B Boubrit (Algeria)

Death

With great sadness, we record the death of the following members

D I McLaren (Essex)

Engineering Council

Registrations

Congratulations to the following members who have qualified as Chartered Engineer and Incorporated Engineer, entitling them to use the designatory letters CEng and IEng after their name, respectively

CEng
R D Jones (USA)
S Peirson (East Yorkshire)

IEng
R Barrass (Devon)

Society for the Environment

Congratulations to the following member who has met the criteria for Chartered Environmentalist, entitling him to use the designatory letters CEnv after his name

Registrations

T W Aidley (Cheshire)

Society for the Environment celebrates 4,000 Chartered Environmentalists

The Society for the Environment is celebrating 4,000 Chartered Environmentalists on its Register only 18 months after receiving its Royal Charter. Working in many different aspects of the environment (regulation, industry, consulting, government, research, academia) Chartered Environmentalists hold the highest level professional qualification available to environmental practitioners. It demonstrates high standards of professional practice, knowledge and engagement.

Chair of the Society, Dr Peter Matthews, said: "The Chief Executive of the Environment Agency, Baroness Young, was the first Chartered Environmentalist to be registered. Less than eighteen months after receiving the Royal Charter, the Society has achieved its initial target and now has four thousand Chartered Environmentalists on its Register. This is a great achievement, especially for those who have been awarded the qualification. It demonstrates a real need for a single high level qualification that employers, environmental professionals and the public can support and trust."

Chair of the Society's Registration Authority, Neil Atkinson, added: "The Chartered Environmentalist qualification is now the recognised standard of excellence for environmental practitioners. It is the Chartered Environmentalists, working in many sectors of business, regulation, academia and national agencies who will take a leading role in managing environmental assets and who will play such an important part in the goal of a sustainable world".

Mike McNulty said: "I'm very proud to be the 4000th registered Chartered Environmentalist and part of a network of professionals who can really help industry, commerce and the public sector make decisions and deliver projects in a much more sustainable way". In his role as Environment Agency Project Manager of the Tees Valley Project, Mike leads a wide range of bodies improving the environment and quality of life of local communities.

The Society for the Environment (SocEnv) was first established in 2000 and gained its Royal Charter in 2004. It is the leading co-ordinating and regulatory umbrella body in environmental matters and a pre-eminent champion of a sustainable environment. Now with over 4000 Chartered Environmentalists, the Society has the resources to actively influence the sustainability agenda in a meaningful way.

New industry partnership manager to work with land-based engineering industry

Lantra, the Sector Skills Council for the environmental and land-based sector, has appointed John Godden as Industry Partnership Manager to drive forward new skills, training and business development for the land-based engineering industry.

John brings a wealth of knowledge to the role having previously worked in the industry for 30 years with experience of sales, maintenance and management, as well as being a technical course instructor. John has been with Lantra for eight years and is also the Employer Engagement Manager for the organisation.

John's new role will involve working closely with industry representatives and engaging directly with employers and businesses throughout the UK, to ensure the views of the land-based engineering industry are represented on the skills agenda.

John Godden said: "The driving force behind my first few months as Industry Partnership Manager is to progress the work of the Sector Skills Agreement to improve access to training and funding to ensure industry has the right skills. Lantra have completed the first three stages of the research which will form the basis of an action plan to influence government and reshape the supply of funding, training and business support for the land-based engineering industry."

Lantra and partners are now working together to develop an action plan to address the issues raised in the research and to take the agreement into the next stage. One of the proposals is the development of a business competency framework that links to a skills passport. The scheme will recognise formal accredited qualifications, vocational courses and experience. This will provide the passport holder with evidence of a defined career structure and help present a professional image.

John continued: "This work is extremely important for the industry, as potentially it will change the way that training is delivered and funded. I want employers to contact me and let me know what they have to say on the issues of training so that we can ensure that Lantra's work is accurate and relevant to them."

MORE INFORMATION

The first three stages of research towards the agreement can be viewed on www.lantra.co.uk/SSAreports.asp. To feedback on the research or for further information about Lantra's work, please contact John Godden on +44 (0)7867 908197. E-mail: john.godden@lantra.co.uk.
Log onto www.ajobin.com and www.afuturein.com for careers information in the environmental and land-based sector.

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DG1 3NE

Bicton College
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Budleigh Salterton
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Coleg Sir Gar
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Pibwrlwyd
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Harper Adams University College
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Shropshire
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Institute of Technology, Tralee
Clash
Tralee
Co Kerry
Ireland

Myerscough College
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Oatridge Agricultural College
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West Lothian
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Pallaskenry Agricultural College
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Pencoed College
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BN7 3AE

Reaseheath College
Reaseheath
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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

Writtle College
Chelmsford
Essex
CM1 3RR

Innovation in Mechanisation at Myerscough College

Inventive students at Myerscough College have being using their skills to design and make their own landbased machinery.

The students are on the National Diploma in Landbased Mechanisation course at the College and have just completed their Craft Design Project as part of their final year assessment. For their individual projects, they needed to research, design, make and market a product to a commercially acceptable standard. This required them to pull together all the knowledge and skills they had learnt on the course and to present and demonstrate their work to an industry panel.

Some of the best projects included Joseph Webster's bale spike that partially pushes the bale off the spike to make stacking bales easier. Joseph, aged 17, from Ormskirk, is planning to work on the family farm after the course to use the skills he has learnt at Myerscough to fix his own machinery. Karl Sweeting, aged 18, from Ulverston, Cumbria made a transporter box to move sheep and sheep feed to and from the fields and he hopes to become an agricultural engineer. Mark Watkin, aged 18, from Blackburn, designed a model of a wheel lifter to help people change wheels and he wants to progress on to the Foundation Degree in Machinery Management and Logistics at Myerscough College.

(L-R) Karl Sweeting, Mark Watkin and Joseph Webster surrounded by their practical projects

Kevin Davenport, a Course Co-ordinator in Mechanisation at Myerscough College said: "These projects show that the youth of today have still got it in them to come up with new ideas and are able to implement them. Over the years, I have seen that the students' standard of work is still high but they need to want to do it and be prepared to work hard to reap the benefits of their work."

The students' work was verified by an industry panel which included Gordon Keeling of Syzygyn Ltd, an automation consultant to the industry. He said: "Many of the products are extremely good and I am sure they will find a niche market for some of the ideas."

The National Diploma in Landbased Mechanisation is the only full-time course of its kind offering a range of subjects in landbased machinery including how machines work and how to fix, modify and manage them.

MORE INFORMATION

Myerscough College, Bilsborrow, Preston, Lancashire PR3 0RY. For further information about Mechanisation courses at Myerscough College please contact course enquiries. Tel: +44 (0)1995 642211. E-mail: enquiries@myerscough.ac.uk Website: www.myerscough.ac.uk

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Ethiopian farmers embrace sustainable agriculture

Farmers in Ethiopia, the birthplace of coffee, have announced the birth of a sustainable coffee movement. The group of 678 family farms in the Djimmah region are the first in Africa to win Rainforest Alliance Certification. The news marks the Rainforest Alliance's first coffee partnership outside Latin America, where more than 3,400 farms in ten countries already promote socially responsible and environmentally sustainable agriculture.

"We are proud to be recognised as the first holder of the Rainforest Alliance certification in Africa", said Suffian Mahdi, Managing Director of ASK International Trading and the project leader in Ethiopia. "The support for sustainable coffee farmers is an honourable step and an encouragement for the people of our country. Rainforest Alliance certification is a means for the farmers to generate a better price and helps our company to remain competitive."

The farmers began preparing for certification a year ago. In order to win Rainforest Alliance certification, farms must meet an exacting set of standards that require ecosystem and wildlife conservation as well as agro-chemical reduction. The standards verify that workers have access to healthcare, education and dignified housing. Farms that meet the standards are awarded the Rainforest Alliance Certified seal.

The EFICO Foundation in Belgium helped finance improvements on the farms that were needed for certification, and Belgian coffee importer EFICO is purchasing the certified coffee. "This achievement means the empowerment of a local African community in one of the poorest countries in the world", noted Patrick F. Installé, Managing Director of EFICO. "Rainforest Alliance certification enables the farmers to sell their coffee as a specialty product. One of the biggest challenges in Ethiopia is environmental degradation, and the Rainforest Alliance certification is a step to do something about it."

"The support for sustainable coffee farmers is an honourable step and an encouragement for the people of our country. Rainforest Alliance certification is a means for the farmers to generate a better price and helps our company to remain competitive."

The newly certified farmers cultivate the coffee in gardens covering 4,500 acres, together with subsistence crops like avocado, banana and beans. The announcement comes as demand for Rainforest Alliance Certified coffee is rapidly growing. "We congratulate these progressive farmers and EFICO," said Karin Kreider, director of Sustainable Agriculture at the Rainforest Alliance. "The Rainforest Alliance started its work in Ethiopia at the request of coffee buyers, suppliers and farmers. We are involving local stakeholders to make sure that our certification standards are properly adapted to the local realities. We will also start training auditors because we believe that local professionals are the best experts in environmental and social issues."

Coffee was first discovered in the Kaffa region in Ethiopia. Arabs cultivated the wild plant as early as 600AD, first as a medicine. The beverage made from roasted beans was introduced from Arabia into Turkey in 1554, from Turkey into Italy in 1615 and soon thereafter into other European countries. It reached Brazil – now the world's largest producer – in 1727.

Today Ethiopia is an important producer of high-quality coffee. Shade-grown Arabica beans are cultivated throughout the country. Some 95% of the Ethiopian coffee production – around 5 million 60 kg sacks – is produced by small farms. Native coffee also grows wild in the rapidly declining natural forests in the western part of the state, where it still has the potential to be sustainably harvested. The Rainforest Alliance is working with Ethiopian farmers to fight deforestation and preserve native plants and habitat.

Coffee drinking remains an integral part of Ethiopian culture: some 35% of production is consumed domestically. Traditional coffee ceremonies are part of all important events and figure prominently in the lives of the Rainforest Alliance Certified farmers. As one farmer recounted: "We drink three cups of coffee in the morning and then some more in the afternoon. We share the coffee ceremony with our neighbours. Coffee drinking, but also picking, is a social event."

The Ethiopian farmers were certified as a group under the administration of ASK International Trading, plc, and Jihad Mohammed, owner of a washing and buying station in Haro, Manna. Experienced auditors from the Rainforest Alliance and Fundación Natura, its partner conservation group in Colombia, performed the certification audit on farms.

About the Rainforest Alliance

The Rainforest Alliance's mission is to protect ecosystems and the people and wildlife that depend on them by transforming land-use practices, business practices and consumer behaviour. Headquartered in New York City, the organization works in more than 50 countries around the world to ensure that forestry, farm and tourism operations are managed sustainably. To date, the Rainforest Alliance has certified 28 million hectares of forests worldwide and 175,000 hectares of agricultural land, including banana farms (15% of the international market, including 100% of Chiquita's own farms in Latin America) and coffee, cocoa, citrus and fern farms.

MORE INFORMATION

Website: www.rainforest-alliance.org

WATER TREATMENT INNOVATION

Turkey producer's trials show glass-based reed beds set to take off

Trials at a Norfolk site of Europe's largest integrated turkey producer show an innovative reed bed design using recycled glass in place of quarried gravel definitely has legs.

Bernard Matthews is enthusiastic about interim results of a five-month trial, funded by the Waste & Resources Action Programme (WRAP). This investigated the potential of recycled glass as an alternative to traditional washed gravel as the base material for a reed bed at its site in Great Witchingham. The new medium, made from 100 per cent recycled bottle glass, was found to have performed successfully in comparison to quarried gravel in removing suspended solids and biological oxygen demand (BOD) from effluent at the Bernard Matthews site, before it was discharged into the local watercourse.

Reduction of suspended solids in effluent is important, as they have a negative effect on the environment by de-oxygenating water, with a consequent detrimental impact on fish habitat. Excessive growth of blanket weed brought about by suspended solids can also affect river flow, as silt and other particles build up when caught in it.

Mark Lowe, Operations Director with Wakefield-based consultants Aqua Enviro, who conducted the trial, explained: "We used the glass to support reeds and filter out suspended solids in a vertical, or downflow, bed at the site. Vertical beds are becoming more popular for treating effluent, as – unlike the traditional horizontal type – they can remove ammonia.

(L- R) Graham May, General Manager for Maintenance and Management Services at Bernard Matthews and Matthew Smyth, Process Scientist at Aqua Enviro Ltd who ran the trials.

"The tests demonstrated that fine particles on the media can impede the flow of liquid through the bed. But they also indicated that two of the three products we tested – those from Krysteline and the Glass Recycling Company – were perfectly suitable for reed bed applications and are an entirely appropriate substitute for 5-10 mm and 6-12 mm washed gravel."

The reed bed trails removed, on average, 63 per cent of BOD and 57 per cent of suspended solids, which Mr Lowe said were highly satisfactory proportions. Further work is now taking place, partly because mature, fully performing reed beds can take up to 12 months to develop, depending on the rate at which the root or rhizome structure emerges.

Bernard Matthews is now examining different process applications for the Great Witchingham site. Many different configurations – using hybrid systems to achieve nitrification, denitrification and balancing flows – are possible, and the process capabilities of glass in achieving the best solution are being examined. More testing of flow rates, the nature of the wastewater and solid loadings will also help it develop detailed design criteria.

Graham May, General Manager for Maintenance and Management Services at Great Witchingham, said: "We take our environmental responsibilities very seriously and while removal of suspended solids in our effluent discharge already exceeded industry guidelines, we like to take a proactive approach in improving water quality and were therefore eager for the trial to be conducted at our site. "Beforehand, influent suspended solids in our wastewater averaged 12.3 mg/l and influent BOD 16.3 mg/l. The effluent, once passed through the reed bed, gave average figures of 5.3 mg/l and 6.0 mg/l, respectively, showing a significant improvement.

"It's often the case that high performance equals high cost, but the glass-based reed beds are relatively economic to install and operate, as well as offering a highly effective solution to managing effluent discharge.

Andy Dawe, Materials Sector Manager (Glass) with WRAP, said: "Reed beds are becoming increasingly popular, as they can be part of sustainable urban drainage systems. So there's potentially a large market for recycled glass as a base medium in these and other effluent filtration systems.

"We're delighted with the initial feedback from Bernard Matthews, which supports the findings of WRAP-funded trials at other sites. These indicated recycled glass is viable commercially and offers performance benefits over traditional filtration media."

MORE INFORMATION

Interested in setting up a trial or learning more about recycled glass applications? Contact Andy Dawe at WRAP. Tel: 0808 100 2040.

ENVIRONMENT QUALITY

Steps to reduce stink from sewage works

Some of the nasty whiffs from local sewage treatment works could be a thing of the past thanks to a new voluntary Code of Practice published by Defra.

The *Code of Practice on Odour Nuisance from Sewage Treatment Works* highlights to water companies and local authority regulators suggested good practice for controlling bad smells and how best to respond to complaints of odour from members of the public.

The problem of sewage odour, which generally exists as a result of more extensive treatment process, is recognised as an issue for local people, especially given their increased awareness of local environment quality. As such, previous consultations on the issue have shown strong support for the development of a Code of Practice.

Local Environmental Quality Minister Ben Bradshaw said: "There is a clear public demand to minimise the impact of unpleasant odours from waste water treatment works. In response to that demand, we have developed this voluntary code of practice to advise the public, local authorities and the water industry how best to assess, control and deal with these odours.

"However we do need to be realistic: while the new Code will help to tackle odour in many cases, it cannot guarantee that minor odour will not occur in all circumstances."

The Code advises sewage treatment works operators and regulators how to:

- understand odour by, for example, assessing its concentration, intensity, character, and hedonic tone (i.e. unpleasantness and offensiveness);
- assess how much of a nuisance it is to the surrounding area by, for example, taking account of frequency, intensity, duration, offensiveness, local environment, and sufferer sensitivity;
- manage complaints by, for example, showing who is responsible for different aspects of a complaint, including liaison between sufferers/the community and the operator;
- abate or limit odour through good housekeeping such as maintenance of plant and equipment, and locating or re-locating sources of odour as far as is practicable from the site boundary and nearby residents; and
- abate or limit odour through further measures such as enclosure, covers or venting, and proactive management practices.

Most sewage treatment works are controlled under the statutory nuisance regime. It remains the responsibility of local authorities, and ultimately the courts, to decide on a case by case basis what a statutory nuisance is.

MORE INFORMATION

Defra. Tel: +44 (0)8459 335577.
Website:
www.defra.gov.uk/environment/localenv/odour/index.htm

ERRATUM

Erratum, Spring 2006 issue

The development and launch of the JCB 444 diesel engine
A report compiled by Geoffrey F D Wakeham

The Editor apologises for the duplication of Fig. 4 above the caption for Fig. 3 on p14. The correct speed torque graph is presented below.

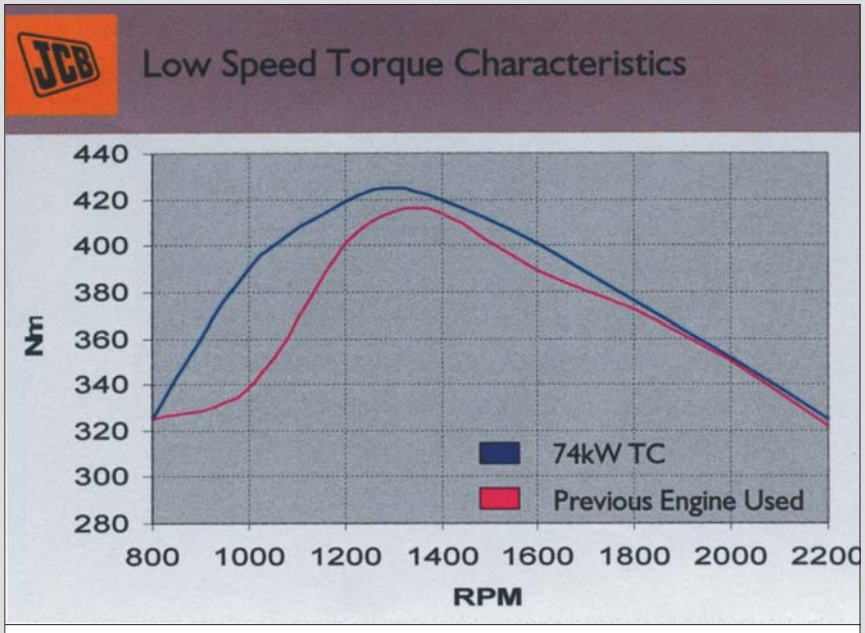

Fig. 3 Low speed torque characteristics.

REGULATIONS

Noise regulations come into force

The Health and Safety Executive (HSE) is reminding employers that the Control of Noise at Work Regulations 2005 are now in force. The regulations replace the existing Noise at Work Regulations 1989 for all industries in Great Britain except music and entertainment, which have until April 2008 to comply.

Welcoming the new regulations, health and safety minister Lord Hunt of Kings Heath said, "With over one million employees in Great Britain exposed to levels of noise at work which could damage hearing, the new regulations will reduce exposure without placing unnecessary burdens on employers."

It is hoped that full compliance with the regulations will eliminate all new cases of hearing damage caused by work by 2030. The Regulations put the emphasis on identifying measures to eliminate or reduce risks from exposure to noise at work rather than simply relying on hearing protection, although this may also be needed in the short term. Workplaces, which fell within the scope of the 1989 Regulations, should already have measures in place and the main effect is likely to be a need to review their risk assessments and prioritise their noise-control measures. Employees whose use of hearing protection under the 1989 Regulations was advisory will now have to wear the protection supplied.

Brian Lamb, Director of Communications at RNID, says: "We welcome the new Control of Noise at Work Regulations. Prolonged exposure to loud noise can cause permanent hearing loss and employers have a legal duty to cut down noise and protect their employees from the harmful effects of noise at work. However, employees also have to play their part and use the hearing protection available to them.

"Noise induced hearing loss is often cumulative and not immediately obvious, so its threat is seldom recognised or taken seriously. Whilst the effects of noise are irreversible, noise induced hearing loss is totally preventable."

Employees newly covered by the Regulations are at relatively lower risk, and the employer will need to put in place proportionate noise reduction measures and provide hearing protection on request.

MORE INFORMATION

Copies of Controlling noise at work L108, ISBN 0 7176 6164 4, price £13.95, are available from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA. Tel: +44 (0)1787 881165. Fax: +44 (0)1787 313995. Priced publications are also available from good booksellers. HSE's InfoLine: 0845 3450055. Website: www.hse.gov.uk/noise

RECRUITMENT

Honda celebrates training success with its 500th apprentice

Honda (UK)'s state of the art training facility, the Honda Institute in Berkshire, is celebrating an impressive landmark this month as its 500th apprentice was recruited. This is a significant achievement for a programme that is only now in its fifth year and demonstrates Honda (UK)'s commitment to the recruitment and regular training of its 'young blood'.

"We are all very proud of what we have achieved in just four years," comments Head of the Honda Institute, Geoff Matthews. In order for the business to develop, it is vital that we have the best talent available and we are delighted that in all areas of the business – cars, motorcycles and power equipment – we are developing a strong pool of gifted young people."

The Honda Apprentice Programme also scores extremely highly in retention rates with 85% of recruits opting to stay on with the manufacturer against a national average (across all industries) of 45%. The Honda Institute – which currently has over 300 apprentices in training – has clearly identified a successful formula.

"Everything has been perfect so far," said 23 year old Arunjeet Sandhu who is a Parts Apprentice with Johnsons Honda in Slough. "I was doing a degree but I chose to opt out and go on the Honda Apprentice Programme because you get experience along with a qualification. I am really enjoying the training at the Honda Institute and the work at the dealership. It helps me put into practice what I learn at the Institute."

Seventeen year old Gareth Stewart from Perth is in his first year as a Car Technician Apprentice and chose this route in order to find a way into the motor industry. "This way I can be gaining a great deal more experience than if I was just sitting in college," he explained "I didn't study for my Highers because I don't enjoy being in a classroom all day. I am really enjoying this apprenticeship as I am learning all the time and getting the practical experience in my dealership, Glenvarigill Honda."

The Honda Apprentice Programme is open to ambitious and enthusiastic 16-24-year olds willing to commit to a two- or three-year Technician or Parts apprenticeship.

MORE INFORMATION

Honda Apprentice Programme. Tel: +44 (0)870 2411 555. Website: www.hondauk.co.uk/people

FORAGE WAGONS

Mengele forage wagon from Reco

Mengele's Rotobull range of self-loading forage wagons has been expanded with the addition of a new model with a 58 m^3 capacity at medium compaction.

Like the existing machines in the range, the new model enables grass to be picked up, chopped and loaded in a single pass as a one-man operation and includes in-cab control of all major functions.

A special height adjustable drawbar enables ground clearance to be accurately set, and a wide flexible pick-up ensures very effective grass collection. Six rows of tines in reinforced carriers give high loading performance and carry the grass to a rotary cutting mechanism, which can be automatically adjusted to alter the chop length. A special mechanism protects blades against foreign objects.

The floor conveyor has an on-board hydraulic system driving four heavy-duty chains with off-set scraper bars, resulting in continuous, fast unloading, which is assisted by the smooth, near-vertical side walls of the wagon. Unloading can be performed as a fully automatic sequenced operation started by pressing a single button in the cab, or as a series of separate operations.

The machine is rated for 40 km/h and has a twin-circuit air-brake system operating on all four wheels.

A 58 m^3 capacity model from Mengele's Rotobull extended range of self-loading forage wagons

CONTACT

Rustons Engineering Co. Ltd, Brampton Road, Huntingdon, Cambridgeshire, PE29 3BS. Tel: +44 (0)1480 455151. Fax: +44 (0)1480 52116. E-mail: sales@reco.co.uk Website: www.reco.co.uk

INTERLOCKS

eGard provides flexible machine access control in a single, simple to configure unit

eGard - simple flexible machine access control

eGard is a new, fully modular approach to controlling access to hazardous machinery and equipment. In addition to providing all the features that are required in a gate switch, eGard, developed by safety specialist Fortress Interlocks, also includes electrical operator controls as standard modules. It can even be used solely as a flexible, easily installed, control unit.

eGard simply clips together and provides a vast number of options. Modules such as stop and start switches and indicator lights can be included in the one unit, with or without gate switch modules. This eliminates much of the wiring and connection time involved with control panels. Ease of installation also provides a huge cost saving for specifiers.

eGard is designed to fit straight on to standard extruded aluminium machine guarding without the need for additional brackets. The internal network is self-configuring, for easy installation and reconfiguring and it features quick disconnects that allow for easy electrical installation and disconnection. It can be easily connected to programmable logic controllers (PLCs) and mimic panels, or used on an AS-interface network, where an AS-interface (AS-i) is a cabling system that allows machinery safety equipment, such as access gate switch interlocks, to operate in parallel with standard machinery controls on a single network with a common communication protocol.

eGard is also easily adapted to changing circumstances. As regulation or procedures change, modules can be removed and new features can be simply added to the unit. It includes safe and standard input/output (I/O) in one simple modular arrangement. It is engineered for Category 4 applications, where 'Category 4' is a 'High risk category defined by European machinery safety regulations EN954-1. It also complies with international standards. Polymer bodied for corrosion resistance, it has stainless wear parts for long life.

CONTACT

Louise Guest, Fortress Interlocks Ltd., 148 - 150 Birmingham New Road, Wolverhampton, WV4 6NT. Tel: +44 (0)1902 499600 Fax: +44 (0)1902 499610 E-mail: sales@fortress-interlocks.co.uk Website: www.fortress-interlocks.co.uk

WEED WIPERS

Non-drip weed beet wiper

WeedSwiper is a new non-drip weed wiper from Micron Sprayers. It is dedicated to safe and efficient control of tall weeds at least 150 mm above non-target plants and therefore finds application in a wide range of situations including arable crops.

Nowhere is WeedSwiper more applicable than in sugar beet, a crop that traditionally suffers severe competition from tall weeds and especially those of its own making, i.e. weed beet and bolters amongst the crop plant population. Weed beet and bolters produce large quantities of seed that accumulate and lay dormant in the soil, building up year on year to cause increasingly severe competition and loss in yield.

WeedSwiper's success is due to the reliable and accurate control of wetness so that the pad is continually saturated for efficient transfer of the herbicide while not dripping to cause damage on crop plants below. This is achieved by the unique hydrostat electronic control system that operates simply, safely and effectively just like a thermostat. A thermostat regulates room temperature by switching heat supply on and off in response to changes in temperature. The hydrostat regulates the supply of herbicide transferred to weed plants by switching a pump on and off in response to changes in the amount of herbicide in the pad.

The pad is continually saturated for maximum effective transfer of herbicide to weed foliage above the crop but never becomes over-saturated, which causes dripping on to sugar beet crop plants below, irrespective of travel speed or density of weed beet and bolter targets.

The WeedSwiper unit is completely versatile with specific units for tractor, quad bike or trailer mounted operation depending on situation, choice and requirement. All units can be folded and operated at narrower widths than their overall working width and have a simple boom end break-back return system.

Pad height can be adjusted to suit a range of variables including the terrain and height of target weeds above the crop. All units are supplied with pad covers to prevent accidental contamination and to safeguard operator safety.

The WeedSwiper from Micron Sprayers - eliminates weeds without making any contact with the crop

Core technologies of the WeedSwiper comprise patented sensors and the hydrostat control system that automatically controls flow of fluid to the contact pads.

Pads are made from state of the art material technology. With its first class fluid retention property, the strong and tufted material used to a depth of 150 mm on the pads provides a large fluid transfer area sufficient to ensure adequate doses of active ingredient are maintained on the pads throughout operational weed control above the crop.

Pad wetness is continuously measured by sensors in the pad material and information relayed to the hydrostat controller. Variable settings on the hydrostat controller regulate pump output to the pads and only replace fluid after it has been swiped onto the target weed plant.

A scale of settings (0-9) on the hydrostat controller is used to determine dilution rate of the active ingredient. The pad cannot receive fluid in excess of that allowed by the hydrostat setting selected by the operator, thus preventing dripping and damage to non target plants. Hydrostat settings can be altered on the move if required

All WeedSwiper units are supplied with one tank for pre-mixed herbicide solution and another tank for clean water that is used to wet the pads close to saturation point *before* operational weed swiping and also to flush the WeedSwiper *after* operation, prior to brushing with detergent to remove soil and plant wax from the pads if necessary.

Treatment may be carried out from when weed beet rises to minimum required height and therefore becomes a clear and discrete target above the crop. Generally the critical height above the crop is 150 mm, which usually occurs from June to early July. Sequential treatments are determined by phased appearance of weed plants. Best results are often achieved by carrying out two treatments in opposite directions.

Treatment can be carried until early August but best results are obtained by treatment to freshly bolted stems which will have collapsed and decomposed by September. Swiping in late July to early August will be treating plants that have already formed some seeds.

Treated plants are unlikely to collapse and decay but seed viability will be greatly reduced and therefore such treatments are still worthwhile.

For high densities of weed beet plants at this time choose an appropriately high Hydrostat setting and treat twice in opposite directions on the same day, making sure that herbicide from the first swiping has dried before re-treating.

Weed beet is effectively controlled using herbicides containing glyphosate. Products containing glyphosate have clearance for use through weed wipers.

Sugar beet farmers using the environment friendly WeedSwiper get maximum control without wasting herbicide and avoid chemical damage to the plants of the sugar beet crop below.

CONTACT

Micron Sprayers Limited, Bromyard Industrial Estate, Bromyard, Herefordshire, HR7 4HS. Tel: +44 (0)1885 482397 Fax. +44 (0)1885 483043 E-mail: micron@micron.co.uk Website: www.micron.co.uk

BALERS

Vicon targets silage quality with RF235 baler

With a clear focus on improving bale quality and machine performance, Vicon has introduced the RF235 fixed chamber round baler primarily for use in grass crops.

The silage baler replaces the RF135 model and should confirm their position in the market as a leading baler specialist as a result of the model delivering a level of bale density, throughput and durability previously not seen from the firm.

Available to create a circular bale chamber, the rollers offer low power consumption and a positive effect on bale rotation in dry crops, making the RF235 also suitable for use in dry, brittle straw.

A fundamental design feature of the new baler is a new bearing and cat-iron housing for each roller, with remote greasing. This integrates with the roller design to allow quick access for maintenance and easy bearing replacement if required, without the need to dismantle the roller from the bale chamber. It is an element said to contribute to increased durability and lower operating costs.

A revised auto-lube system now provides a constant oil supply, while a simplified drive line with extra heavy duty, 31 mm pitch chains combine to make the RF235 perhaps the most durable, highest performing fixed chamber baler ever made by the company.

Addressing the issue of blockages in heavy, wet silage crops, Vicon has retained its existing system of hydraulic rotor disengagement from the tractor seat, that allows the bale to be tied off and ejected, creating an empty bale chamber and allowing full pto torque to then be applied to the rotor, to clear the intake.

A new feature on the RF235 is the development of PowerPush. Using hydraulic assistance and also activated from the tractor seat, PowerPush applies amplified torque to the intake rotor via a double acting hydraulic ram. Extending the ram pushes the blockage through to the bale chamber, freeing up the pickup and intake system.

Vicon targets silage quality with the all new fixed chamber RF235 round baler

Furthermore, should the baler pick up a foreign object in the swath, the system can be reversed to eject the obstruction from the feed rotor area, rather than push it into the bale chamber.

Other improvements include a change to hydraulic ram geometry for the tailgate which is claimed to allow a 10 - 20 % increase in bale density and also ensures bale ejection is quicker, so reducing down-time when bale formation is complete. In addition, net is now fed into the upper front part of the bale chamber, simplifying its application and easing the way net rolls are changed.

Vicon states net application is more effective, as full-width spreading of the net now takes place as it enters the baler giving consistent, edge-to-edge coverage of each bale.

In-cab controls extend to Vicon's Autoform system which allows the operator to make adjustments to the baler from the comfort and safety of the cab. Using it, the operator can select net or twine tying and adjust the quantity of net or twine applied. The system also indicates the position of the Opticut knives when fitted.

CONTACT

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HEDGE TRIMMERS

Four blades tackle heavy growth

Landowners seeking to comply with the stringent demands of the Countryside Stewardship Scheme will welcome the timely arrively of the Spearhead LRS2001 and LRS2401 Quadsaw. Designed to cleanly cut hedges that have been allowed to remain untrimmed for three or more years, the Quadshaw takes the proven single circular saw concept forward and into a new era of productivity and efficiency.

Proven in Scandinavia, it has seen extensive use in coppicing applications. Here the need is to cleanly cut coppice wood when it reaches diameters of up to 20 cm. The success in this application has seen the Quadshaw also used to trim high windbreaks when mounted on the boom of a telescopic handler.

With respective cutting capacities of 15 and 20 cm, the LRS2001 and LRS2401 offer a cut width of 2 m and 2.4 m. Each uses a set of purpose designed 500 mm circular saw blades, greater inter-blade clearance on the LRS2401 enabling it to tackle heavier growth.

Two Quadshaw variants are available. The first is designed to be interchangeable with the flail head on a conventional reach mower/hedgecutter. The second mounts via a telescopic handler carriage the HXF33000, with an integral 3.3 m side boom extension from the centre of the carriage. For safety, the HXF3300 incorporates a hydraulic safety breakback of 45° and the attachment manually folds in and out of work.

"The Quadshaw is an important innovation from Spearhead", says company General Manager Anthony Posnett. "A number of farmers, landowners and contractors are going to be faced with altering how they manage and care for the 6,000 miles of hedges in Stewardship, enough to stretch from London to Tokyo and the thousands of additional miles of hedgerow in the UK. Quadshaw will be able to tackle heavy growth with a good clean cut".

"We are constantly looking at new ways to make it easier for the end user to meet changing demands," adds Mr Posnett. "The Quadshaw has excellent productivity and when mounted on a telescopic handler it is an affordable tool for farmers and landowners to consider. It has a low power requirement, is safe and relatively easy to operate and is capable of producing a manicured finish. It is just the tool to meet the stewardships demands of the 21st century".

The LRS2001 and LRS2401 Quadshaw models from Spearhead have respective cutting capacities of 15 and 20 cm and cutting widths of 2 and 2.4 m

CONTACT

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LUBRICANTS

Millers Oils develops unique hydraulic oil

Millers Oils, a leading independent manufacturer of oils and lubricants, has extended its collection of food industry oils, with the development of Millfood synthetic hydraulic oils.

The new synthetic hydraulic oils are food grade, non-toxic oils, developed specifically for hydraulic systems in food, drink and pharmaceutical processing and packaging equipment. They are also extremely effective for use in other hydraulic systems where a clean, non-staining hydraulic oil is required.

The new synthetic oils are recognised as having excellent stability during extreme temperatures (+240°C to -30°C), making them suitable for use in a range of sectors. It also offers the advantage of having a low friction coefficient, providing excellent lubrication and consequently reducing wear and tear.

Martyn Mann, Technicial Director for Millers Oils comments: "The Millfood range of synthetic hydraulic oils has been developed without the use of genetically modified ingredients, and do not contain any nut oil or derivatives. The oils have been formulated to be low foaming and are effective in reducing residue and scum build-up, which can help to extend maintenance intervals".

CONTACT

Millers Oils technical team. Tel: +44 (0)845 6455377. Website: www.millersoils.co.uk

RoGator 618 with liquiliser fertiliser injector and auto guide steering

Ag-Chem Europe's RoGator 618 creates a new way of injecting high quality liquid fertiliser

Recently Ag-Chem Europe supplied two RoGator's 618 with both Liquiliser Fertiliser Injector and auto guide steering.
Rogator is the most effective machine for the Liquiliser Injector. This creates a new way of injecting high quality liquid fertilisers. Liquid fertiliser can be injected efficiently using a variable dosage of between 50 l until 1700 l/ha. The Liquiliser fertiliser Injector has a working width of 12 m.

The RoGator 618, which has been designed and constructed by Ag-Chem Europe B.V in Grubbenvorst, has a powerful 169 kW Caterpillar motor, combined with hydraulic drive that can be shifted under pressure. The wide tires (800/65R32 or 750/65R26) and the Ag-Chem tire pressure control system enable efficient and high capacity injection of fertilisers under any conditions and in various types of crops. The tire pressure can be reduced to 0.5 bar so hardly any indentations are made in the soil. The RoGator is fitted with a tow bar so it can easily pull a trailer of up to 16 t. The RoGator also has 4-wheel steering for ultimate agility, a lifting mechanism, a 4400 l stainless steel tank and stainless steel centrifugal pump. Combined with the Liquiliser Injector the RoGator can easily inject more than 7 ha/h.

The RoGator is fitted with Auto-Guide. This is a sophisticated satellite navigation system, incorporated into the electronics of the machine which accurately steers the machine using GPS to an accuracy of 2 cm. This user-friendly system makes operation simple. The Auto Guide terminal makes operating the machine even easier for the driver. All the important data can be read out and set on the integrated flat screen monitor.

CONTACT

Horsterweg 66a - 5971 NG Grubbenvorst - The Netherlands. Tel: +31 (0)77 - 327 84 00. Fax: +31 (0)77 - 327 02 02. E-mail: info@agchem.nl Website: www.agchemeurope.com

UAT united with Raniplast

Crop packaging specialists UAT have entered a long-term agreement with RaniPlast of Finland to distribute the RaniWrap brand of silage stretchfilm throughout the United Kingdom and Ireland for the next seven years.

RaniPlast has a turnover of approx. 170m, and is a family business trading for over 50 years in plastic related products. The company has been producing agricultural films for over 20 years.

"This agreement cements our supply commitment for the next seven years," explains Keith Ockenden, sales director of UAT. "RaniWrap is recognised as a leading quality product across the UK. Presented with our existing range of netwrap and baler twines, this addition will ensure UAT continue to supply quality crop packaging products to the agricultural industry."

RaniWrap is a co-extruded silage stretchfilm which has been developed in line with the new generation of high-speed bale wrappers. RaniWrap offers security to professional contractors looking for consistency, high strength, maximum cling and trouble-free wrapping.

"We look forward to a long-term relationship with RaniPlast," adds Keith Ockenden. "Their manufacturing know-how coupled with the marketing and distribution skills of UAT will provide our customers with the product quality and service they deserve."

RaniWrap will be available from all major agricultural retailing outlets. The Crop Packaging Association can help find customers the best deal on RaniWrap silage film. To find your nearest retailer, telephone the Deal Locator freephone line on +44 (0)800 0689914.

CONTACT

UAT. Tel: +44 (0)1420 545800. Website: www.croppackaging.com

DIAGNOSTIC TOOLS

Schaeffler (UK) launches new damage diagnosis instrument

Schaeffler (UK) has launched Detector III - the latest addition to the wide portfolio of damage diagnosis instruments from FAG Industrial Services.

A high percentage of machine failures and problems can often be attributed to imbalances or faulty alignment. These conditions can in turn lead to increased wear of machine components during operation, which in turn can lead to unplanned machine and plant stoppages over time if they are not detected in good time. This is a costly exercise for businesses and can be easily prevented by investing in the right detection systems.

The Detector series is a tried and tested and easy-to-use measuring system which can not only detect imbalances in machinery but also eliminate them. The new addition to the range, the Detector III, can be used to balance any rotors or shafts in one or two planes and is available with an extended operational balancing function thanks to new redeveloped hardware. As

Schaeffler (UK)'s Detector III is the latest damage diagnosis instrument from FAG Industrial Services

the operational balancing function is optional, it can be activated at a later stage if users wish to start with the basic function.

The Detector III balancing device includes the full range of accessories required to carry out a balancing process such as sensory equipment, trigger, magnetic holder, reflection marks, etc.

With a built-in step-by-step user dialogue, the Detector III series will allow even inexperienced operators to achieve a reliable and accurate balancing result.

As well as retaining some of the familiar characteristics of the popular Detector series, the Detector III also has a number of new and improved features. In addition to completely redeveloped 16-bit hardware, the new Detector III has increased storage space, a longer time signal and a new reporting function. It also features a second measurement channel for operational balancing, a new expanded keyboard and a new viewer for displaying signals.

CONTACT

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COMPANY NEWS

BSI acquires German certification business NIS ZERT

BSI Group - the renowned global certification and standards body - has announced its acquisition of German certification company NIS Zertifizierungs und Umweltgutachter GmbH (NIS ZERT).

This acquisition establishes an operational presence for BSI in Germany, one of Europe's largest certification markets. It also develops BSI's capabilities to service global accounts and brings a broad range of accreditations to add to the BSI portfolio in Europe, especially in the food, healthcare and automotive sectors.

NIS ZERT, based outside Frankfurt, has a significant market share in Germany, Italy and Turkey where it generates revenues of 3.5 million euros per annum and has delivered nearly 3,000 certificates across a number of sectors. The acquisition additionally provides BSI with a platform to expand into Austria and Switzerland. NIS ZERT will operate as a standalone business in Germany, ensuring continuity for all NIS ZERT's clients.

Together BSI and NIS ZERT will enable businesses across Europe and multi-nationals operating in the region to raise their performance and enhance their competitiveness on both a local and global scale through an enhanced range of services. These include certification to established and newer international management systems standards such as Information Security (ISO/IEC 27001), as well as through specialist regional schemes.

Commenting on the announcement, Stevan Breeze, CEO of BSI Group said: "This acquisition helps build BSI's presence in mainland Europe in line with our strategy and serves our clients both locally and globally. We are delighted to welcome NIS ZERT to BSI Group."

To ensure continuity of services for clients, BSI also intends to retain the expertise of all the NIS ZERT staff, including Michael Stowasser, who will continue as Managing Director. He said of the acquisition: "We are excited to become part of one of the biggest international certification bodies in the world. This creates considerable opportunity for our clients and for our people."

CONTACT

BSI Group website: www.bsi-global.com BIS ZERT website: www.nis-zert.de

Widest rotary mower tops the lots in East Hampshire

Evesham-based power arm and mower specialist Spearhead Machinery has reported the first orders for its latest wide area mower, the 820. With a working width of 8.20 m, it is claimed to be the widest trailed rotary mower in the world, with the ability to cut over 8.5 ha an hour. It is this high work rate that attracted the mower's first customer, John Seale.

An existing user of the 6.2 m wide Spearhead 620 mower, Mr Seale typically has to manage between 120 and 160 ha of predominantly organic grassland. This may need topping up to three times a season, a non-productive task that has to be carried out as economically as possible. Added into the mower's job mix is a varying amount of arable set-aside that also has to be topped prior to cultivation. Again, the priority is to get the job done as quickly and economically as possible.

"With the 820 mower I can now cut far more acres in a day" he says. "This means fewer days are spent carrying out what is basically a non-productive job. Time is money, especially so in a farming business. Having worked with the Spearhead 620 previously, there was no hesitation in opting for the new, larger 820. You simply cannot fault Spearhead machinery. It is well designed and well made".

Besides operating his own farming business, Mr Seale is the proprietor of established John Deere, Spearhead and Kverneland dealers John A. Seale Ltd. Serving Sussex and East Hampshire, the company has an established reputation for understanding the demands of its customers. Those coming to the company for advice on how to manage large areas of grass or set-aside have the added assurance that the man at the top really does know what he is talking about.

Spearhead Machinery's 820 model wide area mower claims to be the world's widest trailed rotary mower

The Spearhead 820 is based on the folding wing design of the existing 620 model. Fitted with five rotors each fitted with three 7 kg boron steel blades, the mower has an extremely robust driveline. The main gearbox is rated at 188 kW, with the slip clutch protected rotor gearboxes each having a capacity in excess of 83 kW. The input drive shaft is a substantial 69 mm diameter, with in-built strength ensuring both reliability and longevity.

Quality of cut is not compromised either. Although Spearhead wide mowers are variously described as toppers and rotary cutters, a generous blade overlap of 110 mm ensures an even cut between each rotor. This is linked to a high blade tip speed of 89 m/s, thus delivering a finish that enables these units to be used in applications that includes airfields and parkland. Height of cut can be set between 25 and 400 mm.

In line with the mower's anticipated operation with contractors, the unit is designed for safe road transport. The transport wheels are mounted on a walking axle, which as well as maintaining continuous contact with the working area significantly mitigates the effect of uneven road surfaces. A novel suspension system is also incorporated to provide a smooth ride in transit, the outer sections folding to give a transport width of within 2.8 m. Road legal lighting is fitted as standard.

The Spearhead 920 is suitable for use with tractors of 113 kW plus fitted with a 1,000 rpm pto and 44 mm 20 spline shaft and two external services.

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