Agriculture • Horticulture • Forestry • Environment • Amenity

LANDWARDS

Autumn 2006

Innovative Entrepreneurs

Career Reflections

THIN KERF SAWMILLING

IAgrE JOURNAL Volume 61 No.3 www.iagre.org

INNOVATION

The Institution for Agricultural Engineers Award for equipment contributing to sustainability in agriculture and land use & RASE Silver Medal

Simba Consolidation Systems - Aqueel Roller

The Aqueel is a roller which effectively consolidates seedbeds while pressing a lattice of indentations into the soil. Water is retained in the indentations, leading to reduced water erosion, some reduction in wind erosion and more effective use of irrigation water.

The roller, made up of wheel units mounted on an axle, is formed from micro-cellular polyurethane which flexes in use and has excellent self-cleaning properties. Scrapers are not required, so that the downtime and inconvenience of maintaining, cleaning and replacing scrapers is eliminated and under most conditions draft is reduced. The roller is mainly used as a final pass in the cultivation and planting of vegetable crops, or behind a range of cultivators and presses in general arable production.

The majority of users consulted were on the lighter lands and growing mainly potato and vegetable crops. They used the Aqueel to give good soil firming without the excessive action of some steel rollers on fragile soils, to conserve water (both irrigation and rainfall) and reduce wind and water erosion. The self-cleaning and reduced draught gave quality and uninterrupted work over a wide range of soil conditions. Other users were on heavier land, were growing combinable crops, and did not have erosion problems. They had been looking for an alternative to steel and tyre-packer systems, and benefited from the versatility and low down-time of the self-cleaning Aqueel. The length of life of the roller was generally put at about 800 ha of use.

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RASE GOLD MEDAL AND RHASS GOLD MEDAL

Bryce Post Drivers - Bryce Suma post driver

Bryce Post Drivers of Morebattle, Kelso were the proud recipients of a Gold Medal from the Royal Society of England's (RASE) awards at this year's Royal Show, Stoneleigh Park, Warwickshire.
They were also the recipients of the *first* Gold Medal to be awarded since 2002 by the Royal Highland and Agricultural Society of Scotland (RHASS) under its New Implements Award Scheme at the Royal Highland Show, Ingliston, Edinburgh.

The award winning piece of equipment - the Bryce Suma Profi Post Driver - had previously won a Silver Medal and a Certificate of Commendation at the Royal Highland Show.
The Bryce Post Drivers combine a range of outstanding features which allow one man to work on his own safely, quickly and with precision.

The tractor mounted driver, designed by Jock Bryce, features a 376 kg hammer which provides unbeatable hitting power under all ground conditions. Combined sideshift and backshift allows driven posts to be kept in line with the telescopic mast in both directions at all times without having to move the tractor.

Independent hydraulic legs give stability on sloping ground, raised hammer height and easy driving of stakes down the fence line. There is no need to lift and lower the machine for every stake.

The design of the driver is deliberately simple and robust with a minimum of moving parts with a safety cage preventing accidental activation of controls.
Users, for the RASE awards, in particular, reported reduced labour, greater output and superb quality of work with the machine. They indicated that a single operator, achieving double their daily output, had replaced three-man teams. The machine was easy to operate, had excellent safety features, was rugged and was expected to have an indefinite life and good resale value. The routine greasing requirement was not a problem for operators. Tractors used were often in the range 64 - 75 kW, usually with some extra front-end ballast. Others used a JCB Fastrac and one used a rubber-track carrier vehicle with three-point linkage so that the supply of posts and wire moved with the post driver.

RHASS Director Doug Fowlie, Millhill, Longside, Peterhead, convener of the panel of judges for the RHASS awards, said: "We have observed this machine being developed over a number of years and agreed that it had tremendous potential. Modifications and adaptations have brought it to a very high level of efficiency. This year we were even more impressed and it is well worthy of a rare gold award."

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Front cover: *Princess Michael of Kent, presenting the IAgrE Sustainability Award (a certificate and engraved crystal bowl) to Peter Mason (Salesman – Simba Consolidation Equipment), with Philip Wright (Technical Director, Simba), Charles Creyke (inventor of the Aqueel) and Professor Paul Miller (President of IAgrE) beside the award winning roller mounted on a Kverneland machine.*

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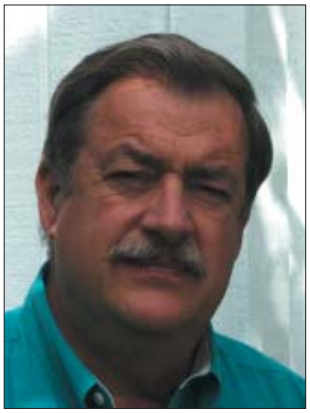
THIN KERF SAWMILLING — AN ENVIRONMENTALLY FRIENDLY HARVEST

Jack Petree

Very thin kerf means less sawdust and more timber



BIO NOTE

Jack Petree has written more than 2,500 articles published in the world's trade press and dealing with business, environmental and land use issues. His firm, Public Policy Perspectives, is dedicated to 'translating' the work of academicans into practical approaches businesses and individuals interested in environmental enhancement can implement in their everyday work world.

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'Kerf' is the thickness of the cut made by a saw blade as it passes through wood fibre when timber is milled. The ratio of usable timber to sawdust generated in sawmill operations has a direct relationship to kerf.

Thinner kerfs yield more sawn timber and generate less sawdust from a given volume of wood fibre. Over the past 25 years, portable, ultra thin kerf, band sawmills capable of being operated by one of two people have become available. These have become increasingly important tools in the worldwide quest to achieve numerous environmental objectives commonly held by both governments and ordinary citizens of the world alike. Although the contributions of these thin kerf sawmills have gone largely unheralded, the technology used, and the nature of the materials they often process, make them a significant asset in achieving:

- efficient raw material utilisation;
- effective waste management;
- recycling objectives; and
- carbon sequestration needed to minimize greenhouse gas emissions from both rural and urban forests.

The environmental advantages of thin kerf sawmilling are substantial and demonstrable. As just one example, United States Forest Service researcher, Stephen Bratkovich of the Service's Northeastern Area State and Private Forestry division, has reported that typical sawmills in the United States operate at about 50% efficiency in terms of timber recovery. A study in a pallet sawmill in Missouri, Bratkovich continues, demonstrated 69% efficiency for a thin kerf mill with a 1.25 mm blade cutting thin planks.

"The US annual cut of timber for wood products is equivalent to approximately 240 million trees," Bratkovich writes. "We could save the equivalent of 69 million trees annually if our recovery efficiency improved from 50% to 70% in our primary processing industry." Those unharvested trees, according to Bratkovich, would continue to absorb about 900,000 t of carbon dioxide and produce about 650,000 t of oxygen each year as they continue to grow (Bratkovich, 2004). Similar studies at sawmills in other places, including Russia, have produced like findings.

A relatively new technology

In recent decades, the increased sawmill efficiency, to which Bratkovich points as being important to the environment, has come to be widely available through the development of portable thin kerf band sawmills, first introduced to the public on a commercial basis about 25 years ago.

On introduction, the new technology drew little attention from the commercial forest industry. In fact, those in the trade who did notice tended to view the sawmills as being little more than 'hobby saws'. That perception arose because the low cost of the units combined with their capacity to produce fine quality sawn timber, even when run by novices, led to enthusiastic acceptance of the new concept by hobbyists, farmers, and others wanting to

Sawmilling timber from a farmer's woodland

saw relatively small quantities of inexpensive timber to support personal needs.

Today, increasing attention to environmental issues and advances in thin kerf technology have combined to create a flourishing, albeit still mostly unnoticed, industry producing large quantities of sawn timber from fibre that would have been, in the past, either completely wasted or underutilised,

One manufacturer alone, Wood-Mizer Products of Indianapolis, Indiana in the United States, reports that it has sold more than 30,000 units over the past 25 years. According to the firm, if those sawmills are processing timber at average production levels of even one quarter of their capacity, total sawn timber production on them may exceed 5.5 billion board feet (13 Mm^3) per year. (A board foot is defined as one square foot of sawn timber, one inch thick.)

From an environmental standpoint, the source of much of the timber sawn on thin kerf equipment is more important than the quantity. As very thin kerf sawmills are typically smaller than conventional sawmills, cost less than a small tractor, are usually highly portable (either to tow behind a small vehicle or capable of being easily disassembled, transported and reassembled), and can be operated by a single operator, they are often used to mill timber from logs and other tree parts conventional sawmills cannot or will not accept – material that would otherwise be wasted or underutilised.

Environmental enhancements

Since even small changes in the atmospheric carbon balance are believed by some to have significant impacts on the earth's climate, portable sawmills can and do play an important role in some of the carbon mitigation strategies many believe to be critical in reducing atmospheric carbon.

Substituting wood products for more energy intensive products and reducing demand for energy in growing timber, harvesting timber and wood processing

Many believe, and numerous studies appear to confirm, that wood fibre, in general, requires less energy and creates less pollution in its production than do materials such as steel or cement. Much of the timber milled on portable, thin kerf sawmills provides a double benefit because so much of the timber is manufactured from material otherwise destined to be discarded.

The timber processed on a portable mill replaces fibre that would otherwise be harvested, removed from the living forest, transported to a mill and then sawn.

Reducing biomass burning in wildfires

Forest fires pump immense quantities of carbon and other pollutants into the atmosphere. Thinning is an increasingly important way to reduce fuel loads in forests.

Portable sawmills are often used at the harvest site to process material that is either too small or too limited in terms of quantity to warrant a complete harvest, yet must be removed in the battle to reduce catastrophic forest fires.

The fibre removed not only contributes to reductions in the severity and thus the potential for emissions of a forest fire but is also sequestering the carbon it contains for the life of the wood product.

Afforestation of marginal crop land and pasture to forest, reducing conversion of forest land to non-forest use and increased agroforestry

Portable band sawmills have become a common sight on farms in recent years. Farmers, especially those with woodland available, use the mills to reduce expenses by sawing timber for their own use as well as milling timber for others and, thus, gain extra income.

In making timber a viable crop, capable of providing much needed income in a farm situation, portable sawmills provide the means to encourage farmers to allow marginal crop land and pasture to go back to forest as well as discourage wholesale clearing of already existing farmland to provide new pasture.

Improved forest management

Forest management to reduce catastrophic fire losses, improve habitat and restore altered forests to their original conditions is becoming an important focus for both public and private landowners around the earth.

Portable, thin kerf, sawmills can reach areas not accessible without extensive roadwork, can mill material that conventional mills will not accept and can be utilised on small quantities of material. As a result, the mills are increasingly utilised to improve forest health and habitat in areas that might not otherwise be treatable.

Reduced harvest

One of the most cost effective, as well as efficient, ways to reduce the timber harvest is the substitution of timber milled from wood that would

A log most sawmills would reject

otherwise be burned, left to rot, or otherwise wasted for timber milled from freshly harvested wood from healthy forests.

A double benefit is realised when this substitution takes place. First, the sawn timber recovered from wood, which would otherwise be wasted, sequesters carbon rather than releasing it when burning or rotting takes place. Second, as Steven Bradkovich has pointed out, trees that would have otherwise been harvested to provide the needed timber are left in the forest to grow and sequester additional amounts of carbon.

Thin kerf portable sawmills are, almost without question, one of the world's leading tools in reducing harvest through substitution. Literally, hundreds of thousands of cubic metres of boards per year are sawn by portable mill owners from demolition debris, trees removed from rights of way or other public areas, logs discarded in mills or fibre left in the forest because it is not useful to traditional mills. Each cubic metre of this material sawn on thin kerf sawmills substitutes for additional harvest elsewhere.

Increasing the proportion of retention of carbon in durable wood products

Across the planet, in the absence of the thin kerf, band sawmill, most recycling and recovery efforts for construction and demolition debris, urban wood, and fibre left in the forest after harvests consists of chipping and grinding. The products of chipping and grinding only sequester carbon for a short lifecycle while timber sequestration cycles are measured in decades or even centuries. A log sawn for planks thus has a value many times higher than one processed for more temporary use.

An especially important application for thin kerf, band sawmills has come to the fore in recent decades. The recovery and re-milling of timber from old structures, some hundreds of years old, has become an area of special interest in recent times with some sawmilling companies achieving impressive results.

In the western United States, for example, a Blackfoot, Idaho company, Cannon Structures, has recovered more than 30 million board feet of material (71,000 m³) from an old railroad trestle that once spanned a part of the Great Salt Lake. Removal of the trestle not only provided substantial environmental advantages for the lake, but also resulted in the raw material base Cannon has utilised in producing timber trusses, unique softwood flooring, mantelpieces, skirting boards, architraves, mouldings, and other products for the speciality homebuilding, furniture making, and the construction marketplaces of the Trans-Mississippi West.

In addition to its base product, marketed under the trademarked name 'Trestlewood', Cannon processes material recovered from demolished factories, barns, warehouses, docks, and other structures into similar products. Much of that material is processed using the two thin kerf sawmills which the firm utilises not only to refurbish the wood but also to reduce waste.

Conclusion

Thin kerf sawmilling has emerged as a tool in reaching the important objective of enhancing the earth's environment. In recent years, sawmill manufacturers have developed advanced technologies allowing very small businesses to profitably utilise thin kerf sawmilling to process timber from fibre conventional mills cannot, or will not, handle.

With perhaps 50,000 or more very thin kerf units operating worldwide, thin kerf sawmilling has taken its place as an important asset to governments and individuals seeking to enhance the earth's environment. Impressive as the progress made in recent decades has been, thin kerf sawmilling may only be on the cusp of its importance as the significance of the technology comes to be more recognized by farmers, foresters and others utilising wood fibre in their businesses.

Reference

Bratkovich, S. (2004). Thin kerf sawing: a technology worth adopting. Northeastern Area State and Private Forestry, USDA Forest Service.

TREASURED LAND

Metal detecting code of practice

The National Farmers Union (NFU) has welcomed the launch of the new Code of Practice for Responsible Metal Detecting in England and Wales. The voluntary code of practice is endorsed by the NFU, one of a number of high profile organisations working for the responsible use of the countryside.

Easy to understand, the new code offers metal detectorists advice on how to proceed before embarking on a metal detecting expedition and on how to conduct themselves on farmland whilst indulging their hobby. There is also advice on how to report any finds to landowners and occupiers, and how to abide by the provisions of the Treasure Act and the Treasure Act Code of Practice.

MORE INFORMATION

Copies of the Code of Practice for Responsible Metal Detecting in England and Wales can be found on the NFU website, www.nfuonline.com

AWARD

Honorary DSc for Dr Alan Reece

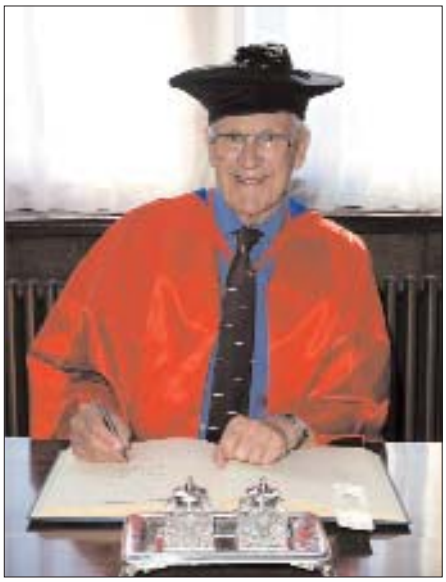
The honorary degree of Doctor of Science (Hon DSc) was conferred upon Dr Alan Reece, founder of Soil Machine Dynamics (SMD), by the Chancellor of Newcastle University, Lord Patten, at a ceremony held in the University's King's Hall on 5th May 2006.

Alan Reece was Reader in Agricultural Engineering at Newcastle University until 1984, when he left to develop his engineering companies. His links with the University can be traced back to 1947, when he gained a BSc in Mechanical Engineering, followed by an MSc in Agricultural Engineering in 1950, both awarded by the then King's College of the University of Durham. These were followed by a PhD awarded by the newly-formed University of Newcastle upon Tyne, in 1964. Between his BSc and Doctorate, he worked as a designer for seven years with Vickers Armstrong, Ford and International Harvester. He served the University for 28 years in the Department of Agricultural Engineering, proving himself to be both a highly innovative researcher and a passionate and gifted teacher. Alan's many former students recall with gratitude how he enabled them to pursue successful careers in farming and many other sectors.

Alan's engineering brilliance lay in pioneering the application of soil mechanics principles to the design of earth-moving equipment. He can now claim not only to have moved earth, but to have moved the Earth!

In the early 1980s, the foundations for today's Global Economy and 'Information Age' were being laid, quite literally, in the form of undersea pipelines and telecommunication cables. As fast as they could be laid on the seabed however, they were being damaged by trawler dragnets. Extrapolating from his agricultural engineering experience of soil mechanics and tractor three point linkage systems, Alan Reece designed a highly efficient undersea plough, slashing the costs of installing cables and pipelines safely below the seabed, beyond the reach of dragnets.

Alan's first instinct was to commercialise his invention alongside his



academic pursuits. Sadly, the culture of the University at that time was ill-prepared to accommodate such an inventive and entrepreneurial talent. Rather than see his inventions gather dust, Alan reluctantly resigned his Readership in 1984, and founded a company to bring his seabed plough to market.

Soil Machine Dynamics, the first of the three companies Alan would eventually own, began life as a three person operation, 'camping-out' in the front room of his house. In Year One, turnover reached £100,000. In Year Two it was £1.5 million. By then employing eight graduates from this University, the company went on to sustain an annual growth rate of 20%, achieving an annual turnover of £60 million by the dawn of the new Millennium.

Along the way, Alan established Pearson Engineering Ltd as global leaders in the manufacture of specialist equipment for the safe removal of land mines and for related military ground-clearing operations.

To date, more than £400 million worth of business has been brought to Tyneside by Alan's companies. Impressive as they are, these financial figures cannot convey the full extent of Alan's achievements in business. The companies founded by Alan now employ several hundred people on Tyneside, giving the lie to those who maintain that the UK can no longer compete globally in engineering and manufacturing. Alan's commitment to the region goes far beyond job creation: substantial charitable donations have been made to numerous educational and community projects in the region. Further afield, Pearson have supported humanitarian organisations involved in removing land mines in former war zones.

The dedicated engineering and technical staff in Pearson draw their inspiration from Alan's enthusiasm, passion and *joie de vivre*. His particular charisma as both an engineer and a businessman lies in his ability to rapidly analyse problems and explain them, before lucidly outlining how they may best be solved.

Alan brought the same enthusiasm to his principal recreational activity, as an accomplished mountaineer. An excellent rock climber and skier, Alan has long maintained as his principal indulgence a transporter van known as 'The Daysack', which allows him and his partner Margaret to escape at short notice to the Lakes or the Highlands. He got within a dozen summits of completing the Munros before wear-and-tear on joints placed the high ridges beyond his reach; so he took to a mountain bike instead, which is now Alan's principal means of communing with the great outdoors.

Alan's enthusiasm for the mountains proved infectious at work and his companies soon developed a tradition of evening rock-climbing outings in Northumberland, and ski holidays in Europe and the USA. The notion that business should be fun remains a cardinal principle of life at Pearson Engineering to this day – to the extent that it has sometimes left American clients speechless as their preferred suppliers took a break from the earnest contract negotiations to keep a prior appointment on the nearest piste! Despite his mountain-biking commitments, Alan retains a strong personal interest in the research and design aspects of Pearson. For instance, he is currently active in the development of designs to improve the boat guidance structure beneath the Gateshead Millennium Bridge.

TRADE BENEFITS

Exporting success

International trade can be a tough nut to crack; there's a lot to learn and a lot at stake. As part of its programme of support packages for exhibitors, Glee – Europe's largest annual event for the garden and leisure industry – has teamed up with Christopher Murley, MD of Murley Venture Consultancy to give an overview of how to minimise the risks and maximise the benefits of export trading.

Do

- Use the commercial section of British Embassies to:
- carry out personalised research into specific markets;
- be accompanied at meetings by an embassy representative to gain credibility;
- hold a presentation or mini-exhibition at the embassy premises.
- Use the shelter of a trade mission or trade show to meet contacts and customers face to face.
- Make and adapt your products to the export market, but more importantly to meet the needs of the international customer.
- Get credit information and insurance on customer and other trade suppliers. Thorough credit checks should be made on any agents or intermediaries used; it may be possible to be paid all or part in advance. Letters of credit and even bills of exchange are fairly widely used in continental Europe and advantage should be taken of this facility. Good banking relations with a local bank should be established early.
- Prepare price lists in local currency and establish a cost for insurance and freight (CIF) delivery price.
- Go and visit the customer, experience the culture without the pressure of having to achieve sales; this gives you time to develop a deeper understanding of how the market works and how to do business there.
- Be persistent and keep communication going.
- Offer to help agents / distributors to sell your products. Raise awareness by issuing a professionally written press release translated into the local language, supply promotional leaflets or offer support through trade shows / incentives.
- Talk to others in the industry and carry out specific marketing research to obtain intelligence on topics such as market size and segmentation etc. Successful exporters consider their entry into new markets with care.
- Plan, get grants, enjoy and above all have fun!

Don't

- Don't sign on the dotted line and accept an order on your first visit. Every important piece of information should be checked and double-checked. Promises must be in writing and timetables carefully assessed. It is essential to have a full understanding of the details.
- Don't do business if you don't trust the buyer.
- Don't ignore local customs. Conduct research into your target markets to establish local considerations. Learn a little of the language to establish mutual confidence and try to avoid colloquialisms and metaphors in promotional material that could lead to embarrassing situations.
- Don't try and sell the UK version of your product before assessing its suitability for exporting.
- Don't give away exclusivity for life with countries that won't sell your product elsewhere.
- Don't be ignorant. Set your prices carefully – don't assume that your UK pricing policy will work in other international markets. Consider what your potential customers will expect and prefer to pay.
- Don't take financial risks: request a pro forma on 1st/2nd order and offer extra discount; set a credit limit; invoice promptly; and highlight bank and credit details on invoice.
- Don't chase payments early.
- Don't 'dress down' on your initial visit: first appearances can leave a lasting impression.
- Don't skimp on travel or accommodation expenses until you know more about the area. Your first visit is crucial and you can save yourself substantial time and money in the long run by making the most of it.
- Don't try and conquer the world in a week!

CONTACT

Glee is Europe's largest annual event for the garden and leisure industry and takes place at the NEC, Birmingham on September 17th-19th. Tel: +44 (0)20 8277 5813 (Prospective exhibitors); 0845 051 2611 (buyers: register for free entry). Website: www.gleebirmingham.com

Ag Eng ACTIVITIES STILL ALIVE AT THE PARK

It is now two months since Silsoe Research Institute (SRI0 closed at Wrest Park, Silsoe, but there are still old faces to be seen there, busily pursuing research and development activities that have arisen phoenix-like from the ashes. The soil physics research group that is now part of Rothamsted is still based there but there are also seven other activities, five of them start-up businesses. Here is a short list of what is still going on.

Silsoe Spray Applications Unit (part of The Arable Group)

Paul Miller is leading a research and development group focussing on pesticide spraying technology as part of the agronomic R&D of The Arable Group. The wind tunnel and other facilities from SRI are still there and Paul is working to build a team and portfolio of research work that will maintain and further develop capabilities relating to spray application. The team also includes ex-SRI staff Andy Lane, Geoff Richardson, Christine O'Sullivan and Clive Tuck.

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Wind Tunnel facility

Silsoe~Birmingham Research

Members of the former SRI wind, structural and environmental engineering group have formed this joint venture with the Department of Civil Engineering at the University of Birmingham. The new organisation, based at Wrest Park, aims to retain and develop the unique full-scale wind engineering test site there, and hopefully also the unique Atmospheric Flow Laboratory (see www.silsoeresearch.org.uk/envir-wind-waste/wind.html).

Current research projects include: building-augmented wind energy generation; natural ventilation measurements and studies; over-turning of high-sided vehicles by cross-winds; ventilation of animal transporters.

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Adam Robertson or Roger Hoxey. Tel: +44 (0)1525 864869. E-mail: a.p.robertson@bham.ac.uk or r.hoxey@bham.ac.uk. Andrew Quinn is now based at Birmingham University and is the principal. E-mail: a.d.quinn@bham.ac.uk

Atmospheric Flow Laboratory, with preparatory work for an experiment to simulate thunderstorm downbursts which produce short-term, extreme, surface winds

Solutions for Research Ltd

John and Pete Richards have established this business to provide what they feel is a design and construction service for all your Research and Development needs. From a single part to a complete system, they aim to provide high quality solutions to all your problems. With their mechanical and electronic expertise they can provide a 'one-stop-shop' for all research and development (R&D) requirements.

CONTACT

John or Pete Richards. Tel: +44 (0)1525 860776. E-mail: Info@SolutionsForResearch.co.uk

Silsoe Odours Ltd

Robert Sneath has established Silsoe Odours Ltd to continue the independent odour measurement and consultancy service that Silsoe Research Institute operated for over 10 years (the first odour laboratory to gain UKAS accreditation). Robert and Laurie McCartney offer the same high quality rapid service they did before.

In October and May each year they hold Odour Study Days aimed at increasing awareness about the objective measurements of odours and how measurement and modelling techniques can be used to address odour nuisance and planning problems.

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Tillett and Hague Technology Ltd

Nick Tillett and Tony Hague established this business in 2005 in order to provide a service that would otherwise have been lost on the closure of the Institute. The founders both worked on automation technologies at the Institute and have particular expertise in precision guidance (they provide the technology behind Garford Farm Machinery's Robocrop vision guidance system).

The business is based on conducting research and development contracts for industry and government departments and to license technology to the agricultural industry. Their broad range of expertise in the field of automation covering mechanical design, electronics, real time computing and control allows them to offer complete in-house solutions, though they normally collaborate closely with industrial and academic partners.

CONTACT

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Garford built Robocrop hoe, running Tillett and Hague Technology Ltd's vision guidance and tracking software and operated by Intercrop (a large salad producer) in Kent. Three cameras are used to track and hoe three separately planted beds in one pass.

Silsoe Technology Ltd

John Reed and Simon Miles set up STL (www.silsoetechnology.co.uk) in September 2005. The company is based at Wrest Park and carries out innovative engineering and automation for the food, agricultural and biotechnology sectors. STL provide a concept through to production service including concept initiation and development; design of machines, prototypes and test rigs; computer aided design (CAD) based dynamic simulation modelling and production line planning; machine testing in the field, laboratory or factory.

Their specialised areas include automated food handling and harvesting systems, robot end-effectors and food grippers, field and factory machinery simulation and video analyses, optimising the presentation of products to improve downstream automation efficiency. Recent projects include simulating and analysing tractor-implement interactions, dynamic analyses of vehicle rollover impact energies, conceiving a novel food product singulation and orientation system, facilitating the development of automated bag handling and manipulation systems.

CONTACT

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Silsoe Livestock Systems Ltd

Jeff Lines and Paddy Schofield are continuing their research fields under the company name Silsoe Livestock Systems Ltd. They currently have research contracts with the European Commission (EC), the Department for the Environment, Food and Rural Affairs (Defra), the Scottish Executive Environment and Rural Affairs Department (Seerad) and the British Pig Executive (BPEX), for the development of a range of humane stunning systems for fish, for a remote fish inspection system and for the further development of camera based systems for estimating pig mass and condition.

Current discussions with a commercial Spanish organisation may lead to the development of this visual image analysis (VIA) approach still further. Due to the links they still have with other ex-SRI staff, they are also seeking to expand into new areas. A partnership with ex-SRI staff members Paul Berry and Dave O'Neill has recently secured a two year contract with Defra to explore ways of improving the welfare of poultry at slaughter.

Links with universities - particularly Bristol, Oxford, Strathclyde, Wageningen, Kiel and the Scottish Colleges - also continue to develop through collaboration. They continue to make use of the unrivalled electronics and engineering services of 'Solutions for Research Ltd' just as in former days when all worked under the SRI banner!

FORESTRY

Potential to develop short-rotation forestry for wood fuel

Short-rotation forestry, by which fast-growing trees are cultivated and harvested between eight and 20 years after planting, appears to have potential as a source of renewable fuel for heat and power generation in Great Britain, according to a study undertaken for the Forestry Commission and Defra. However, the study authors advise that a number of issues need to be addressed before short-rotation forestry could be widely established.

The two departments commissioned the review of possible environmental impacts of short-rotation forestry (SRF) as part of ongoing investigations and development of the wider mix of contributions that forestry can make to climate change mitigation and sustainable energy production. This mix includes energy crops, sawmill residues, and wood from existing forest and woodland.

Interest in SRF has been growing as part of the drive to develop renewable, carbon-lean alternatives to non-renewable fossil fuels such as oil, gas and coal. The build-up in the atmosphere of greenhouses gases, such as carbon dioxide, as a result of humans burning non-renewable fossil fuels is widely accepted as contributing to climate change.

The study looked at the potential impacts of SRF on biodiversity, soils, hydrology, pests and diseases, archaeology and the landscape. The study, the report of which which has been published on the Forestry Commission website, looked at 10 species of trees: four native species – alder, ash, birch and poplar; one naturalised species – sycamore; and five non-native species – three of Eucalyptus and two of southern beech.

Among the issues that the authors recommend should be examined further were:

- impacts on biodiversity, archaeology and the landscape. They recommend that clear guidance should be provided through a code of practice on how growers could establish and manage their SRF crops in ways that would minimise the effects on these aspects; and
- the high water use by some species, particularly eucalypts, which in certain parts of Britain could threaten water supplies. Further research is recommended to develop clear guidance for potential growers and land-use authorities on the areas where SRF would and would not be acceptable.

The study concludes, "Overall, SRF appears to have potential .as a source of renewable fuel. There are potential negative impacts from SRF, but these may be controlled and minimised by application of a creative, integrated code of practice to ensure that SRF operates in an optimal way to secure the positive impacts."

The report recommends further research on three main areas: the growth rates and yields that might be achieved in Britain from SRF; the economics of SRF, particularly for the grower; and the water use of SRF stands.

The Forestry Commission's environment and operations advisor, Dr Helen McKay, said the report was a valuable contribution towards the possible development of SRF as part of a wood-fuel industry in Britain, adding, "Because wood is a renewable, clean, carbon-lean fuel, short-rotation forestry could have a valuable role to play in Britain's contribution to climate change mitigation as part of a wider wood-fuel industry. This report has, importantly, given us a better insight into the potential for SRF, and has clear advice on further research.

"We will carefully consider all the recommendations and put in hand some of the research and development work. We recognise that there are potential problems as well as gains from expanding this type of woodland, and the report confirms this. Forestry operates within a well developed regulatory framework that includes safeguards to protect the environment and landscape, and the report shows where we have to do some work to make sure that SRF fits into this."

CONTACT

Download the report from the Forestry Commission website at www.forestry.gov.uk/pdf/SRFFinalreport27Feb.pdf/$FILE/SRFFinalreport27Feb.pdf

HYBRID STONE FRUIT

Royal fruit growers introduce children to Pluot

Capitalising on children's fascination with dinosaurs, one of the world's largest stone fruit producers the Seville-based Royal is marketing a new weird and wacky Brontosaur egg Pluot® stone fruit that resembles dinosaur eggs and is in season for only the first two weeks of August. The Pluot has a strong apricot flavour, colourful, mottled skin with orange and pink flesh. The skin is a mixture of yellow and purple with green speckles. The sweetness and lusciousness of the Pluot means that they are particularly popular with children and are starting to be found in lunchboxes throughout Europe.

A Pluot is a hybrid of a plum and apricot. The fruit is not genetically modified and has been created by natural cross-fertilisation. The outer skin of the Pluot looks like a plum with a bright skin and a rounded shape. At the same time, it has distinctive characteristics that mark it out as a different fruit - the skin is finer and often the skin and flesh is a mixture of colours.

Pluots are a natural source of vitamin A, essential for healthy skin, vitamin C and high levels of potassium which plays a role in nerve and muscle function. The fruit is also a rich source of antioxidants.

José Gandia, the company's President and fruit enthusiast is passionate about the new variety of Pluot. He says, "Royal invests in new varieties such as the Brontosaur egg Pluot® which are starting to be popular in Spain, Germany and France. We are looking forward to seeing what UK fruit lovers will make of the exciting new produce".

MORE INFORMATION

For more information on Royal visit www.royal.es

ORGANICS

Organic farming encourages younger, happier people into agriculture

Results from the most comprehensive survey comparing employment on organic farms to that on non-organic farms shows that organic farming is delivering 32% more jobs per farm on average across the UK.

If organic farming, currently practised on 4% of UK farmland, was adopted by all UK farmers, it would produce an additional 93,000 on-farm jobs – 16 times more people than were employed by the Rover car company when it closed in April 2005. The independent research also reveals that organic farmers are:

- **younger** – the average age of organic farmers surveyed was 49, seven years younger than their non-organic counterparts, who average 56 years old;
- **more optimistic about the future of farming** – 64% expect their family to take on the farm compared to 51% for non-organic farmers; and
- **more entrepreneurial** – three times as many organic farms are involved in direct or local marketing schemes than non-organic farmers.

Notwithstanding such beneficial on-farm processing and retailing, the survey confirms that it is the actual system of husbandry required by organic farming that generates the majority (81%) of the additional jobs. These findings for organic farming run counter to the trends for UK agriculture generally which have seen the number of farm workers drop by nearly 80% over the last 50 years. Applications to the Soil Association from existing farmers and new entrants wishing to convert to organic reinforce the survey's findings:

- the average age is 46 years, 10 years younger than the national average age and 3 years younger than found in the survey;
- 28% of applicants were female and 72% male, of those who responded; and
- overall enquiries for converting to organic production have more than doubled over the last year.

Peter Melchett, Soil Association Policy Director said, "This younger, energetic generation of organic farmers revitalising agriculture and boosting their local economies offers a dynamic and viable future for UK agriculture. We will be asking the new Secretary of State for the Department of the Environment, Food and Rural Affairs (Defra) to do all he can to support the energy and efforts of his organic contemporaries.

"The implications of this research are not limited to the UK. In the developing world, some 2.5 billion people are still dependent for their livelihoods on agriculture. If they adopt the model of industrial farming, as has been the dominant trend in the developed world, millions will be forced off the land into the shantytowns of Africa, Asia and Latin America. In contrast, organic farming offers a truly sustainable development path."

Chris Kaufman, National Secretary of food and agricultural at the Transport & General Workers Union said, "As the UK's leading rural trade union, the Transport & General Workers Union is happy to support the important work of the Soil Association in promoting the organic farming sector. The development of this vital industry is pivotal to helping regenerate agriculture as a major employer, with a major role in the rural economy."

MORE INFORMATION

Soil Association, Bristol House, 40-56 Victoria Street, Bristol, BS1 6BY. Tel: +44 (0)117 929 0661. Fax: +44 (0)117 925 2504. Website: www.soilassociation.org

FOOD MILES

Polytunnels save British strawberry crop

Strawberry farmers are breathing a huge sigh of relief, because the British strawberry crop has been protected from the unusually heavy rain during the critical fruiting time of May by polytunnels.

Since the introduction of polytunnels 13 years ago, British soft fruit growers have been producing increasingly successful crops by using polytunnels, partly because they prevent rain damage to the developing fruit – in an average year 40% of the crop will be damaged by rainfall and this year most of the early crop could have been ruined.

Anthony Snell, National Farmers Union (NFU) Horticultural Board member, said: "Polytunnels have allowed British fruit growers to make huge advances, both in saving the ripening fruit from rain damage and in extending the season which now lasts from May until October. The season used to last only six weeks but now it can last up to six months.

"British growers are now successfully competing with foreign imports from Egypt and Spain, extending the growing season has a big impact on the food miles that used to be attached to strawberries before June and after July.

"The enclosed nature of polytunnels means that growers can reduce their use of pesticides by 50% and the enclosed environment means they can also release natural enemies like lacewings to eat aphids and other pests. The British soft fruit industry is worth £185m every year and that is down to the improved conditions that polytunnels offer the plants."

Despite the environmental benefits there has been criticism of polytunnels because of their visual impact on the landscape. In an effort to address the problem some growers are now fitting recently developed plastics which reduced glare and shimmer by 70%.

Anthony Snell continued: "The advantages of polytunnels far outweigh the negative aspects of this method of fruit production for everyone, but it is important that soft fruit growers use their polytunnels sensitively.

"That is why we urge our members to work to the code of conduct developed by the NFU and British Summer Fruits, the organisation responsible for promoting soft fruit."

BYWAY PROTECTION

Controlling BOATs in the countryside

New provisions regarding the use of rights of way by motorised vehicles have been made in the Natural Environment and Rural Communities Act 2006. These provisions significantly curtail the scope for adding further public rights of way for motor vehicles, known as byways open to all traffic (BOATs), to the definitive map and statement (the local highway authorities' legal record of public rights of way).

Rural Affairs Minister, Jim Knight, said: "The Government is delivering our commitment to curtail the inappropriate use of green lanes and ancient ways by motor vehicles, by putting an end to claims for motor vehicular use of them on the basis of historical use, and evidence of that use, by horse-drawn vehicles, as soon possible.

"Some of the worst damage is happening in our national parks, which is why we have given National Park Authorities the power to make traffic regulation orders, to commence later this year.

"We must ensure that our green lanes, ancient ways and rights of way are protected for the enjoyment of everyone who use these important parts of our countryside, now and in the future."

The new provisions will extinguish – subject to certain exceptions – all unrecorded public rights of way for motor vehicles, so that they cannot then be claimed as BOATs under the fundamental legal principal 'once a highway, always a highway'. The Act also prevents use by motor vehicles giving rise to any kind of public right of way.

A new category of right of way – 'restricted byway' – to make these provisions work on the ground is used within the Act. It enables ways where vehicular rights have been acquired by non-motorised vehicles, such as horse-drawn vehicles, to be recorded as restricted byways rather than BOATs, ensuring that the future use of these ways will be consistent with their history.

Restricted byways were first introduced by the Countryside and Rights of Way Act 2000. The relevant provisions of that Act and changes to other highways legislation are also taking effect in order to dovetail with the commencement of parts of the Natural Environment and Rural Communities Act 2006. Restricted byways can be used by pedestrians, horse-riders, cyclists, and those who wish to use them with a horse and cart or carriage.

However, when these provisions come into force it will be an offence under the Road Traffic Act 1988 to drive a motorised vehicle on a restricted byway except in certain circumstances.

Because some people rely on a public right of way for motor vehicles to access their land or property, the Act provides for a private right of way for such people, wherever a public right of way for motor vehicles is extinguished, and an exemption from prosecution in limited cases.

MORE INFORMATION

Defra. Tel: +44 (0)8459 335577. Website: www.defra.gov.uk

PESTICIDE CONTROL

New code of practice for using pesticides

A new Code of Practice for professional users of plant protection products has been published. The Statutory Code replaces and updates three previous codes of practice including the code for using pesticides in amenity areas, which was previously a voluntary code.

Sustainable Farming and Food Minister, Lord Bach, said: "I am delighted to launch this new and up to date code. It is an important development as it will help all professional users of pesticides, whether they work in agriculture, horticulture, forestry or the amenity sector, to better understand and operate within the legislation.

"The latest code provides information on the new legal requirement to keep spray records and advises on the new laws regarding protection of ground water and waste management. We are delighted that our close working with the Plain English Campaign has resulted in a code which is clearer, more focused and easier to read and understand."

The three codes replaced are:

- **a**the Code of Practice for the Safe Use of Pesticides on Farms and Small Holdings ('the Green Code');
- the Code of Practice for the use of Approved pesticides in Amenity Areas and Industrial Areas ('the Orange Code') a voluntary code produced by the National Association of Agricultural Contractors and the British Agrochemical Association; and
- those parts of the Code of Practice for the safe use of Pesticides for Non-Agricultural Purposes – The Control of Substances Hazardous to Health Regulations 1999 ('the Blue Code') which deal with forestry.

The new code's statutory basis means that it can be used in evidence if people are taken to court for offences involving pesticides.

An important feature in the code is the reference to the need, by law, to keep records of pesticide treatments as a result of two new EC regulations. These regulations require that everyone who produces or harvests plant products for people or animals to eat must keep records of any plant protection products (pesticides) they use. Other professional users of pesticides are advised that they should start keeping records now since it will soon become a legal requirement for them also.

CONTACT

Defra Publications, Admail 6000, London, SW1A 2XX. Tel: +44 (0)88459 55 6000. Website: www.pesticides.gov.uk

Download the code for England and Wales from the PSD website free of charge. A free copy on compact disk, or a printed copy for a charge of £15, are also available (quote product code PB11090; ISBN: 0855211709).

A Welsh language version of this code will be available on the National Assembly for Wales website at www.wales.gov.uk. Printed copies of the Welsh language version will also be available.

The Scottish Executive Environment and Rural Affairs Department plans to issue its own version of the Code of Practice. The Department of Agriculture in Northern Ireland has its own code at present and are considering issuing an updated edition.

FOOD DEVELOPMENT

Online Information Centre for Genetically Modified Foods

European consumers have access to a comprehensive online Information Centre for Genetically Modified Foods. The English language website is the work of independent scientists, making it one of its kind in Europe. The project is funded by the European Commission.

The moratorium on new genetically modified organism (GMO) authorisations in the EU has come to an end, and in the future consumers will likely face more genetically modified (GM) products in supermarkets. GMO authorisations in the EU have been a source of controversy and have led to considerable public debate.

The European Commission has launched GMO-Compass to help consumers develop informed opinions on genetically modified food. To this end, the website offers explanations that are easy to understand to help demystify safety assessments. Unbiased, science-based background information will help foster informed debate on current issues in genetic engineering.

In addition, GMO-Compass offers users information about breeding aims, uses, and authorisation status for genetically modified crops in the EU. The 'Regulation' tab provides users with an orientation to the EU's policies on labelling and traceability. A comprehensive glossary offers explanations clarifying technical jargon often used by molecular biologists.

In the future, the Europe-wide scope of GMO-Compass will be complimented by national reports from individual Member States. Local correspondents will communicate aspects of the GMO debates in specific countries and connect users with local research projects and relevant public institutions.

CONTACT

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Experts and consumers may use www.gmo-compass.org to interact and contribute to the public debate on current issues in genetic engineering.

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MEMBERSHIP MATTERS

THE NEWSLETTER OF THE INSTITUTION OF AGRICULTURAL ENGINEERS

Human powered off-road vehicle exercise at Harper Adams

Teams of young engineers at Harper Adams University College have been battling it out to complete the Human Powered Off-Road Vehicle Design and Build Exercise.

Last month, seven teams completed nearly 23 weeks of work to design, build and develop human powered, off-road vehicles capable of traversing the 'long hill' on the Harper Adams off-road test track.

The task was for each team to drive their vehicles over the hill, carry the vehicle round the base of the hill and then, with a new driver, cross the hill again.

The vehicles ranged from a simple three wheeler with a single drive ratio to a tracked vehicle with questionable steering characteristics. One machine sported 147 possible drive ratios and another 105, even if a spanner was required to select any one of five ranges.

Geoff Wakeham, Consultant to the Engineering Group, said: "In spite of a series of failures to the commercial components, the students seemed to find the whole exercise great fun. The aim of taking a simple product specification through to a prototype machine demonstrated that a pirouetting 3D model on the computer is a long way from a working and robust product.

"The students did however get the opportunity to go through the whole process and get both their technical and practical skills stretched."

The trial started with the team 'AEMM for the stars' going like a rocket until drive failure produced an early withdrawal. A second run produced a creditable 2 minutes 26 seconds time. 'Belle Ends' managed to get further up the first hill before suffering a similar fate. Their second run was little better as their single gear ratio made the climb almost impossible before they escaped down the side of the hill. 'KISS' failed as a design principle.

The tracked 'Blind Deere' was the tortoise of the race but quickly sank into a mud hole due to its determination to stick to a straight line. On its second run with assistance at the edge of disaster and liquid refreshment, they managed to get over the hill but ran out of time after five minutes of furious peddling.

The winning team - Peter Nicholas Brown, Llion Wyn Davies, Gwion Tydu Hughes, and Jonathan Andrew Sykes - who made up 'No Name', with their vehicle.

'Dirt Track Riders' then showed that it was possible to complete the trial in style with a time of one minute and twenty eight seconds. A later second run produced a time of two minutes and eighteen seconds. The drive was close to its design limits but survived the ordeal.

'Landy Rovers', fitted with a roll cage, suffered early disaster when they slipped sideways into a deep pit and demonstrated that bicycle wheels are not designed to take high side loads. The wheels were realigned by foot but on a second run quickly failed again.

'No Name' managed a creditable run of 1 minute 45 seconds in spite of a jumping drive chain. Their second run showed an improved time of eighty eight seconds, one of the best of the day.

The 'Tour de Mound' team managed a flying start but gear change failure dashed their hopes. A second run clocked up a time of 122 seconds with excessive external assistance.

Mr Wakeham added: "The winners of the trophy were the team with No Name, and members Peter Nicholas Brown, Llion Wyn Davies, Gwion Tydu Hughes, and Jonathan Andrew Sykes. The students had an aggregate time of 202 seconds, 12% faster than the next team.

"However, the overall winners were all the students who took part with so much enthusiasm."

Harper Adams University College is the UK's leading university institution serving the rural and land-based industries.

SECONDMENT

Adam's Antarctic adventure

A member of staff at Myerscough College will soon be off on a chance of a lifetime expedition to the Antarctic.

Adam Eckersley, aged 24, from Much Hoole near Preston works as a Mechanisation Instructor at Myerscough College and is on a six month secondment starting in September until March next year. He has managed to secure one of only four sought after Plant Maintenance posts which are available each year. This involves repairing fixed plant machinery such as generators and mobile machinery such as skidoos, which are snowmobiles used to travel around.

Adam said: "I first got interested in going to Antarctica after a talk by the British Antarctic Survey at the Lancashire Farm Machinery Club of which I am a member. Some of my friends have travelled to Australia and New Zealand and I have always wanted to travel but never had the chance to go. When I found out that I had got the job, I was thrilled. It is such a great opportunity that was too good to miss."

He will be flying to the Falkland Islands in early September and from there will travel by boat to the Antarctic as the conditions are too dangerous to fly. On the journey home, he may have to travel back all the way by boat, which will take eight weeks!

There will generally be a normal working week for Adam with 8.00 am - 6.00 pm Monday to Friday and most weekends off. He has already been measured up for his 'survival suit' which he will wear when repairing machines in the freezing outdoor temperatures but most of the work will be in a workshop.

Adam Eckersley checking whether he's likely to fall off from where he's going unless he keeps a firm hold on the globe

In his spare time, Adam is looking forward to getting involved in some of the activities including snowboarding, rock climbing and skiing and seeing the penguins, seals, whales and other Antarctica wildlife.

When asked if he was nervous about his trip, Adam said: "My main concern is the food I will be eating! Boats bringing food supplies only arrive about twice a year so I will be on a high sugar diet to conserve my energy with no fresh food. Also, it costs £48,000 to send someone in to the Antarctic, so I have had to pass full medical and dental checks and it would only be in extreme circumstances that I would be allowed to come home. Christmas day will be strange as it will be the first time I have spent Christmas away from home but, generally, I am excited about the new experiences I will get."

"When I found out that I had got the job, I was thrilled. It is such a great opportunity that was too good to miss."

Those working for the British Antarctic Survey usually stay on the two main bases of Rothera Point, Adelaide Island, which is situated on rock or Halley on the Brunt Ice Shelf, Coats Land, which is built on a floating ice shelf. The station at Halley is the most isolated UK base and has to be moved back every few years due to global warming melting the ice.

The harsh weather conditions in Antarctica mean that the temperature is never above freezing with temperatures of -20?C in summer and -40?C in winter. It will be summer when Adam is there which means there will be daylight 24 hours a day.

Adam will be flying the flag for Myerscough and has promised to plant the College flag on the Antarctic! He will be keeping in touch regularly with his colleagues at Myerscough to let us know how he is getting on. One of the benefits of his excursion will be the money earned whilst he is out there, which he is saving for a deposit to buy a house on his return.

Adam will be coming back to work at Myerscough after Easter next year and will be giving talks about his trip to staff, students and external parties.

National Land-based and Environmental Diploma

From September 2009, a qualification designed by land-based engineering employers will be available to 14 to 19 year olds across England.

The Land-based and Environmental Diploma offers employers a rare opportunity to influence the content and structure of a national qualification. It will ensure that young people have the essential knowledge, capabilities and personal skills that employers need, giving them a fast track into their chosen career.

The development of the Land-based and Environmental Specialised Diploma is being led by Lantra, the Sector Skills Council. A consultation is now underway and Lantra is urging employers working in land-based engineering to have their say. To get involved, all you have to do is visit the new Land-based and Environmental Diploma website – **www.diplomalbe.co.uk** – and complete a short questionnaire. You can also sign up for the latest news on developments and be kept informed on new areas of consultation.

Peter Martin, Lantra Chief Executive, said: "The exciting thing about this new diploma is that it is designed by industry, ensuring that it is in line with employers' needs. It will give young people a real understanding of the practical skills and knowledge required to work in land-based engineering in the UK and help provide a steady flow of young recruits with the skills and attitude for work in the sector."

Lantra is also working closely with five partner Sector Skills Councils to ensure complete coverage of the industry sector. These are Improve (food), People 1st (hospitality), Skills Active (sport and leisure), Energy and Utility Skills and Construction Skills Ltd.

For further information and to pass on your views please call 0845 707 8007 or e-mail **info@diplomalbe.co.uk**. Further information about the specialised diploma is available on **www.diplomalbe.co.uk**

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eMapSite launches new generation digital mapping service

Plans Ahead is the latest online service from eMapSite providing the country's most up to date and detailed mapping based on the Ordnance Survey's 1:1250 scale MasterMap.

Environmental consultants, planners, consulting engineers, developers and surveyors are among the many professionals who will find this an invaluable service that provides instant access to the latest mapping, detailed aerial photography and environmental data for their project sites. The online service enables them to search, identify project sites, investigate, customize, print and export into their own applications.

Plans Ahead delivers the Ordnance Survey's latest OS MasterMap – the most detailed mapping available for GB, widely recognised as the definitive project base used by professionals. Users will also have access to the most recently captured aerial photography from other suppliers at the highest resolutions to best illustrate natural environment and real features.

With the latest on this exciting new service, James Cutler eMapSite CEO says, 'Plans Ahead has been developed to address the growing needs of our clients and continues to evolve, soon to provide access to key environmental data from a variety of new sources. Access to this new information coupled with the underlying OS base mapping allows users to quickly determine the suitability of each project site in an instant and without the need to invest in traditional environmental reports.'

CONTACT

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Oxford Bus Museum

"We've found a tractor!" went up the cry, although this was slightly unfair as we had not come to look for tractors. This was the summer outing, on Saturday 10th June, of the *West Midlands Branch* and the *Pioneering Technology Specialist Interest Group* to a small and dynamic motor museum, the Oxford Bus Museum.

It holds a well earned position as being a flagship transport museum. Its collection policy limits itself to buses and transport used within thirty miles of Oxford. This is not as restricting as it might seem. They have sixty or so vehicles. Many of their exhibits are in running order and part of the visit included a ride around the Oxfordshire countryside in a double decker bus. We all crowded onto the top deck of the bus. John Bradfield had last travelled in the same seat on the same bus when attending school quite few years ago.

John Bradfield with his bus

Our pre-arranged guided tour included their restoration workshop which will hold six vehicles. The oldest undergoing restoration was a sleeve valved Daimler engine bus with solid tyres and the Morris Motors band two level coach.

Within the museum is a separate museum dedicated to Morris motors, their founder Lord Nuffield and vehicles produced by and connected to the Morris Cowley plant. The frame of building used for this museum had been built from a salvaged part of the original factory building. This is the only museum dedicated to Morris cars and it was here that we found the Nuffield tractor which, for two years, had been built at Cowley.

William Waddilove
Chairman, Pioneering Technology Group

Up North – getting a head of steam

Yorkshire Branch members enjoyed an informal evening visit to the premises of the Great Northern Steam Company in Darlington.

This small engineering company is involved in all facets of steam engineering from model locomotives and traction engines, through to steam launch engines and building full size traction/showman's engines from scratch.

Members were able to see a range of work in progress through to completion, including half and full scale traction engines, and they heard of proposals to build a full scale steam locomotive.

The Great Northern Steam Company offers general machining and engineering services to any potential client - not just steam enthusiasts and can be contacted on +44 (0)1325 464616.

Steve Peirson
Chairman, Yorkshire Branch

Long service certificates

Name	*Grade*	*Date of Anniversary*
35 years		
Peter Worland **Woodliffe**	IEng MIAgrE	22 Jul 2006
Jeffrey George **Beck**	FIAgrE	22 Jul 2006
Richard David John **Lacey**	CEng FIAgrE	22 Jul 2006
William Thomas Roadnight **Lock**	IEng MIAgrE	22 Jul 2006
Michael Douglas Parry **Matthews**	IEng MIAgrE	22 Jul 2006
Leonard Bryan **Ollier**	MIAgrE	22 Jul 2006
25 years		
Christopher William **Plackett**	CEng MIAgrE	1 Jul 2006
Richard Charles **Osborne**	CEng FIAgrE	9 Jul 2006

News of Members

Professor Simon Blackmore left the Royal Veterinary and Agricultural University in Denmark in 2005 after five years spent developing a range of small smart machines and robots for the outdoor sector. These included an autonomous tractor, an autonomous weeder for small trees, and a smart seeder and weeder combination. Since then he has been setting up a spin-off company called Unibots Ltd to commercialise their results (**www.unibots.com**).

In addition to being managing director of Unibots Ltd, he has taken up a visiting Chair at the University of Thessaly in Greece. Simon says that he can recommend the business arrangements there, as when they want a group meeting, they drive a short distance up into the mountains and discuss their issues under the shade of an ancient plane tree, drinking coffee, overlooking the bay of Volos!

Organisation of the next (6th) European Conference on Precision Agriculture which will be held on the island of Skiathos in Greece from the 3rd to 6th June next year. The web site (**www.6ecpa.gr**) is now up and running and he looks forward to seeing Members in Greece next year.

This has been an extremely successful year for **Geoff Freedman**. Having won the 'Best PhD Poster' award at Napier University, School of the Built Environment, he went on to successfully complete his Doctorate in June.

His PhD research study title is 'The Development of Stress-laminated Timber Arch Bridges for Pedestrian and Minor Vehicle Use' and has resulted in the construction of some of the most innovative timber bridges, which will be of particular value to the forest industry and the rural environment. These bridges use short lengths of plantation size sawn timber to produce up to 24 m spans. They are material-efficient structures which will eventually be built for very low cost and, through modular construction, could have an impact in developing countries. One particular forest example is a 9 m span arch – 175 mm deep – which took 36 t forwarders for one year and has now been converted into an attractive footbridge.

During this intensive final academic year, while writing up the final thesis, Geoff worked full time for Forestry Civil Engineering and one of his many designs was an exciting treetop walkway in Salcey Forest. This starts at ground level, finishes at 20 m in the high canopy and provides all-ability access. This structure demonstrates all the aspects of timber engineering which Geoff has been involved in – including a stress-laminated timber arch roof. In June, this structure was short-listed in the final four (out of two hundred designs) for the British Construction Industry Awards (Small Civil Engineering). In July, it was short-listed in the final fourteen for the Prime Minister's 'Better Public Building' Awards. As Architect, Quantity Surveyor, Structural Designer and Engineer for the works, and as a Chartered Environmentalist, Geoff is rightfully very pleased with this achievement, which demonstrates the Forestry Commission's commitment in encouraging the Public to enjoy the forest environment – the facility being free of charge.

In May, at the AGM, Geoff received two Honours from the Institution of Agricultural Engineers, of which he is a Past President. Firstly, he received the Bomford Trust Award for an outstanding Paper, co-written with Professor Abdy Kermani, on Timber Recreation Structures (published in 'Landwards'). This paper dealt with the design of mountain bike 'north shore' structures, children's adventure playground equipment and stress-laminated bridges. He was later pleasantly surprised to find he was also to receive the 'Award of Merit' – the highest award the Institution can confer – for an 'outstanding contribution to the forest industry'. This Award is rarely given, previous recipients including Anthony Bamford (Mr JCB), and Helmut Claas.

On the 1st of November 2006 Geoff will receive the Bill Curtin medal, along with co-author A Kermani, from the Institution of Civil Engineers for the 'the best paper presented to the Institution of Civil Engineers describing innovative design in civil engineering'. This is a significant breakthrough for timber as an engineering material and stress lamination as a form of construction.

Arduous prototype testing with 36 t forwarder meets safety requirements for the next generation of heavier hikers traversing the conversion to provide an attractive footbridge (bottom)!

Although he has reached retirement age, Geoff has no intentions of hanging up his theodolite just yet. He intends to continue with the development of stress-lamination until he produces a long span all-timber bridge for 44 t lorries – and then he can concentrate on his golf!

Write to Tony with your news! His address is: 32 Beverley Crescent, Bedford MK40 4BY

Tony Chestney

Obituary

His son regrets to advise that **Ronald B. Jessop** passed away on 20th July, 2006 at Fairseat Home for the Elderly, in Nairobi, Kenya. His father was always very proud of his membership and long association with the Institution.

His participation in the field of Agricultural Engineering commenced immediately after the war with a leading role on the Ground Nut Scheme in Tanzania (then Tanganyika), then the Gal Oya Development Scheme in Sri Lanka (then Ceylon) followed by more than 25 years with the Food and Agricultural Organisation of the UN, covering land development and reclamation spanning South America, Saudi Arabia, the Emirates, through to Indonesia and Fiji.

Membership Changes

Admissions

A warm welcome to the following new members

Member

N R Macer (Perth)
A H Mosley (North Yorkshire)
R S Ruddell (Co Londonderry)
P R Thomas (Gwynedd)

Associate Member

M J Mulligan (Staffordshire)

Associate

M Ansell (Dumfries)
A J Ellis (Cornwall)
A J Haycocks (West Midlands)
I Riyah (Surrey)

Student

Cranfield University:
T Garcia-Suarez
A M Szczypinska
E G J Vitsitsi

Readmission

Associate

I N Scrafton (Cambridgeshire)

Transfers

Congratulations to members achieving a further phase of their professional development

Member

R T Borland (West Midlands)
A T Cragg (Kent)
I H J Cromie (Leicestershire)
B Hamilton (Peebles)
T C Lansdell (Suffolk)
J I Turnbull (Dumfries)

Associate Member

R R Georgison (Canada)

Death

J H Roberts (Hertfordshire)

Engineering Council

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

Registrations

CEng

I H J Cromie (Leicestershire)

IEng

P N Leech (Lincolnshire)
N R Macer (Perth)

EngTech

A J Franklin (Lincolnshire)
M R Stagg (North Devon)
M Willner (Shropshire)

Transfer

IEng

G Hayden (Oxfordshire)

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

Registration

CEnv

M Dresser (Bedford)

European Federation of National Engineering Associations

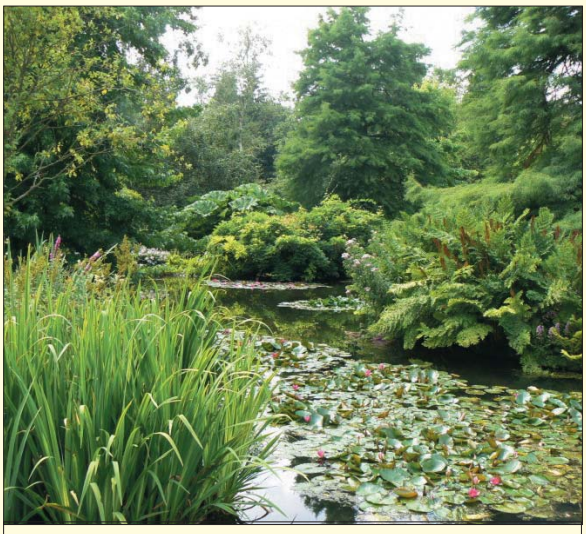
Congratulations to the following member who has met the criteria for European Engineer, entitling him to use the designatory prenomial Eur Ing

Registration

Eur Ing

S R Hunt (Somerset)

Leckford Estate tour



The famous Water Gardens on Leckford Estate

Members in the south had a summer day visit to the 1600 ha Leckford Estate, part of Waitrose, the food store for the John Lewis partnership. Farm director Malcolm Crabtree gave us an excellent presentation as we rode around the estate on the tour trailer.

We had a superb visit to this excellent working farm, with modern milk processing plant, free range poultry, cereals, poppies (for morphine production) and orchards. A 600 cow, £3 million, milking and dairy cow housing unit was nearing completion. It has a 48 cow rotary milking parlour. We also had a most interesting tour of the mushroom production unit.

The estate has four river keepers maintaining the five miles of the River Test flowing through the middle of the estate, the river is famous for fishing and, looking into the clear water, we could see trout and other fish in abundance.

We took lunch in the open at the beautifully located 'Mayfly' situated on the banks of the Test.

In the afternoon, the tour continued to the famous Water Gardens only open to the public on a few days of the year. The lilies, lakes and streams were a joy to see. Far more impressive than the water gardens in France made famous by Monet, claimed those who had seen both.

We took tea at the plant nursery and visited the farm shop.

We were only allowed 34 people on the visit because this was the tour trailer's capacity. So, apologies to all those who were on the waiting list for whom a place was not available.

Denis Welstead
Visit Organiser

The Trantor

The final technical meeting of the *Wrekin Branch* for the 2005/6 season took place on the 8th May at Harper Adams University College. This took the form of an informal presentation by Mr Graham Edwards of Trantor International Ltd that included on going debate throughout the evening.

Mr Edwards presented a history of both the Trantor tractor and the British tractor industry over the past 30+ years. The realisation in the late 1960's, early 1970's, that the traditional agricultural tractor spent 70% or more of its time in 'transport' mode led to the development of a light, low cost, high speed rural transport vehicle able to perform many of the functions of the heavy draught tractor. The ability to plough, seen by many as one of the prime requirements of a tractor, was reduced to a secondary function. "Do all fighting vehicles need heavy armour?" was a question posed by the audience by way of a comparison.

As a result, the Trantor tractor was put into production but failed to get the support of a major producer so the numbers built were limited. In retrospect, the marketing strategy was possibly aimed at the wrong market. Though UK farmers, who bought the early machines, were aware of the advantages of such a tractor it might have been better to concentrate on overseas markets with poor rural transport systems. These markets demand a low cost, versatile machine such as the Trantor, used for both business and social transport and not primarily aimed at heavy draught work.

During this period, the UK tractor industry declined from a major exporter with sales of 150,000 per year to some 25,000 per year projected for 2006. Mr Edwards put this decline in part to the loss of local control of the manufacturing plants. This prompted some discussion from the audience. Currently, India produces some 285,000 tractors a year while in 1978 the level of production was nearer 58,000.

This transfer of engineering production is not confined to agricultural tractors and is evident throughout the UK's manufacturing industries. To survive in this changed environment, UK engineers need to adjust their expectations and sell their expertise rather than hardware to these new centres of manufacture. This should be based on a first class education and UK based research and development. Trantor International Ltd. has taken this approach and now focuses it's technical and research effort to:

- improve tractors and factories already in tractor manufacturing;
- extend market research to a better and wider product range; and
- help develop an acceptable export model range for its clients, partners and licensees around the world.

To this end they are working with a number of overseas partners and developing new designs based round the original concept for both developing countries and advanced specialist users. Mr Edwards analysed a number of overseas markets and outlined specifications for transport-first tractors that would find a market large enough to justify the investment needed to enter that market.

Mr Edwards summarised his views on what was required for success of a British-owned firm. It needed to have a long term business plan aimed at international markets, be based in the UK with access to highly professional engineers and a sound market research and product development capability, continuously update its technology, seek to take market share from traditional large scale suppliers and be pleased to pay UK tax on its profits. He did *not* consider that production needed to be based in the UK.

The Trantor in use in India

The evening closed with a discussion on the problems for the UK industry posed by the significantly reduced higher education provision, the closure of Silsoe Research Institute and the loss of industry-specific government support. If the UK is to strengthen the professional agricultural engineering base working nationally and internationally, then a coherent plan of action is required. This needs to find ways to attract good engineers to the industry, provide extended Higher and Further Education opportunities and facilities, instigate and finance industry wide research and coordinate overseas activity.

Mr Edwards provided a stimulating end to the Wrekin branches 2005/6 programme. This harked back to lost industrial empires but challenged current UK agricultural engineers, including the IAgrE, to fight for an exciting future around the world.

Geoffrey Wakeham
Press Officer, Wrechin Branch

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Mill Meece Water Pumping Station

Members watching the start up of one of the main pumping engines

On Sunday the 16th July 2006, sixteen friends, family and members of the *Wrekin Branch* of the Institution of Agricultural Engineers visited Mill Meece Water Pumping Station in Staffordshire. The steam driven pumps were fired up for the occasion.

The station was built just before the First World War and pumped water to the Pottery Towns using steam until 1979. The use of steam was justified on the basis of reliability and an expected life of 25 years. Until 1966, the 70 t of coal required to pump the 2 million gallons of water a day, against a 530 head, was stoked manually.

The 90 ft long engines and ram pumps were impressive in how quietly they ran. This was in contrast to modern free standing power plants. Some of the younger visitors were frightened by the massive size of the moving parts and the heat of the boilers when the furnace doors were opened. Maybe this will turn into a passion for engineering, as they grow older.

The interests of the day included a rally of vintage motorbikes and a number of small stationary engines parked in the station yards.

For those interested in early 20th century engineering, a visit to Mill Meece is well worth while and details for opening times and location can be found on **www.millmeecepumpingstation.co.uk.**

Thanks go to Simon Cooper for suggesting the visit and getting us together for a fascinating few hours on a glorious summer day.

Geoffrey Wakeham
Press Officer, Wrechin Branch

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AGRICULTURAL ENGINEERING OVER MY FIFTY YEARS

Dan Boyce

Early years

I was born and brought up in a small town in the South West of Quebec, Canada. My father was a farm machinery dealer and my uncle farmed near by. At an early age I helped with both enterprises. In the late 1930' rubber tyred tractors began to replace steel lugged wheel tractors and pto drives and hydraulic mounted implements were becoming available. Before leaving for college I undertook high tech jobs, such as servicing milking machine pulsators and binder knotters.

My Uncle's farm had around thirty cows, all milked by hand. There was no electricity and the only mechanical power, a gasoline (petrol) engine driving a water pump. The milk was cooled during the summer using ice which was cut from the river in winter and stored insulated by sawdust.

Side-delivery rake and hay loaders where great innovations in the 1930's, replacing the simple dumping rake, hay coils and then the very hard work of forking the hay on to a wagon. Rubber tyres were replacing wooden steel rimmed wheels on farm wagons and carts. With this machinery and two horses over a period of six weeks, my uncle and I managed to harvest and store – in the loft above the cattle stable – over one hundred loads of hay. I suppose a load hardly exceeded a ton. When the weather was favourable, we began work in the stable at 6 a.m. and didn't finish work until around 9 p.m.

Study

I went on to attend Macdonald College, McGill University (1947 –51). The first two years there was a science curriculum, common to all degree students. In my third year I enrolled in a new option, Agricultural Engineering. While there was a general awareness of technology in transit, staff were reported to have seriously discussed whether horse shoeing should be a part of our practical work! Farm building and land drainage were important parts of the curriculum. On graduating from Macdonald College I accepted a Colonial Probationership for an MSc in Agricultural Engineering at Newcastle-upon-Tyne. Here, I acquired a taste for Newcastle Brown Ale.

There was the Great Expectations that Newcastle would become a serious centre of Agricultural Engineering. Early soil mechanic work by Peter Payne and Bill Willets provided the basis for subsequent academic studies and the commercial development by Alan Reece in undersea cable laying ploughs.

I spent six weeks during the early summer of 1953 at National Institute of Agricultural Engineering (NIAE). We students slept in army bunk beds, in huts north of the Chinese Bridge. The emphasis of work at Wrest Park was machinery testing.

Career development

Newly married and employed by the Department of Agriculture, Federation of Malay Malaya 1953. The Emergency was then a reality but early independence was expected. I was responsible for Workshop & Pool at Serdang, Selangor. Initially, there was a staff of about forty made up craftsmen and mechanics. There was a responsibility for the equipment being used on Agricultural Research Stations throughout Malaya and principally to develop and investigate equipment suitable for *padi* mechanisation.

I carried out investigations into drying *padi* and coffee beans using wasted heat from an intemal combustion engine driving a fan. This approach worked well but the management requirements of such systems made them impractical. The principal agricultural engineering activity was an attempt to mechanise wet land *padi* cultivation with tractors and equipment developed for UK dry land conditions. *Padi* growing was carried out in very small fields, often only a fraction of an acre, evolved for traditional manual and animal husbandry with technically unsophisticated labour. The fields were either extremely wet or under water and consequently traction was very poor. There were also deep holes and very frequently water entered the tractor engine or transmission. Such an approach could not succeed though it was not apparently obvious to anyone at the time, let alone a newly graduated agricultural engineer. In 1956, I saw no long term future in the Colonial Service but had a continuing interest in tropical agriculture.

BIO NOTE

Dr Dan Boyce CEng FIAgrE was founder of the Systems Department (later, Operational Research) at what was then the National Institute of Agricultural Engineering and later Silsoe Research Institute. He was awarded his 50 year long service certificate of membership of IAgrE in 2004 by the Immediate Past President Peter Redman and, by way of acknowledgement, offers this insight to relevant aspects of his career and important reflections which remain equally relevant to the management of current research and development activities, despite the closure of his former workplace. He is currently enjoying his retirement in Cumbria.

Change of location

In 1958 I joined the Department of Agricultural Engineering, College of Agriculture and Mechanic Arts, an American Land Grant College and part of the University of Puerto Rico at Mayguez. I taught farm mechanisation to agricultural students and carried out development work, initially in coffee processing and then sugar cane harvesting mechanisation. The approach to introducing mechanical harvesting of sugar cane, with machinery developed for very different sugar cane crops grown in very different conditions in the USA and Australia, to Puerto Rico, where the crop and field conditions had been developed around hand harvesting, were unsuccessful.

My experience with unsuccessful attempts to mechanise tropical crops by importing machinery and equipment developed for temperate agriculture, with different field systems and soil conditions and with a relatively technical labour force and rural infrastructure, was a common feature of attempts post World War II, to increase agricultural production in underdeveloped areas. The long forgotten Ground Nut Scheme was one of the earliest of many such attempts. I hope that by now the lessons from these failures have been learned. To be successful, all the parts of an agricultural cropping system – field layout, land tenure, machinery and available technical know how subjected to the restraints of climate and soil – must all either have evolved or been designed to work as an integrated system that yield a positive economic return. Now, there is the additional mandatory requirement that the system must be sustainable and not degrade the environment.

Doctoral studies beckon

In 1963, I had study leave from the University of Puerto Rico for PhD studies in the Agricultural Engineering Department, Newcastle-Upon-Tyne. At that time the department was probably at its highest point. There were well supported undergraduate degree courses in agricultural engineering and farm mechanisation. The two year MSc in Agricultural Engineering was well subscribed to and there were several Ph.D. students. The principal area of research was soil dynamics, either aspects of traction or the interaction of the soil with an implement under Alan Reece.

I had a very enjoyable three years at Newcastle. I was fortunate that for the first time serious, reasonably simple to programme computers were available. As a consequence, I was able to be, to the best of my knowledge, the first person to demonstrate the feasibility of providing an understanding of the interaction of heat and moisture transfer in a deep bed of drying grain by means of a computer simulation. While within ten years computer simulation of the drying process was an accepted part of crop drying studies and management, it is worth noting that, at the time, it was generally derided as being utterly without any relevance to actual crop drying.

I supervised a number of MSc students' dissertations which provided experimental understanding of air flow in deep beds of grain being dried with ambient air and another which suggested that the exhaust air temperature from a high temperature drier would provide the basis of a control system. This is now the basis for most drier controls.

Onwards and upwards

During 1969, I joined the National Institute of Agricultural Engineering, later known as the Silsoe Research Institute (SRI), as founder of the Systems Department, later renamed Operational Research. Initially, there was general doubt, myself included, as to what the Systems Department was about. It is, however, gratifying that Operational Research continues and that the first two qualified maths/operational research (OR) graduates who I initially appointed, Eric Audsley and David Parsons are still in post and the OR has had a serious and, I believe, worthwhile role.

The initial role of the Systems Department was to evaluate the feasibility of proposed and ongoing research and development projects especially in economic terms. This created quite a lot of problems as to begin with there was no general acceptance of any analytical approach to agricultural systems, let alone an acceptance of computer based operational research. There was a general feeling that only valid conclusions could be obtained from field experiments with little consideration being given to whether or not they were either repeatable, or of statistical significance.

One of the first difficulties to overcome was for the management to accept that professional staff should use a computer keyboard rather than to delegate such work to support staff.

Difficulties surmounted

One of the first difficulties to overcome was for the management to accept that professional staff should use a computer keyboard rather than to delegate such work to support staff. While the operational research studies did not result in any single outstanding result, I do think that over the years this work contributed to a much better understanding of the importance of timeliness in agricultural field work. While the importance of timeliness in this type of fieldwork was being gradually intuitively appreciated, the OR studies did a great deal to confirm and quantify the value of timely field operations. The economic importance of the need to carry out postharvest cultivations and the establishment of cereal crops was quantified. At that time, consideration was being given to the development of tillage equipment to work under the unfavourable field conditions of late autumn and winter regardless of the agronomic and economic consequences.

During my last few years at Wrest Park, I was also responsible for Crop Drying and Spraying. I found it very gratifying to see how Martin Nellist had developed the initial computer heat and mass transfer models, extending them to dynamic beds with either mixed, counter or concurrent flow dryers. These models not only provided a better understanding of these drying processes but also enhanced and extended the results from tests of actual dryers. Martin Nellist's contribution to grain drying achieved international recognition.

When Martin Nellist retired from Wrest Park, work on crop drying was terminated. While this may have been justified on many grounds, as far as I know no provision was made to maintain the computer models, keeping them up to date. This would have meant that they could be used with computers with up to date operating systems, or could have been

made widely available for general use. I believe that this is something of a general problem with current research and development projects, when based on a computer model which may have taken many man/woman years to develop and represents valuable intellectual property, with perhaps applications in many parts of the world.

Survival and prosperity

I am pleased to see that the spray work, now Chemical Applications, under Paul Miller has achieved such a worldwide reputation for this group. Initially when I became concerned with this work, it was very development orientated with the main emphasis being on sprayer boom suspension. This work had prospered during the previous decade when the width of spray booms had significantly increased and the need for more sophisticated suspensions was indicated. During this period there is no doubt that a very worthwhile contribution to the solution of this problem had been made but it was also apparent that further work on this aspect of spraying would be subjected to diminishing returns. The work of the Chemical Application Group was subsequently redirected to provide an understanding of spray droplet formation and the movement of spray droplets. I understand that over the last decade this work has provided a much better understanding of spray drift and consequently ways to control and reduce it.

In retrospect

I can look back on a varied and satisfying career in interesting parts of the world. It is my experience that there has been a great deal of misunderstanding by senior management, be it executive and non executive and the interested public, in what research and development is and its limitations. These misunderstanding have the consequences of greatly reducing the effectiveness of these activities and have, on occasions, been very frustrating for the personnel concerned.

There has been frequent confusion as to the difference between research and development. I believe that the purpose of research is to produce original information which provides a better understanding of a physical phenomena. On the other hand, development is directed at producing some device or process. While research frequently provides the basis for improved devices and processes, these require a specific development stage. Without this understanding, potentially useful research can be discarded as being of no interest. This is unfair to the staff concerned.

A 'sometimes' attitude of senior management and the interested public, that has a serious consequence on the choice of research and development work, is their attitude to the risk of possible eventual failure. A great deal of research, by its very nature, does not produce the anticipated result. While there must, on initiation, always be great expectations of success, much research and development does not achieve at least initially the anticipated result. One approach to minimise the risk of an unsuccessful result is not to undertake work which would significantly depart from the *status quo*. Most serious technological advances, however, have historically been carried out by individuals despite the active opposition of the current establishment, for example tractors and jet engines. While with finite resources decisions must be made between different proposals, it should be appreciated that if there is no risk in achieving a specific result, there in no point in devoting resources to it. It's only the difficult and risky endeavours that have the potential to be worthwhile.

Related to a misconceived ideal that research and development can be carried out without the risk of not achieving the specified result, is the tendency to 'spin' such unfavourable results to create a favourable impression. This can have the unfortunate consequence that no appreciation is given to the actual results achieved and whether the work was carried out competently. On occasions, at a later date due to the lack of a clear statement, similar work may be repeated with the same unfavourable result.

Another aspect of publicly funded research and development is that while satisfactory functionality is a necessary precursor, it is not the *only* requirement for a successful commercial development. Publicly funded developments are usually carried out by technically sophisticated personnel, not overtly subjected to financial and market restraints. In contrast, if such developments are to be commercially viable they must be manufactured and marketed by a commercial organisation with probably less technically sophisticated personnel who are much more aware of, and are restrained by, economic and marketing considerations. Unfortunately, this contrast between staff background and the different cultures of public and commercial organisations are frequently not conducive to successful joint ventures. On occasions, commercial organisations have thought that if they obtained an interest in a publicly funded development, it would be financially rewarding with little technical input on their part to further develop a marketable product. They were usually disappointed but were unwilling to recognise their technical deficiencies were, at least in part, contributory.

There are many other aspects of research and development management which are of great importance. I feel, however, that the three I have raised, namely: the attitude to the risk of an unsuccessful result; the candid and constructive reporting of such a result; and the difficulties of public and commercial organisations to carry out joint developments, are of considerable national importance and have not been given the consideration they require.

Retirement

Now I am comfortably retired in north Cumbria. I cycle most days along the Hadrian's Wall. This is an upland area with sheep and suckler beef. Forage is conserved as silage is rolled in plastic wrapped bales by high capacity contractor machines. The most used machines are quad bikes whose origin was a recreational machine! Medium sized tractors with front end hydraulic loaders handle the bales and load and spread the slurry and manure from the cattle sheds. Even thirty years ago quad bikes and plastic wrapped round bailed silage were unheard of. I wonder what farm machinery will be used thirty years from now?

I believe that the purpose of research is to produce original information which provides a better understanding of a physical phenomena.

PUBLICATION REVIEWS

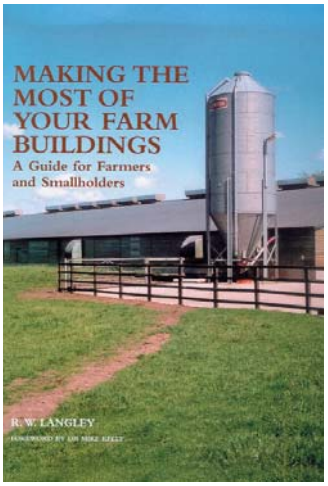
FARM BUILDINGS

Making the Most of your Farm Buildings

Author: Richard Langley
Publisher: The Crowood Press, Crowood Lane, Ramsbury, Wiltshire SN8 2HR E-mail: enquiries@crowood.com
ISBN: 1861268467
Price: £19.95 hardback 192pp

It only needs a quick scan to realise the skill of the author not only in logically structuring the text but also in imparting practical guidance on building planning and construction from a background of personal experience honed by instructing students on his lecture courses. This practical book presents a wealth of useful information in a concise style to all those with farm buildings in need of renovation, reconstruction or diversification.

The book is well-illustrated with some 57 monochrome photographs and 50 line diagrams, visually demonstrating the 'rights and wrongs' of designs and practices. Topics examined include: legal aspects relating to the construction and environmental impact of farm buildings; traditional and new farm structures; constructional materials; foundations, walls, floors, roofs and frames; water and electricity supply, lighting and drainage; heating and heat loss from buildings; natural and forced ventilation systems; measurement of the building environment; conversion of existing farm buildings into



structures with new uses; and health and safety.
The book includes a comprehensive glossary and index, essential refinements for readers who may be unfamiliar with all the modern acronymic jargon of a different trade and who want direct access to information or specific solutions without reading a text from cover to cover.
The son of a dairy farmer, *Richard Langley* is a graduate in agricultural engineering and holds an MSc degree in Building Conservation. Richard was a Senior Lecturer in Agricultural Engineering at Writtle College, Chelmsford, for nearly twenty years and dealt with both the theoretical and practical aspects of the subject. He has written numerous technical articles on building design and is now a self-employed agricultural engineering consultant.

BDW

AIR QUALITY

Mosses indicate air quality

Guideline VDI 3957 Part 12: Biological measurement techniques for the determination and evaluation of the effects of air pollutants (bioindication) – Mapping of diversity of epiphytic bryophytes as indicators of air quality

The revised Guideline VDI 3957 Part 12 *'Mapping of diversity of epiphytic bryophytes as indicators of air quality'* has been published by the Commission of Air Pollution Prevention of VDI and DIN – Standards Committee KRdL. It describes a method of bio-indication that specifies the diversity of epiphytic mosses. Therefore the frequency with which moss species are found on a defined part of the tree bark is determined. The observed frequency of occurrence of moss species is combined with the sensitivity data of the respective species. The procedure described in the Guideline is a quick, cost-efficient method to outline zones of different air pollution.

Due to their anatomy and physiology epiphytic mosses react particularly sensitive to air pollutants and have been in use as bio-indicators of air quality for decades. While concentration measurements provide solely data on the amounts of individual air pollutants present in ambient air at the time of measurement, mosses yield insight into the combined effects of all biologically relevant environmental factors. In addition, they have the advantage that each species reacts with a different degree of sensitivity so that from the presence of certain species conclusions on ambient air quality can be drawn.

CONTACT

The Guideline VDI 3957 Part 12 is available at the price of 62,20 from Beuth Verlag, Germany. Tel: +49(0) 30 26 01-27 59. The VDI guideline is released in German and English language. For online orders and further information please refer to www.vdi-richtlinien.de or www.beuth.de

SUSTAINABLE FORESTRY

Revised forest mensuration handbook

Forest mensuration - the assessment of the sizes, shapes, volumes and biomass of trees, forests and felled timber - is a key skill vital to sustainable forest management.

Now the Forestry Commission has published a new edition of the 'forest mensuration bible' to update the advice and guidance on forest mensuration procedures. The first edition of the book, first published in 1975, has served as an industry standard manual for more than 30 years and is still in regular use by the forestry and timber industries, scientists and researchers. It has also influenced thinking on the presentation of mensuration procedures in other countries.

The new book is written by Robert Matthews and Ewan Mackie of Forest Research, and is entitled *'Forest Mensuration: A Handbook for Practitioners'*. Robert Matthews noted, "We have tried to preserve what was best about the original classic text, while introducing new material to address the needs of modern forestry. Overall, we have aimed to cut through some of the complexities of forest mensuration by making the text easy to read, providing a logical format, and giving additional advice to help readers find the information they need as easily as possible".

A major change is made in the discussion of procedures for assessing standing volume, where low-cost abbreviated tariffing procedures have been incorporated alongside a simplified set of the methods published in the first edition.

Another important revision deals with assessment of wood quantity by weight, where the procedure for assessment of volume from weight has been expanded and now gives more prescriptive guidance. A new procedure for assessment of dry weight - which is particularly relevant to the growing wood fibre and energy sectors - has also been included.

MORE INFORMATION

'Forest Mensuration: A Handbook for Practitioners' is priced £24 and can be ordered from Forestry Commission Publications, PO Box 25, Wetherby, West Yorkshire, LS23 7EW. Tel: +44 (0)870 121 4180. Quote stock code FCBK039.

GREENSPACE

Website promotes 'best practice' land regeneration

A new website launched this month marks an important step forward in efforts to convert the United Kingdom's legacy of derelict, contaminated and brownfield land back to usable woodland and green space.

The Forestry Commission, which has developed considerable expertise in regenerating land to woodland and green space over the past 40 years, launched the website to bring together advice on current best practice into a convenient, one-stop-shop package.

Commissioned by Forestry Commission England and drawing on research and development by Forest Research, the Commission's research and development agency includes eleven 'Best Practice' guidance notes. These cover various aspects of land regeneration and the 'greening' of urban spaces. Topics range from soil sampling and testing to weed control and the use of fertilisers, composts, sewage sludge and native and non-native trees. More Guidance Notes will be added to the suite over the next two to three years.

The Head of Forestry Commission England's Land Regeneration Unit, Chris Robinson, said, "The United Kingdom has an estimated 300,000 ha of contaminated land. Hundreds of thousands of hectares are also lying derelict and unused because of the legacy of previous development on it. For example, it is estimated there are 66,000 ha of unused, previously developed land in England alone.

"The presence of damaged and disturbed land is also frequently linked to areas of social deprivation, where unemployment levels are high and environments are poor. Woodland and other greenspace can vastly improve the appearance and perception of an area, which is a key factor in encouraging investment to a region.

"So this is a huge untapped resource that could be used to establish high-quality green spaces and improve the lives of millions of people. Although commissioned by Forestry Commission England, the website has been developed for a UK audience, because Scotland, Wales and Northern Ireland have a similar need for the expertise that it brings together. We believe it will also be relevant to other countries that face similar issues."

Formerly developed land, especially former industrial land, can be contaminated with chemicals such as heavy metals, arsenic, cyanide, asbestos, polychlorinated biphenyls (PCBs)/dioxins, herbicides, pesticides, solvents and explosives. Such land needs phased investigation and appropriate remedial treatment to make it safe for use, to protect local rivers, streams, ponds, lakes and water supplies from pollution, and also, often, to make it fertile enough to grow trees and other vegetation on it.

The site includes protocols for the commissioning of phased investigation to ensure that developers capture a site's opportunities and constraints, including such factors as archaeology and biodiversity.

Industries that can leave a legacy of contaminated land include collieries, gas factories, welding workshops, foundries, wood treatment plants, mines, building sites, refineries, petrol stations, paper mills, textile laundering plants, waste incinerators, ammunition factories and landfills.

The site also promotes the new 'roots' decision-support software that was commissioned by Forestry Commission England, with support from a range of other organisations, to provide bespoke specifications for land remediation projects. It is designed to apply best practice to the specification, scheme design and tendering processes involved in the creation of attractive, sustainable and multi-functional greenspace.

MORE INFORMATION

Jenny Claridge, Forest Research. Tel: +44 (0)1420 22255. E-mail: jenny.claridge@forestry.gsi.gov.uk Website: www.forestry.gov.uk/landregeneration The Guidance Notes are available from the website and also as paper packs.

CROP PROTECTION

Direct chemical injection speeds Amistar application

The Direct Chemical Injection (DCI) system from Techneat Engineering will speed up Amistar in-furrow application during potato planting operations, improve accuracy, avoid waste and reduce the risk of nozzle blockages. The DCI unit fits neatly onto the potato planter and precisely meters Amistar into the spray line at the point of application.

The system's designer, Tom Neat, said: "To avoid the risk of nozzle blockages operators have previously had to flush through applicator spray lines with clean water and drain the tank of any pre-mixed Amistar overnight – or even during lunch breaks and rain hold-ups. Now, with the DCI system, chemical is precisely metered and mixed only as the machine is working, so the spray tank and spray lines always remain clean.

"DCI saves time and reduces the risks of mixing spray in the field, as well as the need to repeatedly drain out and rigorously clean equipment. There is no unused pre-mixed spray to handle, store or dispose of at the end of the day."

New Techneat Direct Chemical Injection units will improve accuracy, speed up operations and avoid waste with Amistar application during potato planting

The Techneat DCI unit is fitted with a high capacity 20 litre tank, to treat over six hectares during potato planting. Operators can use conventional Amistar packs, or returnable LinkPak® containers through the coupling fitted as standard.

The Techneat DCI system is an optional extra to both the company's 90 litre and 250 litre capacity Amistar applicators and can be simply retro-fitted to all existing Techneat Amistar application machines. The DCI system costs £690.

Mr Neat added that Techneat Amistar application equipment gives growers the flexibility to build a machine bespoke to their specific requirements. The 90 litre machine starts from around £1100, including a fixing kit individually designed for the different makes of planter available. Growers can then specify options including additional rows, automatic on/off switching, remote pressure gauge and flow indicator.

Techneat is also the only manufacturer to offer a physical flow indicator, which will instantly alert operators to any change in application rate, long before simple blockage indicators come into effect.

CONTACT

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VEHICLE CARRIER

Novel use of Morooka tracked carrier

Cautrac of Colchester in Essex, the sole UK importer of the Morooka range of the 2.5 - 17 t payload tracked carriers, has supplied a model MST800VD to Jones Engineering for use as the prime mover for one of its 'Positive Selection' parsnip harvesters.

Doncaster based Jones Engineering designs and manufactures specialised agricultural machinery and was looking for a suitable vehicle to which it could mount one of the harvesters for use on a farm in Southern Ireland where ground conditions make it virtually impossible to use conventional wheeled tractors.

The marriage of the two pieces of equipment has proved highly successful and the customer is now able to lift approximately 1 t of parsnips every 10 minutes compared with the previous manual system which took up to 40 minutes to accomplish the same production rate.

Model MST800VD in use as a 'Positive Selection' parsnip harvester

The Morooka MST800VD is normally equipped with a tipping body capable of carrying 4300 kg but, in this case, the main attraction to Jones Engineering was its ultra-low ground bearing pressure of just 14 kPa, made possible by the machine's 600 mm wide rubber tracks.

The machine is powered by a Mitsubishi diesel engine developing 86 kW at 2800 rpm and features an hydrostatic steering system that allows the driver to perform super smooth changes in both direction and speed, again to minimise ground damage.

MORE INFORMATION

Mark Dutton, Cautrac, The Causeway, Great Horkesley, Colchester, Essex, CO6 4EJ. Tel: 44 (0)1206 273111

AWARD

Queen's Award to Industry for International Trade: Micron Sprayers Ltd

Micron Sprayers Limited is delighted to have won the Queen's Award to Industry for International Trade to add to an earlier Queen's Award for technological innovation.

Micron is a small family owned company that has been located in the Bromyard town of Herefordshire for over 35 years. However, it sells worldwide - with over 90% of production exported (regular sales to over 60 countries).

Micron was founded to improve crop protection techniques and equipment, with particular emphasis on the Third World. The majority of Micron's production is of hand-held sprayers for smallholder farmers, particularly in sub-Saharan Africa where the introduction of Micron's low volume 'Controlled Droplet Application' equipment is viewed by many, including the World Bank, as one of the rare success stories in agriculture in this region in the last 40 years. Micron sprayers are widely used by some of the world's poorest countries and people. They are also now the world's leading supplier of application equipment for control of migrant pests, primarily supplied to governments and aid agencies, with their sprayers in the forefront of the recent battle to halt the last desert locust plague in Africa in 2004-5. This equipment is also supplied widely to the Middle and Near East.

Micron has won numerous awards for its international activities including recognition of its long-term commitment to sustainable development stemming from the dedication of its founder, Edward Bals.

After more than 50 years, Micron continues to be at the forefront of innovation in equipment for crop protection. Developments in the last few years include:

- sprayers for public health;
- shielded sprayers for weed control;
- a range of weed wipers;
- sprayers for variable rate application of agrochemicals using GPS systems;

novel spray nozzles and atomizers; and sprayers for poultry vaccination.

However, Micron's core business remains hand-held sprayers for smallholder farmers in sub-Saharan Africa. Micron has increased sales in sub-Saharan Africa despite the huge problems faced by agriculture in this area. In particular, low commodity prices - caused at least in part by subsidies in developed country agriculture - and enforced liberalisation of input supply, leading to huge problems in ensuring timely provision of good quality sprayers to smallholder farmers in many countries. Micron's Chairman Tom Bals said: "Micron is delighted to have won this award. We are proud to have been able to help Third World agriculture, particularly smallholder farmers in sub-Saharan Africa, overcome some of the potentially devastating pest challenges they face in protecting their crops and thereby help to protect agricultural production and incomes."

CONTACT

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SPEED CONTROL

Same Deutz-Fahr UK introduces Stop-Go

Same Deutz-Fahr's Stop-Go system has been designed to allow easier and more precise tractor control for a wide range of operations.

Tasks such as loader work, vegetable planting, potato harvesting and even round baling could all benefit from its use.

Stop-Go, which is now available as an option on Dorado, Lamborghini R2 and Hurliman XA tractors, uses an electronic management system which allows the brake pedal to be used to provide precise speed control. It becomes, in effect, an inching pedal with speed control.

A button on the dashboard activates the system and, its operation is relatively simple, although most drivers say a few hours familiarisation is required to fully exploit its potential.

Stop-Go system from Same Deutz-Fahr allows easier, more precise tractor control for a wide range of operations

Stop-Go works like this: The driver selects his choice of gear ratio - on the Dorado there is no need to declutch, there is a button on the gear stick to do this - and then the shuttle lever is put in, say forward position.

The tractor then moves off conventionally but should it be required to slow down or stop the driver merely presses the brake pedal progressively and the tractor slows accordingly. A creep speed can be maintained or, should it be required, the tractor can be brought to a halt.

Releasing the brake pedal allows the tractor to gradually return to normal speed, once more.

The advantages of the system are obvious - it allows the tractor when loading a trailer, for example, to be inched forwards – or backwards - so that the loader arms are correctly positioned. Where precise speed control is needed for operations such as vegetable harvesting, speed can be adjusted without affecting engine or pto speed.

The Stop-Go system puts about another £2800 onto the list price of the tractor.

CONTACT

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RAKING SYSTEMS

PowerRake™ makes short shift of concrete

Somero enterprises have invented *the* solution for freshly poured concrete. Its called the PowerRake™, a time and labour saving device.

PowerRake takes the back-breaking work out of raking freshly poured concrete. It is a one-man laser controlled, four wheel drive ride-on-raking system designed and build to deliver better and faster results. It significantly reduces the time needed to set up floors for screeding. The workers will get closer to a finished grade using the PowerRake, delivering more accurate results than ever before.

PowerRake is a one-man laser controlled four-wheel drive ride-on raking system which delivers better results in less time

The PowerRake has a unique design that allows a single operator to ride the machine and rake the dumped concrete down to grade in less time, with no manual labour. It can grade material to +/- 0.5 cm accuracy using a laser referenced plough blade. It rakes and maintains an even height of concrete across the entire placement area and is designed to work with all screeding equipment: from the 2" x 4" to the handheld vibrating screeds on up to the Copperhead™ Laser Screeder and even the large Laser Screeds. By reducing the time it takes to place a floor, the PowerRake reduces workers fatigue, leaving them fresher for the finishing touches to the floor.

It has a four wheel drive system and rugged power train with plenty of traction means that it can work in varied depths and different slumps of concrete. A combination of power and hydraulics allows the machine to move a lot of mud around. It can perform equally well when driving in either direction and it pushes and pulls concrete around with ease - no matter what the slump. It has a tight turning radius meaning that the workman can work in close proximity to the screed as well as in a smaller space and in tight spots.

The PowerRake - an essential part of everyday concreting - works faster, delivers better results and reduces overall physical efforts.

CONTACT

Somero Enterprises Ltd, Broombank Road, Chesterfield Trading Estate, Chesterfield, Derbyshire England 541 9QJ. Tel: +44 (0)1246 454455 Fax: +44 (0)1246 261673 E-Mail: somero-uk@somero.com Website: www.somero.com

LOAD CARRIER

Ditch that barrow – Muck-Truck™ it

The Muck-Truck is the world's number one micro dumper. Powered by a super reliable and durable 4 kW Honda engine and capable of carrying a quarter of a tonne, it is the effortless way to move top-soil, concrete, sand, manure, rocks, peat, turf, paving slabs or any load that you require it to move.

With four forward gears and with one reverse and with four-wheel-drive, the Muck-Truck will take that load almost anywhere. It is quick, safe and easy to handle and is light and simple to steer and, at 70 cm wide, it will go through a standard doorway.

There are a range of quick-fit accessories that fit to the Muck-Truck™ in less than a minute including a flat bed, tow bar, snow/yard blade as well as a foldaway skip loading ramp which make this machine the perfect load carrier whatever you are doing. There is even an engine powered vacuum unit that will empty gullies, litter bins and is magic for leaves and manure.

The Muck-Truck™ is very reasonably priced and is held in stock together with all accessories and spare parts.

MORE INFORMATION

Chris Hardy, MuckTruckScotland, PO Box 19570, Johnstone, PA9 1AD. Tel: +44 (0)1505 702600 Fax: +44 (0)1505 703783 E-mail: sales@mucktruckscotland.com Website: www.mucktruckscotland.com

ROYAL HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND AWARDS 2006

Judges for the Royal Highland and Agricultural Society of Scotland (RHASS) awards 2006 were: John Gordon, Wellheads, Huntly; Robert Maitland, West Balhalgardy, Inverurie; Martin Mackay, Easter Suddie, Munlochy; John Wight, Midlock, Crawford; Tom Arnott, Haymount, Kelso; and James Muir, Finch Cottage, Blairhoyle, Port of Menteith.

The Gold Medal award winner, the Bryce Suma Post Driver from Bryce Post Drivers, also won a Gold Medal award from the Royal Agricultural Society of England (RASE), presented at this year's Royal Show in Stoneleigh Park, Warwickshire and so a joint review of both their awards can be viewed on the inside front cover.

SILVER MEDAL

Quickfencer Ltd – Quickfencer

Quickfencer is a new concept for the unrolling and tensioning of wire fencing. It is now also available with a built on post driver.

This machine saves time and money when erecting new fencing, making the job both easier and safer. It is versatile and can be mounted on a tractor via a three-point linkage, a front mounting or on a telescopic arm. To save even more time the machine can carry up to three 100 m rolls of netting or two 350 m rolls and a roll of barbed wire.

CONTACT

John Brewer, QuickFencer Ltd, Moorgate Farm, Kenyon Lane, Dinkley, Langho, Blackburn, BB6 8AN. Tel : +44 (0)1254 248858 E-mail: info@quickfencer.co.uk Website: www.quickfencer.co.uk

SILVER MEDAL

Manitou UK Ltd – Manihoe MLB625T

The Manihoe MLB625T is a patented concept machine, the first of its kind in the world, which draws on Manitou's considerable expertise. This latest product helps create a family of machines that can cope with both handling and excavating. The name is a contraction of the brand Manitou and Backhoe, a tractor shovel.

For handling, by using its front telescopic arm, it can reach forward at heights far exceeding traditional machines. The simple hitching system makes it quick and easy to change attachments without wasting time. Almost all Manitou accessories (forks, buckets and 4 in 1) can be used.

For earthmoving and excavation, the Manihoe can carry out all the operations normally done by a tractor shovel such as digging trenches, excavation work and drains. The front-mounted telescopic arm makes light of everyday jobs on a construction site, passing over obstacles such as trenches and low walls or hedges, loading skips, laying pipes or cables in the middle of trenches and loading trucks from above.

CONTACT

Manitou UK Ltd, Ebblake Industrial Estate, Verwood, Wimbourne, Dorset, BH31 6BB. Tel: +44 (0)1202 825331 Fax: +44 (0)1202 813027 E-mail: info@manitou.co.uk Website: www.manitou.co.uk

SILVER MEDAL

J.G. Middleton – Drive through quad gate

A Silver Medal was awarded for the 'Drive Through Quad Gate' to J.G. Middleton.

The gate consists of an outer frame in which an inner gate, hinged on the bottom, allows the gate to open either way when driven through by a quad bike. It is automatically closed to a vertical position by a weight and pulley system.

CONTACT

J G Middleton, Helmside Farm, Dent, Sedbergh, Cumbria LA10 5SY. Tel: +44 (0)1539 625328

SILVER MEDAL

Ecorider – Ecorider 230 diesel

Ecorider 230 Diesel – winner of an RHASS Silver Medal - is the latest in all terrain vehicle (ATV) innovation with extra wide tyres offering stability, gentle footprint and access to difficult areas. It can run on bio fuel to achieve 36 km/litre, giving low operating costs.

The Ecorider is the first of its kind; a diesel, high performance, low ground pressure all terrain vehicle. Its unique features and environmentally friendly attributes make it the ideal vehicle for numerous applications. Over-engineered, with high quality components this is a truly remarkable workhorse.

It has low fuel consumption and is available in diesel, biodiesel or petrol. The Ecorider is sensibly priced and environmentally friendly (low ground pressure and minimal CO_2 emissions). It is automatic and easy to operate. It tackles side slopes and negotiates narrow gaps superbly. It can also pull trailers in high, low and reverse gears and is safe stable and robust.

The Ecorider requires low maintenance and is transportable without a trailer.

CONTACT

Ecorider Ltd, Balmakeith Business Park, Nairn, IV12 5QR. Tel: +44 (0)1667 459988 Fax: +44 (0)1667 459977. E-mail: sales@ecorider.com Website: www.ecorider.com

SILVER MEDAL

Landmec Pottinger – Pottinger Novacat 306 'alpha motion'

Winner of a Silver Medal, the Pottinger Novacat 306 'Alpha Motion' marketed as a mower conditioner that heralds a new era in disc mowers.

The mower can be mounted on any size tractor between 60 - 225 kW regardless of make or size. It is compatible with any front linkage and mows at high forward speeds.

The 'alpha-motion' headstock is the latest 'clever farming' development from Pottinger where the key features on these groundbreaking new concept front mowers makes for an impressive read.

It provides a greater freedom of movement (16° sideways movement). The Novacat also has slim 3 m transportation and working widths - in either plain 7 disc format (Novacat 306F) or with Extra Dry quick detach conditioner. Four drum versions are also available.

Headstock automatically adapts to ground contours, on slopes, the angle of inclination changing automatically to prevent either scalping or leaving long stubble. Even cutting equals faster regrowth and less chance of soil contamination.

The Novacat offers driveline protection where vertical movement of the mower section protects the pto shaft from excessive telescoping and reduces dynamic load factor.

Visibility to the mowing area is greater than with other mowers. This is due to the headstock's wedge-shaped profile which provides an excellent view to the front edge, particularly on tractors with forward sloping bonnets.

Included in this new model is all the well-proven technology from Novacat Extra Dry – including ultra clean cutting Pottinger built disc cutter bars with quick-fit knives and the 'Y' tine rapid wilting and spreading near full-width conditioner.

CONTACT

Landmec Pottinger, Cantrell Works, Bittaford, Ivybridge, Devon. Tel: +44 (0)1752 891291 Fax: +44 (0)1752 891283. E-mail: info@landmecpottinger.co.uk Website: www.landmecpottinger.co.uk

CERTIFICATES OF COMMENDATION

Scot Seat Direct – Scot Horse Shuttle

MORE INFORMATION
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B. D. Supplies – Dura-Bull mineral feeder

MORE INFORMATION
B.D. Supplies Ltd, 4 Muirend Grove, Oakbank, Perth, PH1 1JW. Tel/Fax: +44 (0)1738 447677. Mobile: +44 (0)7979 814231. E-mail: brian@bdsupplies.fsnet.co.uk

RASE MACHINERY AWARDS 2006

Royal Show awards highlight engineering excellence

Overview

Reduced labour, greater output and superb quality of work have earned the Bryce Suma post driver from Bryce Post Drivers (inside front cover) and CHK PLC's Spread-a-bale (inside back cover) the top machinery award at this year's Royal Show. The prestigious Royal Agricultural Society of England's (RASE) Gold Medal meant pride of place for the two manufacturers in the machinery area at the show which took place at Stoneleigh Park, Warwickshire from 2nd - 5th July.

Rigorous judging procedures

The RASE Machinery Awards are unique in that they are based on a rigorous examination of the performance of the machines in the hands of commercial users. These judges, primarily farmers and contractors, noted how the Bryce Suma post driver, allowed one man to safely replace a three man team, yet still drive in posts quickly and accurately. A similar saving of labour has been found with the Spread-a-bale. Even spreading from this one-man operated, self-loading device, designed for use with a material handler, means less straw is used and dust levels are lower.

"The Spread-a-bale is robust, easy and quick to attach and use and self-loading is entirely reliable," was the verdict from the judging panel. "Similarly the Bryce Suma post driver is easy to operate, has excellent safety features and should have an indefinite life and therefore a good resale value."

A Silver Medal, and a new sustainability award (inside front cover) goes to Simba Consolidation Systems' Aqueel Roller. This roller consolidates seedbeds but conserves water and reduces wind and soil erosion on more fragile soils, earning it the 'Institution of Agricultural Engineers award for equipment contributing to sustainability in agriculture and land use' in addition to a Silver Medal.

Three other manufacturers have been awarded Silver Medals for innovations that have outstanding advantages for the user. Claas UK Ltd's Scorpion Telehandler is a "delight to use", with high performance and trouble-free loading work from a compact and fuel-thrifty machine.

Knight Farm Machinery Ltd's "outstanding" service and support helped win a Silver Award for the 1830 self-propelled sprayer, with excellent boom-suspension and high forwards speeds, delivering superb coverage and significant time savings. Quick to install and switch between machines, the Trimble EZ Steer from AS Communications (UK) Ltd is a low-cost, reliable and accurate way to bring global positioning system (GPS) steering assistance to a tractor, sprayer or other farm vehicle.

The Sir Roland Burke Perpetual Challenge Machinery Trophy 2006 (inside back cover), for sustained and substantial contribution in a particular sector of the machinery industry was awarded to Harry West (Prees) Ltd. The judges considered that the long term record of the Shropshire company to the grassland-based livestock industry was outstanding, spanning 40 years of innovation, quality, service and close attention to the needs of the industry.

"Visitors to the show were able to view a truly prestigious line-up of the very best of agricultural machinery," comments Royal Show event presenter Jimmy Birchmore. "The awards stand has become a central attraction in the machinery area and the stand was staffed by well-qualified engineers, throughout the Show period.

"A RASE Gold or Silver Medal brings a manufacturer well-earned esteem throughout the industry, since it is the only set of awards based on the experiences of those that use the machines."

Awards Scheme

Collectively, the Machinery Awards Scheme, the New Equipment Awards and the Sir Roland Burke Perpetual Challenge Machinery Trophy demonstrate the Society's support for innovation, technical excellence, proven reliability and its long-standing commitment to the machinery and equipment sector.

Innovative and reliable machinery is essential to farm profitability. The Machinery Award Scheme is unique, being based on a rigorous examination of the performance of machines in the hands of commercial users. Machine users across the country are visited and interviewed to assess the performance of the equipment in a variety of working situations. While efficiency and effectiveness are of paramount importance, judges also report on the economic value of the equipment, durability, availability and cost of spares, the support provided by the supplier and safety aspects.

Award of Merit – signifies that a machine or item of equipment has been found to be effective and reliable by users in terms of its performance and function and that it should be included by a potential buyer in a list of possible purchases.

Silver Medal – implies similar assurances but additionally that the product has important new features, outstanding advantages for the user and is a major item of equipment.

Gold Medal – may be awarded at the discretion of the Society to replace a Silver award for an item that is clearly outstanding in terms of innovation, technical achievement and potential service to the industry.

Entries meeting the criteria for a Silver Medal may also be awarded the Grower Award for a machine of particular significance for the horticultural industry.

"A RASE Gold or Silver Medal brings a manufacturer well-earned esteem throughout the industry, since it is the only set of awards based on the experiences of those that use the machines."

SILVER MEDAL

Claas UK Ltd – Scorpion telehandler

The Scorpion is a compact, high performance, fuel thrifty, highly manoeuvrable telehandler, offered in four versions with engines of 74 kW, 90 kW and 105 kW, lift height of 6.10 or 7.10 m, and lift capacity of 3.0 to 4.1 t.
The cab has full all-round visibility, control is by joystick, and manoeuvrability, through the all-wheel drive and tight turning radius, is excellent.
The Scorpion 'Varipower' transmission delivers a very high level of efficiency, which is reflected in low fuel consumption, maximum power delivery to the wheels and the ability to accelerate continuously from 0 to 40 km/h. It is based on a hydrostatic motor with

45° wide-angle technology and the corresponding control elements. Speed and power are constantly and automatically matched, giving torque on demand. On two of the models (7040 and 6040) there is 'Varipower Plus', an additional fixed displacement motor to further boost performance.

Users found the machine a delight to use. In addition to trouble-free loading work (in one case between 150,000 and 200,000 t in 5 months) and general farmstead use, it performed exceptionally well as a towing machine, delivering plenty of pull even at the full 40 km/h.
Fuel consumption was put at 25% lower than similar machines.

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SILVER MEDAL

Knight Farm Machinery Ltd – 1830 self-propelled sprayer

The 1830 self-propelled sprayer is a state-of-the art machine that incorporates the latest technology with well proven, and previously award-winning, Knight features.
A 130 kW Perkins engine provides power, transmission is full hydrostatic all-wheel drive, the air-suspension is self-levelling, and track is adjustable between 170 - 200 cm. Steering is two or four-wheel, with 'crab' steering when required.
There is platform access to the cab and spray tank, and a hydraulically operated step. The cab is superbly fitted and has wide-angle visibility through a curved screen. Vehicle control is by multi-function joystick, and sprayer control is by RDS application controller. There are remote throttle and pto controls for use when filling.
The standard spray tank is 3000 *l*, with an optional 3500 *l* tank also available. The spray tank is wrap-round to lower the centre of gravity, while under-clearance is 1 m. Knight Laser agitation is standard and there is a nozzle body choice of single, triple, quad or quin jet. Booms can be up to 36 m.

Users interviewed first mentioned the level of personal attention given to them by Mr Brian Knight when particular requirements and the specification of their machine were being decided. The machines in use did a superb job, often covering 200 ha/day and giving a 30% time saving over previous equipment. Boom suspension was excellent, allowing forward speeds of up to 18 km/h. Cab comfort and controls were praised, with younger drivers being more enthusiastic about the joystick control than their older colleagues. Service and support from Knight Farm Machinery was at all times outstanding.

CONTACT

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SILVER MEDAL

AS Communications (UK) Ltd – Trimble EZ Steer

The EZ Steer is a low-cost, retrofit, global positioning system (GPS) steering assistance device that works through a motor and friction wheel fitted to the steering wheel of the tractor, sprayer, or any other approved vehicle.
Installation takes less than 30 min, requires no special tools, and does not involve hydraulic connections. It can be removed from the vehicle in a matter of minutes, allowing full flexibility of use between machines. 150 - 200 mm pass-to-pass accuracy is claimed, making it suitable for spraying, spreading, tillage and harvest applications.
An inexpensive upgrade is available to improve accuracy on rough or sloping ground. Further upgrades are available to give a drilling level of accuracy (100 mm or better).
The basic Trimble unit is the EZ Guide, a GPS lightbar unit which provides the driver with a visual guide for manual steering. Adding the EZ Steer provides hands-off operation.

Users found the equipment extremely reliable and easy to understand and use. Accuracy was well within the manufacturer's claims, and use reduced driver stress and allowed them to concentrate on the operation rather than steering the machine. The advantage of having the machine automatically turn into the correct (and possibly obscured) tramline was quoted as a typical assistance. In every case users saw the EZ Steer as a low cost entry to automatic guidance, with the option of taking up further modules as the need arose. Easy fitting and switching between machines was a key feature.

CONTACT

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RASE GOLD MEDAL

CHK PLC - Spread-a-bale

Spread-a-bale is a one-man operated, self-loading, straw spreading device. It is specifically designed for use with a material handler.

Four models are offered to suit two sizes of rectangular and two sizes of round bales.
The machine consists of a bale chamber with a bed conveyor and a pair of spreading rotors. The system is controlled and powered from a single double acting auxiliary hydraulic point. When loading, the spreader head is raised, the chamber is presented end-on to the bale, and the reversing bed takes in the bale. Then the rotor head is lowered, rotor speed is increased to 450 - 650 rpm and the forward moving conveyor takes the bale into the spreading rotors. The straw is not chopped which minimises dust levels, to the benefit of the animals and the operator. Spread distance from the head is up to 8 m. The operator, except for pulling out the twine from the bale, does not need to leave his cab or enter the yards with the stock.
The users who visited were making intensive, often everyday, use of the spreader. One using about 16 t of straw a week estimated a 30% reduction in straw use due to the even spreading and the 'little and often' approach, with another user estimating a 50% reduction. Time to spread one large square bale was of the order of 20 to 40 s, giving a very large advantage in labour use. A typical quotation was one man taking 30 to 40 min to do what previously took two men two hours. The spreading process did not disturb cattle and dust levels were low. Operators found the spreader robust, easy and quick to attach and use, and the self-loading was entirely reliable. It performed particularly well on articulated loaders.

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CHALLENGE TROPHY

Sir Roland Burke Perpetual Challenge Machinery Trophy 2006

Harry West (Prees) Limited for livestock equipment

The Burke Trophy is the senior machinery award of the Royal Agricultural Society, and is for a sustained and substantial contribution in a particular sector of the farm machinery industry.

Princess Michael of Kent beside Harry West (Company Chairman) holding the Sir Roland Burke trophy, together with (L to R) John Taylor (Field Sales Manager), Jeff Auton (Sales and Marketing Manager) and Alan West (General Manager) of Harry West Prees Ltd in front of the West 1600 Dual Spreader.

The judges considered that the long term record of Harry West (Prees) Limited of service to the grassland-based livestock industry was outstanding, spanning 40 years of innovation, quality, service and close attention to the needs of the industry.

The family firm was started in 1966 as a fabrication unit to meet the needs of local farmers. One of their early products was safety roll-over bars for tractors, of which 18,000 were made. Today they manufacture a range of manure spreaders, trailers, bedders and feeders. Harry West, the founder, is now Chairman, Julie West is Managing Director and Alan West is General Manager and Technical Director. The company has in the past won RASE Gold and Silver medals for machinery.

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