Agriculture • Horticulture • Forestry • Environment • Amenity

# LANDWARDS

Late Spring 2005


- Milk Production
- White Finger

# Autonomous Machines

IAgrE JOURNAL Volume 60 No.2 www.iagre.org

# Taking stock

The 2005 Annual Conference confirmed yet again that we are privileged to work in a fascinating arena with masses of challenges and opportunities and all aimed at the most worthwhile of objectives – the production of food and raw materials, making opportunities for sports and leisure, and the provision of habitats in an enriched landscape. All of that now has to be achieved against demanding and competing criteria for sustainability.

Most importantly, IAgrE has the potential to bring together the mix of people with the range of expertise, interests and skills that are needed to make it happen. The mix is a potent one – innovators, researchers, teachers, practitioners and managers: engineers, scientists, technologists, technicians and business people all across the full spectrum of interests and disciplines at home and overseas. For some of these groups the Institution provides the route for obtaining and maintaining the increasingly important professional credentials.

This is an ambitious agenda. How are we progressing?

First of all we need to take a 'reality check'. We are seeking to do this almost entirely from our own resources be it our own time or subscriptions. We can be proud of that, but some help from others who benefit from IAgrE activity, be it indirectly, would be well received and justified. We are planning to put more effort into this centrally but we must think of opportunities for external funding, sponsorship or support in kind and either make an approach or inform the Secretariat.

In this context the Executive, endorsed by Council have had to make some hard decisions to consolidate our financial position. This will result in a change of service and some increased charges to members. These appear to have been widely, though not universally, accepted so IAgrE can continue to move forward. Be assured, those of us at the 'centre', will strive to maintain and improve value.

There is a full diary of meetings, conferences and workshops. Recent conferences either organised centrally or by Technical Groups have been relevant to the issues of the day and well attended. The Young Engineers Competition, thanks to the generous sponsorship and enthusiasm of Richard Robinson, is now into it's second year and well subscribed. Paul Miller's Masterclass was acclaimed as a huge success and is a model that we must pursue. We are now strengthening our relationship with other organisations such as NFU, IAgM, BIAC with a view to the joint planning and marketing of future events. Sadly the reality is that not all Branches have been able to maintain their momentum but members do have access to all events and, where appropriate, we plan to move Technical Group and other events to these areas in association with the local Colleges and businesses.

Obviously IAgrE needs to engage students, young engineers and all those entering our professions. There has been good progress here. Dan Mitchell has been out there visiting Colleges recruiting students and staff with welcome support from the Douglas Bomford Trust. There are now 516 student members, 24% of our total, and the retention rate has been good. We must now make sure that they are welcomed into our community with programmes that they can relate to and that they are given the opportunity to take the lead. It would be good to see the Colleges in particular back in the mainstream of our activities.

Are we doing enough for the Technicians upon whom so much depends? We have made a good start. The Industry Careers project that came out of an IAgrE initiative is now firmly rooted. BAGMA and the AEA have teamed up, the funding is coming in and some very relevant outputs are appearing to promote the extensive opportunities and benefits of life as a technician in the land based industries, there is support for dealers in the recruitment process along with ideas to raise the status and esteem of technicians out on the job. Keep an eye out for the booklet 'A World of Opportunity'. Ian Jones, Director General of BAGMA has been at the heart of this backed by a Steering Group chaired by Dick Godwin. We are now taking the debate to the politicians. Chris Whetnall is continuing his mission to get all the key manufacturers signed up to the EngTech programme that has been pioneered by John Deere UK in association with Brooksby College Melton.

IAgrE's commitment to the Society for the Environment, now firmly established with the award of the Royal Charter, has resulted in the opportunity for suitably qualified members to gain the new qualification of Chartered Environmentalist that is particularly appropriate to the Sustainability Agenda. Over time this will widen still further the network of expertise and activities that is available to members and provide a vehicle for exerting influence at the core of these issues. Some 56 members have been awarded the CEnv qualification but time is running out for those who have not yet taken advantage of the 'Grand-parenting process' that comes to an end in September this year.

The five year audit required for renewal of IAgrE's licence with the Engineering Council is scheduled for September 2005 and preparations are in hand within the Secretariat to ensure that this is successful. Candidates are using the Registration Mentoring Service to good effect with a steady flow of applications coming forward.

The Journal *Landwards* is the mainstay for communication with members particularly in those areas where a record and an opportunity to browse at leisure are beneficial. For some it is the principal and most tangible outcome of membership. The Editor, Brian Witney, is convinced that members have lots of useful material to offer particularly arising from Conferences and Meetings and he is urging us all to make a contribution and increase the content originating from IAgrE so that it becomes more clearly 'our' journal. At the same time IT in the form of the web site and the electronic newsletter are sharing more of the communications role particularly on issues that are more immediate.

So we are a good outfit with an important job to do and we are making good progress. We can only be effective by working as a team involving the Secretariat, officials and members and there is every sign that this is happening. Sure this takes up valuable time, but there are rewards. We need to share the benefits, commitment and costs with more people so make sure that everyone you know that should be a member is a member.

*Peter L Redman*
*President*

Volume 60 No 2, **2005**

# LANDWARDS

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

**Editor**
Eur Ing Prof Brian D Witney
PhD CEng CEnv FIMechE HonFIAgrE MemASAE FFCS
LAND TECHNOLOGY LTD
33 South Barnton Ave,
Edinburgh, EH4 6AN
Tel/Fax: +44 (0)131 336 3129
E-mail: landwards@landtec.co.uk
Website: http://www.landtec.co.uk

**Advertising**
*All enquiries to IAgrE*
Tel: +44 (0)1525 861096
Fax: +44 (0)1525 861660

**Origination:** David King

**Printing:** Barr Printers Ltd

**Publisher**
*Landwards* is published bimonthly by:
IAgrE,
West End Road, Silsoe,
Bedford, MK45 4DU
Tel: +44 (0)1525 861096
Fax: +44(0)1525 861660
E-mail: secretary@iagre.org
Website: http://www.iagre.org

**President**
Peter L Redman
BSc(Hons) CEnv FIAgrE

**Chief Executive & Secretary**
Christopher R Whetnall
CEnv IEng FIAgrE MemASAE

# CONTENTS



**Front cover:** *Maize forage harvesting (Photo courtesy: Claas GmbH)*


**ISSN 1363-8300**

**Claas global positioning system (GPS) autopilot; unlike other 'Lightbar' systems, the Outback S (in box outline) not only displays the current lateral deviation of the vehicle but also the required steering adjustment on the upper light emitting diodes (LEDs). This look-ahead information leads to higher driving accuracy (Fig. 4 shows the relationship between vehicle attitude and Lightbar information).**

# AUTOMATIC GUIDANCE OF HARVESTING MACHINERY — FROM MECHANICAL SENSORS TO GLOBAL POSITIONING SYSTEMS

**Andreas Brunnert**

**BIO NOTE**

Andreas Brunnert, winner of the Industry Innovation Award presented at AgEng2004 in Leuven, Belgium, is an engineer at Claas GmbH, 33428 Harsewinkel, Germany. E-mail: Andreas.Brunnert@claas.com
Website: www.claas.com

## Requirements for automatic guidance systems

The operation of a harvesting machine makes great demands on the driver. Apart from the supervision of various functions the main task is to keep the machine precisely on the desired path. The tasks for the operator when guiding the vehicle are to detect the deviation and to correct it (Fig.1).

Research institutes and the agricultural industry have put a lot of effort into the automation of these tasks. The aim of their work was to substitute the human 'controller'. The major difficulty in achieving this aim, was the measurement of a vehicle's deviation from a desired track. As the operator of a harvesting machine has to follow different guidance lines, depending on the application, suitable sensors for the different environments have to be developed. Figure 2 gives an overview on guidance lines that appear in agriculture and sensors for their detection [Brunnert & Diekhans, 2002].

Existing guidance lines in the field are usually rows of solid plants, such as maize. These plant rows can easily be used for automatic guidance with mechanical sensors. The autopilot for maize has been state of the art on Claas combine harvesters, for more than 25 years. Self-generated tracks, for example a crop edge, are a result of a previous operation. As these guidance lines are not solid, a contact free sensor has to be used.

The Claas Laserpilot, for instance, is a two-dimensional (2D) Laserscanner that can detect swaths, crop edges and other guidance lines. In the more recent past GPS guidance systems have become very popular. The main advantage of these systems is that they are not dependent on visual guidance lines but instead use computed tracks. This makes GPS guidance very universal, with the constraint, that high accuracy still has a very high price.

## Principle of the Claas autopilot

The Claas GPS Pilot is designed as a cascade control consisting of an electro-hydraulic wheel position control and the

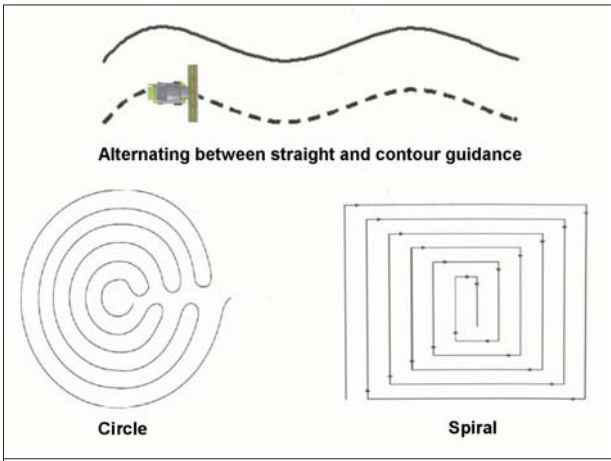



**Fig. 1 Contour guidance: changing between straight and contour guidance is possible at any time (top); and circular and spiral contour guidance (bottom)**

superposed tracking control. The wheel position control is a closed loop control which gets feedback from the steering angle sensor (Fig. 3).

The vehicles course is a result of the current wheel position and the vehicle's kinematics and dynamics. The deviation of the vehicle from the desired course is measured by the guidance sensor which could be any of the sensors mentioned in Fig. 2.

The desired steering angle is a function of the measured deviation and is generated by the tracking control. The relation between deviation and desired steering angle is a function of the wheelbase; here we have to distinguish between a combine harvester and a forage harvester and especially the look-ahead distance of the sensor.

The mechanical sensor, for instance, detects the plant rows directly in front of the header, whereas the Laserpilot scans the crop edge 14 m in front of the header. Physically both the wheel position control and the tracking control are integrated on the digital steering controller. Independent from the type of sensor that is used, the operator has the same user interface and safety functions, such as the seat switch and the steering wheel switch to override the autopilot.

## Claas GPS Pilot

This autopilot is based on the parallel tracking system Outback S that is distributed by Claas subsidiary Agrocom. The Outback S offers two different guidance modes, straight and contour guidance (see Fig. 2).

To use the Claas GPS Pilot on combine harvesters, the signals that drive the LEDs are send on the controller area network (CAN) bus. It is obvious that for automatic guidance also the look-ahead signal of the steering guide has to be used to achieve smooth control. The GPS guidance system is connected via CAN to the autopilot where a desired steering angle for the combine harvester is computed by the tracking control.

The GPS Pilot uses the European Geostationary Navigation Overlay Service (EGNOS) correction service which is broadcasted free of charge. The accuracy of the Outback S was proven in several tests. Performance measurements carried out by the University of Illinois showed that the Outback S was the most accurate guidance system using free correction services (Han et

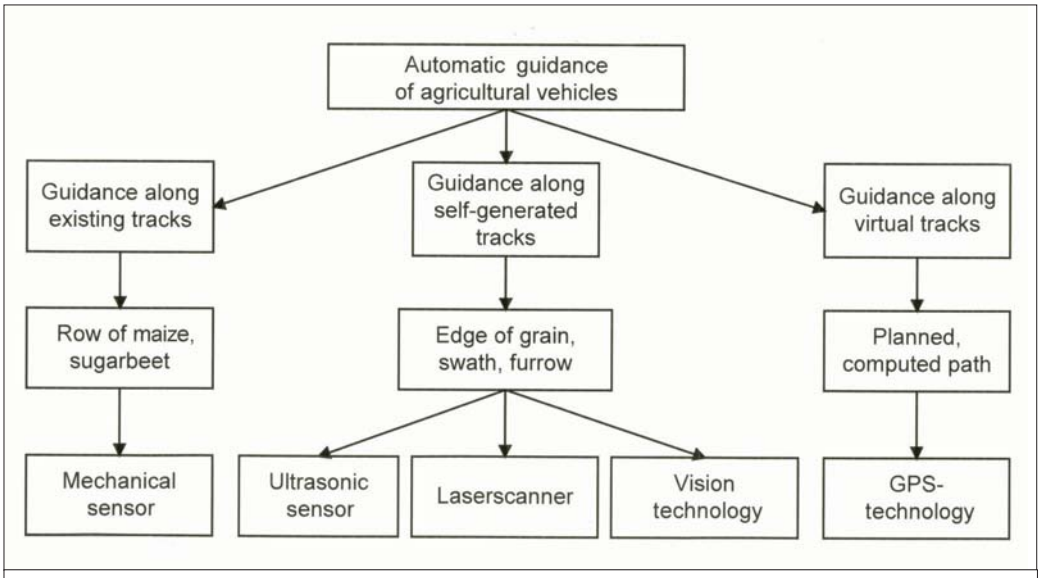



**Fig. 2 Classification of autopilot tracks and sensors**

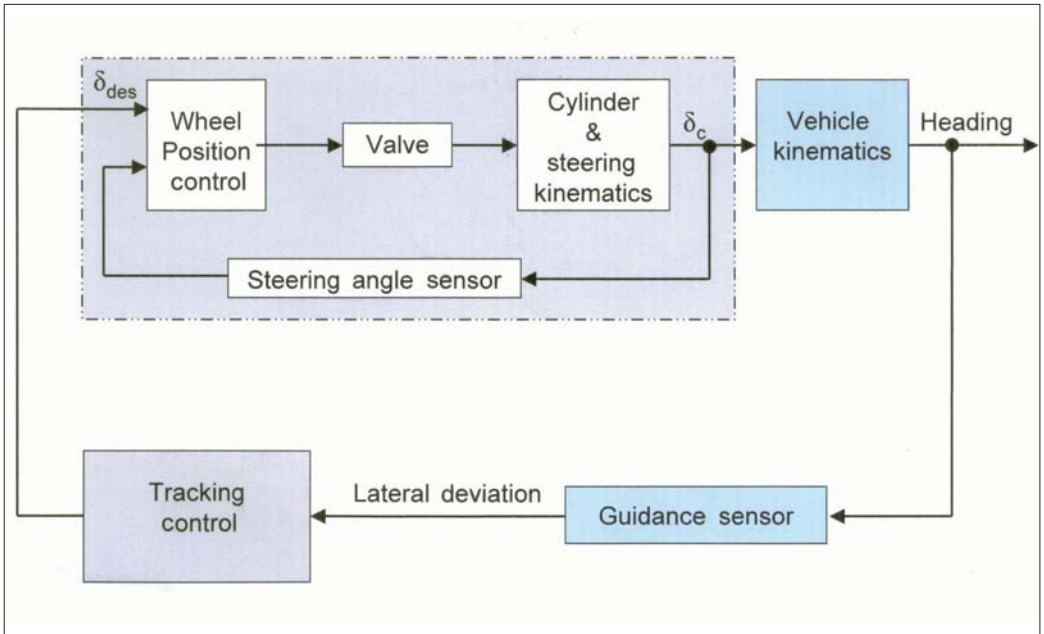



**Fig. 3 Control principle of the Claas autopilot; $\delta_{des}$, desired steering angle; $\delta_c$, actual steering angle**

al., 2004). The range of deviations was between 2 and 21 cm with an average error of 8 cm using the North American Wide Area Augmentation System (WAAS) correction service. At 44% of the driven paths, the error was less than 5%. In regions where no satellite-based correction is available, the exclusive Extended Differential Technology 'e-Dif' correction offers a high level of accuracy.

## Conclusion

Auto guidance systems have a long history on Claas machinery. The mechanical sensors are still first choice for the maize harvest, on combine harvesters as well as on forage harvesters. For the grain harvest, the Laserpilot offers a high level of accuracy and reliability at moderate costs. The latest development, the Claas GPS Pilot, is an additional sensor option for the Claas autopilot system. The GPS Pilot features the subdivision of large fields into sub areas and delivers signals for the yield mapping system.

## References

**Brunnert, A.; Diekhans, N.** (2002). Machine guidance with laser and GPS. VDI-MEG Agricultural Engineering Conference, Germany.

**Han, S.; Zhang, Q.; Noh, H.; Shin, B.** (2004). A dynamic performance evaluation method for DGPS receivers under linear parallel tracking applications. Transactions of the ASAE, **47**(1), p 321-329.

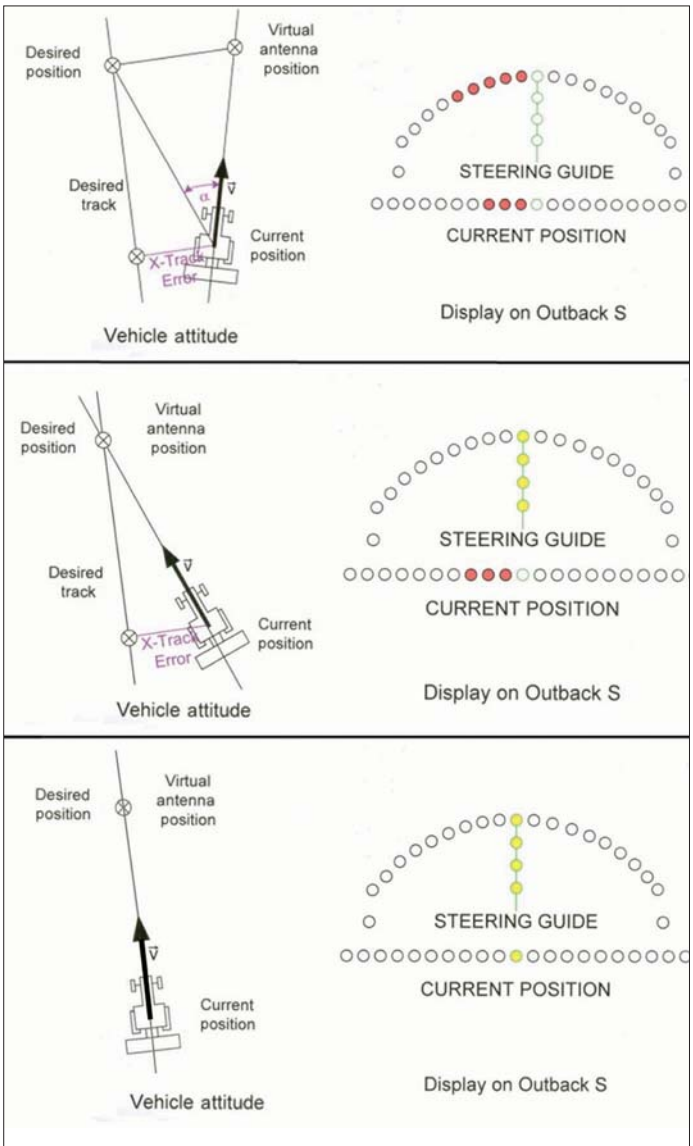



**Fig. 4 Function of the steering guide; shows the relationship between vehicle attitude and Lightbar information**

AWARDS

# Industry Innovation Award

The International Conferences on Agricultural Engineering, the AgEng series, are held biennially in different European countries and organized by membership associations within the European Society of Agricultural Engineers (EurAgEng). These conferences have always been well attended by researchers and academics and have accrued an excellent reputation for quality and diversity. Generating interest in research ideas and promoting subsequent technology transfer for commercial exploitation relies on an effective network between academia and the commercial sector.

EurAgEng established the Industry Innovation Event in 2000 to encourage greater participation by engineers from industry. The Industry Innovation Award is based on the content and delivery of papers describing innovative products in the agricultural engineering industry.

At the Industry Innovation Event in Leuven, Belgium, the winning presentation was based on the commercial exploitation of the research on automatic guidance of harvesting machinery - from mechanical sensors to global positioning systems.

The Judges for the Industry Innovation Event were Professor Aad Jongebreur (Vice President, EurAgEng), Professor Ettore Gasparetto (Italy) and Professor Brian D. Witney (United Kingdom).

**Andreas Brunnert from Claas, receives the Industry Innovation Award at AgEng2004 from Professor Aad Jongebreur [Courtesy: Mike Hurst]**

FOOD PROCESSING

# Tate & Lyle to build new sucralose plant in Singapore

Tate & Lyle plc has announced that a new £97 million sucralose manufacturing plant is to be built in Singapore. This will be Tate & Lyle's second such facility, which is being constructed in response to strong and sustained international customer demand for the product.

The new plant, which will complement the highly successful existing operation in McIntosh, Alabama, USA, will use a patented manufacturing process and will be completed by January 2007. Once fully operational, the Singapore plant will have a capacity two-thirds of that at the expanded Alabama facility.

The total capital cost of construction will be £97 million (US$175 million). The plant will be funded from existing resources and is expected to cover the cost of capital during the financial year ending March 2009. After an extensive review of alternative locations, Singapore was selected due to its attractive tariff structures, availability of a highly skilled workforce, proximity to key markets and the excellent support from the Singapore Economic Development Board.

Sucralose is a no-calorie sweetener that is made from sugar, so it tastes like sugar. Its excellent taste profile and unique functionality as a food ingredient has driven exceptional levels of demand from food and beverage producers around the world. The success of brand tabletop products has further increased demand.

Iain Ferguson, Chief Executive of Tate & Lyle said: "We are delighted to announce the construction of a second sucralose plant. Sucralose continues to enjoy impressive growth in demand across all major food and beverage categories. Together with the previously announced investment in our Alabama facility, the new plant in Singapore will enable us to continue to meet our customers' needs and better serve a growing global market.

"The new plant will broaden our manufacturing base and help facilitate improved access to the Asian and European markets. Sucralose has enjoyed success in Japan since the first products were launched there in 1999 and we aim to replicate this success across the region. European Union approval of sucralose was granted in February 2004 and becomes final in all member states in February 2005.

"By January 2007, we will have more than tripled sucralose manufacturing output compared to the level at the time of the realignment of the business in April 2004. This will significantly contribute to delivering on our strategy of growing the contribution to profit from value added ingredients.

"We have received excellent support from the Singapore Economic Development Board and look forward to future co-operation. The sucralose manufacturing process is sophisticated and patent-protected and technical training of key members of the operational workforce in Singapore will begin shortly to ensure the creation of an expert local workforce ahead of plant commissioning."

Mr Teo Ming Kian Chairman of Singapore Economic Development Board said: "We are proud that Tate & Lyle, a global leader in renewable ingredients, has chosen Singapore to spearhead its growth in Asia and to be a vital part of the global success of sucralose, especially as this is the company's first manufacturing investment in Singapore. High value specialty ingredients is an area that has tremendous potential in Asia as this region develops. Tate & Lyle's choice of Singapore reaffirms our position as a strong combination of trust, science, innovation and connectivity to end markets

END-OF-LIFE LEGISLATION

# New guide for depolluting vehicles over 3.5 tonnes

Defra today launched a new guide for vehicle breakers on how to depollute vehicles over 3.5 tonnes, including buses and coaches, so that they comply with the End-of-Life Vehicles Regulations 2003.

End-of-life Heavy Goods Vehicles (HGVs) have many pollutants associated with them and are classified as hazardous waste. Legislation requires that end-of-life HGVs are depolluted to remove their hazardous components and fluids. The new guide will not only help vehicle breakers meet the new regulations but will help to ensure that breakers can cash in on the considerable resale market for parts, both in the UK and abroad.

The guide also provides a brief overview of the equipment and facilities relevant to depolluting HGVs as well as a description of the depolluting operations that need to be conducted to meet the requirements of the relevant legislation. The depollution process for heavy goods vehicles is very different from that for cars and small commercial vehicles. The variety of vehicle designs means that each lorry must be cut according to its construction and depolluted as each part becomes accessible. However, to maintain their value, vehicle parts need to be stored with their fluids intact.

The new guidance draws on best practice and considers the commercial requirements for vehicle breakers' sites in the context of other environmental legislation.

MORE INFORMATION

**The guide, 'Depollution Guidance for End-of-Life Vehicles over 3.5 tonnes' is available from www.defra.gov.uk/environment/waste/topics/elvehicledir.htm Tel: +44 (0)8459 335577.**

SHOWS

# Survey revelations for Royal Highland Show

A visitor survey conducted during the 2004 Royal Highland Show, has overwhelmingly endorsed the event's position as one of Scotland's most popular summer attractions – for both farming and general public.

An impressive 96% of all respondents rated the show as very or fairly good, with around 70% stating that the show had improved since the last survey carried out six years ago, with better livestock accommodation, more quality products on offer and generally, a much bigger event.

The survey was conducted by Lowland Market Research on all four days of the show which ran from June 24th - June 27th. The main objectives of the survey were to: form an accurate profile of visitors to the show; establish the motivation and reasons for visiting the show; measure the levels of interest in show attractions; and evaluate visitors buying habits.

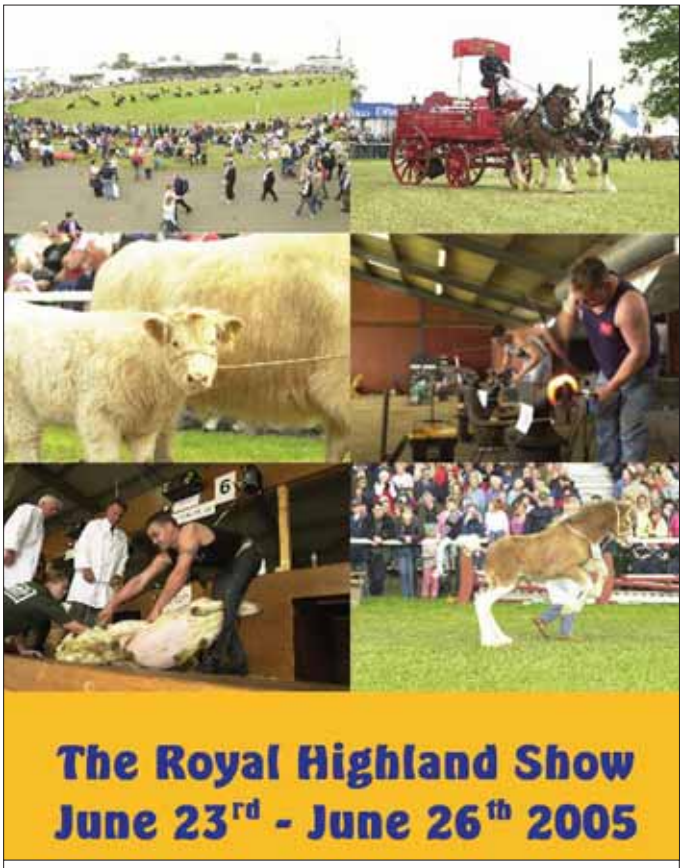
Show manager, David Dunsmuir, said: "The wealth of information collected in response to these objectives is crucial to the further development of the Royal Highland. We have evidence of what makes the show tick, what pulls in the visitors and what we have to do to improve facilities and services, in order to encourage people to come back.

"It is obvious we are running a successful and extremely popular even but we cannot be complacent. We are constantly seeking improvement, not only for our members and visitors but also for our trade and livestock exhibitors.

"Interestingly, though, three out of four of the respondents had previously visited the show. We must be doing something right to get that repeat business, although we will be widening our marketing campaign to appeal to the new visitor."

## Visitor profile

Some 58% of all respondents were classified as members of the public with a further 40% in the farming or land-based industries and 2% from food processing and retail (see Fig 1). Almost three quarters of those surveyed were in the socio-economic grouping ABCI. An increasing number of visitors came from the Glasgow/Strathclyde and Central areas, fewer from the Highlands and Borders with Edinburgh/Lothian visitors account for a predominant 27%.




**Highlights of the Royal Highland Show 2004 and the dates of the Show for this year**

## Reasons for visiting

Some 84% said for "general interest – a day out". The three next most popular reasons were shopping, food and drink and a major event in the social calendar.

Among farming visitors, main reasons were to view or purchase livestock and associated products and to view or purchase machinery.

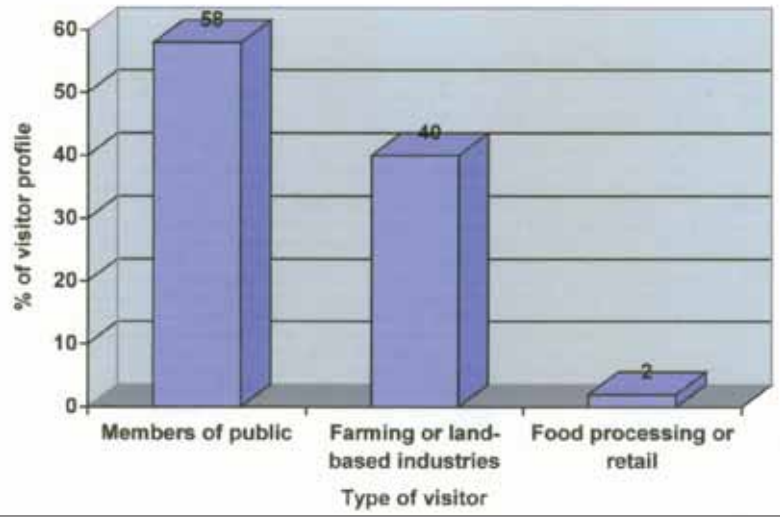



**Fig 1. Visitor profile of those attending the Royal Highland Show in 2004**

## Main areas of interest

The main elements which people stated were of most interest at the Royal Highland Show in 2004 were:
food and drink (96%);
general shopping (92%);
main ring events (90%);
crafts and arts (89%); and
outdoor living (88%).

## Farming interest

The farming community were most interested in the livestock rings (72%) and the livestock areas

(70%).

Of all the respondents, 70% thought the ticket price was good value for money and 73% said that free admission for children had been important in their decision to visit the show.

### Buying habits

Separate to food and drink, purchased either for on the ground or later consumption, 42% of respondents indicated they had bought goods ranging from clothing, crafts and cosmetics, to horse related and household items.

As for the amount spent, about one third of visitors spent between £50 and £100 with only two people surveyed who had spent over £20,000! The larger purchases tended to be by members of the farming community, many of whom intended to buy after the show anyway.

### Future growth

With an attendance of around 150,000 there were inevitable complaints, the main bone of contention being car parking. Some 16% stated they were either fairly or very dissatisfied with that element. Other aspects included seating, toilet facilities, information boards and sign posting.

"We need to address all of these for 2005," said David Dunsmuir. "We took a hit on parking with the weather and we are looking at the way other major events do their signage. In addition, out older toilet blocks are being demolished and upgraded.

"We are never going to satisfy every single visitor but our show management team's task is to keep complaints to a minimum and strive to deliver what we promise our visitors – a great day out."

# Environmental profit in greenhouse horticulture

Market growers need pure $CO_2$ to speed up the growth of their crops. Until now, this $CO_2$ has been obtained mainly from flue gases directed into the greenhouse from the heating installation, which is therefore operated continuously throughout the day, even in summer. Although the supplied heat can be partly stored in so-called heat buffers and, if necessary, used at night, a large part of the heat is superfluous (in summer the nights are not so cold) and is wasted. Now a project is underway which means that growers do not have to keep the heating on in summer.

Using a pipeline to supply residual $CO_2$ gas from the petrochemical industry, to greenhouse horticulture centres in Zuid-Holland, the project has attracted significant interest from those involved in greenhouse horticulture: even before the official start, 400 market growers signed an agreement for delivery of $CO_2$. In the first year, the method is expected to save 168 tonnes of $CO_2$ emission and natural gas consumption will be reduced by 94.5 $Mm^3$.

The pipeline now being prepared for transporting $CO_2$ , was previously the property of the Dutch State and the municipality of Amsterdam and was constructed during the oil crisis in the 1970s to transport oil from Rotterdam to Amsterdam. Although the pipeline has been out of use for over 25 years, it runs relatively close to a number of key greenhouse horticulture areas; additional branches are to be added to supply the various greenhouse horticulture areas, where a fine-meshed distribution network will distribute the $CO_2$ to the market growers.

The gas company Hoek Loos, a subsidiary of the German-based technology group Linde AG, and construction concern VolkerWessels set up a new company, which took over the pipeline last year and which will buy $CO_2$ released in the refinery process of Shell in Pernis.

Rein Willems, CEO of Shell Nederland B.V. thinks this project shows innovation, cleverness and good entrepreneurship. "I think of durability and acting in a socially-responsible way: on the one hand, for example, economical management of energy (natural gas) and, on the other, using $CO_2$ for industrial purposes. The use of $CO_2$ from our Shell Pernis refinery for Zuid-Holland greenhouse horticulture is one of the many elements we can use to create a global climate policy."

In order to realise the network of branches and distribution pipelines on time, the building activities are progressing at a very high pace. According to VolkerWessels, this is technically feasible although the co-operation of the province and the municipalities is of vital importance. Given the great significance of the project for both horticulture and the environment, OCAP is counting on the full co-operation of all organisations involved. Nearly 100 million euros is being invested in the project.

Volker Wessels and Hoek Loos have not only been working in close co-operation with Shell but have also been consulting frequently with agriculture and the horticulture organisation LTO during the preparations. In this way, the delivery agreements for the market growers have been fully aligned with LTO. Peter Vermaat, project manager of OCAP, pointed out in the long run OCAP also wants to work closely with LTO in the field of research and development. "Much is, of course, known about the effect of $CO_2$ as a growth accelerant. But now that it is becoming available on a large scale as an environmental-friendly and economical method, the need for know-how will increase enormously. OCAP intends to play a leading role in that. After all, the use of $CO_2$ offers Dutch greenhouse horticulture a fine opportunity to strengthen its worldwide leading position."

According to Don Huberts, Director of gas company Hoek Loos, this project is a splendid example of how private initiative can contribute to government objectives. "With this project we deliver a substantial contribution to the Kyoto objectives of the government," he said at the presentation of the plans.

RECYCLING TECHNOLOGY

# Save money with the 'bring' bank

The Department for the Environment, Food and Rural Affairs (Defra) and the Waste and Resources Action Programme (WRAP) will be working with local authorities and retailers to pilot and roll out new ways – from new technology at recycling 'bring' banks to financial incentives such as discount vouchers – to get people recycling more.

The announcement, by the Secretary of State for Environment, Food and Rural Affairs, Margaret Beckett, forms part of Defra's five-year strategy, which has a local and global focus on improving the environment. To help deliver Defra's overall strategy for waste and recycling, novel ways of encouraging people to recycle through retailers and at home are needed. New techniques to engage the public on waste issues in their local community will also be explored.

The first in a new era of 'high tech' recycling facilities at supermarkets has already been unveiled. The new recycling facility – built by Norwegians for the supermarket chain Tesco – promises to be faster, cleaner and more efficient than recycling units currently in use.

The facility uses space technology, including infrared spectroscopes and a real time camera, to scan and sort plastic, glass and aluminium and crushes them to maximise use of space. It will be on trial at Tesco's Winchester store and, depending upon customer feedback, it will be rolled out to other stores across the country. It is hoped that the new machine will help to boost local recycling rates and attract new recyclers. Currently, 16 per cent of household waste is recycled in Winchester.

Since 1996/97, recycling in England has almost doubled from 7.5 per cent to 14.5 per cent in 2002/03. To make further substantial increases in recycling, Margaret Beckett said new approaches to public engagement were essential: "Government has a pivotal role in trying to influence behavioural change. Well-researched and prepared general public awareness campaigns are important but they have to be complemented by approaches that make it easier for people to take active steps to play their part. "This is why we are putting in the resources to help people to 'do things differently'. But we can't do it alone, we need to work with local authorities, businesses, householders and the community at large.

"I am delighted to see retailers using their unique position to help encourage their customers to recycle. With nine out of ten people saying they would recycle if it were easier to do so, improved recycling facilities at supermarkets will hopefully attract a new generation of recyclers and encourage those who already do to recycle more."

Retailers are ideally placed to play a key role:

- WRAP will be leading a £1.2 million project to help retailers pilot new ways of encouraging householders to recycle their waste at supermarkets. The project will look at whether these new approaches, including the use of new technology in bring banks and financial incentives such as discount vouchers, could help bolster recycling rates and attract new recyclers.
- a major new retailer recycling initiative will be launched later in 2005 by Defra to improve supermarket 'bring' sites.

In addition, Defra will be working directly with local authorities to explore original ways to motivate householders to recycle:

- £5 million has been earmarked for 2005/06 to help local authorities carry out pilot programmes of novel incentives to encourage household recycling and waste reduction. Research into existing schemes in England is under way, and will help to inform the pilots.

Margaret Beckett added: "To be a leader in sustainable waste management we must ensure communities are supported by modern waste facilities. To do that, we need to find ways to foster new, more inclusive, early and active engagement of local communities."

To achieve this, Defra will be working with local authorities – through the revision of guidance on Municipal Waste Management Strategies – to encourage strategic planning for sustainable waste management.

TRANSPORT INFRASTRUCTURE

# £13 million for Scottish timber transport

The Scottish Executive is allocating a special £13 million fund to pay for projects that reduce the impact of transporting timber by road. The multi-million pound project will run over three years, with the fund being administered by Forestry Commission Scotland.

The country's annual timber production is set to double from 5 Mt/yr to 10 Mt/yr by 2020 as trees planted back in the 1980s are due for harvesting. The new funding package will help manage this increase in production by paving the way for a new transport infrastructure which helps to minimise the negative impact of timber lorries on communities and on fragile public roads. The fund will also be a major driver in opening up new timber supplies that have previously been out of bounds due to transport problems.

Scottish Forestry Minister, Lewis Macdonald, said: "With timber volumes set to increase we need action now to set up a transport network that reduces the impact transporting timber can have on rural communities. Preparation is vital as any increase in timber flow also has the potential to damage fragile rural roads.

"This new fund will play a major role in taking away lorries from minor roads which are often used as a main route by remoter communities. A key ingredient in the strategy is the development of new piers and railheads which will be a great asset in allowing more timber to be transported by sea and by rail. This will allow the forestry industry to access new timber supplies through an improved transport infrastructure without the need to use smaller unsuitable roads. Not only will this be good news for communities, but it will be a boost for the timber industry which can maximise the potential from the forests."

Estimates suggest that use of this fund has the potential to bring economic benefits of up to £340 million over a 20 year period. These benefits would derive mainly from higher timber output, savings in haulage and environmental benefits through reducing travelling distances and by directing lorries away from towns and villages.

ENVIRONMENT

# Green light for environmentally smart retail packaging

In a first for the UK retail sector, Environment Minister, Elliot Morley MP, today launched a groundbreaking £8 million Innovation Fund to stimulate innovative packaging design.

With the aim of significantly reducing post-consumer household food and packaging waste, the Waste Minimisation Innovation Fund will see the Waste & Resources Action Programme (WRAP), which developed and manages the fund, working closely with major retail partners and their supply chains to deliver real change.

Commenting on the launch, Environment Minister, Elliot Morley said: "This is a major step forward in reducing the 30 million tonnes of household waste that is produced every year. I am delighted that the retail sector has thrown its support behind this groundbreaking initiative. I am looking forward to seeing high quality projects which bring savings to retailers and their suppliers, and reduce the waste householders have to throw away."

Research undertaken by WRAP shows that over 40% of household waste which ultimately ends up in landfill, originates from purchases from retail supermarkets and convenience stores. The aim of the Innovation Fund is to reduce this waste by 310,000 tonnes by March 2006. To put this challenging target into context, this is approximately equivalent to the total amount of household waste collected from the streets of Birmingham annually.

Jennie Price, Chief Executive of WRAP, said: "Many consumers are becoming more aware of how much rubbish they are generating. They are recycling more and more, but there is relatively little they can do to control how the goods they buy are presented and packaged. Supermarkets and their supply chains have a major influence on what ends up in the household dustbin, and WRAP is looking forward to working with them to develop innovative products and packaging to reduce waste." As well as achieving the primary aim of waste minimisation, these projects will also help retailers to reduce their production, storage and transportation costs, lead to more efficient use of in-store shelf space and improve performance in relation to their corporate social responsibility (CSR) and sustainability targets.

David Reid, Non-Executive Chairman of Tesco & Vice President of the Institute of Grocery Distribution (IGD), said: "I welcome and support WRAP's Innovation Fund both in my Tesco role and as Vice President of IGD. Innovation is key to growth and profitability for both retailers and suppliers and this fund will help us to develop new packaging and product designs whilst also minimising household waste." The British Retail Consortium (BRC) supports the initiative and Director General Kevin Hawkins said: "The BRC fully supports the launch of the Fund and would encourage all those involved in the design of packaging for the retail sector to apply. This fund will create the opportunity to make major advances in the retail arena to the benefit of the environment and the sector as a whole."

Jane Bickerstaffe, Director of INCPEN, Industry Council for Packaging and the Environment, added "INCPEN shares people's concerns about packaging and we welcome WRAP's initiative to stimulate innovation to optimise use of materials and reduce waste throughout a product's life."

## MORE INFORMATION

**WRAP is inviting proposals for projects that offer direct and significant reductions in the amount of household food and packaging waste originating from the retail sector. Calls for applications to the fund have been posted on the WRAP website at www.wrap.org.uk/innovation-fund**

STRESS MANAGEMENT

# Government support to combat rural stress

Some £300,000 of Government money has been made available for projects that help people who are suffering from stress in rural areas. The Action Plan, which is administered by the Rural Stress Information Network, is aimed at helping rural people who are suffering from or are at risk of stress in four target groups:

- owners, occupiers and workers on the land;
- people who run small rural businesses and their employees;
- people with debt problems;
- people at risk of suicide.

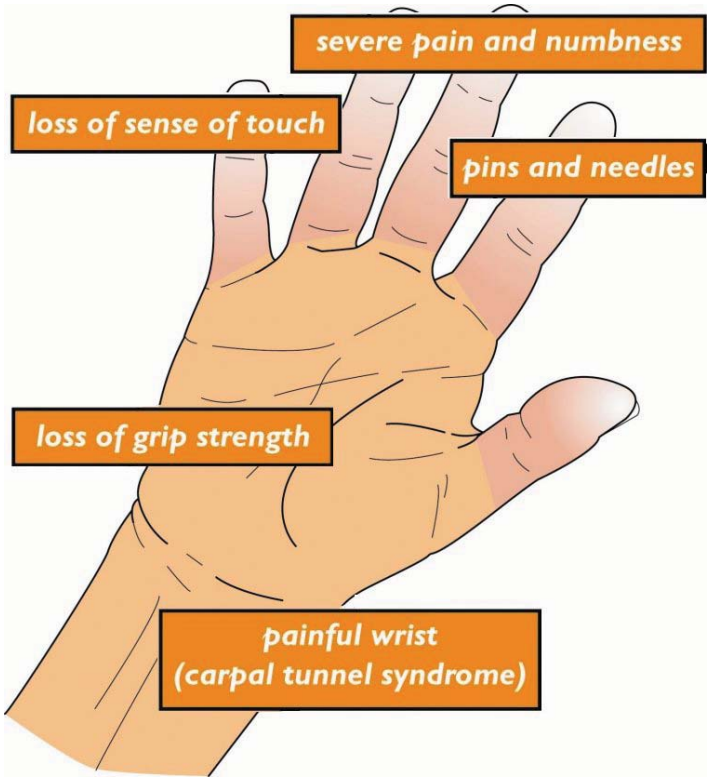
Rural Affairs Minister Alun Michael said: "The Rural Stress Action Plan has helped many people over the past five years, and this money demonstrates our continued commitment to helping rural communities gain access to the support they need. The voluntary and community sector has a vital role here, and we want to see the further strengthening of the networks and the support services they provide at local, regional and national levels. This includes work to influence mental health and well-being services, and tackling social, practical and psychological isolation, which can be a particular problem in rural areas."

Grants will be distributed through an open process and are expected to range between £5,000 and £75,000. Part-funding of the proposals from other sources is encouraged.

## MORE INFORMATION

**Renny Wodynska, Rural Stress Information Network, Arthur Rank Centre, Stoneleigh Park, Warwickshire, CV8 2LZ.**
**Tel: +44 (0)24 7641 3605. Fax: +44 (0)24 7641 2560. E-mail:hq@rsin.org.uk Web: www.rural-net.org.uk/~rsin//news/rsap.htm or www.defra.gov.uk/rural/stress/rsap.pdf**

**Injuries that Hand-Arm-Vibration (HAV) can cause workers including Vibration White Finger (VWF)**




# MAKE SURE THE WHITE FINGER ISN'T POINTING AT YOU

**BIO NOTE**

Derek Vaughan, Managing Director of the UK Trades Confederation (UKTC) wrote this article to highlight, to employees, the new proposed health and safety regulation to control vibration at work.

For more information about reducing Hard-Arm-Vibration health risks visit www.uktc.org to download an information leaflet, produced by leading tool manufacturers Hilti.

Around 3,000 new claims are made each year for Industrial Injury Disability Benefit and huge sums of compensation are paid out, the latest being an estimated £3bn for 165,000 ex-miners. Therefore, it is hardly a surprise to the trade industry that there is new health and safety legislation set to come into force in July 2005 to control vibration at work.

According to the Health and Safety Executive (HSE), who are responsible for the regulation of almost all the risks to health and safety arising from work activity in Britain, there are an estimated 300,000 people with advanced stages of Vibration White Finger (VWF), the most common form of Hand-Arm-Vibration (HAV) syndrome and reason to claim occupational ill health. The industries that are most vulnerable to these claims are those where workers are regularly exposed to high levels of vibration from hand-held or hand guided power tools and the holding of materials that vibrate when fed into machines.

The transmission of vibration into the hand and arms can cause permanent injury to workers, sometimes leaving them unable to continue working because of loss of grip strength. The common symptoms of HAV are pins and needles, severe pain to the fingers and wrist and also numbness to the fingers which may cause a person to lose their sense of touch. The VWF syndrome is caused by the intermittent lack of blood supply to the fingers that can be triggered by the constant use of vibrating hand machinery.

Vibration hand tools and equipment are so widely used within a number of industries including construction, engineering and forestry that a huge amount of awareness of the new legislation needs to be created. The new health and safety act will require employers to take action to prevent the effects of HAV and the long-term development of VWF, caused by the exposure to high levels of hand-arm vibrations.

Perhaps one of the biggest challenges to employers is how to regulate exposure to vibration as applications may differ according to the work

carried out. Research that is conducted in laboratory conditions may not be an accurate measure of vibration for a number of reasons. For example:

- tools vary according to their condition and age;
- a person operating the tool may not have been trained accordingly or may find it difficult to monitor exact usage time to meet recommended exposure limits; and
- base material and direction of use also influence vibration levels.

Hilti, one of the leading international suppliers of tools has taken all these considerations into account by providing solutions based on real life data and the variations that may occur. Product selectors have been produced to match the correct machinery and consumables to the task whilst accurately identifying the amount of work that can be carried out safely before the legal exposure is reached.

Maximum daily use

A colour coding system for labelling tools according to vibration levels has also been devised by the Hire Association Europe (HAE) and the Construction Confederation. The traffic light system designates a maximum daily use according to the vibration level measured in m/s≈. For example, less than 5 m/s≈ means the worker can use that tool for 8 hours in the day without exceeding the exposure limit. However, this doesn't take into account other factors previously highlighted that influence vibration levels.

Employers are advised to speak to the manufacturers of the equipment they are using to find out relevant information like Hilti's product selector and to inquire if there are training manuals or courses that employees can undertake to reduce HAV risks. Also, seeking alternative ways of working, by using a number of anti-vibration mounts and supports, reduce hand-arm vibration and can separate workers from the vibration source.

Tools that have not been regularly serviced or maintained worsen vibration if they are worn or the rotating parts are slightly out of balance, so it is imperative to ensure regular servicing and maintenance of tools. Paul Langford Marketing Director of Hilti explains: "Tool vibration and performance may vary over the age of the tool and as the tool parts wear out. To monitor the performance Hilti are introducing an electronic digital counter with an indicator light that comes on when the tool needs a service. After adequate warning, the tool will then stop working as it is due for a service. Hilti has also introduced 'wear marks' to indicate when a drill bit is worn beyond safe practical use".

Ensuring every precaution is taken by providing and monitoring the usage of tools is obviously the main priority for employers. However, employers will need to be extra vigilant in co-ordinating job rotation and giving employees adequate breaks. Providing employees with training may also be necessary to ensure the correct use of equipment and continuous awareness about the risks of HAV is communicated to employees. The HSE also advises that as a precautionary measure, employees should also have a medical pre-employment assessment to see if they have any symptoms of HAV. This might also be necessary for existing employees to detect any developing stages that may later result in VWF if not monitored by regular health checks.

Controlling vibration at work is going to be a difficult task for employers as constant surveillance and careful monitoring is going to be needed. The UK Trades Confederation is aware of this and will provide its members with all the relevant information needed to comply with the proposed legislation. Although the new health and safely law is predicted to come in this July 2005, employers are encouraged to start contacting their tool suppliers now to see what steps they are taking. Employers should also be aware that special applications need on site vibration measurements as there might not be any relevant data. There are already services which offer this vibration measurement that include a risk assessment report.

GEOPHYSICAL RESEARCH PARTNERSHIP

# Mapping the under-water world in 3-D

A new research laboratory in the School of Earth, Ocean and Planetary Science at Cardiff University will enable researchers to look at the sea bed for the first time in incredible three-dimensional (3-D) detail. The CodaOctopus Research Laboratory will use novel 3-D methods to map the seabed, addressing risks in terms of marine security, the environment and health and safety. Little is known about the sea around Wales and the new laboratory will map extensive areas off the coast of Wales to create a virtual reality image, allowing scientists to walk the seabed from the laboratory.

Dr Chris Wooldridge, Project Co-ordinator and Senior Lecturer in the School of Earth, Ocean and Planetary Science, said: "At a time of increased risk in terms of marine security, the environment and health and safety, mapping the seabed and bringing the results to a wider audience is an important part of our research within the School of Earth, Ocean and Planetary Science. This collaboration will provide visualisation of the seabed for scientists and strategic decision makers for purposes of renewable energy, port operations, dredging and environmental protection."

The University has recently invested over £200,000 in seabed mapping technology from Science Research Investment Fund (SRIF). The impact of this has been enhanced by a further £50,000 sponsorship in computer software and hardware provided by CodaOctopus, an internationally recognised company specialising in underwater technologies for imaging, mapping, defence and survey.

Paul Baxter, Commercial Manager of CodaOctopus said: "CodaOctopus is pleased to sponsor this geophysical research laboratory and to be associated with Cardiff University. CodaOctopus has a strong tradition of bringing scientific research into commercial applications and with this new partnership, hopes to foster strong links between academia and industry with the aim of focusing research on commercial requirements and developing further the University's marine reputation."

MORE INFORMATION

**Dr Chris Wooldridge, School of Earth, Ocean and Planetary Sciences, Cardiff University. Tel: +44 (0)2920 875563. E-mail: Wooldridge@cardiff.ac.uk**

AWARD

# ROSE Award for Ag Tech graduate

John Deere's Technician of the Year for 2004/2005 is Mike Strange from dealer Masons in Devon. This is the second time the annual ROSE Award has gone to a graduate of the John Deere Ag Tech apprentice engineering training scheme, and the first time a Masons service technician has won the national Gold Award, after three second places in 1990, 1995 and 2001. Runner-up Danny Robinson of Ripon Farm Services in Ottringham, Hull, gained this year's Silver Award.

ROSE stands for **R**ecognition **O**f **S**ervice **E**xcellence, with the top award going to the best all round service technician from John Deere dealerships all over the UK and Ireland. John Deere provides upwards of 5000 training days each year to dealer personnel, on more than 40 different subjects, including around 3500 days for service technicians. Each technician undergoing training during the eight month season is automatically competing for the ROSE Awards – and those who achieve the highest standards become area finalists.

Representing the south west, Mike was one of 10 finalists who competed at John Deere's purpose built, state of the art training centre at Langar, Nottingham, in an intensive series of specialist tests. These are designed to assess the technicians' skills in the various product ranges, in service procedures, in communications and presentation and in customer relations.

Mike began his three year apprenticeship with Masons in 1996, taking part in the award winning John Deere Ag Tech training scheme, which is run in conjunction with Brooksby Melton College in Leicestershire. The standard apprenticeship at the College consists of three month-long residential blocks each year, covering all the normal agricultural engineering principles and systems. These blocks also include weekly sessions at the John Deere Training Centre.


**ROSE Award winner Mike Strange (left) with his gold framed certificate, presented along with the John Deere silver ROSE bowl trophy by John Deere Limited managing director Alec McKee.**

Mike attained his NVQ Level 2 and 3 qualifications through the scheme, and was also presented with a prestigious national City & Guilds Medal of Excellence, the first of only three Ag Tech graduates to have achieved this at NVQ Level 3, followed by the John Deere Ag Tech Diploma, both in 2000.

"Everyone at Masons congratulates Mike on his achievement. It's very pleasing to have one of the UK's top technicians working for our dealership," said dealer principal Jim Mason. "We have always been committed to high levels of customer service, and to improving the skills of our technicians. As a result, we are great believers in the John Deere Ag Tech programme, which works very well for us.

"Mike was the first Masons apprentice ever to sign up for the scheme, in 1996, and we have sent trainees regularly ever since. Out of the 12 full-time staff now working in our service department, five have gone through Ag Tech, and we have another new apprentice in his first year on the course.

"The advantage of Ag Tech over local courses is that it covers all the basics, but it's also tailored to John Deere equipment, involving John Deere's own specialist instructors. The future lies in good people and good training – Ag Tech enables us to provide an even better service to our customers, and I believe it is the best way to overcome the current shortage of skilled technicians in our industry."

The other eight area finalists who won Bronze Awards were: Adrian Bell of Johnston Gilpin & Co in Lisburn, Co Down; Alan Irvine of Netherton Tractors, Finavon, Angus; Jamie Jewitt of Everitt & Marshall, Hexham, Northumberland; Andy Murr of Palmers Agricultural, Linton, Kent; Ray Parker of Agricultural Machinery (Nantwich) in Cheshire; Steven Smith of P Tuckwell in Worlingworth, Suffolk; David White of The Burdens Group in Wrangle, Lincolnshire; and Paddy Delahunty of Irish dealer Templetuohy Farm Machinery in Thurles, Co Tipperary.

**Submit an article?**

Landwards is always interested to receive articles of interest to our readers from both members and non-members.

We require an article with accompanying quality images (225 dpi) together with captions. Alternatively you can send original photographs which will be returned.

Full details are on our website www.landtec.co.uk/landwards.html

Bimonthly LATE SPRING 60(2)

MEMBERSHIP MATTERS

THE NEWSLETTER OF THE INSTITUTION OF AGRICULTURAL ENGINEERS

# EAST MIDLAND MEMBERS IN OUTER SPACE!

East Midland Branch members benefit annually from attendance at the Professional Engineering Institution's annual lecture held in Nottingham. Topical, complex and challenging engineering subjects are always on offer and this year *'Beagle 2 and the future of Mars exploration'* transported us well beyond our normal agricultural horizons.

Professor Colin Pillinger CBE FRS talked to 800 East Midlands PEI members and their guests, offering a thoroughly informative and entertaining presentation. The engineering challenges of compact lightweight components was explained where saving weight down to being within 100 g of the target final lander weight was critical highlighted extremes compared to normal agricultural work. That a gas chromatography unit comparable in function to a normal room size unit could be just one component within the lander's overall diameter of just 660 mm was astonishing.

He presented a frank review of the Beagle 2 project and drew many lessons to be learned. Two key ones were the need for the Mars lander to be a prime purpose of the mission, and the absolute essential need to

maintain contact with the lander for the whole of its journey. Without that contact, unforeseen events could be neither detected nor remedied, nor could lessons be learned for the future.

In considering the apparent lack of success of the mission through lost contact, he cited media references to Beagle 2 which continued to run at a far higher level than expected, even 11 months after the disappearance. This was undoubtedly a good example of how a full explanation of a mission can capture the public imagination and bring pressure to bear on the UK government to increase its science engineering and technology budget.

This was Professor Pillinger's first speaking appearance since the International Astronomical Union had a few days before recognised his scientific discoveries and contributions to planetary science by giving Asteroid 15614 the name PILLINGER. Asteroid Pillinger lies between Mars and Jupiter and Professor Colin Pillinger said: "This is a particularly special honour for me - it is nice to know that something named after me will be existing for the next billion years". But Professor Pillinger assured everyone that asteroid Pillinger is not on a collision course with planet Earth. On the other hand, he was almost apocalyptic in describing the dangers of objects recovered from Mars contaminating Earth, and the scientific loss if Earth landers were allowed to contaminate Mars.

Answering lively questions from the audience, Prof. Pillinger said that, given the budget and support in the right time-frame, he would undoubtedly 'do it again'; but the statistics of space exploration meant it needed two missions to give a reasonable chance of success. On wider issues, he was clear that 'life', in some form or other, would happen wherever and whenever in the universe the environment became appropriate. A sobering thought.

Within one of the largest audiences for a PEI lecture were many schoolchildren and their interest and questions to Professor Pillinger auger well for the future. He was right to adopt Winston Churchill's phrase: "This is not the end. It is not even the beginning of the end. But it is perhaps the end of the beginning."

*Bill Basford FIAgrE*
*Information Officer, East Midlands Branch.*

MEMBERSHIPS

# Academic Members

Askham Bryan College
Askham Bryan
York
YO23 3FR

Barony College
Parkgate
Dumfries
DG1 3NE

Bicton College
Budleigh
Budleigh Salterton
Devon
EX9 7BY

Cranfield University at Silsoe
Bedford
MK45 4DT

Duchy College
Rosewarne
Camborne
Cornwall
TR14 0AB

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

Harper Adams University
College
Newport
Shropshire
TF10 8NB

Institute of Technology, Tralee
Clash
Tralee
Co Kerry
Ireland

Myerscough College
Myerscough Hall
Bilsborrow
Preston
Lancashire
PR7 0RY

Oatridge Agricultural College
Ecclesmachan
Broxburn
West Lothian
EH52 6NH

Pallaskenry Agricultural College
Co Limerick
Ireland

Pencoed College
Pencoed
Bridgend
CF35 5LG

Plumpton College
Ditchling Road
Lewes
East Sussex
BN73AE

Reaseheath College
Reaseheath
Nantwich
Cheshire
CW5 6DF

Royal Agricultural College
Cirencester
Gloucester
GL7 6JS

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

Sparsholt College
Sparsholt
Winchester
Hampshire
SO21 2NF

Willowdene Training Ltd
Chorley
Bridgnorth
Shropshire
WV16 6PP

Wiltshire College - Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

# COMMERCIAL MEMBERS

Autoguide Equipment Ltd
Stockley Road
Heddington
Calne
Wiltshire
SN11 0PS

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

Bomford Turner Limited
Salford Priors
Evesham
Worcestershire
WR11 5SW

John Deere Ltd
Harby Road
Langar
Nottinghamshire
NG13 9HT

FEC Services
NAC
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2LS

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

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

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

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

Silsoe Research Institute
Wrest Park
Silsoe
Bedford
MK45 4HS

White Horse Contractors Ltd
Lodge Hill
Abingdon
Oxfordshire
OX14 2JD

# LONG SERVICE CERTIFICATES

| *Name* | *Grade* | *Date of Anniversary* |
|---|---|---|
| **50 years** | | |
| John Brian **Finney** | HonFIAgrE | 11 Jan 2005 |
| **35 years** | | |
| Charles Michael **Blackbrough** | IEng MIAgrE | 27 Jan 2005 |
| Peter George **Braithwaite** | CEng FIAgrE | 27 Jan 2005 |
| William **Hancox** | CEng MIAgrE | 27 Jan 2005 |
| John **Matthews** | CEng HonFIAgrE | 27 Jan 2005 |
| Anthony Edward **Moore** | IEng MIAgrE | 27 Jan 2005 |
| Robert Tyson **Pringle** | CEng MIAgrE | 9 Jan 2005 |
| David William McQueen **Pullen** | CEng MIAgrE | 9 Jan 2005 |
| James Wilhelmus **Squires** | AIAgrE | 27 Jan 2005 |
| Matthew James **Taylor** | CEng MIAgrE | 27 Jan 2005 |
| Edward David **Weekes** | CEng MIAgrE | 1 Jan 2005 |
| **25 years** | | |
| Richard John **Belding** | MIAgrE | 24 Jan 2005 |
| Kenneth **Hopkins** | IEng MIAgrE | 28 Feb 2005 |
| Robert James **Hunter** | AMIAgrE | 20 Feb 2005 |
| Richard Waiter **Langley** | CEng MIAgrE | 24 Jan 2005 |
| Terence **Massen** | IEng MIAgrE | 20 Feb 2005 |
| Henry Duncan **McLain** | CEng MIAgrE | 21 Feb 2005 |

# A DAY IN THE FENS

***Joint Horticultural Engineering Technical Group & E. Midlands Branch Technical Visit***

Its unique arable landscape and the omnipresence of heavy goods vehicles, mostly carrying vegetable produce, are a reminder of the importance of vegetable production to the economy of the Fens. This latter point was particularly relevant last November when our technical visit was centred on post-harvest engineering of the potato.

**Assembled with our hosts (Jo Herbert and Ken North, 2nd and 3rd from right, front row) at Herbert Engineering**

To find a fully fledged engineering business in a remote part of the Fens comes as something of a surprise but RJ Herbert Engineering, founded by Rod Herbert supplying machinery for the farming industry, has certainly drawn from the advantage of a location surrounded by its market! Thirty years on, Herbert Engineering has successfully expanded into an important manufacturer of root crop and field vegetable handling equipment employing 130 personnel and supplying, apart from the UK, an export market of at least 15 other countries. A particularly outstanding feature of Herbert's business is the wide range of equipment offered to growers and packers. Pressure from the retail market to improve grading quality and packaging while holding down costs has forced producers and packers to invest in labour-saving and increasingly sophisticated handling equipment. This has certainly presented opportunities for specialist machinery manufacturers such as Herbert Engineering and it is currently in this particular sector where most of their business lies.

A morning's visit was hardly sufficient to do justice to our host's complete manufacturing operation so our group opted for a general tour of the factory and design department followed by a review of their current range of automated equipment for grading and packing. In our tour of the well lit assembly shops, covering a total area of approximately 7500 m$^2$, striking features were their spacious, uncluttered character and absence of fixed assembly lines. As our guides – Andy Hubble (Sales Manager) and Ken North (Operations Manager) – pointed out, this was largely due to the fact that most of their product range is custom-built and such equipment as washers, cleaners and grading lines can be bulky to say the least! It was here in constructing such systems, customised to specific tasks, where Herbert's main business now lay. We learned of the current increasing demand for mobile systems which operate in the field, often directly linked to the harvesting process. Such trends demand a positive response from experienced innovative design and technical support teams: an essential factor in maintaining a firm foothold in this manufacturing market.

**With Simon Bowen at one of the Solanum grading lines**

Automation has opened up considerable scope for labour saving and simplified handling systems, leading to better grading and a reduction in mechanical damage to produce. Herbert Engineering has been at the forefront by taking on this technology in its product range and, certainly, one of the first to include image analysis in robotics systems for produce grading. This is exemplified by their Autosort electronic potato grader which employs

## TECHNICAL VISIT contd

high-speed colour cameras mounted above the grading line, taking a series of images of each tuber as it is mechanically rolled below. These images are then transmitted to a computer, programmed to compare this information with a series of standard grading modules, which in turn controls the automated grading system for defect and size selection. Herbert Engineering is confident that this technology can be economically incorporated in grading systems for a range of vegetable produce and are currently developing it for other produce.

**Inspecting a Solanum automatic packer in action**

With ever greater sophistication and, often, substantial capital investment, product support and equipment servicing become increasingly important issues. Herbert Engineering is well aware of this highly significant factor in its marketing strategy and, to adequately cover this part of the business, have recently formed a separate company – Herbert BV (Europe) – which, working independently located at a base in Northern Europe, gives it both greater operating flexibility and a shorter response time for servicing – particularly with its export market. Another important facility built into Herbert's service is of ensuring their mechanised systems are as energy efficient as possible - running costs for motorised cleaning and grading lines are certainly not insignificant! The 2004 rise (approaching 30%) in steel prices has certainly had its impact on increasing production costs for manufacturers of plant and machinery. Herbert Engineering has been no exception to this and, as a direct result, its average production costs have increased by approximately 4.5%. Fortunately, this has coincided with a major stores handling review they recently instigated which has halved the average holding time of equipment and materials; the resultant saving has offset at least some of the increased steel costs.

We were particularly indebted to Jo Herbert (Marketing Manager) for organising such an interesting morning visit. A most encouraging point was that, despite all we are told about Britain's declining manufacturing base, here in the heart of the Fens we found a thriving family engineering business successfully expanding into a highly competitive export market.

A drive of a few miles took us to our next stop at the Sutton Bridge pack-house of Solanum Ltd. Aptly named, Solanum runs a contractual service for potato producers from its Sutton Bridge pack-house providing suppliers with a fully integrated storage, grading, packing and marketing facility. Although their origins can be traced back for sixty years, the present company was founded in 2000 when Russell Burgess Potato Ltd merged with SuttonBridge Ltd, creating one of the larger potato packers in the UK. The Sutton Bridge pack-house, now grading and packing 50 000 to 60 000 tonnes of potatoes annually, originally provided a marketing outlet for local potato growers and, along-side the major link route across the Fens, was ideally located to serve these customers. Today, its supply of potatoes is almost exclusively home grown coming mainly from growers in the E Midlands and E Anglia but some as distant as the W Midlands and Scotland. The relatively central location of Sutton Bridge lends itself to distribution to the retail market and processors, particularly in the SE and Midland areas. Sutton Bridge also has facilities of on-site controlled temperature storage of 8000 tonnes of potatoes for its suppliers. Solanum is proud of its strict quality-assurance service; the core feature of which is a rigorous programme of selection throughout the grading process with its ability to trace all produce back to source at every stage of handling. This is achieved by testing and recording each incoming consignment on arrival for varietal conformity, condition (damage, disease defects and greening) and waste (soil, stones and other material) by systematic sampling.

The quality and uniformity in grading standards currently demanded by the retail and processing markets can only be economically achieved by substantial investment in pack-house mechanisation; much of which is increasingly automated. There was certainly no shortage of evidence of this at Sutton Bridge and it was reassuring to see equipment supplied by Herbert Engineering in action making its particular contribution. Engineering technology, certainly automation, has not only improved labour productivity but also simplified handling in the grading process leading to a significant reduction in tuber damage - particularly important for retail pack production. Provision of grading lines to process more than 40 different varieties of potato in a multiplicity of packs is an achievement in itself, emphasising the essential factor of good pack-house design. Maintaining operating flexibility while meeting stringent hygiene standards, clearly demands a well trained team of operatives working under good management. In a commitment of improving their service both to suppliers and customers Solanum runs its own programme of development covering the whole process of storage, pack-house operation and maintenance of retail quality. At Sutton Bridge we were shown their ongoing trial investigating problems of retail

display and shelf-life; dealing with both pack design and pack environment.

A short walk across the ample vehicle turning area (essential for coping with a constant stream of HGVs) brought us to the British Potato Council's Sutton Bridge Experimental Unit. It is no coincidence that both the Unit and the Solanum pack-house share the same site, as both originated as part of the Potato Marketing Board (PMB) and it was not until the mid1990's that they became separate entities. In 1997, the PMB was replaced by the British Potato Council (BPC) which, financed by a levy on British potato growers, provides a full technical and promotional service for the industry. The PMB Sutton Bridge Experimental Unit was opened in 1964 for the purpose of providing UK potato growers with their own dedicated R&D service, and its role in this respect has remained essentially unchanged ever since.

Approximately 5.5 Mt of potatoes are grown annually in the UK: 40% of which go to the retail market while the remaining 60% to processors – less than a decade ago these proportions were reversed. At least 4 Mt find their way into storage, mostly on farms, and it is here that the Experimental Unit has made a major contribution to the potato industry. As a result of work done at the Unit, augmented by strong links with other centres often funded by PMB/BPC, our growers and packers can boast of having access to the most sophisticated storage technology currently available. The Unit's present R&D programme is still mainly concerned with improving storage technology focusing on in-store disease problems and management techniques related to potatoes both for human consumption and use for seed. In this work their suite of controlled environment stores, commissioned in 1992, continue to play a central role. The Sutton Bridge specialist team also provide a comprehensive advisory service (free to levy-paying growers) on matters such as store design and management, pest and disease diagnosis and hygiene.

Both our afternoon's visits left us in no doubt as to the importance of the wide spectrum of engineering technology helping British potato growers to meet the demands of an increasingly exacting and selective market. We were particularly fortunate in having such well informed guides as Simon Bowen (Technical Director) and Simon Faulkner (Agronomist) of Solanum and Adrian Cunnington (Operations Manager) of the BPC Experimental Unit.

*John A C Weir*
*Horticultural Engineering Technical Group*

## USEFUL CONTACTS

RJ Herbert Engineering Ltd., Middle Drove, Marshland St. James, Wisbech, Cambs. PE14 8JT Tel: +44 (0)1945 430666 Fax: +44 (0)1945 430487 E-mail: sales@rjherbert.co.uk Website: www.rjherbert.co.uk

Solanum Ltd., East Bank, Spalding, Links. PE12 9YB Tel: +44 (0)1406 350528 Fax: +44 (0)1406 351091 E-mail: sales@solanum.co.uk Website: www.solanum.co.uk

British Potato Council, Sutton Bridge Experimental Unit, East Bank,.Sutton Bridge, Spalding, Links. PE12 9YD Tel: +44 (0)1406 351444 Fax: +44 (0)1406 351125 E-mail: sbeu@potato.org.uk Website: www.potato.org.uk

## BRANCH MEETINGS

# Diary of Events

### MAY 2005

**Tuesday 10 May 05 10.00 h**
**IAgrE Technician Focus Group**
***Young Engineers in our Industry - How IAgrE can better serve & engage this group, followed by IAgrE AGM & Council Meeting***
*Venue:* John Deere UK, Langar, Notts

This discussion will be important to those involved in recruitment, retention and development of young engineers within our industry.

There will also be a guided tour of the John Deere UK facilities.

For further details contact the IAgrE Secretariat on 01525 861096 or *Email:* rachel@iagre.org

**Sunday 15 May**
**West Midlands Branch**
***Annual Social Event***

Visit and conducted tour of Coventry Motor Museum commencing at 14.00 h. The entrance fee is £2.50 per person. If members wish to meet at the main entrance around 12.30 h, William Waddilove will give them directions to a nearby venue for lunch. Please confirm if you wish to attend the visit and/or the lunch at least a week beforehand, so that bookings can be made.

For people wanting to make a day of it, there are many nearby attractions such as Ryton Gardens, Brandon Marsh Nature Reserve, Coventry Cathedral, shopping centres, etc.

For more information contact: westmids@iagre.biz

**Thursday 19 May**
**Horticultural Engineering Specialist Group Subject Day**
***"Energy in the Greenhouse – Planning for the Future"***

Morning Session – Farm Energy Centre, Stoneleigh, Warwickshire – Seminar – Speakers to be announced.

Afternoon Session – Warwick HRI, Wellesbourne, Warwick – Review of Greenhouse Energy Conservation Programme

For further information please contact John Weir (telephone 020 8788 0062 or email putney.john@virgin.net) or contact the IAgrE Secretariat to reserve a place on this event.

### JUNE 2005

**Thursday 9 June 2005**
**Horticultural Engineering Specialist Group**
***Visit to Kew's New Alpine House in Focus***

A unique opportunity to visit the new Alpine House at The Royal Botanic Garden, Kew (opening to the public this summer) and meet the principal members of the team responsible for the design of its advanced structure and environmental system.

For further information please contact John Weir (telephone 020 8788 0062 or email putney.john@virgin.net) or contact the IAgrE Secretariat to reserve a place on this event.

### JULY 2005

**Saturday 16th or Sunday 17th July**
**East Midlands Branch**
***Summer Social Meeting - Visit to Papplewick Pumping Station, Nottingham. Main Water Pumping Steam Engine/Collection of Other Steam Engines***

Ladies and guests most welcome. Further details and date to be confirmed (This is currently awaiting designation as World Heritage Site www.papplewick-pumpingstation.co.uk

# MEMBERSHIP MATTERS

## Admissions

*A warm welcome to the following new members*

### Fellow

R Clay (Staffordshire)

### Member

C English (Hertfordshire)
D L Swan (Warwickshire)

### Associate

S Bazeley (Canada)
W A Rowley (Shropshire)

### Student

*Cranfield University:*
K E Allton

*Institute of Technology Tralee, Ireland:*
D Brennan
M Broderick
M P Burke
A Carey
A Cliffe
J Collins
J P Corkery
P Crowe
B Darcy
J Deegan
J J Fitzpatrick
T W Greene
B Griffin
K Hennebry
K Hynes
D Kenny
R Kielty
P J McGeough
K McNicholas
P Moriarty
P K Myers
B O'Driscoll
D J O'Mahony
K O'Riordan
M Purcell
M Sexton
N Young

## Transfers

*Congratulations to members achieving a further phase of their professional development*

### Fellow

P S Imonigie (Nigeria)

### Member

J R Speir (Nottinghamshire)
G A Walker (Suffolk)

## Death

*With great sadness, we record the death of the following member*

James Roberston Whitaker (Liverpool)

Mr Whitaker recently resigned his membership as a Fellow owing to ill health. He had been a member since 1951, having received his Fifty Years Long Service Certificate in 2001.

## Society for the Environment

*Congratulations to the following members who have met the criteria for Chartered Environmentalist, entitling them to use the designatory letters CEnv after their name*

### Registrations

W J Bradfield (Norfolk)
Q L Dawson (Bedford)
P J Doyle (Wiltshire)
G J H Freedman (Peebles)
S J Gossage (Dorset)
R G B Jackson (Hampshire)
B M Keeble (Essex)
B Morgan (Shropshire)
T Rollinson (Edinburgh)
L E D Smith (Kent)
C Taylor (Perth)
J A C Weir (London)
W A S Wyllie (France)

## European Engineer

*Congratulations to the following member who is now entitled to use the prenominal letters Eur Ing*

N J Paul (Wiltshire)

CAREER CHANGE

# Less stress in forestry

Having a stressful job is worse for your heart than putting on 40lbs in weight or ageing 30 years – and with 1,750 people dying of cardiac arrest in the UK every week, it's time the workplaces of Britain sat up and took notice. A recent TUC survey found that stress has become the number one concern in terms of workplace hazards and that the prevalence of workplace stress has doubled in the last decade with an estimated 500,000 workers feeling the pressure.

A staggering 13m working days are lost each year to stress related problems – this equates to a loss of £3.7bn to the national economy. Along with having the longest working hours in Europe, the UK also has the highest number of sudden cardiac deaths. Least at risk are those working in:
catering
hair & beauty
farming, fishing, forestry

A survey carried out by The Samaritans found that one in three cite work as the main cause of stress in their lives, with the condition increasing the risk of heart attack by two and a half times.

Abe Elkinson, director of Trust Medical, which supplies a complete end-to-end first aid solution to UK workplaces, says: "High stress occupations often lead to high-risk activities such as drinking, smoking and over-eating – plus chronic stress can raise blood pressure and this can become permanent. High stress can also lead to depression, which can induce a higher risk of developing high blood pressure, heart disease and having a heart attack."

Sudden cardiac arrest most commonly occurs between 08.00 and 11.00 in the morning, typically when people are at work and yet most UK businesses still aren't equipped to deal with this eventuality. Of those who do suffer sudden cardiac arrest, less than five per cent currently survive. Early response is vital and by introducing a defibrillator on site, staff can now potentially save a life in those first crucial minutes.

Mr Elkinson adds: "When a person suffers a cardiac arrest, prompt treatment with an Automated External Defibrillator (AED) is the only effective treatment. Ninety per cent of victims survive if defibrillated one minute after cardiac arrest, 50 per cent after five minutes and only ten per cent survive after nine minutes."

Trust Medical is committed to reducing the number of deaths in the workplace from cardiac arrest and provides needs analysis, equipment, training, installation and maintenance to all workplaces.

Produced by: Land Technology Ltd, Edinburgh  Printed by: Barr Printers, Glenrothes

The Al-Safi dairy in Saudi Arabia is the largest commercial dairy in the world.

# TURBINE PUMPS WATER WORLD'S LARGEST DAIRY FARM

## Introduction

At the world's largest integrated dairy farm in Saudi Arabia, submersible turbine pumps from Goulds Pumps, ITT Industries are supplying reliable service while pumping extremely hot and aggressive water.

## Desert dairy farming

If farming is difficult to picture in the desert, a booming dairy farm challenges the imagination even more. Yet more than 29,000 head of cattle are raised at Al-Safi farm in Saudi Arabia.

The Al-Safi farm comprises 3,500 ha in the Al Sahba Valley, some 100 km southeast of Riyadh, the capital city of Saudi Arabia. Al-Safi enjoys international recognition from the Guinness Book of World Records as the largest integrated dairy farm in the world. All the dairy's operations are on-site at the Al-Safi farm. These include:

- 29,000 head of cattle;
- production of feed;
- milking parlours;
- processing and packaging plants; and
- distribution system.

All basic feeds needed by the herd, such as alfalfa, Rhodes grass hay, and sorghum Sudani silage, are grown on the farm.

Al Safi dairy began as an ambitious, seemingly impossible project: importing cows and locally producing milk rather than importing it. Notwithstanding arid desert realities, temperatures in the country can drop to freezing in the winter and soar to 64°C in the summer.

Importing the world's finest stock of cows from Europe and Canada (Holstein Friesian cows), a large team of scientists, veterinarians and laboratory technicians literally conquered nature by drilling wells 610 m deep. Today, Al-Safi dairy stands as an agricultural and science marvel.

The farm is huge by any standards. Production levels are up to a staggering 390,000 l of milk a day. The amount of water used in the operation is also staggering. In addition to water required for the irrigation of crops, a great deal of water is needed for the dairy

herd itself; with each of the milk cows requiring 90 to 135 litres of water per day.

Besides consumption by the herd and irrigation, water at Al-Safi is also used for cooling the herd. To protect the cattle from the intense heat, especially during the summer, Al-Safi has equipped their cattle pens with evaporative cooling systems. Using the latest technology, air-droplet cooling fans cool the cattle that take shelter under special awnings.

### Hot and aggressive water

According to Fred Clise, Export Manager for Goulds Pumps' Water Technology Division, "The water for this operation is currently being pumped from four on-site wells, some as deep as two kilometres." A submersible turbine pump from our Texas Turbine unit is already pumping water from deep inside one well with another pump that is being installed in a newly dug well."

Even though there is plenty of water in the deep aquifer beneath the dairy, the nature of the water itself presents problems for both pumping and its use in the dairy operation. "The water from the aquifer is extremely hot and extremely aggressive," said Clise. "The water comes up almost at boiling point, heated by the underground geothermal activity in the area. The water is also aggressive, containing minerals such as calcium and magnesium."

The new turbine pump, as well as the one currently in use, are both 280 mm CHC submersible turbines. The aggressive nature of the water necessitated the use of special metallurgy, employing nickel and bronze in the pump. The ten-stage pump (with an impeller in each stage) is powered by a 750 kW motor and pumps 90 litres per second.

Clise notes that the motor was specially designed for these corrosive and very hot conditions. "Usually, a submersible well water pump and motor works in an environment that ranges from 30° to 40° C," said Clise. "Because these conditions are much hotter and more corrosive, we've employed a special motor that usually sees work in oil production." Clise went on to say that this combination of turbine pump and motor is normally used for salt water injection in oil fields, where sea water is injected into wells to retrieve the last bit of oil.

**Reliable and corrosion resistant turbine pumps from Goulds are being used to pump extremely hot water, containing minerals, from wells on the grounds of the Al-Safi dairy in Saudi Arabia.**

To provide a sense of just how aggressive this underground water source is, the cost of the new well at the dairy is $1 million - a great deal of that due to having to line the well with 4.8 mm stainless steel in order to resist the corrosive effects of the water as it is pumped to the surface. Even though the full depth of the well may reach below 610 m, the turbine pump will sit at a depth of approximately 305 m below the surface at water level.

Once the water is pumped to the surface, it must be cooled before it is consumed. From the well, the water is either sent to a large cooling pond where the heat evaporates off or it is sent to a large stainless steel storage building where the water is circulated until it is cool enough for consumption by the herd or for irrigation.

### Energy savings

Even in a country where there is a surplus of energy, the efficiency of pumping systems is still very important. Clise notes the high energy efficiency of the CHC pump: "This 275 mm bowl has an 87% bowl efficiency which is extremely high for that size of bowl." Clise goes on to say that the efficiency of the bowl determines the size of the motor. The higher the efficiency of the bowl, the smaller the motor and the greater the energy savings.

Clise said that this particular model pump is also seeing service in water supply for the city of Riyadh, the capital city of Saudi Arabia. "There are only a few suppliers who can provide the specialised metallurgy and motors necessary for pumping water in these conditions," says Clise.

### Agricultural and economic growth in the desert

Dairy farming is probably the last thing that springs to mind when people think of Saudi Arabia. However, the country is actually a world leader for innovation in the sector.

"The water for this operation is currently being pumped from four on-site wells, some as deep as two kilometres." A submersible turbine pump from our Texas Turbine unit is already pumping water from deep inside one well with another pump that is being installed in a newly dug well."

Today, at the Al-Safi dairy, every phase of the operation is well integrated from plantation, irrigation, breeding, feeding, and milking until trucks roar out to support Al-Safi's control of over 33% of the country's dairy market.

The success of the dairy farming industry has also made Saudi Arabia a prime exporter of dairy products in the Middle East.

Al-Safi's promise continues to lie in its abundant - although very hot - fresh water supply. With Goulds Pumps' reliable submersible turbine pumps on the job, Al-Safi will continue to keep its herd cooled and well watered as it runs the largest dairy farm in the world.

*[Courtesy: Minett Media]*

REDESIGNATING RIGHTS OF WAY

# Government's response to users of 'green lanes'

Inappropriate use of public rights of way by mechanically propelled vehicles will be curtailed via legislation, Rural Affairs Minister Alun Michael confirmed today. The Minister's confirmation follows a Department for the Environment, Food and Rural Affairs (Defra) consultation on proposals to address widespread concern about the use of ancient, and often fragile, tracks by motor bikes, quad bikes and 4x4s. In particular, views were sought on the existing principle that permits use by modern motor vehicles on the basis that the routes were once used by horse-drawn carriages.

The Government's response to the consultation has been published, alongside the results of a Defra research report on the use of byways open to all traffic by motor vehicles. Alun Michael said: "We need a rights of way network that responds to the needs of the 21st century, not a network based solely on historic use patterns. The pressures of modern day use are very different to those a hundred or more years ago and new legislation is needed to reflect these changes.

"It is not right that future use for leisure purposes by four wheel drive vehicles, quad bikes and motorbikes is established because horses or horse drawn vehicles used a route long before motorised vehicles were commonplace. At present, other considerations – such as the environmental impact, the effect on local people, or the effect on other users – cannot be taken into account.

"I have never sought to restrict existing use of the established rights of way vehicular network and I am pleased that the findings of the Defra research report support this view. There is a place in our countryside for all users of rights of way, whether on foot or on four wheels, but the use must be responsible, sustainable and appropriate.

"Our proposals will give clarity to users to enable that to happen, but new legislation alone will not deliver the solution. We need to work at effecting cultural change amongst all user groups, make better use of existing and legal powers, and offer better guidance on management of vehicular traffic on rights of way, to ensure that the rights of way network is safeguarded for the enjoyment of everyone."

A public right of way can be established through historical documentary sources, on the basis of long public use of a route, or through express dedication. Following a recent House of Lords ruling [Bakewell Management Limited v Brandwood and Others (April 2004)] there may also be instances where more recent illegal vehicular use may give rise to vehicular rights.

The consultation response 'The Government's framework for action', centres on:

- new guidance to promote the better enforcement of existing powers, including Road Traffic powers, to manage vehicle use;
- an update to the publication 'Making the Best of Byways' providing robust advice on managing the different traffic on vehicular rights of way;
- legislation to limit the basis on which new rights of way may be acquired for mechanically propelled vehicles; and
- an end to the situation whereby historic use by horse-drawn vehicles, dedications made before the existence of the internal combustion engine, or illegal use, can give rise to a right of use by modern mechanically propelled vehicles. This will provide greater certainty about the public vehicular rights that exist by making it no longer possible (with some exceptions) to establish a 'byway open to all traffic' on the evidence of past use by non-mechanically propelled vehicles.

The Minister confirmed that he wants the measures to become law as soon as a legislative opportunity is available. The new legislation will ensure that future use by non-mechanically propelled vehicles can be used only to establish a 'restricted byway', a new category of right of way introduced by the Countryside and Rights of Way Act 2000, which excludes rights for mechanically propelled vehicles.

The statement also deals with the approach to the technical regulations to implement the provisions in the Countryside and Rights of Way Act 2000 to redesignate roads used as public paths to restricted byways.

"We need to work at effecting cultural change amongst all user groups, make better use of existing and legal powers, and offer better guidance on management of vehicular traffic on rights of way, to ensure that the rights of way network is safeguarded for the enjoyment of everyone."

## MORE INFORMATION

**The full response, 'The Government's framework for action', and the Defra research report are published online at www.defra.gov.uk/wildlife-countryside/cl/publicrow.htm**

CARBON ECONOMICS

# Five year strategy – promoting energy efficiency

The five year strategy of the Department for the Environment, Food and Rural Affairs (Defra) confirms the Government's commitment to energy efficiency and sets out a number of new initiatives and additional funding to achieve it. This builds on the firm foundation laid by the Government's Energy Efficiency Action Plan published in April 2004. Energy efficiency is the most sustainable way to meet all four of our energy policy goals – reducing carbon; security of supply; competitiveness and ensuring that every home is adequately and affordably heated.

Margaret Beckett, Secretary of State for Environment, Food and Rural Affairs, said: "This strategy spells out how we intend to make a step change in energy efficiency and successfully deliver the transition to a low carbon economy. In doing this, fuel bills will also be reduced.

"It will be vital for everyone to play their part and to work effectively together to sustain the move to an energy efficient economy. Government will play a leading role but we need the support and active participation of the public – from individual citizens, to businesses, non governmental organisations (NGO's) and the wider public sector.

"Energy efficiency is a win-win: tackling climate change while keeping fuel bills down."

High on the list of priorities are the following tasks.

- Continuing the £50m Community Energy Programme, which delivers heat networks to reduce energy bills, tackle fuel poverty, reduce carbon emissions, support combined heat and power (CHP), and build modern urban infrastructure. The programme will continue for at least the next three years, to March 2008, with additional funding of £10m available once the original allocation of £50m is exhausted.
- Undertaking a high level Energy Efficiency Innovation Review into whether technological, policy, financial and behavioural innovation, by Government, industry or consumers, is contributing fully to energy efficiency measures, as announced by the Chancellor in the Pre-Budget Report. The Chancellor also announced £20m to accelerate the development of energy efficient technology. The new funds, will provide a focus for public and private investment in energy efficiency, and will help to build new partnerships between experts from business, research and policy-making.
- Developing a new approach to Climate Change Communications – to communicate the urgency of climate change and the part which we all can play in tackling it. Defra expects to contribute substantial new resources over the period 2005-08 to raise awareness and change public attitudes towards climate change.
- Improving social housing: ensuring public-funded programmes make an important contribution to reducing carbon emissions and tackling fuel poverty. Defra, working with the Office of the Deputy Prime Minister (ODPM), Department for Trade and Industry (DTI) and industry is playing a major role in the development of the Sustainable Buildings Code and we hope the finalised Code will be widely adopted across the public sector.
- Explore and assess the role which tradeable 'white certificates' could play in promoting a further improvement in energy efficiency.
- Advising and supporting individuals, businesses and the public sector through the activities of the Carbon Trust and the Energy Saving Trust. Defra has allocated an additional £10m for the Energy Savings Trust, in addition to £60m announced in 2004 for the Carbon Trust.

PESTICIDES

# Government tests system for reporting potential effects of pesticides on human health

A recent exercise to test the extent to which pesticide companies meet their obligation to report human health incidents involving their products has been reported to ministers and is described in an Information Update for the pesticides industry, issued today by the Pesticide Safety Directorate (PSD). The exercise was intended to find out if incidents involving potential effects on human health go under-reported, and to help ensure that the procedures governing the reporting of adverse effects of pesticides are robust. It was welcomed today by Rural Affairs Minister Alun Michael as another contribution to Defra's efforts to protect human health and the environment, and to enhance the information available to protect the public.

Regulations in the UK require any company wishing to advertise, sell, supply, store or use a pesticide to apply to PSD for an approval to do so. This approval is given only when evidence of the safety of the pesticide has been evaluated. Approval Holders then have an on-going duty to report immediately any new information on potentially harmful effects.

To discover whether that reporting system is working effectively PSD asked Approval Holders to submit details of all reports and enquiries received about potential human ill-health incidents involving their pesti-

cide products in 2002, however seemingly insignificant. Responses were received from 171 Approval Holding companies, representing over 99% of the pesticides market. Action has been taken against those approval holders who did not respond, with the suspension or revocation of their product approvals.

The survey established that a small number of companies are no longer trading. It also indicated that some incidents should have been reported to PSD and/or the Health and Safety Executive for further investigation. Steps will now be taken to ensure that companies fully comply with their legal requirement to provide information when incidents occur. PSD will also repeat the exercise on a regular basis in future.

Some 16 Approval Holders – accounting for over 80% of the pesticides market – reported a total of 137 contacts involving pesticides during 2002. Their reports included details of all enquiries and requests for information relating to concerns about possible health effects of their products, in addition to reports of ill-health. PSD has broadly categorised the results on the basis of whether the products in question appear to have been used in the correct manner when the incidents occurred.

Based on the information supplied:

- 55 contacts concerned misuse, or accidents resulting in expected symptoms for example irritation caused by products being splashed in the eye;
- 12 were enquiries or requests for information about the possible health effects of pesticides; and
- 8 were unclassifiable from the information supplied

The remaining 62 appear to involve the approved use of pesticides, but did not demonstrate a causal link between the pesticide and the symptoms described. PSD's initial examination of these does not indicate that there is a need to take any immediate regulatory action. Responses were split equally between amateur and professional products.

The figures present a very small percentage of contacts against the total pesticide use in the UK, where 540 amateur products are available for use, 4600 tonnes of which are purchased by 6 million households every year. Of the 2 million professional pesticide applications in England and Wales for the test year, reports were received for less than one hundredth of one percent.

As part of PSD's commitment to maintaining a robust system of monitoring and control, all the information supplied will be submitted to the Advisory Committee on Pesticides and the Health and Safety Executive's Pesticides Incident Appraisal panel (PIAP) for consideration. Alun Michael has asked for an early and full report from both bodies on their response.

MORE INFORMATION

**The Information Update is published at www.pesticides.gov.uk/approvals.asp?id=1479**

RISK ASSESSMENT

# Farm risk self-assessment software

The Health and Safety Executive (HSE) has released a free interactive software package to help farmers carry out a risk assessment of their farms and to raise the levels of health and safety awareness in the industry. The software is aimed at all farmers and farm managers who are responsible for health and safety. It provides a step-by-step route into learning about what farmers need to do to protect their health and safety and to comply with the law, without being overwhelmed.

Roger Nourish from HSE's Agriculture and Food Sector said: "HSE has produced this self-assessment software to help improve the health and safety record of an industry that has one of the worst fatal accident levels. In the ten-year period from 1994/95 to 2003/04, 489 people were killed as a result of agricultural work activities and several thousand more were injured or became ill.

"This software simplifies the process of risk assessment and is intended to help farmers apply good health and safety practices. We hope farmers will find it a useful tool to help improve awareness of health and safety and so reduce the risk of costly accidents on their farms."

Features of the self-assessment software include:

- an application which can be installed on a computer and completed off-line at leisure;
- a configuration screen that tailors the questions to those which are relevant to the farm business;
- a series of questions on key health and safety topics;
- a benchmark for each question detailing the minimum standards which should be reached to comply with legal requirements, and the reasoning behind the benchmark;
- the ability to order relevant free HSE guidance;
- a facility to add additional risks to the assessment on issues and hazards which are either not covered by the questions or which are unique to the farm;
- a facility to allow separate assessments to be produced if more than one farm or holding is managed or owned;
- printouts in the form of a prioritised list of identified actions; and
- an optional facility to submit the completed assessment to HSE.

MORE INFORMATION

**A CD-ROM can be obtained from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA. Tel: +44 (0)1787 881165. The software can also be downloaded from the HSE website at www.hse.gov.uk/agriculture/assessment/. The website provides further details of the software as well as information on how to get the best use from the package, step-by-step instructions to use it and a forum where users can share good practice and obtain support**

AIR CONDITIONING

# Remploy Automative help drivers stay cool

Life for drivers of some of the world's toughest off-road machinery will be made a little easier, thanks to workers at Remploy Automotive.

Heat builds up so quickly in the cabs of heavy off-road trucks, earthmovers and tractors that special climate control equipment has to be fitted to keep the drivers cool.

Remploy Automotive has won a contract to both source and build components for the special air conditioning units fitted to heavy-duty construction equipment. The order has been placed by Bergstrom (Europe) Ltd, one of the world's leading suppliers of climate control units for buses, off-highway vehicles and specialist industrial vehicles. Bergstrom supplies firms such as JCB, Caterpillar and Case.

The Remploy Automotive's Bridgend factory, where all but four of the 92 employees are disabled, already supplies Bergstrom with wire harness assemblies. So when the firm was looking for a reliable company to help with the climate control job, it turned to Remploy Automotive.

Remploy is Britain's largest provider of job opportunities for disabled people. It provides jobs and training in all parts of the economy - as well as its own factories. Working closely with Government programmes like Workstep and the New Deal for Disabled People (NDDP), it assists over 5,500 people with a range of physical and mental disabilities to find work every year. In addition, it supports 4,500 people in the employment of other organisations and over 5,500 people on its own sites.

**Remploy Automotive's contract with Bergstrom (Europe) Ltd, will mean that components built by Remploy will be used in special air conditioning units fitted in construction equipment for companies such as CASE IH, JCB and Caterpillar.**

The Bridgend factory was one of the first plants in Britain to gain the sought-after TS 16949 quality assurance certificate, awarded by the British Standards Institute (BSI).
Paul von Driska, Chief Executive of Bergstrom (Europe) Ltd which is based in Ystrad Mynach, Caerphilly, said: "Remploy Automotive has delivered the quality we demand and met our supply deadlines, so we were very pleased to give them further business.

"Bergstrom has expanded rapidly in Europe and our Welsh plant, like all other suppliers, occasionally needs to out-source specific jobs. Remploy Automotive is an excellent partner and by working together we are making sure our orders are completed on time for our customers."

Bergstrom is a successful American-owned company which began operations in the UK in 1990. It opened a Chinese factory in 1998.

John Price, General Manager of Remploy Automotive, said: "We are increasingly winning new business from clients who are delighted with the high levels of service we provide.

"The new Bergstrom contract involves us not just in sub-assembly work, but we are responsible for sourcing and procuring all the components. Again, a number of companies are now turning to us to take on this kind of work to allow them to concentrate on their core business."

Remploy Automotive has worked in the automotive sector for 50 years and last year expanded from six to nine factories. It now has plants in Coventry, Birmingham, Stoke-on-Trent, Bridgend, Porth, Abertillery, Derby, Jarrow and Huddersfield. There are over 80 Remploy factories altogether which supply half the top British companies with goods and services. Products include high-tech motor and electronic assemblies, school and college furniture, protective clothing for military and civil use and printing and packaging.

Remploy is committed to promoting the independence of disabled people through their full economic inclusion in the labour market.

## MORE INFORMATION

**Doug Wallace, Impact Press & PR. Tel: +44 (0)1789 490530 E-mail: doug.Wallace@impactpr.co.uk**

CONTROL SYSTEMS

# SOYL team with AGCO to make application maps for control systems

Precision farming specialists SOYL Ltd have teamed up with the newly formed AGCO Global Technologies team to provide a one stop shop for growers who require agronomically sound variable rate application maps for the Agco Fieldstar and Falcon control systems.

SOYL Ltd are equipped with satellite geographic information system (SGIS) software, an enterprise standard Geographic Information System (GIS) which is developed by Agco subsidiary SoilTeq.

SGIS is a unique software system, used to determine optimum fertilizer need and tailor the application rate accordingly. Input application maps can be created in anumber of different ways, including SOYL maps, yield maps, soil maps, local knowledge and imagery. These can be overlaid in the SGIS software and enable fine tuning of management decisions.

"We are pleased to be able to support Fieldstar and Falcon users, variable rate application is becoming common practice and customers need to be sure that they can source sound recommendations, advice and application maps to get maximum economic and environmental benefit" comments SOYL Managing Director, Simon Parrington.

He continues "We have provided applicaton maps for Fieldstar for a number of years but using SGIS we can work with Falcon and provide a more detailed and efficient service for Fieldstar users".

"Our range of Precision Agriculture products requires specialist support for growers to gain maximum benefit from such systems, a provider like SOYL brings agronomic and technological expertise to the grower" comments Mark Moore, General Marketing Manager for the AGCO Global Technologies Group.

The AGCO Fieldstar Precision Farming system can be found on combine harvesters and tractors whilst the Falcon control system is common on AgChem Terragators.

"Compatibility is a key area of concern for growers and this type of arrangement ensures AGCO customers can receive application maps across the UK." Concludes Mr Parrington.

CONTACT

**Dorus Van Esch, Sales Director, Ag-Chem Europe B.V., Horsterweg 66a, NL-5971 NG Grubbenvorst, The Netherlands.**
**Tel: +31 77-3278400**
**Fax: +31 77-3270202.**

FINGER SCREENS

# Harpscreen Finger passes the test

With recent emphasis on all things environmental, companies operating in the recycling and soil with recent emphasis on reclamation industries are under increasing pressure to provide cost efficient services. To help companies such as these, Harpscreen is offering an improved range of finger screens and grids, designed to provide a vast range of screening solutions.

The Harpscreen Finger SC has been purposely developed for applications within a host of areas, including the recycling and waste disposal industries as well as the gravel, topsoil and cornpost reclamation sectors. Of extremely robust and modular construction, the screens can be manufactured to fit all makes and models of screening equipment with little or no modification

required.

One major benefit of the product is that the material being processed cannot congest or snag on the screening surface, as there are no cross wires used in its design. The screen employs a cascade effect using a series of fingers (the angle of which can be adjusted) so that screening properties are of the highest quality, even in rigorous and challenging application conditions.

The fingers are manufactured from high quality tensile steel and both fingers and holders can be separately replaced for ease of maintenance. Screens are available in a selection of apertures and wire diameters to suit any application.

For applications of a more heavy-duty nature, Harpscreen offers its Finger Grid, which has the ability to completely eradicate top deck clogging, even though applications are becoming increasingly demanding. This aptitude is predominantly due to its heavy duty forged fingers, which come in fixed or adjustable angle variants. Some of the applications for which the grid can help to improve efficiency include contaminated soil cleansing, excavation, landfill, reclamation, demolition and recycling to naine but a few. Each finger can be quickly and easily replaced if the need should arise and a wide range of apertures is available to users.

Te robust design is compatible with many brands of vibrating grids including Powerscreen, Finlay,

Extec, Masterskreen, Viper, Read, Nordberg and Svedala as well as several others. Another major benefit of the finger grid is that it can be completely dismantled with ease so that shipping or

transportation between sites can be managed without any logistical problems.

CONTACT

**Harpscreen GB, Unit 4, The Portland Centre, Sutton Road, St. Helens, Merseyside, WA9 3DR. Tel: +44 (0)1744 757272 Fax: +44 (0)1744 757274 E-mail: info@harpscreen.com Website: www.harpscreen.co.uk**

CROP SPRAYERS

# Optispray - one nozzle fits all needs

The most important part of any sprayer is the nozzle. The nozzle determines:

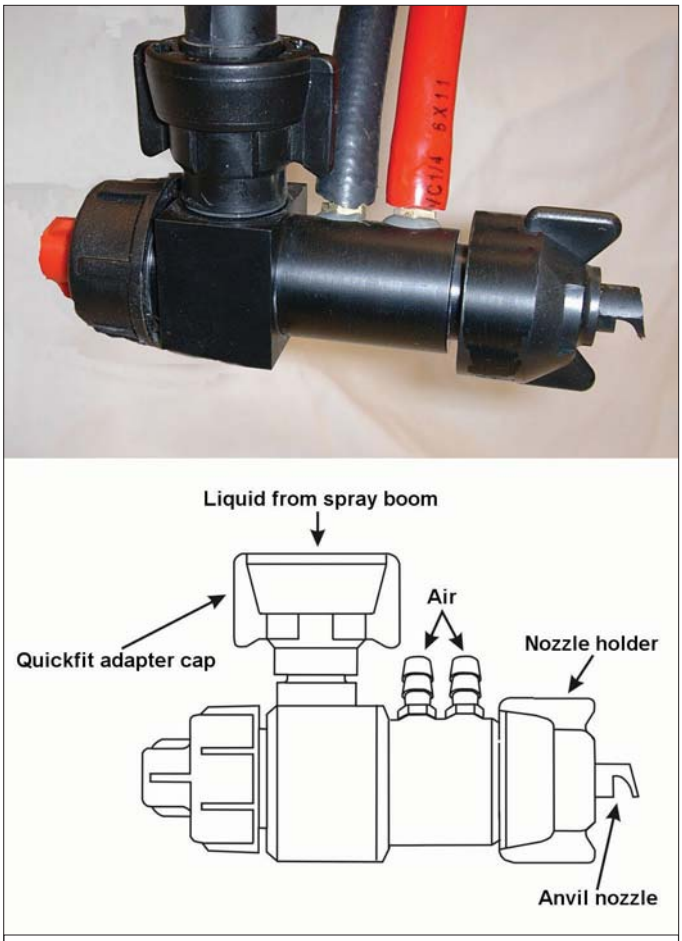
- flow-rate;
- drop size;
- distribution;
- spray pattern;
- chemical usage;
- levels of pest control; and
- safety and environmental protection.

The needs of agricultural and horticultural spraying are inherently variable due to the many biological factors relating to different types of crop and various growth stages, as well as the insects, diseases and weeds that invade them. Increasingly tight legislation, related to safety and environmental protection [e.g. Local Environment Risk Assessment for Pesticides (LERAP) requirements], add to the variation and complication in the choice of nozzles.

Due to this, traditionally there has always been a requirement for the use of multiple nozzles - a range of types and sizes - with accompanying costs related to:

- nozzle purchase
- spares store
- downtime during changeovers; and
- associated training of sprayer operators and management.

Current designs of twin fluid nozzles can generate a range of spray qualities by varying both spray liquid and air input pressures, but their flexibility is limited because of their inability to produce all spray qualities at higher flow rates. With current demands for increased sprayer speeds to increase work rates there is an urgent need for a nozzle that can produce all spray qualities at these higher flow rates.




**The Optispray from Micron sprayers; pictured (top) and in annotated outline drawing (bottom)**

The introduction of the OptiSpray nozzle from Micron Sprayers Ltd is a major breakthrough. It offers all the flexibility and simplicity needed for increasingly hard pressed farmers who are simultaneously faced with demands for increased spray safety and - by environmental legislation and the economic need [also beneficial for Integrated Pest Management (IPM) programmes] - for higher work rates. It allows farmers to purchase one nozzle for all application requirements.

OptiSpray is the first nozzle that allows farmers and spray operators full choice of spray qualities for today's faster sprayer travel speeds. The nozzle - controlled from the cab - can generate and achieve the complete range of British Crop Protection Council (BCPC) spray qualities:

- very coarse (to comply with LERAPs);
- coarse;
- medium;
- fine; and
- very fine.

This can eliminate all the time, aggravation and cost in choosing and purchasing the whole range of nozzles (from the wide spectrum of types and sizes on the market). Use of only one nozzle can dramatically simplify and speed up the operator training required by National Proficiency Testing Council (NPTC), Voluntary Initiative of the National Register of Sprayer Operators (NRoSO) and assurance schemes.

OptiSpray is a unique and patented development by SpraySmart Enterprises in Australia, with whom Micron has collaborated on final commercial development, trials and field-testing. OptiSpray is a twin fluid atomiser fitted with a novel double Venturi chamber and a removable insert (that creates the Venturi effect when liquid flows through its metering orifice). There are two positions for air entry so that the air impinges on the liquid at two distinct points as it flows along the insert with air delivered directly to each chamber. Air supply to the second chamber only occurs when the air pressure in the main line is high enough to open a diaphragm.

In summary, air is always supplied to one of the chambers but only to the other when air pressure is sufficient to open the diaphragm fitted in the airline. This twin fluid, double chamber, two stage arrangement allows small volumes of low pressure air to be directed at one of the chambers for generation of very coarse to coarse sprays.

By increasing air pressure the operator can open the diaphragm and allow air to enter the second chamber to produce coarse to fine sprays as required.

With a large flow rate range (450 - 2000 ml/min per nozzle), Optispray has all the necessary attributes - range of application volumes and spray qualities and drift reduction characteristics - to cope with all the requirements of modern spraying.

OptiSpray has been comprehensively tested and evaluated at the UK's Silsoe Research Institute. Droplet size was assessed using a laser analyser, spray pattern was evaluated with a patternator, and wind tunnel studies were used to assess drift potential.

Wind tunnel studies gave drift levels which were only 25% of those recorded through the conventional reference hydraulic flat fan nozzle (11003 at 3 bar) and show potential qualification for a LERAP 3 star rating (although this has not yet been applied for).

OptiSpray is a major breakthrough for field crop spraying in providing farmers with one spray nozzle that gives the full range of options for optimum application and control of target insects, diseases and weeds.

## MORE INFORMATION

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



# Unimog combines power with off-road strength to drain the Fens

Black Sluice Internal Drainage Board, which is responsible for draining 800 kilometres of fenland in East Anglia, has taken delivery of a new Mercedes-Benz Unimog U400 – the third Unimog that the Board has owned, having bought its first in 1989.

Whilst 90% of the daily work involves on-road driving, it is the 10% of off-road that is vital, says Black Sluice IDB Chief Executive Stuart Hemmings.

"Typically the driver will need to go 16 km and 14 of them is on road, but the ability to cross a field at the end without needing specialist vehicles or surfacing is vital. The Unimog allows us to keep up very high rates of productivity," he says.

The all-terrain Unimog is capable of normal truck speeds on road and can then switch immediately to the most difficult off-road driving.

For Black Sluice Drainage it is carrying out two main functions: refuelling remote excavators, and transporting excavators to new sites.

Black Sluice operates six excavators, each clearing weeds along the 800 km of fens watercourses in Lincolnshire: if the weed growth was not removed from the channels, severe flooding could occur to properties and intensively farmed land. Excavators are moved around by the Unimog hauling a 10 metre Chieftain low loader both on and off road. In addition the Unimog is fitted with a 2,000 litre fuel tank for re-fuelling the excavators in situ.

"This is the first of the new Unimogs we have taken delivery of and the drivers have been looking forward to it. It has a much improved, roomy and comfortable cab, and the drivers find it is a pleasure to operate," Stuart Hemmings adds.

Black Sluice Drainage is the authority responsible for ensuring good drainage of the fens in the area south of Boston. Under the present management, the Board has been operating since 1989, but the organisation can trace its history back to the 17th century when landowners began to drain their land to prevent damaging flooding of the land.


**The new Mercedes-Benz Unimog U400 in operation with Black Sluice Internal Drainage Board which is responsible for draining 800 km of fenland in Lincolnshire. The Unimog's power and legendary off-road capability is ideal for hauling a low-loader with excavator.**

## CONTACT

**Mark Hopkins, Director, Unimog UK,Kim Smith, Grant Instruments (Cambridge) Limited, Shepreth, Cambridgeshire, SG8. Tel: +44 (0)1908 245761 Fax: +44 (0)1908 245107 E-mail: mark.Hopkins@daimlerchrysler.co.uk Website: www.daimlerchrysler.co.uk**

ALL-PURPOSE VEHICLES

# John Deere introduce high performance Gator

Since they were first introduced to the market in 1990, John Deere General All-purpose Turf and Off-Road vehicle (Gators) have made their home on farms and golf courses, parks and sportsgrounds, construction and transport sites, even motor racing circuits and the Antarctic.

Now this already versatile family of utility vehicles has grown to include a brand new model at the top end of the range. The HPX High-Performance Series models are designed to work in any environment, including rough terrain, heavy-duty haulage and general farming applications. They are designed with a low centre of gravity for extra safety and stability and a good power to weight ratio.

**John Deere's General All-purpose Turf and Off-Road vehicle (Gator) fleet has grown to include a new high performance model**

Featuring a 15 kW Yanmar diesel engine, the HPX Gator is available with two or four wheel drive and is equipped as standard with all wheel suspension, front and rear hydraulic disc brakes, rear diff lock and a two speed high-low continuously variable transmission which means that there is no need for gear shifting or clutching.

The HPX Gator is based on a new hydroformed steel frame for increased durability and features a 409 kg steel cargo box, a payload/towing capacity of 590 kg and a 12 V DC outlet. Capable of travelling at speeds of up to 40 km/h, the HPX Gator can be supplied with an optional ROPS canopy or cab if required. As on the rest of the Gator range, the adjustable, suspended high back bucket seats take two adults in comfort.

Ideal for all kinds of transporting, loading, hauling, dumping and general materials handling duties, this new Gator complements the existing petrol, diesel and electric powered vehicles and is available through John Deere's established commercial & consumer equipment (C&CE) dealer network.

Optional attachments for the new HPX Gator include a wide range of tyres, a road kit, rear hitch, utility trailer, front and rear blades and a winch. Other manufacturers, such as Logic Manufacturing of Hexham and TFM Engineering of Kendal, sell a number of specialist attachments to further increase the Gator's versatility. These include seeders, sprayers, spreaders, trailers, containers and snow blowers.

CONTACT

**David Hart, John Deere Limited.**
**Tel: +44 (0)1949 860491**
**Fax: +44 (0)1949 860490**
**E-mail: info@johndeere.co.uk**
**Website: www.johndeere.co.uk**

SELF-LEVELLING CAMERAS

# RIDGID rapid upright diagnostics

The Ridge Tool Company has introduced a new and improved camera designed for use with its RIDGID/Kollmann video inspection system. The SeeSnake® Plus self-levelling camera allows for faster diagnoses. The video image is always in an upright position with water flowing along the bottom of the pipe.

The new self-levelling camera has all the durability and reliability of a RIDGID® Seesnake camera in a rugged, compact, self-levelling design.

"Because the self-levelling camera provides an image as it was meant to be seen, it can give customers a clear understanding of what they are looking at," said Mark Fleming, product manager, RIDGID/Kollmann. "This in turn helps our customers explain what repair is best needed."

At 3.4 cm in diameter and 5 cm long, the new self-levelling camera is one of the smallest cameras on the market today. The smaller size of the camera enables it to push further and through tighter spots, giving the user better diagnostic capability.

All SeeSnake Plus cameras feature a factory-installed 512 Hz transmitter that makes it compatible with the RIDGID NaviTrackTMline locator. When used in conjunction with NaviTrack's six-antenna technology, the camera head is easier to locate in underground pipe.

The new SeeSnake Plus combines high-quality components, stainless steel construction and waterproof camera housing, to provide the most durable, most manoeuvrable camera system available from Ridge Tool for inspecting pipe. It enables the user to see deep inside drain lines and other types of piping in order to determine the cause and location of blockages.

Ridge Tool Company, a leading manufacturer of hand and power tools, markets its products in more than 130 countries. The company's broad offering includes threading and drain cleaning machines and more than 300 types of tools serving the rental, plumbing, HVAC/R, industrial, electrical, petroleum, institutional, commercial and hardware markets.

CONTACT

**Ridge Tool (UK), Arden Press House, Pixmore Avenue, Letchworth, Herts, SG6 1LH.**
**Tel: +44 (0)1462 485335**
**Fax: +44 (0)1462 485315.**
**E-mail: sales.uk@ridgid.com**
**Website: www.ridgid.com**

# Massey Ferguson launches MF 4400 Series to meet livestock farming needs


**Massey Ferguson's MF4400 expands their range of tractors which are designed for small livestock and mixed farm applications**

### Durable, robust and versatile

Massey Ferguson's range of tractors designed for small livestock and mixed farm applications now includes the MF 4400 Series.

With their straightforward specification the new tractors fit neatly into the Massey Ferguson tractor range between the MF 2400 utility and the higher-powered MF5400 Series.

Offering three models from 55 kW to 73 kW, the MF 4400 Series tractors have been designed and built using proven engineering technology that has demonstrated its ability to sustain the rigours imposed by stock farm conditions. They are manufactured to MF specification at Valtra's manufacturing facility, benefiting from AGCO's strategy of the transfer of relevant technology across each of its machinery brands.

These tractors are sturdy, reliable, simple to operate and, above all, economical and easy to maintain - the perfect stockman's tractor with the versatility and capability of performing many other tasks on the farm.

Power is provided by the latest three and four cylinder Tier II compliant Sisu engines, all of which are turbocharged and offer maximum torque at 1,400 rpm.

The straightforward design theme continues into the clutch system which is mechanical and located in a protected section of the tractor's 'H' frame.

Moving into the transmission, the MF 4400 tractors are equipped with a large number of gears - 12 forward and 12 reverse to provide a speed range from 0.9 km/h up to 37.5 km/h, a sufficiently wide speed range to accommodate all farm operations.

For changing direction from forward to reverse and vice versa a mechanical shuttle is operated by the left hand leaving the other hand free for steering.

Four-wheel drive MF 4400 tractors - two wheel drive can be specified - are fitted with a front axle rated at over 75 kW demonstrating the in-built strength of these machines.

Further evidence of such strength is that the front axle has a maximum load rating of 3500 kg which makes the tractor an ideal candidate for loader work.

Recognising these tractors will often be working in confined spaces; the front axle also has been designed with a steep 55° turning angle and, for rough terrain operation, a 13.5° oscillation.

Electro hydraulic engagement of the rear differential lock - plus a limited slip front differential - ensures traction is maximised in all conditions.

In the all important brake department, the MF 4400 tractors are fitted with oil immersed brakes to provide powerful stopping power and, for trailer operation, there is an option for a trailer brake valve.

### 540 and 1000 pto

A hand lever on the left hand side of the dashboard which activates a simple, but effective and reliable, clutch system engages the pto.

An operating speed of 540 rpm is achieved at 1,890 engine rpm but when maximum engine power is not required to power an implement there is a 540 pto economy setting which runs at 1,594 engine speed. A 540/1000 pto speed is optional.

Options for this versatile tractor range also extend to a front pto and a front linkage having a 2.5 t lift capacity - the linkage is operated from a third spool valve and incorporates a linkage 'float' setting.

Linkage arms at the rear of the tractor boast a lift capacity of 2,900 kg for the 55 kW model and an impressive 3,400 kg for the 66 kW and 73 kW models. There is an option for the 55 kW version to boost its lift capacity to 3,400kg.

### Open centre hydraulics

MF 4400 tractors are equipped with open centre hydraulics operating at 19 bar having a flow rate capacity of 37 l/min (55 kW) or 52 l/min (66 kW and 73 kW models).

Oil for the hydraulics is drawn from an independent reservoir and passed through dual filters to ensure there is no opportunity for the oil to become contaminated.

As standard, the tractors are fitted with two spool valves with control from a single joystick but there is an option for a third and fourth spool valve should it be required.

For the operation of the rear linkage there are controls for draft, position and rate of drop making the MF 4400 tractor a machine equally at home in the field as the yard - and capable of excellent reliable performance.

In the cab, the operator can enjoy a low flat floor which can easily be kept clean and wide opening doors that allow unobstructed access.

Standard specification includes a filtered air system - air conditioning is optional - and an adjustable steering wheel. Options also extend to an air suspension seat.

### CONTACT

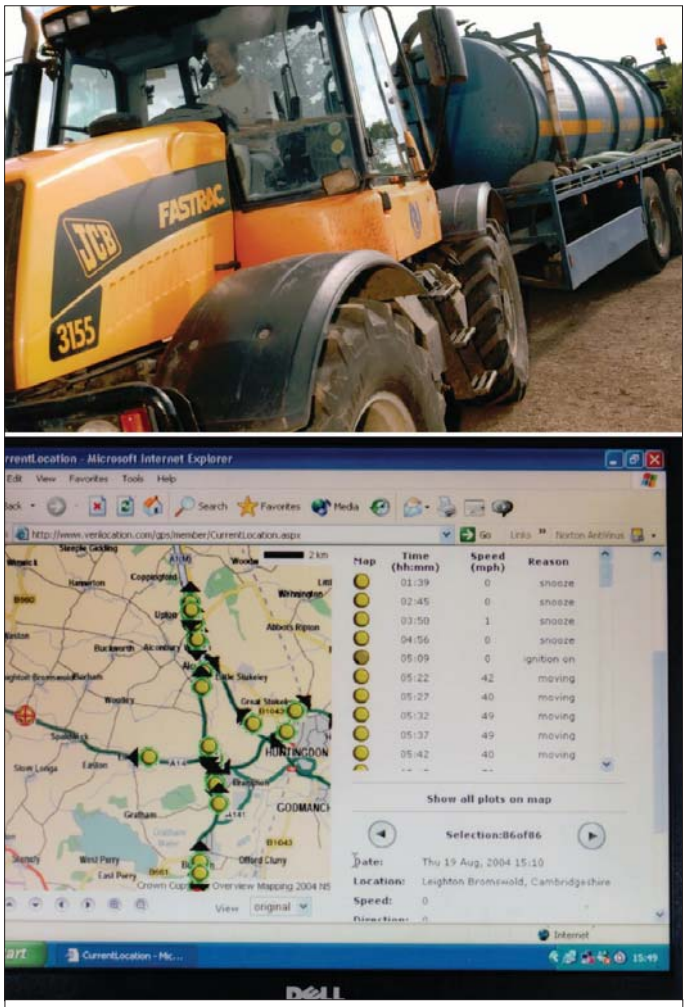
**Paul Lay, Manager, Public Relations & Communications, AGCO Limited, P.O. 62, Banner Lane, Coventry, CV4 9GF. Tel: +44 (0)2476 851209 Fax: +44 (0)2476 851182 E-mail: paullay@uk.agcocorp.com Website: www.uk.agcocorp.com**

TRACKING SYSTEMS

# Tracking tractors with VeriLocation

The Milton Keynes based agricultural and industrial haulage company, the Fullers Group, has recently purchased a GPS tracking system from VeriLocation for its JCB Fastrac tractors and trailers. The system was purchased to gain control over the Company's remote fleet of high capital cost equipment but it has delivered far more.

Fullers handle liquid and solid waste for such diverse clients as Anglican water and Faccenda Chickens to farmers and the general public. They could be emptying a septic tank in Milton Keynes in the morning and working in Southampton for Faccenda Chickens in the afternoon. Matthew Fuller, Head of Operations, takes up the story, "We needed to have far greater control of our tractors' whereabouts. With tractors costing £60 – 70k and trailers £20 – 40k, our insurance company was very keen on us knowing exactly where our equipment was at any time and we needed to have more real time information to improve the efficiency of our business.




**A JCB Fastrac tractor and trailer from Fullers fleet, fitted with the VeriLocation VL - Tracer GPS system which has helped to gain location control over the haulage Company's remote fleet of high capital cost equipment (top); checking the progress of a tractor via the VeriLocation website**

## Trailing the system

"Having bought our mobile phones for DiALECT, we asked their sister company, VeriLocation, if they could help us out with a comprehensive tracking system at a reasonable price. They suggested we ran a four week trial of their new VL - Tracer GPS system on a JCB Fastrac tractor we had bought to service out work in the South. Their service was fantastic; we made our initial request on a Thursday and by that Saturday afternoon the unit was installed on the tractor and was up and running.

"After just two weeks of the trial we were totally convinced of the benefits that the system was bringing to our business and, as a consequence, committed to a total of 10 units for our expanding fleet of tractors and trailers," enthused Fuller.

So what was it that convinced Fuller so quickly? "It did exactly what the Company claimed it would do and much more," Fuller expanded. "A lot of our jobs are emergency work, which comes out of the blue and has to be sorted immediately. Before we had the VeriLocation GPS system it meant lots of phoning around to find out which tractor was nearest to the emergency and could respond. That cost us time and money and we had to rely on the drivers giving us accurate information which wasn't always the case.

## Improving customer service

"Now when we get an emergency call we just log on to the VeriLocation web site using our username and password and we can tell in minutes exactly where all our vehicles are at that moment. Then we just call the nearest driver and tell him to go to the emergency, knowing that we have selected the closest vehicle to attend the emergency. We can then call the customer back immediately and tell him very accurately when we will be at the site to sort the problem out which our customers love.

"What's more because the VL - Tracer GPS system keeps a full log of every vehicle's journey for three months, we are building up an invaluable database of information on journey and job times. This will enable us to provide more accurate job quotes and time schedules for clients. However, more importantly perhaps, it eliminates potential disputes between our drivers and customers. If a customer phones up to say our driver was late or left the site early, we can check on the Internet and find out the facts before responding. That means there's no place to hide which is great for the customer because it ensures all our workforce are kept on their toes despite the fact that they are working remotely," said Fuller.

On the financial side there are clear benefits too. "With GPS tracking installed it means that if one of our vehicles is stolen, we know exactly where it has been taken, or is travelling," explained Kear Fuller, Matthew's father and owner of the business. He went on, "This was music to the ears of our insurance company who, when we told them that we had installed a GPS system, immediately reduced our premium by 20% which was very welcome news given our annual premium is around £40k.

## No ongoing costs

However, one of the key financial advantages of the system that impressed Fullers was the charging structure. Kear Fuller

explained, "The way some GPS companies charge for their systems makes it impossible to budget future costs because you never know what the charges are going to be until after the event. With the VL - Tracker GPS system it is very simple, there are no ongoing costs. You can either buy a unit outright or lease it over three years; either way, you know exactly where you stand. Also the system is saving us money in terms of improving workflow, reducing our telephone bills and saving us administration time both in invoice reconciliation and faster production of more accurate job quotes," concluded Fuller.

Since access to the system is via the Internet, there is no software involved at the user's end. This means not only can it be operated by relative computer novices but also the system can be accessed anywhere Internet access is available - at home, on the move, or in the office. There is also no software involved which means the installation process is speeded up and the need for software upgrades at a later date is also removed.

Another benefit of the system is that users can view multiple vehicles simultaneously on maps that are produced in-house by VeriLocation's parent company, Overview Mapping. Overview is one of the UK's largest map providers and is an Ordnance Survey Gold Partner; consequently, it provides the most up-to-date street level mapping data in the UK. When just one vehicle is selected, the map automatically zooms into street level and displays a highly accurate position of the vehicle - you can even see which side of the road it is on!

It is then possible to 'drill down' into each vehicle's log to get an historical look at its data. Any journey undertaken on any day in the last three months is logged and the user can see information such as ignition on/off, travelling, direction and when the vehicle stopped. Even if you have a manual tachograph, the VL - Tracer GPS system complements this with digital data that provides real time information over the Internet, plus the three month historical data for each vehicle.

### Peace of mind - no hard sell

Summing up, Matthew Fuller said, "Although we originally asked for a four week trial we placed the order for another nine units after just two weeks because we could clearly see it was going to make a huge difference to the efficiency of our business. The decision was made even easier by the service VeriLocation has provided which gave us complete confidence in their ability to support us going forward. Peter Thompson, their Sales Director, has bent over backwards to ensure that we are happy with the system but at no stage has he given us the 'hard sell' that is a typical feature of the GPS market.

"The VL - Tracer GPS system has given us so much more than visibility of our workforce and control over our high value capital equipment. Whilst our initial order was for ten units, as our fleet expands we're committed to putting GPS units into each new vehicle, not only because it makes sound business sense but also it gives us peace of mind and that's worth its weight in gold," concluded Fuller.

CONTACT

**VeriLocation Ltd. Tel: +44 (0)871 223 0442 E-mail: info@verilocation.com Website: www.verilocation.com**

PLOUGHS

# Dowdeswell ploughs now suit tractors up to 128 kW

**A six furrow Dowdeswell 110 series plough with shearbolt protection**

Dowdeswell has launched its 110 Series range of fully-mounted reversible ploughs available in four, five and six furrow versions for use in-the-furrow behind wheeled tractors of up to 128 kW.

Equipped with manual furrow width adjustment from 30 cm to 20.5 cm, all three models come as standard with shearbolt protection. Alternatively, auto-reset can be specified for the four and five furrow models to minimise costly down-time in shallow or difficult soils or on land with a high stone content.

Engineered to meet the demands of farm and contract operations wanting high performance, flexibility and ease of setting and use, the 110 Series is adaptable to suit differing soil types and tractor power availability. The basic shearbolt models start as one-piece four or five furrow ploughs, extendable to five and six furrows respectively with the addition of a single bolt-on furrow. The auto-reset model starts as a one-piece four furrow plough, extendable to five furrows with the addition of a single bolt-on furrow.

Although it is a new model in the Dowdeswell range, the 110 Series borrows proven technology from Dowdeswell's popular 140 Series heavy-duty ploughs, first launched in 2000. This technology includes a one-piece cast steel headstock with fabricated top mast which provides increased rigidity and durability over an all-fabricated design

Tucked in neatly, close to the main beam, the side-mounted depth wheel is adjustable for height without spanners using a simple slider mechanism which allows up and down movement of the wheel in 13 mm increments across the plough's full working depth range. The ploughs also features generous underbeam and interbody clearances of 72 cm and 91 cm respectively to sustain operations in trashy conditions without blockage.

Available with the full range of Dowdeswell bodies and ancillary components, the 110 Series comes as standard with UCN bodies, skims and rear discs, tipping the scales at 1420 kg for a four furrow shearbolt model and 2010 kg for a five furrow auto-reset plough.

CONTACT

**Phil Coleman, Product Development Manager, Dowdeswell Engineering Co. Ltd, Blue Lias Works, Stockton Road, Stockton, Southam, Warwickshire, CV47 8LD. Tel: +44 (0)1926 812335 Mobile: +44 (0)7795 446884. E-mail: sales@dowdeswell.co.uk Website: www.dowdeswell.co.uk**

FOOD TRANSPORTATION

# Companies respond to supermarket guidelines

New guidelines from UK supermarkets on the transportation of vegetables, such as carrots, broccoli and cauliflower, are set to cause a fundamental shift in the way produce is transported from the field, with timber boxes being replaced in certain applications by plastic boxes.

Staying ahead of developments is Kettle Produce in Fife, Scotland's largest salad and vegetable processing company which has made the decision to update its internal controls and replace all wooden boxes with plastic boxes over the next few months.

The decision by Kettle Produce is part of a bid to improve box longevity and reduce costs - a goal now made possible thanks to the company's work with United Box based in Fife.

Formed through a joint venture between the Scott Timber Group and James Jones & Sons Ltd, United Box, in partnership with East of Scotland Growers in Cupar, has helped lead the development of the plastic box in the UK.

While still maintaining the same levels of production for its core products, namely potato and vegetable timber boxes, United Box has responded quickly to new guidelines from supermarkets. These aim to remove the possibility of vegetables coming into contact with foreign objects, such as splinters and nails, that can result from traditional timber boxes.

As a response to the growing demand from the sector, United Box has developed a new generation of plastic box that is stronger, more versatile and, most importantly, easier to repair, a feature that has been largely lacking from the current generation of boxes.

Michael Jack, Business Development Director of United Box, said: "As a result of the influence from supermarkets the plastic box is taking on ever greater significance. We have invested in this product to ensure our customers can look to us to keep them at the forefront of developments and for a reliable solution that is second to none. With sales of plastic boxes forecast to increase by as much as 200% over the next two years it is essential that we continue to be proactive in harnessing this significant growth opportunity."

As the Scott Timber Group continues to acquire strategic sites across the UK, United Box is now aiming to marry this expansion with its ability to come up with innovative solutions for its customers.

This ability is certainly evident within a second significant growth area, with Scotland's premier box manufacturer turning its focus to slashing haulage costs through the introduction of new flat pack potato boxes for England and Ireland.

Newly developed to be more durable and flexible, Michael Jack believes over 10,000 will be sold over the next year alone.

A further innovation from United Box will also see stillage boxes which are used to carry vegetable seedlings for planting, receive an overhaul with a new generation built to take 60 plus trays, while being stronger and having a greater life expectancy due to being easier to repair.

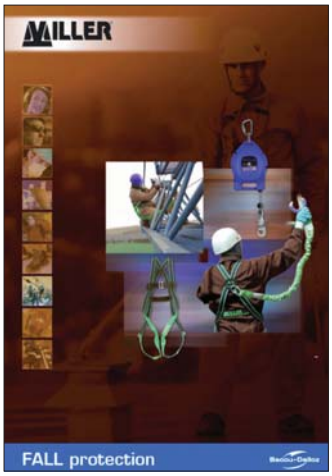
Michael added: "We have brought a fresh eye to the market which is allowing us to make a number of significant innovations based on customer needs. A key part of what we are doing is also about giving our customers a tailored solution and if we continue to get this right, I believe we will see strong growth for United Box."

CONTACT

**Alan Garland, Catchline PR and Communications. Tel: +44 (0)1592 643200**

SAFETY EQUIPMENT

# Miller Catalogue - one-stop shop for fall arrest equipment




The Miller range, from Bacou-Dagoz is the best-known, most respected brand in the world for fall arrest equipment. With more than 50 years' experience in product development and manufacturing, Miller provides solutions for working safely at height for all sorts of applications, from building and construction to tree pruning and emergency rescue services.

Now all that expertise has been brought together in the ultimate 'one-stop shop' catalogue on Fall Protection from Miller.

The glossy, full colour catalogue offers over 70 pages of ergonomically designed, stylish and comfortable products including harnesses, belts, lanyards and equipment accessories such as fall arrest blocks, anchorage lines and slings and connectors.

The catalogue has been divided into applications and height safety solutions for four key industry sectors: construction and industry; telecoms and utilities; tree pruning and technical access; and rescue. It is therefore easy to identify the correct product for any given application. Each section also gives advice on the fundamental equipment required for working safely in that particular environment.

There is a comprehensive section on basic fall protection essentials as well.

This has been designed as a useful guide to the type of equipment available and the specific function that key items play in ensuring workers are safe and able to work effectively on site. The catalogue also includes information on the training available from Bacou-Dalloz to ensure correct product use.

CONTACT

**Sarah Croker, Bacou-Dalloz Ltd, Osborne Way, Hook, Hants, RG27 9HX. Tel: +44 (0)1256 693200 Fax: +44 (0)1256 693300. E-mail: scroker@bacou-dalloz.com Website: www.bacou-dalloz.com**

**The brochure is available free to all fall arrest professional and can be ordered by contacting Bacou-Dalloz Ltd.**

# TCE55 joins the family

**The New Holland Series TCE tractors are designed to offer operators plenty of power in a compact, straightforward package. The range comprises four models from the 28 kW TCE40 to the new 40 kW TCE55, with emphasis on affordable performance which is easy to use**

The New Holland Series TCE tractors are designed to offer operators plenty of power in a compact, straightforward package. The range comprises four models from the 28 kW TCE40 to the new 40 kW TCE55 and the emphasis is on affordable performance that is easy to use.

"The newly-expanded TCE range is ideal for amenity applications, golf courses and turfwork, as well as polytunnel operations and specialist farming. Users have been delighted with the 'no nonsense' approach of the TCE. It is built on the quality and reliability that customers expect from New Holland, yet is simple to use and has low operating costs," said Kevin Carley, New Holland product specialist.

The Tier II emissionised engines are clean and quiet, with excellent torque and power characteristics. The frugal three-cylinder TCE40 develops 103 Nm torque at 1800 rpm while the top-of-the-range TCE55 achieves a maximum 160 Nm at just 1600 rpm from its two litre four-cylinder turbo-charged engine. The balance of low-end torque and top-end power means the TCE is equally at home engaged in light ploughing or towing.

Control, traction and manoeuvrability make the TCE stand out from the crowd. The 16x16 creep speed transmission provides operators with the full spectrum of working speeds. Four ratios in each of the four working ranges enable operations to be carried out from as slow as 250 m/h or up to 30 km/h.

Four-wheeled drive can be selected by the driver when required and is complemented by electro-hydraulic differential locks when maximum traction is needed. A choice of agricultural and turf tyres is available to suit various requirements, be it high levels of grip or low ground pressure. An impressive 55° steering angle translates into superb manoeuvrability allowing short headlands to be easily accommodated, whether out in the field or in the confines of a fruit farm.

The TCE has a high capacity for work. A separate dedicated pump for power steering means a genuine 28 l/min is available for hydraulic applications front and rear. The 1200 kg rear hydraulic lift capacity and three-speed pto (540, 540E and ground speed) allows a wide variety of implements to be operated. A 400 kg front-linkage capacity and optional 1000 rpm front pto further extends the versatility of the TCE.

The cab-less version of the TCE uses a suspended platform mounted on 'silent blocks' to isolate the driver from any noise and vibration. The adjustable position of the steering wheel and deluxe seat, and the ergonomic layout of controls provide a commanding location from which to control operations.

Owners of the four-cylinder TCE45, 50 and 55 can enjoy cool summers and warm winters by adding a spacious cab with optional air-conditioning to their tractor. Large glass doors and windows provide excellent visibility, with the windows opening to provide full ventilation.

## CONTACT

**John Hewett, Tel: +44 (0)1268 292183 E-mail: johnhewett@cnh.com Website: www.newholland.com**

The professional institution of choice for engineers, managers, scientists, technologists, environmentalists and students in the land based sector offers five grades of membership from Associate (including students) to Fellow. Non-corporate grades accommodate non-engineers and companies; you do not need to be an engineer to enjoy IAgrE membership

IAgrE

## BENEFITS of MEMBERSHIP

### Professional Registration
Recognition of professional status as Chartered Environmentalist (CEnv), Chartered Engineer (CEng), Incorporated Engineer (IEng) and Engineering Technician (EngTech)

### Professional Contacts
Networking opportunities with over 2000 members worldwide by access to the Membership Directory

### Publications
Personal copy of the bimonthly IAgrE Journal, Landwards, with technical articles, information alerts, products, and news of members

### Career Planning
Continuing Professional Development through Conferences, Branch meetings nationwide, Specialist Group events and Young Engineers programme

### Technical Groups
- Power and Machinery
- Soil and Water
- Horticulture
- Amenity and Sport
- Forestry
- Livestock

### Other Topic Areas
- Food
- Renewable Energy
- Pioneering Technology
- Agro-industrial Products
- International Affairs

If you have found something of interest in this journal, send for details of membership to:

**The Secretary**
**IAgrE**
**West End Rd**
**Silsoe**
**Bedford**
**MK45 4DU**
**United Kingdom**
**Tel: +44 (0)1525 861096**
**Fax: +44 (0)1525 861660**
**E-mail: secretary@iagre.org**
**Website: www.iagre.org**