Agriculture • Horticulture • Forestry • Environment • Amenity

LANDWARDS

Autumn 2007

- LIDAR TECHNOLOGY
- LANDWARDS & BEYOND

CONTROLLED TRAFFIC FARMING

IAgrE JOURNAL Volume 62 No.3 www.iagre.org

SILVER MEDAL and the INSTITUTION OF AGRICULTURAL ENGINEERS AWARD

Richard Keenan UK Ltd – Keenan Klassic 6-paddle mixer

The Keenan Klassik mixer has been developed by the Company through more than 20 years of experience of mixer design and the nutritional needs of animals. The mixer is massively built and simple in design and operation. There are just two drive chains, both with load capacities far higher than technically required, and no gearbox. There are six bearings, all mounted externally for easy replacement, and all protected against corrosion and damage. The paddles are bolted on rather than welded, again for easy replacement. Mixing paddles rotate at low speed (8 to 9 rev/min) giving quiet and low power demand mixing and an estimated 20% reduction in fuel use compared with alternative systems. The Klassik has a two-chamber design. The mixing chamber is separated from the feedout chamber by a guillotine door. As the mixing chamber is sealed, all the ingredients, including liquids, are kept moving all the time and there are no 'dead-spots'. There is a serrated top knife and floor mounted knives, against which the rotating paddles chop bulky ingredients to the required lengths. The gentle lifting and tumbling action of the six angled paddles ensures thorough mixing and the production of the correct ration structure. The feedout chamber contains a full-length auger which feeds out the ration quickly and evenly.

The Klassik is sold with free nutritional advice for the first year, and a continuing option of either of two levels of nutritional guidance. The objective is the production of the optimum Total Mixed Ration (TMR), with effective use of fibre in hay and straw within a balanced, low cost ration. The claimed result is enhanced animal production and reproductive performance, improved health and reduced feed costs.

HRH Countess of Wessex presenting the award to Richard Keenan

All the users consulted confirmed the total reliability and long life of the mixer. Everyday use for ten years without major incident was common. Mixing power requirement was low, with a 75 kW tractor needed only for handling reasons, some using 65 kW. Chop and mix quality was excellent. The machine was 'well made, simple to operate and maintain' and the nutritional backup was excellent. Most importantly, users claimed enhanced production, better health and lower vet bills, lower feed costs and a healthier 'bottom line'.

The Institution of Agricultural Engineers award is for an RASE award entry that has 'the potential to make a significant contribution to the achievement of sustainability in agriculture'. The Klassik fits the criteria by enabling greater production with the same or reduced resources, and, incidentally, giving a very large reduction in the production of methane, a 'greenhouse gas', by ruminants.

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LANDWARDS

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

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CONTENTS

Front cover: *New Holland combine harvester (courtesy: New Holland)*

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Landwards and beyond

After more than a decade and over fifty issues, the last *Landwards* from Land Technology is already underway.

As always, the Editor welcomes contributions for the magazine. Few, if any, items are excluded, even if some are delayed when space is at a premium for time-sensitive material or to maintain balanced coverage of our diversity. Nor has there been a 'hidden agenda' to stifle critical debate and controversy even when the opinions expressed in individual contributions may not be received universally with approval or follow the 'party line'. Editorial policy, like politics, however, can change, and now is the final invitation under the present editorship.

Soon, a 'new broom' or 'new brooms' will seek to assert authority by assuming a fresh identity for the magazine. After all, it is just earlier this year in *Biosystems Engineering* that covert administrative implementation of the publisher's common house style offers the lasting impression of expropriating credit for four issues of the research journal. Only the guest editors of the Special Issue are accorded the courtesy of acknowledgement, even though six months on, the manuscript acceptance dates in each article history continue to predate the change of editorship!

The present title, *Landwards,* was conceived and introduced by Land Technology. The brand image will remain attributed to the originator through its published priority date, even if others seek belatedly to apply for a registered trademark. That, in itself, may be sufficient incentive for some to demand a different title, whilst others may take a more pragmatic approach by following the maxim, 'if it ain't broke, don't fix it'. For long enough, of course, journal mailings have kept the cover under wraps, contrary to the marketing preference of 'facing out' to attract attention and promote interest in the contents. The selection and presentation of an attractive cover of high quality requires considerable artistic and graphic skill, so perhaps there is a subliminal message that it does not hold sufficient appeal to merit frontal display. Is it time for branding innovation? Agricultural engineering identifiers have lost their cachet in the Western World where there is more topicality in food miles and food surpluses than in food production. So, any title must be snappy and generic. To start the ball rolling, how about *Twine*, that indispensable adjunct to earlier mechanization, and one that forms a common bond as it passes into everyday parlance. Many others spring to mind, but what would you propose?

Professor Brian D Witney, Director of Publications, demitting office after over a decade as Editor of Landwards in December 2007, after also concluding a nine year editorial contract in March 2007 to process over 2000 scientific papers submitted to the research journal, latterly known as Biosystems Engineering

With the transfer of ownership of *Biosystems Engineering*, the IAgrE secures its learned society image and, although members' research contributions are dwindling fast, the substantiallly increased revenue stream could well support a popular technical magazine in full colour. Samples for a colour mock-up have been on the stocks for some time, and the portable document format (pdf) file is already available in four colour layout. It only needs the grey scale tinting to be changed into colour shades to effect an instant transformation, but is it value for money?

A couple of years back, there was apparently little adverse reaction to a reduction in publication frequency from six issues to four. Is it time to repeat the decline and switch to biannual? Many members' only contact with the Institution is the magazine and its regular appearance is a welcome reminder of their continuing affiliation; but others argue disparagingly that they receive too many professional journals, both free and on subscription, to scan them all. In which category does *Landwards* fall, I wonder, read or unread? Advertisers certainly perceive that the readership is too low and diverse for marketing promotions, but advertorials may still have a place. Conference speakers also now tend to concentrate on *PowerPoint* presentations with no associated article for publication as conference proceedings. If 'News Scan' and 'Product' press releases are purged as well, then two issues per year could just about cater for professional information and announcements together with submissions of articles and items for Membership Matters. An extended newsletter format might achieve enhanced appeal interspersed between the current electronic news alerts. However, the permanency of the archived documentation could be marginalised by switching to wholly electronic communications. Looking into the future, how many users have the technology to readily handle discs on different platforms from twenty years back?

Agricultural engineering identifiers have lost their cachet in the Western World where there is more topicality in food miles and food surpluses than in food production.

Then again, many members who pride themselves in being unconnected or who dislike reading online would not bother on dial-up to download or to print out an inferior hard copy and would gradually lose professional contact. The end of the printed word is not hailed by some as the ultimate objective. If the contents of the magazine are worthy of our attention, what are the professional ethics of replacing an efficient centralised production system of excellent quality for material delivered to your door with the need to incur the expense of broadband access for electronic delivery and a colour laser duplex printer to provide a personal copy to a similar standard?

The revamp of the research journal was presented as a *fait accompli*, unannounced and executed with the exigency more akin to that for a pre-emptive strike. With the magazine, there is time to savour the potential for change and participate with anticipation in the novel issue that Spring might bring. Will the Publications Committee reach a consensus to satisfy everyone's aspirations or is there still a window of opportunity to join in the debate and influence change or seek to defend the *status quo?* What of *Landwards and beyond?*

BDW

CONTROLLED TRAFFIC FARMING ON SMALL FARMS

W John Foxwell

Since the early 1980's in Australia, 2 million hectares of grain crops are under production where the high powered tractors, large combine harvesters and heavy trucks all have the same track settings of either 2 or 3 m so that they operate on controlled pathways centred 2 or 3 m apart. This is called 'controlled traffic farming' (CTF). The 3 m setting is becoming the standard. In the field, the 3 m tracks are centrally spaced 9 m apart, as shown in Fig. 1, and the combine harvesters and planters are 9 m wide, with the chemical booms 27 m wide. The advantages are that tractors can be less powerful because the wheels run on packed soil, minimum or no tilling of the soil is needed, neither is there any need to subsoil every few years, water penetration is better, there are no ruts or ridges left over from previous operations, the fuel saved is substantial and the crops are much larger because of the zero compaction. Further explanation, in detail with the cost savings, can be obtained on the intemet site **www.controlledtrafficfarming.com** and the ASABE papers noted in the references.

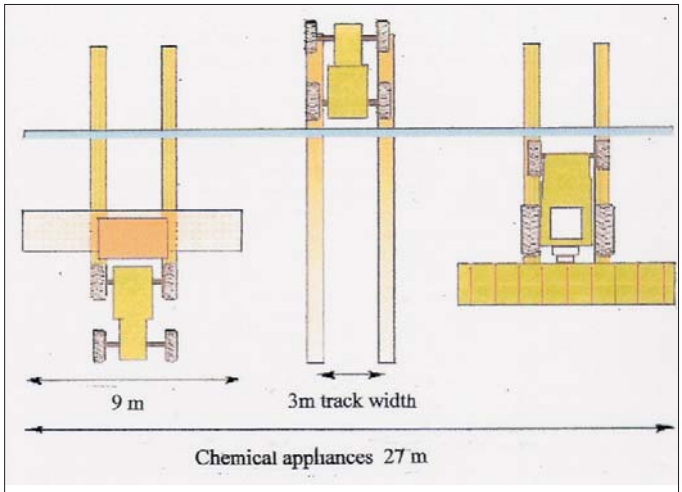

Fig. 1 Controlled traffic pathways or 'tramlines' centred on multiples of 9 m machine widths

How can the small farmer benefit from controlled traffic farming in the production of vegetables, fruit, nuts, flowers, seeds and bulbs?

First, the tractor should be low powered – no higher than 40 kW – and should use as many production parts as possible from current conventional tractors to keep the price low. It should be easily adjusted from the tractor seat for road use between the plots and vice versa. It should not be too wide in order to enable the Cat. II three-point hitch to handle many mounted implements already in use. A maximum width of the soil between the tracks of 3.66 m should be satisfactory with a wheel track setting of 4.27 m.

Figure 2 shows a plan, side and rear view of a tractor which meets the above specifications in the field configuration. It consists of a control unit on the left and a slave unit on the right. The control unit is basically the same as a typical production tractor consisting of an engine, transmission, rear axle assembly and sheet metal, etc. It has one front wheel and one rear driving wheel removed including the fender, axle shaft, bell housing, planetary driving gear set, differential gears, differential lock and brake. A means is provided to connect the remaining planetary gear set to the differential housing in order to drive the remaining rear wheel and a cast plate replaces the bell housing and holds the bearing cup which supports the differential housing. The hydraulic lift housing is also removed. Both the power take-off (PTO) and the drawbar are retained.

Figure 3 shows a 1/16 scale model of a tractor in both the field and road configurations.

The slave unit consists of a transmission and a rear axle assembly which drives only one wheel of the opposite hand of the one in the control unit. The PTO and the hydraulic lift are not

BIO NOTE

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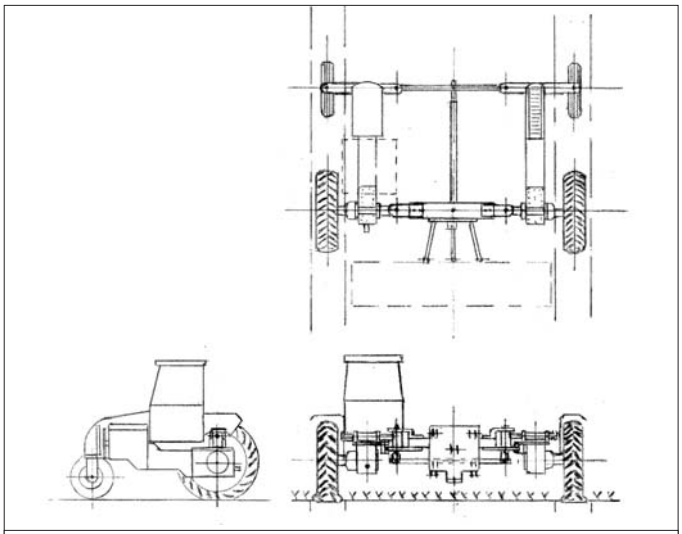


Fig. 2 Plan, side and rear views of a 'gantry' tractor in a field configuration

required. The drawbar is retained. It also only has one front wheel, of the opposite hand to the one on the control tractor and it is rigidly supported by side channels protruding forward from the transmission housing which also carry ballast weights to make the slave drive unit equal in weight with the control unit.

Single front wheels can be used because they run on packed soil making front wheel assist drives unnecessary. They also are easier to turn through greater angles when Helac hydraulic rotary actuators (**www.helac.com**) are used and controlled with a steering wheel. Freely mounted caster wheels can be used if the transmissions are used for steering with control levers similar to that of a zero-turn lawn tractor.

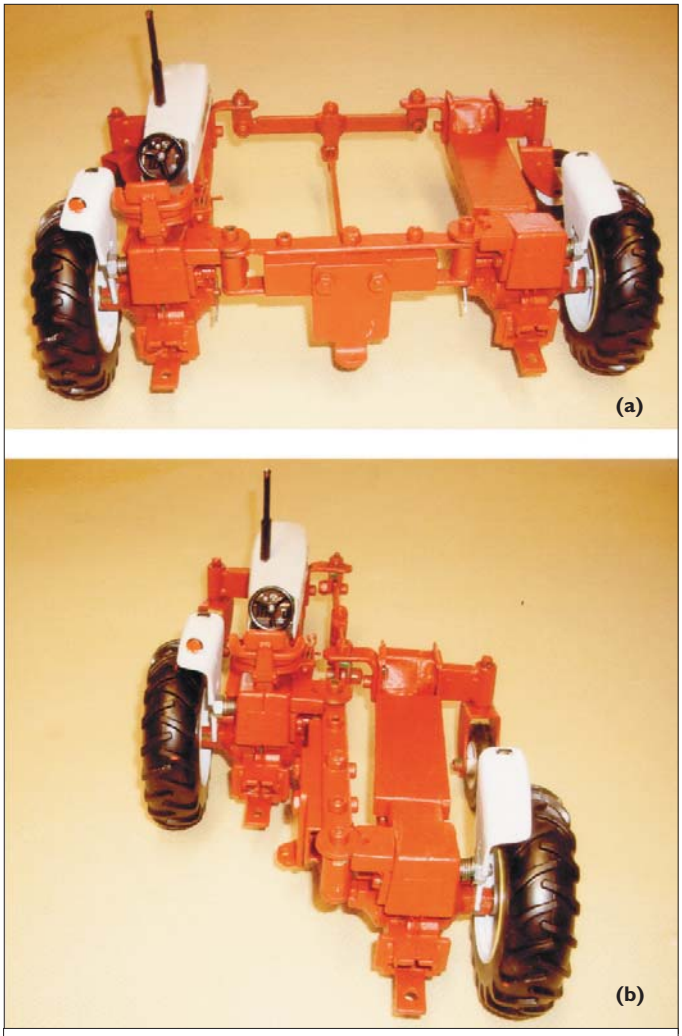


Fig. 3 A 1/16 scale model of a 'gantry' tractor in both (a) the field configuration and (b) the road configuration

The transmission in the control unit is either a hydraulic unit with a pump(s) and motor or an electric transmission with a generator(s) and motor. The transmissions must be able to share the engine power equally between the control unit and the slave unit. The transmission in the slave unit has either hydraulic or electrical motors driven from the control unit through hoses or cables.

The control unit and the slave unit are joined together with a cross beam at their rear ends and a smaller cross beam at the front end. The rear beam has horizontal pivots at both ends to allow the two units to articulate with each other on uneven ground and vertical pivots to enable the beam to turn through 90 degrees, in the plan view, when changing the track from the field position to the road position and vice versa. The vertical pivots are integrated with Helac hydraulic rotary actuators which assist when the track is changed and which lock the beam rigidly in position in both the field and road positions (Fig. 4).

Figure 4 also shows on an actual tractor, as compared to the model, how the horizontal pivots can be connected to the control unit and the slave unit with sleeves which allow the beam to be lowered into position onto two half bearing blocks attached to a plate which is bolted to the opening on top of each rear axle housing, formerly covered by the hydraulic lifts, and then held in place with two half bearing caps. The horizontal pivots are spring loaded against the outer ends of the sleeves longitudinally in order keep the lower plate, which has a circular end attached to the rear cross beam, firmly in contact with the mating circular cut-out attached to each rear axle housing. This arrangement keeps the two driving units in an upright position, with each other, when the track is being changed and also allows the two units to

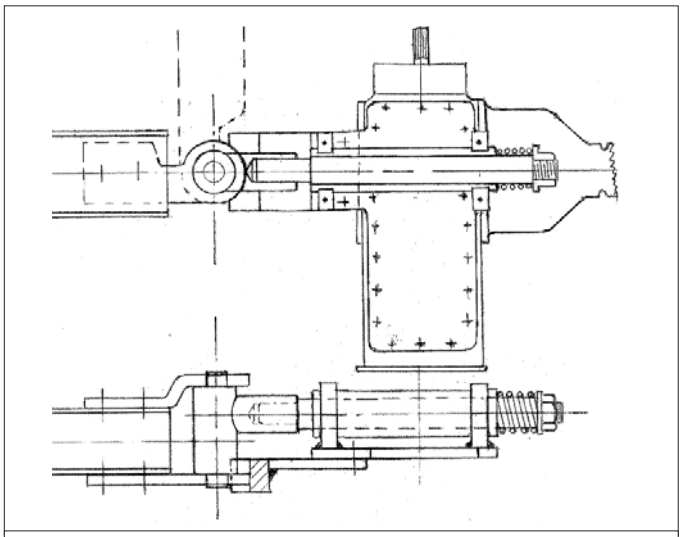


Fig. 4 Design details of the vertical pivot which enables the beam to turn through 90 degrees when changing the track from field to road configuration

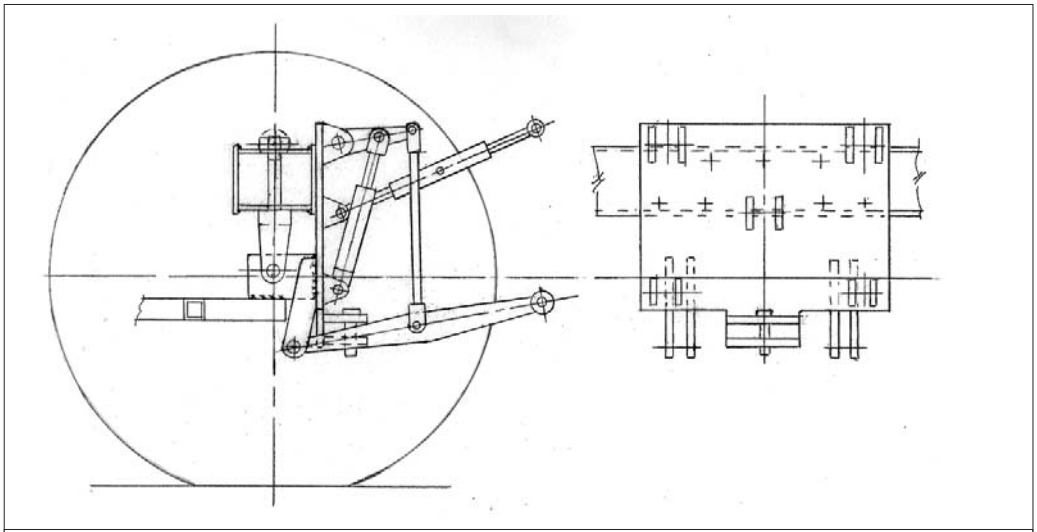


Fig.5 The three-point hitch and drawbar are mounted on a steel plate bolted to the rear of the cross beam so that the torque arm and the rear cross beam revolve as one unit in the field position but are no longer effective when rotated through 90 degrees in the road position, allowing the arm to oscillate at its horizontal pivot on uneven ground

Fig. 6 After removing the cross beams and torque arm, the control unit and slave drive unit can be connected together to provide a shipping configuration for the 'gantry' tractor

articulate with each other in the road position.

The front cross beam is attached to each driving unit with vertical and horizontal pivots to allow for articulation and to maintain them parallel to each other when the beam is rotated 90 degrees to change the track. The front beam also reacts to vertical loads at its centre from a torque arm attached to the rear cross beam which transmits the torque from an implement attached to the three-point hitch evenly between each drive unit. The three-point hitch and drawbar are mounted on a steel plate bolted to the rear of the cross beam so that, in the field position, its front face makes contact with the rear end of the torque arm in order to make the torque arm and the rear cross beam revolve as one unit in the field position and to be no longer effective when rotated through 90 degrees in the road position allowing the arm to oscillate at its horizontal pivot on uneven ground (Fig 5).

To comply with the road regulations in different countries, the control unit with the cab and the slave drive unit can be interchanged during manufacture.

When the tractor is shipped from the place of manufacture to the dealer or farmer, the two cross beams and the torque arm can be shipped separately and the control unit and the slave drive unit are connected together with a short round slave shaft allowing it to be driven onto a truck, etc. (Fig. 6).

When the front wheels are steered with hydraulic actuators only the control tractor is used to drive and steer the tractor on the road. The rear axle on the slave unit is disconnected from the transmission and is free to turn, because there is no differential, and the front wheel on the slave drive unit is fixed in the straight ahead position. The track is a maximum of 2.69 m legally suitable for most roads.

Should the tractor be used permanently in the fields and never driven on a road, the vertical pivots on the rear and front cross beams are not required as well as the hydraulic rotary cylinders which operate the rear cross beam. Should this situation arise, the tractor would most likely use the transmissions for steering in the field with caster front wheels.

PTO driven implements are powered from the PTO drive on the control unit.

The method of construction of the tractor makes it easy to adapt existing designs of high clearance tractors should there be the need for such a vehicle.

Australians are making increasing use of satellite steering systems to set out the controlled tracks in the first place and to find the tracks when they are grown over each new season and to steer the machines automatically in work. While expensive this can pay off on the larger plots (**www.controlledtrafficfarming.com**).

When an implement is too heavy or large to be operated on the three-point hitch, such as a harvesting wagon, it can be pulled by the tractor by attaching it to both drawbars of the two drive units and using caster wheels at each of its four corners to run on the controlled tracks. This makes the implement revolve with the tractor during turns in almost the same space as mounted equipment. For road use the trailer can be pulled from a hitch at attached to one of its narrow sides.

References

Controlled Traffic Farming: **www controlledtrafficfarming com**

Helac Rotary Actuators: **www.helac.com**

Raper I R; MacKirby J (2006). Soil compaction: how to do it, undo it or avoid doing it. 2006 Agricultural Equipment Technology Conference, Louisville, Kentucky.

Tullberg J N (2006). CTF makes tracks in Australia. ASABE Resource Magazine, May.

HYDROPONICS

Vertical agriculture on the up

Over the next 40 years, the UN predicts a global population boom, leading to agricultural land shortages. Great Stuff Hydroponics thinks we can overcome this problem and help to reduce the environmental impact of our cities by building vertical hydroponic agricultural buildings in urban centres.

Supplying food in the West is not an issue, where agricultural land is available and complex distribution systems are already set up. However, the UN predicts that by the year 2050, there will be an additional 3 billion people on this planet, approximately 80% of whom will live in urban centres. This poses a problem, particularly in developed societies where farmers are a dying breed and food often has to be transported over vast distances before it ends up on peoples' dinner tables.

Currently, some cities are greener than others; Singapore, Hanoi and Havana have all been cited as food producing cities. Whilst they are not yet self sufficient, other cities still have very far to go. New York, for example, has to import nearly every morsel of food which is consumed there, and trucking all that food into the city every day takes its toll on the environment and is an incredibly inefficient use of resources in a sophisticated society.

The answer, according to environmentalists, scientists and hydroponics enthusiasts is to stop all these wasteful practices by building hydroponic farms, vertically, in the heart of our cities. This would let the land around our cities return to an unspoilt ecosystem of forests or grasslands, aiding the fight against global warming and climate change. After all, we have developed into an urban species with all of the methods to produce reliable crops every year hydroponically at our fingertips. We do not need to rely on taking up large tracts of land with agriculture, polluting our atmosphere with delivery truck exhaust fumes, and leaving our crops to the mercy of the elements the way our ancestors did. Farming to excess is a contributing factor to desertification, reduced soil quality and it is unnecessarily damaging to indigenous flora and fauna.

There is already considerable popular support for town planners and city councils which take environmentally friendly decisions, dedicating themselves to keeping our countryside green and focusing on making our cities cleaner and more pleasant places to inhabit instead.

Dr Dickson Despommier, a professor of microbiology at Columbia University, originally came up with the idea of the Vertical Farm Project, as a solution to the future pressure on land and resources and as a way of reducing the carbon footprint of our cities. Since the beginning of the project, a number of environmentally friendly 'vertical farms' have been designed for New York, Toronto and Paris.

Toronto scientist, Gordon Graff designed a concept building known as the SkyFarm which would sit in the centre of the city's theatre district. His 58 floor tower design could provide enough food at the centre of the city for an estimated 35,000 people, every day. It would comprise of different crops, vegetables and fruits, all being grown hydroponically, using water in place of soil. During hydroponic growth, plants are fed nutrients dissolved in water in a strictly controlled environment.

The benefits to the environment of producing food in vertical greenhouse-like farms in the centre of town would be multiple. Not only are distribution vehicle emissions cut by growing food in the place where it will be eaten, but there is also no need for ploughing, no digging, and no seasonal droughts. Crops are protected from the elements and run off or 'dirty water' is eliminated as water can be recycled within the hydroponic system of the building.

Also, because plants grown hydroponically are in a controlled environment, with no soil, there are also no soil borne diseases or pests to worry about; the city's food could be produced without the need for chemical pesticides or fertilizers.

Hydroponic growth requires only one twentieth of the water used to irrigate a farm growing the same number of plants, yet yields are higher. Because there is a continuous flow of nutrients to the plant, the plant can concentrate its energy on producing fruit rather than roots. Hydroponic lights and a CO_2 rich atmosphere within the building could also increase food production by stimulating photosynthesis and lengthening the daylight hours available to the plants.

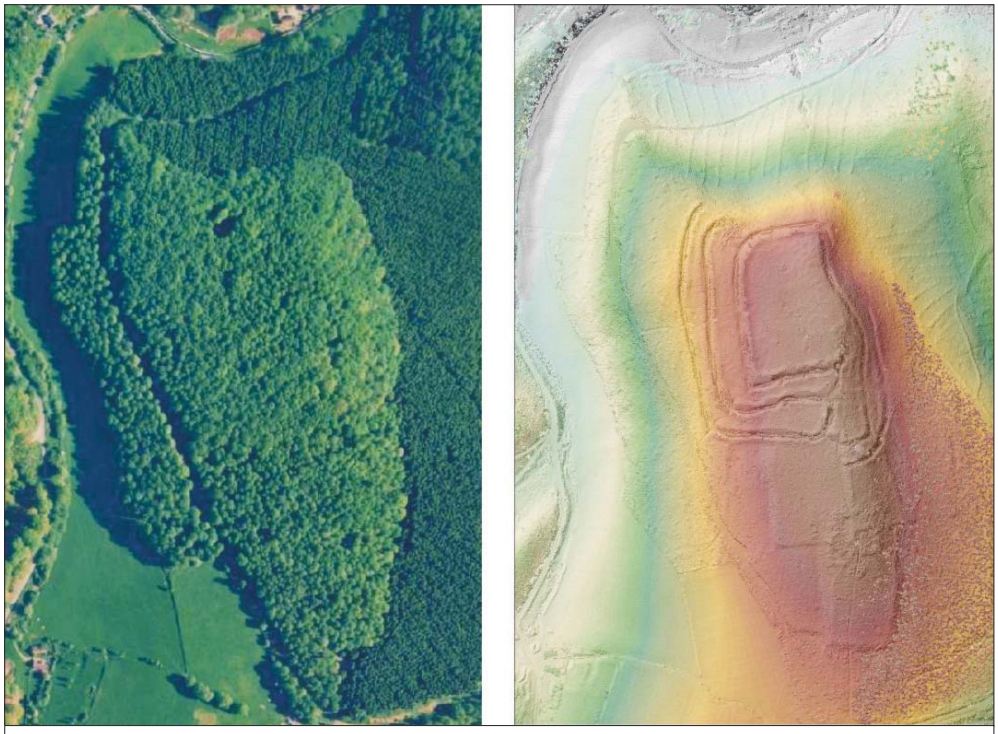
Gordon's SkyFarm idea would be a totally self sustainable building, powered by solar panels. He also says that non edible parts of plants could be composted, producing methane; this biofuel is a source of renewable energy which could be contributed to the local power grid. The SkyFarm could even develop into a scientific research facility or an eco-tourism attraction, creating jobs and drawing attention to the city as a whole.

The spirit and aims of the Vertical Farm Project have been enthusiastically received all over the world. An environmentally friendly Science Barge is run by New York Sun Works to prove the point to city inhabitants that food can be successfully grown hydroponically within the city. School groups and apartment communities have been particularly taken with the project, which illustrates how using the citys' 5600 hectares of sunny rooftop space to grow plants hydroponically, could feed 20 million people across the city of New York and the surrounding area.

The most exciting aspect of these concept buildings is that they are feasible with the technology already available to us. Not only that, but city inhabitants who are tired of paying a premium to buy food which has been brought into the city from afar need not even have a rooftop or garden. Great Stuff Hydroponics, based in Middlesborough, UK, can supply beginners hydroponic kits along with all of the materials and equipment required by established growers, for use inside peoples' homes. Given the correct lighting and nutrients, any variety of plant can be grown in water, hydroponically, absolutely anywhere, regardless of the season or climate.

For more information about the vertical farm project, visit **www.verticalfarm.com** To start growing your own hydroponic fruits and vegetables at home, purchase hydroponic kits or equipment and benefit from special offers online, see Great Stuff Hydroponics' website, **www.hydroponics-hydroponics.com**

HIGH-FLYING LASERS REVEAL FORESTS' ANCIENT SECRETS



Aerial photograph of the forest canopy at Welshbury and associated lidar image revealing the hidden archaeological features

Laser beams shone down from the sky are revealing archaeological and other treasures hidden in Britain's forests - by 'seeing through' the trees.

Scientists, archaeologists and foresters are using pulses of laser energy beamed down from aircraft flying about 1000 metres up to reveal forests' hidden secrets. These can include sites of ancient settlements, fortifications, farms and other signs of human activity which, in woodland, are often difficult to detect from the ground or the air with the naked eye.

Called light detection and ranging (lidar), the technology works by 'bouncing' harmless laser energy off the forest in much the same way as radar (radio detection and ranging) bounces radio waves off solid objects. It measures the tiny differences in time it takes for the pulses to be reflected back to the recording instruments in the aircraft from the ground or objects on the ground, including trees.

This produces data in the form of millions of three-dimensional co-ordinates. Many of these co-ordinates represent the pulses that 'bounce' back off the trees themselves, but special computer applications can strip these out, leaving only the co-ordinates of the pulses that made it through the gaps in the vegetation to the forest floor. These data can then be fed into mapping computers that can convert them into images of the ground that look as if the trees had been stripped away.

By this means, any ground features that look as if they might have been made by humans rather than nature can easily be spotted and investigated to see whether they indicate the presence, or former presence, of buildings, trenches, fortifications, fields, charcoal platforms, mining sites or other features.

Lidar works best on deciduous forests in winter, when the leaves have fallen off the trees, giving the greatest number of laser pulses the best chance of reaching the ground rather than being reflected off leaves and needles. It works less well in evergreen conifer woodland such as spruce and pine forests, where the presence of needles on the trees all year round prevents of a lot of the laser energy from reaching the ground. Nevertheless, it can still reveal some archaeological features in well thinned conifer woods.

One of the first uses of lidar to find archaeological features in British forests was a survey of 280 square kilometres of Gloucestershire, including most of the Forest of Dean. Carried out by scientists and archaeologists from the Forestry Commission and its Forest Research agency, Gloucestershire County Council, Cambridge University and English Heritage, it was the largest single heritage survey of woodland ever undertaken in Britain.

After eliminating known features, this survey revealed hundreds of features or areas of features that Jon Hoyle of Gloucestershire County Council Archaeology Service believes are worthy of further investigation and which have caused considerable excitement among archaeologists. These include industrial remains, parkland features, and what might be banks and terraces, enclosures, areas of coal extraction and areas of charcoal pits or platforms – a relic of the area's

iron-mining days before coal replaced charcoal in the smelting process.

Also among them were a number of previously unknown 'scowles', which are fissures in the ground from which iron ore has been extracted, and are a feature almost unique to the Forest of Dean.

A smaller survey of 42 square kilometres of Savernake Forest in Wiltshire was also carried out to check the accuracy of lidar findings against known archaeological features and veteran trees. This also revealed hundreds of linear and multi-sided features that archaeologists want to check out. And in addition to built structures, lidar is also helping to map the many 'veteran' (very old) trees of Savernake.

Forestry Commission England archaeologist Tim Yarnell explains: "Archaeologists have used aerial photography for decades to spot the sites of ancient human activity, which become much easier to identify from the air. But the archaeological maps made from aerial photographs always have gaps in them where there is woodland, because conventional cameras cannot see through the trees. It's not always easy to spot features from the ground either, even on open moorland and farmland, but especially so in woodland.

"This has been a great difficulty for archaeologists in general, and for the Forestry Commission in particular. That's because although we manage more scheduled ancient monuments than any other land manager in Britain, as well as thousands of other important features, there are undoubtedly many other archaeological sites in our woods and forests that we don't know about yet or which have been forgotten with the passage of time. Indeed, many archaeological features survive in woodland because they have been forgotten, or they've been protected by the woodland from being destroyed by intensive agriculture or development. These sites represent the history of woodland management and other land uses.

"Lidar technology gives us a wonderful opportunity to discover or rediscover some of these sites and, where appropriate, take steps to look after them and perhaps promote them to the public as places where they can learn more about our ancestors and their rich history. It can open up a whole new world to archaeology."

Meanwhile, lidar has other practical uses in forestry. Foresters can use it to accurately map forests in a way that distinguishes trees of different heights and ages (including 'veteran' trees). It can also inform harvesting plans, and it can show up forest tracks, drainage ditches, timber extraction routes and many other features. This information can be visualised in three dimensions to improve forest management activities, including the planning of operations such as harvesting, thinning and the construction of walking and cycling trails. As Tim Yarnell explains: "It's one thing to find an archaeological feature, but its conservationand interpretation present new challenges. Lidar technology makes it much easier for our planning foresters to do things such as identify the size of features and plot footpath routes to the archaeological sites, because it can enable them to 'see' the forest floor so clearly."

Furher information about the use of lidar in forests is available by visiting **www.forestresearch.gov.uk** and typing 'lidar' into the search facility.

NUTRITION

Call for clarity in food labelling

The Forum of Private Business (FPB) has called for clarity when it comes to the labelling of food. The Food Standards Agency (FSA) has decided that all pre-packed foods should display an easy-to-understand indication of their nutrients, and has opted for the idea of a colour-coded box on the label. The box shows the amounts of fat, saturated fat, sugar and salt in colour, using a block of red for too much, orange for quite a lot and green for a small amount. But the FPB's Food Adviser, Bob Salmon, said even that simple proposal has weaknesses.

"The trouble is that they decided to measure the amounts per 100 grams. They also decided to make the proposal voluntary. The problem then got worse when several of the major supermarkets thought that the amounts should be per average quantity eaten. They called this the guideline daily amount (GDA). So now in Britain we have two systems running, both use traffic light colours for the same ingredients but some are for 100 g portions and others are for the GDA. This is causing some confusion."

Ofcom, the independent regulator and competition authority for the UK communications industries, has decided that junk foods should not be advertised to children. Mr Salmon says that created a problem defining junk food. "Ofcom has decided that anything the FSA has coded red should be considered bad and so should not be advertised on television when children might be watching. This has caused even greater confusion."

Many foods are not eaten in 100 g portions but have been banned from advertising, for example cheeses, breakfast cereals, tomato ketchup, raisins and even low fat margarines. Lightweight foods such as bread, oven chips and pasta escape the ban so they can be advertised. Many of the larger manufacturers have reduced salt, sugar and fats in their products but are still classed as junk food as Ofcom are still working to 100 g portions.

Mr Salmon said the figures speak for themselves: "Most parents agree that junk foods should not be advertised when children are likely to be watching. However, few will think that cheese should be banned, as they recognise that it is good for growing children. So it would appear that the UK authorities have got it badly wrong. The French have a better idea," he continued. "They are now insisting that all advertisements carry a suitable message, such as: 'Avoid eating too much fat, salt or sugar', or 'take regular exercise'. This does not classify any food as bad, however it does encourage sensible eating."

The FPB is calling for a similar approach that wouldn't alienate businesses producing healthy foods that have been dubbed 'junk'. No food is inherently bad and the Government should concentrate on education so that people take a sensible mix of foods in their diet.

Listening to the trees

Forestry scientists have been 'listening to the trees' to improve business efficiency and reduce environmental impacts in the UK's wood supply chain. The researchers are from Forest Research (the scientific research agency of the Forestry Commission), working in partnership with Edinburgh's Napier University, Glasgow University, Canada's Laval University, and New Zealand company Fibregen.

They have discovered that they can assess the quality of timber by monitoring and interpreting the behaviour of sound waves transmitted through a log or a standing tree trunk. Features such as wood density, knots, grain angle and fractures can affect the time the signal takes to travel through the log.

In practical forestry terms, this means that a decision can be made in the forest about which customer will receive each consignment of logs. The logs with the stiffest wood can be sent to sawmills for processing into products requiring high strength, straightness and stiffness, such as construction timber, while other logs can be directed to uses such as those requiring pulp and chips.

Currently, logs undergo a comparatively unsophisticated visual assessment in the forest and are divided into two categories: 'red' and 'green' logs, for dispatch to suitable customers. More-sophisticated tests can only be made after the logs have arrived at the sawmill, and unacceptable logs might have to be reloaded on to lorries for a second journey, to another processing mill. This consumes time, money and resources, and contributes to greenhouse gas emissions and other environmental impacts associated with heavy road transport.

The acoustic technology takes two forms. In one, a felled log can be tested by tapping the end with a hammer and using a sensing instrument pressed against the end of the log to measure the time the sound wave takes to travel through it. The sound wave can be converted by the equipment into an assessment of the wood's characteristics, such as stiffness and potential strength.

In the other, two parts of an acoustic instrument can be attached to a standing tree trunk and a signal sent through the trunk from one part to the other. The speed of the signal can be measured and provides similar timber-quality information.

Forest Research staff have just completed six months working with sawmiller James Jones & Sons Ltd to test and develop prototype wood supply-chain systems that incorporate this technology, and they are about to start a programme of training events to roll it out to the whole British forestry industry.

A scientist demonstrates one of the acoustic tools for assessing timber quality (photo courtesy Forestry Commission).

Ultimately, the technology will be incorporated into the sawing 'heads' of the harvesting machines that fell trees in commercial forests. This means the machine operators will become one-stop shops not only for felling, measuring, trimming and sawing the logs into the lengths required by customers, as they do now, but also for assessing their timber quality and sorting them for despatch to the most appropriate customer.

Professor Barry Gardiner of Forest Research's forest management division said, "We're thrilled to have an opportunity to demonstrate how modern technology can not only increase the business competitiveness of our forest and timber industries, but also reduce the environmental impacts and enhance the sustainability of British forestry.

"Timber is a globally traded commodity and its price is set by the world market, so the UK's timber growers have to compete on price with imports from lower-cost economies. Technological developments such as this can help them to remain competitive."

The Royal Society's Summer Science Exhibition is held annually at the Royal Society, the UK's national academy of science. Admission is free and the exhibition is open to the public. This year, 23 interactive exhibits will be on show presenting the best of UK science, engineering and technology. During the four days of the event, more than 4000 people are expected to take up the opportunity to explore the exhibition.

FURTHER INFORMATION

Further information about Forest Research's timber properties research programme is available by visiting www.forestresearch.gov.uk or by contacting Barry Gardiner at barry.gardiner@forestry.gsi.gov.uk, telephone +44 (0)131 445 6950.

DESIGN AWARD

New wind turbine spins success for winning student

A revolutionary new design for personal wind turbines wins top prize at the BSI Sustainability Design Awards 2007.

Ben Storan, an Industrial Design Engineering student from the Royal College of Art (RCA), has been working for the past year in conjunction with Imperial College to design an affordable personal wind turbine suited to the urban environment.

The result is a unique design which uses vertical, rather than traditional horizontal, rotation. This feature gives a slower rotational speed, which allows the turbine to capture more energy from turbulent air flow, common to urban environments. It also means quieter operation.

As a result, it is able to generate more energy than domestic models currently on the market. Similarly sized existing personal wind turbines claim to generate 1 kW at a wind speed of 12 m/s, but typically produce just 40% of what is claimed. Ben's design should realistically produce 3 times that (1.2 kW) of those currently on the market.

The clever vertical rotation design uses lightweight materials, which means Ben's turbine is more stable than other personal turbines leading to better energy capture and making it is easier to install.

Speaking of winning the award and £3,000 first prize, Ben says "I'm delighted to win such a prestigious award. Growing up in the windy west of Ireland, I've always been acutely aware of the huge potential in harnessing such a free, clean and renewable source of energy which, along with a spinning clothes line, gave me the idea in the first place."

Ben Storan with his vertical wind turbine rotor

Whilst still at the early stages of development, Ben hopes that his design will be in production in the not too distant future.

The BSI Sustainability Design Awards support design projects that promote awareness of sustainability issues or provide sustainable solutions and are open to all students studying at the Royal College of Art. The Royal College of Art is the world's only wholly postgraduate university of art and design, specialising in teaching and research and offering the degrees of MA, MPhil and PhD across the disciplines of fine art, applied art, design, communications and humanities. Runners-up in the BSI Sustainability Design Awards 2007 are Joe Wentworth for his retrofit folding handlebars which encourages cycling in urban environments where space for bike storage is at a premium, and Andreas Zachariah for his 'Carbon Hero' personal carbon calculator.

CHEAPER BIODIESEL

Government scraps duty on biofuel production!

New Government regulations are about to come into force which will open up the market for biofuel production in the UK. At present the law requires anyone producing any quantity of a biofuel (mostly biodiesel in the UK) to pay duty of 28.35p* on every litre they produce as well as submit returns to HM Revenue & Customs and hold a permit. As from the 30th June 2007 the following changes applying to biofuel producers were introduced:

- a production threshold of 2,500 litres per annum below which producers will not need to submit returns or pay duty, and
- a reduction in the frequency of returns for all but the largest producers (defined as those producing over 450,000 litres per annum) from monthly to quarterly.

At the present time there are approximately 1,400 producers of Biofuels in the UK, a large proportion of whom produce for their own personal use.

This landmark change in regulation means that everyone will have the opportunity to produce enough biofuel for their own personal consumption, duty free.

The effectiveness of the 2,500 litre level will be monitored and the Government will consider the scope for raising the threshold a year after its introduction.

The full implications for this legislative change will be discussed and debated in workshops at the Biodiesel-Expo 2007 (**www.biodiesel-expo.co.uk**) which will take place at the Newark Showground in Nottinghamshire on 17th and 18th October. Attendees at the Expo will also be able to meet with over 100 exhibitors a number of whom have solutions for taking advantage of this new legislation. Biodiesel-Expo is organised by Biofuels Media Ltd, a company established to bring together the biofuel markets. Entry to Biodiesel-Expo 2007 is free if visitors pre-register by October 5th. After this date entry will be charged at £50.

IAgrE Branch Meetings and Events

OCTOBER 2007

Tuesday 2 October 19.30 h
West Midlands Branch
Traction, Tyres and the Environment
Speaker: Ray Clay
Venue: Stoneleigh Village Hall, Stoneleigh
Ray Clay is the former Chief Engineer of the JCB Fastrac development and is a popular and accomplished speaker. He has had many years experience dealing with traction and tyres, having spent many years at Luton working on Bedford vehicle design, before moving to JCB. No doubt Ray will cover the broad issues surrounding this topic and traction efficiency is very important in terms of saving fuel, reducing tyre wear and lessening damage to the environment.
Engineers, Farmers, Growers alike would benefit from this presentation.
Contact e-mail: **westmids@iagre.biz**

Thursday 4 October 19.00 h
South Western Branch
Lecture on Bioethanol Fuel Production
Speaker: John Waltham, Green Spirit Fuels
Venue: Met Office, Exeter
Find out more about a potentially green and sustainable fuel at an impressive venue. This is a joint meeting principally organised by the IMechE Devon and Somerset Area.
Contact if you wish to attend: Jon Smith (IMechE Branch Chairman) on 01278 451835 by *14th September.*

Monday 8 October 19.30 h
Wrekin Branch
JCB Dieselmax Fastrac … The Fastest Tractor in the World Ever?
Speaker: Speaker from JCB – to be confirmed
Venue: Lecture Theatre, Harper Adams University College
The engineering demands on making a Fastrac go even faster to push start the JCB Dieselmax car.
Contact: Branch Secretary, Graham Higginson, e-mail **wrekin@iagre.biz**

Thursday 11 October 19.30 h
Yorkshire Branch
JCB Construction Equipment
Speaker: Fred Bell – JCB UK Sales Business Manager
Venue: Buckles Inn, Askham Richard, York
Contact for further details: Gordon Williamson, e-mail **gordon.williamson@ntlworld.com**

Monday 15 October 20.00 h
Northern Ireland Branch
Electronic Management of Tractors
Speaker: James Brady
Venue: Lecture Room, Resource Centre, Greenmount Campus, Antrim
James Brady has many years of experience in the application of electronic management systems to tractors and farm machinery. His presentation will link theory and practice in this fast developing subject area.

Tuesday 16 October 19.30 h
South East Midlands Branch
An Introduction to Peak Oil
Speaker: Chris Jones, Foreman Roberts
Venue: Stumble Inn, Cranfield University at Silsoe
The prospect of decline in oil supply, while perhaps welcome from an environmental standpoint, has immense implications in terms sustained growth and lifestyle expectations. Peaking of oil supply may be sooner than many had anticipated!
Contact for further details: Branch Secretary, John Stafford, e-mail **john.stafford@silsoe-solutions.co.uk**

Wednesday 17 October 19.00 h
East Midlands Branch
In with the Old and out with the New – Caterpillar Re-manufacturing and Perkins Bio-diesel fuelled engines
Speakers: Richard Millar, Caterpillar (UK) Ltd; and Tim Cresswell, Perkins Engines
Venue: Melton Brooksby College, Melton Mowbray
In earthmoving, the goals are to move materials faster and more economically (cost per tonne), as well as to run a safe and environmentally responsible business. Re-manufacturing utilises up to 85% of the value from the original manufacture thus eliminating what would have become waste, whilst engine technology advances to run on bio-diesel. Attend this meeting if you are interested in how large plant, engines and applications are embracing greater environmental responsibility.
Meet at 19.00 h for buffet and a 19.30 h start.
Contact for further details and to book a place: Paul Skinner, e-mail **paulskinner57@btinternet.com** or tel. 01205 480431 / 353754.

Thursday 18 October 19.00 h
South Western Branch
Visit to Yeo Valley Organic Dairy at Cannington, Somerset
Yeo Valley Organic is Britain's most successful organic dairy company. It is a family business using organic milk from around 80 farms across the South West to produce high quality yoghurt and other dairy products. For more information see **www.yeovalleyorganic.co.uk**
This is a family owned business producing top quality British food supporting agriculture and caring for the environment.
Contact to book a place: Branch Secretary, Mat Payne, e-mail **mtpayne16@yahoo.co.uk** or tel. 01823 350727.

Tuesday 23 October
FEG Symposium
Venue: Newton Rigg College, Newton Rigg, Penrith
Contact for further details the IAgrE website: **http://www.iagre.org/eventselect.php**

Tuesday 23 October, evening
Scottish Branch
Electricity Generation from Timber
Venue: Barony College, Parkgate, Dumfries
Contact for further details: Branch Secretary, Allan Langley, e-mail **allan.langley@sac.ac.uk** or tel. 0131 535 4308.

Monday 29 October 19.30 h
Wrekin Branch
The New McConnel PA Series of Hedge and Verge Mowers
Speaker: Paul Lloyd, McConnel Ltd
Venue: Lecture Theatre, Reaseheath College
The engineering requirements of designing world class products.
Contact for further details: Branch Secretary, Graham Higginson, e-mail **wrekin@iagre.biz**

NOVEMBER 2007

Tuesday 6 November 19.30 h
South East Midlands Branch
PX Farms as an Agri-Business – from 1950 to the Present and Future
Speaker: James Peck, PX Farms Ltd
Venue: Stumble Inn, Cranfield University at Silsoe.
PX Farms, founded in 2003, currently farms 5000 acres including contracting and employs 7 full time and 4 part time personnel. They have developed a range of services relating to farming and countryside management.
Contact for further details: Branch Secretary, John Stafford, e-mail **john.stafford@silsoe-solutions.co.uk**

Tuesday 6 November 19.30 h
West Midlands Branch
Making Money from Muck
Speaker: Michael Chesshire, Greenfinch Ltd
Venue: Friends Meeting House, Stratford
Michael Chesshire is a Director of Greenfinch Biogas Specialists and is giving an overview of his company's work in the anaerobic digestion and biogas field. Recycling food waste, farm waste bio-digestion, power from ryegrass are just some areas for discussion.
This is still a developing and changing field of work with great benefits in terms of making and saving energy and waste, see **www.greenfinch.co.uk/farmwaste.html**
Engineers and farmers could have a lot to gain from these rapidly developing new systems, especially with the rapid increase in fuel prices.
Contact for further details: **westmids@iagre.biz**

Wednesday 7 November 19.30 h
Yorkshire Branch
Oil Seed Rape Extrusion and Uses
Speaker: Peter Rhodes
Venue: Buckles Inn, Askham Richard, York
Contact for further details: Gordon Williamson, e-mail **gordon.williamson@ntlworld.com**

Monday 19 November 19.30 h
Wrekin Branch
Young Engineers' Challenge
Venue: Harper Adams University College
The 7th Annual Wrekin Branch Young Engineers' Challenge returns to Harper Adams. Will HAUC manage to be victorious this year???
Teams of up to four young engineers. Entries to e-mail **wrekin@iagre.biz** as soon as possible. You can enter on the night too.

Wednesday 21 November 19.30 h
East Midlands Branch
EMESP Prestige Event – Under the Skin of the Bond Car – The Development of the Aston Martin DB9
Venue: East Midlands Conference Centre, University Park, Nottingham, NG7 2RJ
The design and development of the DB9 which is the first of a family of vehicles on the VH platform. The lecture will go into two main areas of the car, namely the Powertrain and the Body Structure. The Powertrain section will discuss some of the design decisions resulting in the Production V12 engine and its associated systems. The Body structure section will cover the design and supporting CAE, which allowed the body structure to deliver its targets.
Speakers: Steve Young, Engines Manager; Andy Syvret, Chief Engineer Body Engineering; Roland Snell, CAE Team Leader; all of Aston Martin Lagonda Limited
Visit website for further details or application form: **www.emesp.org.uk**

Saturday 24 November
Scottish Branch
Weir Shield Competition
Venue: Reekie Group, Stirling
Come along and support Scotland's engineering apprentices as they compete in a range of engineering tasks.
Contact if you would like to act as a competition judge: Branch Chairman, Jeff Livingston, e-mail **jeff.livingston@forestry.gsi.gov.uk** or tel.01786 435614.

Tuesday 27 November 20.00 h
Northern Ireland Branch
Braking Systems for Agricultural Trailers
Speaker: Brian Walsh, Toughline, Kildare
Venue: Cohannon Inn, Dungannon
Brian Walsh represents one of the major suppliers of braking systems for trailers and farm equipment in Ireland and has experience of specifications and legislative requirements.

Tuesday 27 November
Scottish Branch
Forestry Engineering Masterclass
Speakers: Dr Geoff Freedman and David Killer
Venue: Oatridge College, Ecclesmachan, Broxburn, West Lothian.
This is a provisional booking.
Contact for further details: Branch Secretary, Allan Langley, e-mail **allan.langley@sac.ac.uk** or tel. 0131 535 4308.

DECEMBER 2007

Monday 3 December 19.30 h
South East Midlands Branch
Design and Construction of the "Air Walk" in Salcey Forest
Speaker: Geoff Freedman, Head of Design, Forestry Civil Engineering
Venue: Stumble Inn, Cranfield University at Silsoe
The 300 m walkway is designed to be accessible to wheelchair users and buggies as it winds through the trees up some 15 m to the forest canopy. At the end, visitors can climb up to a crow's nest, 20 m above the forest floor and take in the stunning views. The innovative structure was the winner of the Environment prize in the 2006 British Construction Industry Awards.
Contact for further details: Branch Secretary, John Stafford, e-mail **john.stafford@silsoe-solutions.co.uk**

Tuesday 4 December 19.30 h
West Midlands Branch
Visit to Power Torque Engineering, Binley, Coventry with Jon Townley
Power Torque are suppliers of engines, drive trains and components for a wide range of applications including agricultural and construction equipment and the company holds franchises with JCB and Ford.
This visit will give an insight into a specialist engineering field related to a wide range of vehicles and provide an opportunity to see current developments, see **www.powertorque.co.uk**.
This visit will be of especial interest to design and application engineers and is limited to a maximum of 20 people.
Contact if you wish to attend: Mike Sheldon, e-mail **westmids@iagre.biz** or tel. 01926 498900.

Monday 10 December 19.30 h
Wrekin Branch
Bio-fuelling and Bio-lubricating Off Highway Engines
Speaker: Ron Perera, Case New Holland
Venue: Lecture Theatre, Reaseheath College
Bio-fuelling and lubricating are very hot topics in today's environmental awareness discussions. The speaker will give overview on the engineering benefits and trappings of running B-fuels and oils.
Contact for further details: Branch Secretary, Graham Higginson, e-mail **wrekin@iagre.biz**

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MEMBERSHIP MATTERS

THE NEWSLETTER OF THE INSTITUTION OF AGRICULTURAL ENGINEERS

A future for the Rural Landscape

At present the bulk of UK farmland is retained in private hands but reliant on tax payers' support to produce adequate returns for the owners. Because of this, land usage is dependent on the desires of the urban population as expressed by the government. Governmental policy will shape the countryside but it is far from clear as to what this policy might be, certainly not the production of food significantly above current world prices. The impression given is that bio-diversity comes before feeding the country from locally grown food. This, however, is causing concern with regards to 'food miles', the destruction of wild habitat in vulnerable areas of the world and the use of scarce resources in fragile environments. There may well be a significant swing in national policy if the advocates of locally grown food can persuade politicians of the environmental benefits of using

UK land to produce a higher percentage of UK food. It could be argued that in the future it may be one of a very limited number of natural resources available to us. These pressures and uncertainties are likely to reduce the viability of small family farms. However, the bulk of farmland will remain in private hands but an increasing percentage will be owned or farmed by large farming companies, environmental agencies or charitable organisations.

If, however, the countryside was no longer to be used to produce food, what options are available? Currently, the urban population expects increasing access to the countryside. It is envisaged that this should be in a 19th century landscape of small fields, hedges and mixed woodland populated by wild animals, decorative cows and cute lambs and cottages inhabited by jolly rustics. In contrast, there is an increasing expectation that wind powered and biomass powered electricity generation equipment will be sited in rural locations while the land is used to grow crops capable of producing industrial raw materials, fossil fuel substitutes or acting as CO_2 sinks. From a rural point of view, unreasonable demands are being put on a minority of the population by the urban majority. It could be argued that the urban majority need to clarify their demands on the environment so easing the task of balancing the demands on the countryside.

So what about concentrating on one prime function for rural land such as CO_2 reduction?

Global Warming mitigation?

Growing trees (as CO_2 sinks) and bio-fuels (supposedly CO_2 neutral) such as elephant grass and oilseed rape to reduce the impact of our current energy hungry life style have been

proposed. It would require all of the UK to be covered in young woodland to soak up half our current CO_2 production. Alternatively blanket planting oilseed rape could provide enough fuel to power existing diesel cars and lorries but nothing more. Estimates have been made that show planting trees has a more beneficial effect on CO_2 levels than planting bio-fuels (at least in the short term of 100 to 200 years). After reaching maturity, trees can be used as a building material so locking up the carbon for a further 200 to 500 years and save on the energy required to produce bricks. Either scenario would mean obtaining all our food (except possibly nuts) from overseas, unlikely to be an acceptable strategic option. There are, however, areas of land where increasing the tree cover is possible without loss of agricultural land. Using tax levied on CO_2 producers to finance planting and subsequent management is an option that may be acceptable if the public had free access to these areas of woodland. Radical alterations to the landscape would have to be accepted but if a further 30% of marginal land could be afforested then some 15 million tonnes of CO_2 could be locked up per year. This is 3% of current UK CO_2 production.

If £250 per hectare per annum was paid out to maintain this woodland, the cost to the CO_2 producers would be in the order of £500 million or less than 0.2% of gross national production.

Planting trees also has an advantage if wind farms are to be placed in the countryside as they restrict visibility and reduce their visual impact. They would, however, also restrict general visibility and so reduce the visual grandeur of many tourist areas.

Changing agricultural practices to reverse the reduction of organic matter in the soil could, over the short term, lock up large quantities of carbon. Utilities in Canada are paying for farms to act as carbon sinks to mitigate against the damage being done to atmospheric CO_2 levels by the generation of energy from fossil fuels.

Until recently bio-fuels have been grown in large quantities alongside food. Fuel for working horses took up a significant area of fertile land. If the returns are better than the alternatives then such crops will be grown again as they present few if any technical problems. With tax payers' support and legal constraints, this will come about in the short term. This is producing only limited change to agricultural practices but would, as with food production benefit from increasing field size and improved layout. A further 3% of CO_2 reduction may be achievable without totally unbalancing the percentage of low 'food mile' products available to the British consumer.

The effects of 'growing' biofuels to meet politically imposed targets are being seen in the marketplace with the Daily Telegraph reporting the doubling of the price of tacos in Mexico, a 40% increase in the price of beer in Germany and the New Zealand Herald warning about loss of overseas earnings from whey and tallow fats if they are used to meet government targets for green fuels. Farmers are growing energy crops *in place* of food. The Indian government is talking about planting 14 million hectares of jatropha. Soon there will be significant food shortages unless more agricultural land is carved out of the wilderness.

Do we want this with 530 million tonnes/year of CO_2 to go before we become CO_2 neutral?

Geoffrey F D Wakeham

Landscaping students going for gold at 'skills Olympics'

Two students are hoping to bring back the gold medal from the 'Olympics of vocational skills' on behalf of the UK landscaping industry. Tim Lancaster and Keith Chapman of Askham Bryan College near York will represent the UK landscape industry at the WorldSkills Finals in Japan in November. WorldSkills is an international competition held every two years to champion skills and learning for work, where 48 member countries compete in 40 different vocational skills.

Tim and Keith have been working towards this for the last three years as National Diploma in Horticulture students, taking part in a number of elimination rounds to reach the final selection. In the UK heats at Coventry, they built a Japanese-style garden to a specific brief and with judging throughout. "The pressure was immense but to be part of a world-standard competition is brilliant and hopefully we will bring back a medal," said Keith.

The pair will now go through an intensive training programme to prepare them for the finals. In September, they will be given the design brief for the garden they will construct during the contest.

"We know it's going to be tough but it is a marvellous opportunity, not only to represent our country, but to meet other contestants and visit Japan," said Tim. "To get to this level also adds to our credibility as landscape gardeners."

Both Tim and Keith already work in the industry – Tim for RMP Properties in Leeds and Keith for Lowmill Landscapes at Finghall, Bedale. They join their lecturer, Harry Turner, who has already been chosen as both the UK Skills Training Manager and as a judge at the finals.

The contest attracts 850 young people from over 45 countries. At least 200,000 spectators are expected to attend the four day competition in the former Olympic village in Shizuoka, Tokyo.

"Everybody who has been chosen to be part of the UK's WorldSkills 2007 team should be justifiably proud and they are all to be congratulated," said Skills Minister Phil Hope. "Through their achievements, these young men and women are ideal ambassadors for vocational education and training. This country has world class skills and we are proud to show off the unbelievable talent amongst our young people in sector after sector across the economy."

"Landscaping, like many industries in the environmental and land-based sector, is one of those industries where your skills are on show," said David Winn, Lantra's Industry Partnership Manager. "Some of the designs that are made are so eye-catching that they make you stop and stare. I applaud the efforts of Tim and Keith who are representing the UK, and hope that their achievements can motivate others from within the industry."

Green Wood Centre Coalbrookdale

The Green Wood Centre is set in a wooded valley running down to the River Severn on the site of an old railway station. The line once serviced the industries that filled the valley bottom. Are they now all museums? The centre is a pioneer in promoting a revival in woodland coppicing and green crafts. It holds an apple day in October when the major occupation seems to be to make and later consume cider.

For the Summer Visit in July, the Wrekin Branch had two strokes of good fortune on the eve of Friday the thirteenth; one was a break in the rain and the other was in the form of our guide. Adele Mills, of Simmonds Mills Architect-Builders, was involved in the design and construction of some of the ecologically, environmentally, energy efficient and aesthetically interesting building on site. She was an obvious enthusiast for using good design and building techniques to significantly reduce the impact of the built environment on pollution and use of energy. Saved energy means less carbon dioxide production, less fossil fuels and hence less need for environmentally hungry bio-fuels.

The visit took us round the demonstration buildings and the workshops. We were shown the facilities used in courses ranging from making long bows and coracles to managing native woodlands and constructing oak framed buildings. The vegetarian café provided an excellent buffet supper which was eaten with relish as Adele took us through a series of 'slides' demonstrating what can be achieved by building with the environment in mind. (There was a slight interruption at this point as a long train of coal wagons trundled up the hill from the local power station. We must be kept warm and lit and the station needs some 4000 tonnes of coal a day from who knows where to help keep the power flowing to Telford and beyond.) The use of local low impact materials, very high levels of insulation and sealing, solar energy collection systems, large thermal mass, heat recovery ventilation systems along with living roofs, reed bed sewage systems and water management installations were discussed. This was a lively and revealing end to the evening. Simmonds Mills are expecting their designs to achieve at least 70% reduction in energy consumption and are working towards 90% savings.

The Cruck Framed Barn, Green Wood Centre, Coalbrookdale, Telford

Any green, vegetarian environmentalist should have made the visit with us: they would have loved it. Any dyed in the wool 1960's mechanical engineer who drives too large a car and doubts it is worth doing anything to save the human race might have marvelled at what can be achieved using a blend of modern design and age old technologies and a bit of faith.

For those who missed this revealing visit, then log onto **www.greenwoodcentre.org.uk** and then visit the centre. Do, however, make sure your visit coincides with a time when there is staff available and it is not pouring with rain. My first visit earlier in the summer, with an overseas visitor, was on a very wet day in June and all but the café staff had sloped off due to lack of visitors. I was disappointed and had all my prejudices confirmed (see above). In spite of this, my New Zealand visitor found it fascinating but then they are all rampant environmentalists anyway.

The work that is being done by the centre and architects such as Simmonds Mills should have the support of Government and all of us if we have the slightest concern for the future of the environment in this crowded island.

Thanks are due to Ruth Metcalfe for suggesting the visit and Graham Higginson for organising it. Many thanks to you both and to Adele Mills for her time and conviction, I am converted.

Geoffrey Wakeham

Douglas Bomford Trust Travel Scholarship

Tim Lacey's study tour of Australia and New Zealand

The Douglas Bomford Trust was pleased to part sponsor Tim Lacey's study tour to Australia and New Zealand in 2006 following on from his PhD research at Cranfield University. His research looked at improving raingun performance in field scale irrigated horticulture within the UK. The objectives to the trip were to disseminate his work to other researchers and representatives from the irrigated agriculture industry, to learn how other irrigation communities are coping with water resource limitations and thirdly to create and foster research links with colleagues abroad. To achieve these aims, the tour included attending the Irrigation Australia 2006 conference, meeting researchers at a number of irrigation and crop research establishments and visiting growers and industry representatives.

There was a great deal of interest in his work from the research and industrial communities in Australia and New Zealand, particularly in the novel combination of an irrigation simulation model with a crop growth model to demonstrate the impacts of non-uniform irrigation on crop yield and quality. Many of the researchers intend to use data from his thesis to validate and improve their own models.

With regard to irrigated agriculture in Australia and New Zealand, the trip gave a valuable insight into how these irrigation communities are responding to their water resource challenges. Overall, the most striking impression was the amount of effort being applied to irrigation research and dissemination to irrigators compared to the UK (either government funded as in Australia, or predominantly privately, as in New Zealand). In particular, there was a large degree of coherence between the different research and government bodies involved – lessons that must observe in the UK if there is to be a sustainable irrigated agriculture in this country.

This short statement is adapted from Tim Lacey's report to the Douglas Bomford Trust and can be read in full on the Trusts web site **http://dbt.org.uk** along with details of papers produced by Tim after his visit to Australia and New Zealand and published in UK Irrigation News Issue 34 (Summer 2006) and HDC News Issue 134 (June 2007).

Long service certificates

Name	*Grade*	*Date of Anniversary*
35 years		
Thomas **Smirthwaite**	AIAgrE	2 Jul 2007
Donald **Bowler**	AMIAgrE	10 Jul 2007
John William **Britain**	AMIAgrE	20 Jul 2007
George Brian **Sangster**	AMIAgrE	20 Jul 2007
Robert William **Yardley**	IEng MIAgrE	20 Jul 2007
John Harry **Tobutt**	IEng MIAgrE	20 Jul 2007
25 years		
Sesath Purage Chandrasiri **Kumarasinghe**	IEng MIAgrE	1 Jul 2007
David Kipkosgei **Korir**	MIAgrE	1 Jul 2007
Terence John **Southcott**	EngTech MIAgrE	3 Jul 2007
Patrick Michael **Hannon**	IEng MIAgrE	3 Jul 2007
Geoffrey Allan **Godber**	FIAgrE	8 Jul 2007
David Irvine McAllister **Elder**	MIAgrE	13 Jul 2007
Colin Richard **Hitchman**	IEng MIAgrE	14 Jul 2007
Christopher William **Watts**	IEng MIAgrE	23 Aug 2007
Shaun Douglas **Rawson-Smith**	AIAgrE	23 Sep 2007

OBITUARY

Keith M. Base, 1921-2007

Son of a Norfolk farmer, Keith joined the RAF at the age of 17 and became a Spitfire pilot. Towards the end of the war he was involved in a crash which resulted in him spending several years at East Grinstead undergoing plastic surgery by Sir Archibald McIndoe after which he became an enthusiastic member of the Guinea Pig Club regularly attending their annual meetings.

After recovery, Keith went to Harper Adams Agricultural College and subsequently joined Harry Ferguson at Stoneleigh Abbey. During his time with Fergusons, Keith travelled widely and spent two and a half years in New Zealand before returning to the Westcountry.

Well before retirement, Keith was beset by various health problems and bad to find rather less strenuous employment but spent all his working life in agriculture and was finally involved in the setting up of Devon Grain.

Keith was an ardent member of the Institution of Agricultural Engineers which he had joined whilst in New Zealand and, upon return, was involved in the creation of the South West Branch, regularly attending their meetings and social events, the last one being the AGM earlier this year. He eventually became a Fellow of the Institution and also received their Meritorious Award in recognition of his dedication.

Keith had many interests and upon retirement became a guide at Exeter Cathedral as well as a Govemor of a local school where he also helped the children with their reading.

Keith leaves a wife, Julia whom he met at East Grinstead, and four children.

Vitacress and steam railway

As the wet summer had shown little sign of relenting, we were lucky to have a dry July morning although windy, with menacing clouds, definitely a day for warmer clothing. A gathering of thirty-two from the south met for a tour of Vitacress, at Arlesford in Hampshire

Two trailers conveyed the group around the farm, Andy Elworthy Farm Manager and Assistant Manager Simon Hues giving an interesting description of the salad production comprising 75 ha conventional and 10 ha of organic. The flint and chalk soil conditions are not ideal for salad crops and de-stoning has to be done on average every three to four years. However, large flints are at times brought to the surface during cultivations.

The crops are rocket, parsley, and baby spinach, coriander, and red chard, green and red lettuce leaves. We saw a Seed Spider at work, with the beds kept perfectly straight using a military satellite navigation system. Members also had a good look at a salad leaf harvester. The less productive land has been planted with mixed legumes and wild flowers to provide habitat for bumblebees as part of the farm conservation programme.

Vitacress grow salad and watercress in Portugal and Spain and further supplies are bought from Morocco to ensure a supply to British supermarkets all the year round.

Some of the members attending the Summer Visit to Arlesford

The business was originally started when the owner of Vitacress, Malcolm Isaac, purchased a one-acre watercress bed in 1951 vastly expanded this business and went into large-scale salad production. Today over 30 tonnes of green crops a week are produced. We were told that watercress is a relatively simple crop to produce. It is grown organically; however, sometimes there are attacks by flea beetle and cabbage stem weevil. When this occurs, the crop is likely to be a write-off.

Lunch followed at the Watercress Line buffet before we boarded a Diesel Multiple Unit (DMU) for a short trip to the yard and steam locomotive renovation works at Ropley. We were given a tour where our guide Jim described the locomotives in detail and gave us an insight into how the railway and its rolling stock are financed.

Locomotives were in former British Rail livery and either in regular use or awaiting servicing. We were very fortunate in that special permission was given to us for a tour of the large renovation and repair sheds. A full time staff of six work here rebuilding locomotives and tenders, supported by enthusiastic volunteers.

A return steam train trip to Alton enabled us to savour the unique sights, sounds and smells of steam travel on the ten-mile stretch of beautiful Hampshire countryside. A "Porters Tea" was taken during the ride. The threatened rain arrived in earnest, and at least three of our party took an opportunity to have a brief doze and maybe a short dream about the age of steam or even watercress and salad!

Denis Welstead, Visit Organiser

A return steam train trip to Alton enabled us to savour the unique sights, sounds and smells of steam travel on the ten-mile stretch of beautiful Hampshire countryside.

Membership Changes

Admissions

A warm welcome to the following new members

Fellow

R Lane-Nott
(Cambridgeshire)

Member

K Lynch (Ireland)
D Sleath (Warwickshire)
M J Tearle (Devon)

Associate Member

S K Brogan (Dundee)
S McLatchie
(Cambridgeshire)

Associate

C K Akujobi (Nigeria)
K Avotry (Nigeria)
J Lyons (Ireland)

Student

Cranfield University:
P Shipton

Oatridge College:
S M Denholm
D Hutton
C B McGeachie
T Mill-Irving
G J Shaw
S Simpson
C Snowie
D Wilson
S Young

Institute of Technology Tralee, Ireland
R J Brennan
J A Buckley
J Callaghan
M Cocoman
M N Dillon
D Gilroy
B Hamill
P Harty
J G Nolan
J O'Gorman
R O'Mahony
C O'Neill
M Somers
J Walsh

Transfers

Congratulations to members achieving a further phase of their professional development

Hon Fellow

J A C Weir (London]

Member

L A Jagun (Nigeria)
J A McMorran (Peebles)

Associate Member

I Briggs (Nottinghamshire)
D R Clay (West Midlands)
S Claydon (Cambridgeshire)
A M Elphick (Hertfordshire)
D T Field (Lincolnshire)
J R Hulland
(Worcestershire)
M Jolley (Hertfordshire)
R M Sheldrick
(Cambridgeshire)
A J A Smith (Angus)
M T Smith (Norfolk)
A Thomas (Gwynedd)
C G Wagstaff (Staffordshire)
A W Waterson
(Lincolnshire)

Deaths

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

K M Base (Devon)
R P Wainwright (Bedford)

Engineering Council

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

Registrations

CEng

R O Goss (Devon)
D Wilson (Co Armagh)

EngTech

I Briggs (Nottinghamshire)
D R Clay (West Midlands)
S Claydon (Cambridgeshire)
A M Elphick (Hertfordshire)
D T Field (Lincolnshire)
J R Hulland
(Worcestershire)
M Jolley (Hertfordshire)
S McLatchie
(Cambridgeshire)
A Maughan (Kent)
R M Sheldrick
(Cambridgeshire)
A J A Smith (Angus)
M T Smith (Norfolk)
A Thomas (Gwynedd)
C G Wagstaff (Staffordshire)
A W Waterson
(Lincolnshire)
A Wilton (Devon)

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 names

Registrations

E M Davies (Berkshire)
R M Evans (West Sussex)
C A Llewellyn (Bedford)

Commercial Members

Alvan Blanch Development
Co Ltd
Chelworth
Malmesbury
Wiltshire
SN16 9SG

Autoguide Equipment Ltd
Stockley Road
Heddington
Calne
Wiltshire
SN11 0PS

Douglas Bomford Trust
Barton Road
Silsoe
Bedford
MK45 4FH

Bomford Turner Limited
Salford Priors
Evesham
Worcestershire
WR11 5SW

John Deere Ltd
Harby Road
Langar
Nottinghamshire
NG13 9HT

FEC Services
NAC
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2LS

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

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

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

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

White Horse Contractors
Ltd
Lodge Hill
Abingdon
Oxfordshire
OX14 2JD

Academic Members

Askham Bryan College
Askham Bryan
York
YO23 3FR

Barony College
Parkgate
Dumfries
DG1 3NE

Bicton College
Budleigh
Budleigh Salterton
Devon
EX9 7BY

Coleg Sir Gar
Pibwrlwyd Campus
Pibwrlwyd
Carmarthen
SA31 2NH

Cranfield University at Silsoe
Bedford
MK45 4DT

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

Writtle College
Chelmsford
Essex
CM1 3RR

News of Members

In April 2007, **Gabriel John Harris** wrote: "These days, I am running merino sheep for wool production and facing up to much more hand feeding both autumn/winter and summer due to a succession of dry seasons and droughts: droughts in 1982/83, 2002/3, 2005/6/7 (summer): autumn/winter feeding in 1995, 1996, 1997, 1998, 2002, 2003, 2004, 2005, 2006, 2007.

"The present ongoing drought has been uncharacteristic in terms of past experience and past correlation with the southern oscillation index and sea surface temperatures and I think must be influenced by climate change, i.e. global warming due to CO_2 input to the atmosphere."

His new address is 'Mooker Hill', Burrendong Way, Stuart Town, NSW Australia 2820. Sorry to miss the Summer issue and reduce the topicality but we share the climatic concerns of droughts followed by floods!

Maxwell Mutema has just been elected a Fellow of the Institute of Food Science and Technology (FIFST). He is currently an International Agricultural and Rural Development Consultant focusing on Southern Africa-Botswana, Malawi, Zambia, South Africa and Zimbabwe.

Institution of Agricultural Engineers West Midlands Branch Award

On Thursday 15 March 2007 the judging for the West Midlands Branch Award took place at Warwickshire College, Leamington Spa. The judge of the award was Mr John Fox, former Managing Director of Bomford Turner, Salford Priors, Worcs.

There were 11 students on the Maintenance & Repair of Arable Machinery course at the College and each student entered a project. These ranged from big bale handlers, loader fork, loader bucket, transport box and a log splitter.

The award was made to Charles Johnson. Charles comes from Worcestershire. On the death of his father, the family farm was sold and he now helps to run a farm in Serbia. His project was to design and make a car trailer to take a quad bike.

It was very difficult to make a final decision, as there were many good projects produced by the students.

Robert M Voss

Firestone pushes the BOAT out

Firestone will once again support Bicton College in their efforts to improve the lives of farmers in developing countries. A 1962 Fordson Super Dexta was restored to its former glory by a team of Bicton College agricultural engineering students, in a '24-hour Challenge' in April this year. This involved fully restoring the engine, steering, hydraulics and brakes in only one day.

The finished tractor will be raffled at the National Tractor Show in Peterborough on 4th November. The proceeds will go to Bicton Overseas Agricultural Trust (BOAT) and used to teach agricultural practices to people in the developing world. BOAT is a charity which teaches practical skills in food processing and agriculture to key personnel in countries such as Tanzania, which are then transferred to all areas of the community. The blue Fordson tractor is the fifth to be restored by the Bicton College team based in East Devon. The scheme has raised over £50,000 for BOAT to date.

Barry Coleman, Firestone's Marketing Manager commented, 'Firestone is delighted to supply the tyres for such a worthwhile project, providing valuable experience for agricultural engineering students and supporting important training schemes in developing countries. Congratulations to all involved'.

FURTHER INFORMATION

For further information and to purchase tickets to win the tractor, contact Bill Vellacott on 01884 277329 or e-mail: bv@woodbeer.eclipse.co.uk

WORKPLACE SKILLS

LISS warning over lack of training

Thousands of small rural businesses in Scotland are being warned they could be falling behind on techniques and knowledge, because they are not getting enough training to keep up to date.

Chris Wond, the project manager for the Landbased Industries Support Service (LISS) at Oatridge College, points to an estimate from Lantra, the sector skills council, that up to 60% percent of the 24,000 'micro businesses' in the country are missing out. He says they are not only losing touch with new methods in their sector, but with changing legislation and workplace directives.

LISS (**www.liss-scotland.org.uk**)is just about to launch a Scotland-wide survey to try to establish what can be done to increase uptake of landbased training in rural and remote areas. Funded by the British Educational Communications and Technology Agency (BECTA) it will seek views on what part online learning can play to break down resistance.

According to Wond, the survey will allow employers to influence the way training will be delivered in Scotland in the future. He said: "We will be looking at the bread and butter, basic training for employees as well as the professional development of their employers. As the country's premier landbased College, it is the sort of information we at Oatridge need to plan the developments businesses are looking for. No doubt it will be invaluable to other providers as well.

"At present a lot of employers see training as an optional extra, a luxury, or something they will do if they have the time. The fact is people are not up to speed if they themselves trained say 25 years ago. They are not always qualified to train anyone else now and sometimes it's a case of passing on bad habits and old methods. I don't think there's any doubt that it affects the quality of service they provide."

A previous survey, carried out by LISS in 2005, found that few employers thought it was not always possible for them or their employees to take time away from work for full-time courses and there was a preference for workplace training, evening and week-end courses and short courses. At that time, online learning was not available from Oatridge College, but that could be about to change if the demand is there.

Chris Wond intends to consult LearnDirect Scotland, Lantra, Scottish Qualifications Agency (SQA), Scottish Agricultural Organisation Society (SAOS) and the University of the Highlands and Islands to learn from their experience of reaching the more remote communities.

The full survey will go online in July and the findings will be analysed by focus groups later in the year. Wond expects to publish his findings next spring, but he believes that the demand will be for a mix of traditional and online learning. "Training providers in Scotland all realise that there is the need to increase the numbers in training and a structure which makes it easier for people to get involved. Various projects are already underway to make that possible. There are thoughts about providing one-door access to all training in Scotland, but in order to get it right we need to know exactly how employers would prefer to proceed, and the potential role of online delivery. To that extent, every response we get to the survey will be valuable."

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

INSTITUTION of AGRICULTURAL ENGINEERS, BARTON ROAD, SILSOE, BEDFORD, MK45 4FH, UNITED KINGDOM. Tel: +44 (0)1525 861096 Fax: +44 (0)1525 861660

Book Reviews

Sticks and Stones, Antlers and Bones

Jersey farm implements, machines and tractors 4000 BC to AD 1960

Author: Mervyn Billot,
Publisher: Jersey Heritage Trust
ISBN: 0-9552508-0-3
Price: £39.95

Mervyn Billot was born and raised on a farm in La Porte, Jersey. He later served in the Royal Navy. Following this, he was educated in Agriculture and Agricultural Engineering at Sparsholt and Chelsea College. He became a member of our Institution whilst working at firstly Bomford Brothers and then Ransomes. He returned to his native Jersey where he owned and ran his engineering company. He also served in the Island parliament.

In 1996, it was suggested by Geoffrey Le Feurve of the Channel Islands group of professional engineers that with his background and experience, he was perfectly qualified to write a book on the history of agriculture and its mechanisation. At this stage, it was decided that the book would be based on the island of Jersey. This was very sound thinking as it gave the book focus and selected an area of important agricultural development which was small enough to allow in depth research without becoming unmanageable.

Having now waded through the approaching 400 pages of the work which was completed ten years after its conception, I will attempt to do it justice in a few hours of consideration.

Put in a nutshell, it truly is a history of things mechanical in agriculture for a period of some 6000 years and, coupled with this, it outlines the history of the agriculture of the island for the same period. I am in complete awe of the man, it was a mammoth undertaking. It tells the evolution of machinery from mans' first efforts to the modern sophisticated engineer designed implements. All these were developed to make farming more efficient and alleviate the toil of farm labourers.

The work contains a fascinating collection of photographs many rare if not unique which in one book provides a major contribution to agricultural heritage. It also develops a wide range of statistics of the mechanisation of the islands and its implications. Together with this are his excellent sketches/drawings of early implements and excellent descriptions of their working principles and their place in the evolution of farm machinery.

What actually makes this work in my opinion so important is that it spans uninterrupted a period of some 6000 years in detail and in context a truly exceptional outcome. It is a ground breaking contribution to agricultural engineering literature and, unlike many history tomes, it is 'a good read'

It starts by setting the scene with historical notes on agriculture in Jersey dealing with major changes and their implications.

His second chapter, 'The Beginning', deals with early hand tools from wood and stone, antler and bone as used in the title. It is an interesting well researched section of early mans' efforts to till the soil.

The third chapter deals with the development of first the Ard and then the plough. Following chapters first discuss the influence of the bronze and iron ages, and the use of draught animals; and then simple horse-powered and steam engines and threshing machines.

The next section was a surprise (and as a boy of Somerset a pleasure!) cider crushers and presses, yes Jersey had scrumpy!!

After dealing with tractor power and soil engaging implements, the book turns to barn machinery, dairy equipment and other miscellaneous items found on the farm. All are dealt with in the same detail and care.

I can only finish by recommending this book to you. Whether your interest is engineering on the farm, agricultural history or the development of machines, I hope you enjoy the work as much as I have.

M J Hann

A Measure of All Things –

the story of measurement through the ages

Author: Ian Whitelaw
Publisher: David & Charles
ISBN: 978-0-7153269-6-1
Price: £9.99

If you've ever wondered why we use particular units to measure something – or if indeed there are units to measure something, then this is the book for you. Man has wanted to measure things since time immemorial whether for trade or survival.

A Measure of all things – the story of measurement through the ages by Ian Whitelaw does what it says on the cover. You may know that chilli hotness is measured using the Scoville rating, but how did it come about? The answer is in the book – Wilbur L Scoville devised the Scoville Organoleptic Test using a tasting panel of five people. A more mundane subject of measurement is that of area. How did we get acres? It was the amount of land a mediaeval ploughman could work in one day, being a furlong (furrow = 22 yards) by a chain (22 yards) wide. If you ever wondered how big the universe might be, it is probably at least one square yottametre or 10^{48} m^2 or 100 million x 100 million light years.

A particularly topical section is that on energy, as few people really understand the difference between energy, work, & power. This book will open up a whole new world for those who find maths, physics and science a terrifying subject and for those who are more comfortable with those subjects there is bound to be something you didn't know. It is surprising that there appears to be no mention of acoustic noise measurement, and the book is written using American spellings, though the author lives in Canada. This though is a good addition to any bookshelf and would make a very acceptable present to a lot of people.

Donald Bowler

Felix the Fast Tractor and the New Building

Author: Catherine Cannon
Publisher: Red Wellies Publishing
ISBN: 978-0-9547701-3-6
Price: £5.99

Every once in a while a children's book character comes along that really captures the imagination of its audience, garnering a legion of loyal fans eager for the next instalment of their particular hero's adventure. We all know, by first name, a postman and his black and white cat (Pat, oh and Jess, of course), an explorer and her best friend Boots the monkey (Dora, who else?), a builder and his team of mechanical chums (Bob, how could you forget?) and the fireman from the Welsh Valleys with the bright, clean engine (could only be, Sam). But how familiar are you with a kind, friendly, super clever, shiny blue tractor from Ambers Farm? His name is Felix, *Felix the Fast Tractor*, and he is set to become part of the vernacular of every 'tweenie' this summer.

Felix lives with the Story family near the village of Glempsea where he plays a vital role in the running of this busy working farm along with a host of farmyard friends including the farm dog Ben, Colin the Combine Harvester and Daisy the Digger. His adventures centre on everyday farming events – covering many aspects of British agricultural living; from the building of a new barn, to the harvesting of wheat, dealing with the temperamental weather, and helping the Story family find their beloved missing dog.

These delightful tales of rural life are the work of mum-of-two, Catherine Cannon. Having written and self published the first three *Felix the Fast Tractor* titles to satisfy her son's farming curiosity and particularly his interest in tractors, Catherine explains the need for characters such as Felix, "As with most four-year-olds my son was incredibly inquisitive, barraging me with 'whys? wheres? and what fors?' each time we'd sit down to read together. I found the books aimed at his age group were very much plot-based and there was no offering when it came to the finer details, such as 'how does a tractor work, mummy?' or 'where does the rain come from?' he still wanted the fun aspect of reading a book but more often than not he wanted more from story time and so Felix was born."

More factually accurate than other titles of this genre, helpful 'want to know more?' sections appear every couple of pages, while featuring colourful characters, appealing storylines and delightful illustrations, perfect for this age group, it is little wonder that *Felix the Fast Tractor* is already a huge success in Catherine's home county of Cumbria.

In *Felix the Fast Tractor and the New Building* we are introduced to our hard-working hero and see him surprised with a new home as his friends on the farm build him a new barn. Readers find out about low-loaders, diggers, preparing a site for a new building, the laying of foundations and, of course, the workings of Felix himself!

So if you hear anyone aged two or above chatting about 'Felix', you'll know exactly what they mean.

ORGANIC WASTE

The lowdown on sewage and compost in forests

The value of using sewage sludges and composts to fertilise and condition forest soils has been known for many years.

However, there is more to using them than simply spreading them in a forest or on a forest planting site. There are many factors, including legislative controls, which must be taken into account, and a range of decisions that must be made by anyone considering their use.

Now the Forestry Commission has published an Information Note to help foresters and companies trading in sludge, compost and other organic waste products to make informed decisions about the use of sludge on forest land.

The Information Note is entitled '*Use of Sewage Sludges and Composts in Forestry*', and was written by Andy Moffat of Forest Research. It updates guidance given in *'A Manual of Good Practice for the Use of Sewage Sludge in Forestry'*, written by Wolstenholme et al. and published in 1992. In particular, it covers changes in forestry policy and practice, technical developments in waste-water processing that have led to diversification of the sewage sludge products available, and changes in legislation regulating the application of sludge to land. The Note also recognises that sewage sludge is only one of several types of organic waste now being produced.

It is intended to fill a gap until even more comprehensive guidance, probably in a new best-practice manual, has been prepared. This is likely when draft regulations currently passing through the European and national parliaments are established, and when the water and waste industries have had time to respond in the way they produce and market organic products.

The Information Note covers:
the value of organic wastes in forestry;
types of organic wastes;
recent policy developments in waste disposal;
regulations affecting the use of organic wastes in forests;
the use of sewage sludge and compost on mineral and brownfield land;
sludge and compost standards and quality control;
application in practice; and
the health and safety aspects of organic waste use in forestry.

FURTHER INFORMATION

The Information Note can be downloaded free from the Forestry Commission's website at www.forestry.gov.uk/publications. Free paper copies can be ordered from Forestry Commission Publications, PO Box 25, Wetherby, West Yorkshire, LS23 7EW. Tel: +44 (0)870 121 4180; Fax: +44 (0)870 121 4181; E-mail: forestry@twoten.press.net. Quote stock number FCIN079.

GREEN VEINS

New hedgerow handbook to boost biodiversity

A new handbook that promotes greater conservation of hedgerows and the species that live within them in the UK, is published today.

Hedgerows play a vital role in conserving biodiversity, and also make an important contribution to both farming and our traditional countryside landscape. They support a variety of plants and animals, many of which have been identified as species of conservation concern.

Until recently, little was known about their condition or number, making it difficult to make decisions about what needed to be done to conserve these 'green veins' for the future.

The second edition of the Hedgerow Handbook sets out a standard method of surveying hedgerows to ensure that their biodiversity value is correctly assessed. It is a valuable tool for local councils, surveyors and voluntary groups who help to deliver the UK Hedgerow Action Plans and associated Local Biodiversity Action Plans.

The handbook is designed to encourage increased assessment and recognition of the value of hedgerows to ensure they are preserved for future generations.

Barry Gardiner, as Minister for Biodiversity, Landscape and Rural Affairs, welcomed the publication of the handbook: "Hedgerows not only improve the richness of our landscapes, they also provide a habitat for a variety of species, many of which are deemed to be of conservation concern.

"This handbook will help supply the knowledge that's needed, so we can take action to conserve important local hedgerows across the UK. Action like this is vital if we are to reach our target to halt the loss of biodiversity by 2010."

FURTHER INFORMATION

An electronic copy of the Handbook can be found at: http://www.defra.gov.uk/farm/environment/landscape/hedgerows.htm

EASE OF ACCESS

Path Bridges: Planning, Design, Construction and Maintenance

A new guide to path bridges has been produced by Paths for All Partnership with assistance from Forestry Civil Engineering and Scottish Natural Heritage. *'Path Bridges'* replaces 'Footbridges in the Countryside' (CCS 1989) and provides the most up to date good practice for path bridge provision.

'Path Bridges' provides comprehensive, accessible and practical guidance for anyone involved in the planning, construction and management of bridges for non-motorised users. For the inexperienced, the guide will explain bridge basics from the start and enable you to seek and use professional help effectively. For the professional, the guide provides a wealth of information (including updated load tables) to enable you to design the best bridge for a site. Several standard designs are provided, suitable for a range of access takers, for spans up to 9 m. Case studies provide further food for thought by demonstrating the work done by others.

FURTHER INFORMATION

The guide is available from the Paths for All Partnership, tel. +44 (0)1259 218888, e-mail info@pathsforall.org.uk priced at £40.

EMPLOYMENT RELATIONS

Acas publishes new booklet on flexible working

Acas, Britain's leading employment relations service, has published a new booklet – *Flexible working and work-life balance* – to help employers and employees understand how flexible working can benefit their workplace.

There are around 1.6 million employees providing some kind of unpaid care. From 6 April 2007, there is a new right to request flexible working for those who have caring responsibilities.

The new booklet, which can be viewed for free at **www.acas.org.uk**, guides employers and employees through a range of issues on flexible working and includes:
a guide to all the major kinds of flexible working, from flexitime to shift-working, and part-time working to homeworking;
a step by step guide to developing a flexible working policy;
the latest legal changes brought in by the Work and Families Act; and
a useful q & a section to address common concerns about flexible working.

Rita Donaghy, Acas Chair said: 'Flexible working really can add value to the workplace. Employees who work flexibly often have a greater sense of responsibility, ownership and control of their working life. It also makes good business sense. Customers often expect goods as and when they want them and flexible working can help meet these demands.'

FURTHER INFORMATION

The advisory booklet Flexible working and work-life balance can be ordered from Acas Publications by calling +44 (0)8702 429090 and costs £3.95 per copy.

Royal Highland and Agricultural Society of Scotland Awards

Twelve awards for technical innovation

The Royal Highland and Agricultural Society of Scotland has made twelve awards under its scheme to recognise technical innovation in farming and rural industry, including a gold award to a previous silver winner, seven silver medals and four certificates of commendation.

GOLD MEDAL

Bibbb Equipment – Catcher Crate

Gold has gone to Bibbb Equipment, Whauphill, Strichen, Fraserburgh, for their cattle Catcher Crate, a tractor mounted crate developed for the easier management of grazing cattle.

Operated from the tractor seat, the crate eliminates the need for anyone to be on foot when catching an animal. It includes a simple crush and head yoke and can be used for administering drugs, calving, artificial insemination, retrieval of strays and adjusting field numbers.

The Catcher Crate, which won a silver medal in the 1990s, also provides a safe environment in which a farmer can tag a newborn calf, protected from the mother. The equipment includes an optional calf nest, which folds flat when not required, to carry a newborn calf.

Douglas Fowlie, Millhill, Longside, Peterhead, convener of the panel of judges for the awards, said: "With frequent reports of injuries to people working with livestock, the crate provides a high level of operator safety. Animals also remain calm when being caught, indeed they will walk into the crate very readily. It was these two factors that impressed the judges. The crate has been refined and improved since it originally won a silver medal and we had no hesitation in awarding gold."

SILVER MEDAL

Premier Livestock Handling – Unistock Mobile Cattle Handling System

The Unistock Mobile Cattle Handling System from Premier Livestock Handling, Biggar Mill, Port Road, Dalbeattie was designed to be moved quickly around the farm or from farm to farm and reduces stress levels for operator and livestock with high standards of safety.

SILVER MEDAL

Algo (Blairgowrie) Ltd – Calftagging Humbuggy

The Calftagging Humbuggy from Algo (Blairgowrie) Ltd, Algo Business Centre, Glenearn Road, Perth offers a quick hitch safe unit which isolates the calf and protects the stockperson from the cow when used for double tagging, de-horning and castration.

SILVER MEDAL

Landmec Pottinger – Pottinger Isobus Control System

The Pottinger Isobus Control System from Landmec Pottinger, Cantrell Works, Bittaford, Ivybridge, Devon facilitates the running of many different mounted and trailed implements from one in-cab control centre, a joystick giving fingertip control of up to 24 different machine functions.

SILVER MEDAL

John Deere Ltd – John Deere Auto Trac

John Deere Auto Trac, an automatic guidance product from John Deere Ltd, Harby Road, Langar, Notts, provides the operator with a hands free steering system. Tests show a 10% saving in input costs and an 18% increase in productivity.

SILVER MEDAL

Grimme (UK) Ltd – GT Potato Harvester

The GT Potato Harvester from Grimme (UK) Ltd., Station Road, Swineshead, Boston, Lincs is a two row harvester featuring the new 'Terra Coulter' allowing for accurate depth control, ridge pressure control and Diablo pressure control.

SILVER MEDAL

David Ritchie (Implements) Ltd – CombiClamp

The CombiClamp from David Ritchie (Implements) Ltd, Carseview Road, Forfar for sheep handling requires no power or air and is operated hands free. It is ergonomically designed for the operator to catch, hold and release the animal quickly.

Royal Show New Equipment Awards 2007

The Berthoud Tenor sprayer, overall winner of the New Equipment Awards which were presented by Professor Paul Miller (right)

Entry to the Award was open to all those exhibiting agricultural, horticultural and forestry equipment offered for sale for the first time during the calendar year 2007. The judges were Robert Lockhart, farmer and agricultural engineer, and Mervyn Bailey, Technical Editor of Farmers Guardian, sponsors of the event.

The overall winner and winner of the **Husbandry and Maintenance** category is the Berthoud Tenor trailed sprayer. It offers 2800, 3500 and 4300 litre tank capacity, with a 5500 litre option expected in 2008. The Omega Bi-turbine pump is new. Boom width is 20 to 30 m with the 'Axiale' boom, and 36 to 42 m with the 'Ektar' boom. Axle suspension is independent of load and has variable control, and there is the option of the unique Actiflex 2 suspension system. The axle can be fixed or steered. There is useful storage space provided at each side of the machine. The Tenor represents an advanced development of the trailed sprayer.

The winner of the **Livestock** category is the Side Discharge Spread a Bale from SIMBA International. This is an addition to the Spread a Bale range which received a Gold Medal at the 2006 Royal Show, and incorporates the main features of the other four versions in terms of even spread, low dust levels, high work rate and trouble-free operation. This

SILVER MEDAL

The Regional Sales Co – Bracken o'Bliterator

The Bracken o'Bliterator from The Regional Sales Co, 22 Main Street, Tweedmouth, Berwick upon Tweed is a runged roller designed to go behind an all terrain vehicle (ATV), crushing bracken stalks, causing the sap to bleed and the rhizomes to be starved. It offers a simple, inexpensive, non chemical treatment for bracken.

CERTIFICATES OF COMMENDATION

Bale Buddy from **G W Henry**, Treaton Farmhouse, Star of Markinch, Glenrothes

Easyload Trailer from **Ifor Williams**, Cynwyd, Corwen, Denbighshire.

Cover-All Buildings from the firm of the same name from Middlefield, Duns

ATV Mobile Cattle Grid & Bale Feeder from **Donald Ingram**, Rosebank House, Mains of Torryleith, Newmachar

version is smaller, lighter at 730 kg unloaded, can be handled by any 1500 kg capacity front end loader, and is suitable for the smaller farm with restricted buildings and narrow passages. It is not self-loading like the larger machines, and accepts only round bales.

The winner of the **Special Purpose Equipment** category is the LSM Kerrush AgriWaste baler from LSM Engineering Ltd, Portiaoise, Republic of Ireland. This is a machine for contractors or farmer groups which produces a square bale, which can be string or wire tied, in the range 180 – 500 kg. It can handle a wide range of waste materials such as cardboard, packaging, tyres, chemical containers, plastic mulch, bags and string. There are three models, drive in each case being from tractor hydraulics without any electrical power requirement. With farm waste now being classified as 'industrial waste' this baler should reduce the cost of waste handling and disposal.

The winner of the **Tractors and Transport** category is the latest development of the Ifor Williams EasyLoad TM system. The original purpose of this development was to comply with the EC Council Regulation 112005 which relates to ramp angles on livestock trailers, and came into effect for trailers manufactured after January 5 2007 'if transporting livestock over 50 km for commercial gain'. The Ifor Williams development complies with the Regulation, but also provides a substantial improvement in ease of loading of large and heavy sheep at lower ramp angles than previously possible without any loss of deck space.

World's leading recycling hubs at Newport

Associated British Ports' (ABP) Port of Newport is set to become one of the world's leading recycling hubs following the recent announcement that its customer, Sims Recycling Solutions ('Sims'), will build a waste electrical and electronic equipment (WEEE) recycling facility at the port. For its part, ABP will invest £2.2 million to support the construction of the new Sims plant.

The facility will be built following the signing of a 15-year agreement between ABP and Sims, the world's leading metals and electronic equipment recycler. The planned facility will become operational at the end of the year and will have the capacity to process 100,000 tonnes of WEEE per annum. Sims's new plant will be situated on five hectares of land, increasing the size of the Port of Newport's recycling facilities to over 15 ha.

In 2004, Sims opened what has become one of Europe's leading metals-recycling terminals at ABP Newport. The terminal is equipped with the world's largest industrial shredder, capable of processing 400,000 t/yr of scrap iron – from old cars and refrigerators to household discarded pots and pans. ABP invested £3.5 million in support of the development, installing a gantry crane at the terminal, powering up the electricity supply and refurbishing a rail link to the site.

The construction of the new facility comes on the back of a European Union WEEE Directive that came into force on 1 January 2007. The directive requires electrical-goods manufacturers to take responsibility for the recycling of goods sold to consumers, thereby reducing the amount of WEEE waste that would otherwise be sent to landfill sites across the UK.

Graham Davy, Managing Director for Sims Recycling Solutions, said: "This new investment is great news for Sims and ABP Newport. The port's excellent infrastructure network and efficient cargo-handling facilities continue to make it an obvious location for our WEEE-recycling operations in the UK."

John Fitzgerald, ABP Port Director for the South Wales Ports, commented on the agreement: "I am very happy that Sims has decided to construct their WEEE plant at our Port of Newport. ABP has worked closely with Sims over the past four years to develop their metal-recycling operation at the port, and Sims's decision to enlarge their facilities at Newport demonstrates the success of this relationship.

"Having recently been granted the prestigious Port Environmental Review System (PERS) accreditation by the Ecoports Foundation, for 10 of our 21 ports, ABP's environmental credentials will be reinforced by the agreement, which will contribute to the recycling of some two million tonnes of electrical goods discarded in the UK every year."

WASTE MANAGEMENT

Guidance on forthcoming changes under Landfill Directive

The Environment Agency has published new guidance to help business and industry meet the changes to landfill regulations which come into play later this year.

Liz Parkes, Head of Waste at the Environment Agency, said: "From 30th October 2007, new rules mean waste must be treated before it is disposed of at a landfill site. At the same time, liquid waste will be banned from any landfill.

"Waste treatment is good for the environment, as it encourages the recycling of waste and reduces the impact of the waste we send to landfill. Much of the waste we send to landfill is already treated, however for some wastes more effort is needed. Treatment can simply be separating the waste on site, and recycling one or more of the separated components."

To explain what needs to be done, the Environment Agency has been working with members of the waste industry and waste producers on this new two-part guidance, *Treatment of non hazardous wastes for landfill*. Part A explains the requirements of the regulations and part B provides suggested methods from industry on how you could deal with certain wastes.

Liz Parkes added: "There are many easy ways to treat waste and deliver real environmental improvements. If you are a waste producer, now is a good time to review how you manage your waste, including whether it needs to be produced at all. If your waste does go to landfill, check to see if it is already being treated. If it isn't you will need to treat it or ensure that your waste management company does this for you.

"It's also an ideal opportunity for waste producers and landfill operators to discuss how they need to adapt to these changes and take more responsibility for their waste. We will continue to encourage this dialogue as these new rules bed in after October. Rather than having our staff standing at the entrance to landfill sites checking individual loads, our focus will be on helping business to improve the way they manage their waste."

The new guidance for pre-treatment of waste is available to download at **www.environment-agency.gov.uk** or by calling 08708 506 506.
The guidance on how to deal with liquid waste following the landfill ban will be published in the coming weeks.

PRIZE NET

The Crop Packaging Association has a winner!

One very happy contractor, were the words that described Martin Brooks when he received the telephone call from UAT's national sales manager Tim Carr telling him he was the lucky winner of a full pallet of TamaNet Edge to Edge Pro-Tec 3600 netwrap, as the successful entrant in the Crop Packaging Association's annual free prize draw.

Each year, people from the industry can enter the annual prize draw, simply by visiting the website (**www.croppackaging.com**), or filling in the entry form in industry magazines or at shows and open days.

This year, Martin Brooks, owner of Brooks Agricultural Services, a landscaping and agricultural contracting business based in Lancashire, was the lucky recipient. Although landscaping is the mainstay of Martin's business, amazingly he still finds time to produce 15,000 round bales per year, proof that the baling part of his business is still very important. In addition to a fleet of three New Holland balers, he has two older Vermeer balers, which he holds in reserve should they ever be needed. On top of all this, Martin also manages 150 breeding ewes on his farm in Gressingham, near Lancaster.

Martin confirmed that in baling this amount each year he has tried a number of different types of net, and was now looking forward to using the genuine TamaNet Edge to Edge netwrap. With his New Holland baler fleet, the supply of 28 rolls of 3600 m TamaNet should fulfil his needs for this season at least, allowing his customers to see and appreciate the benefits of the full Edge to Edge wrapping technology.

Martin Brooks (left) receiving his prize from UAT's Tim Carr

FURTHER INFORMATION

Crop Packaging Association or UAT Ltd on 01420 545800

First woodfuel pellets made in Scotland

The first successful production of woodfuel pellets from Scottish raw materials is a step in the right direction for Scotland's future in renewable energy. Forestry Commission Scotland, as the Scottish lead partner in the North Sea Bio Energy project, has demonstrated, for the first time, that pellet manufacture is technically feasible for a small rural business.

Wood pellets are made from compressed sawdust, and are well suited to smaller heating systems (under 30 kW). Pellets are a good replacement fuel for oil, because the pellets are of consistent quality and tend to 'flow', so are easy to transfer in bulk. Pellet stoves and boilers are very efficient with low emissions, and usually have programmable timers and even auto-ignition. The compressed wood pellets are made by forcing wood particles through a 6 mm die, these pellets are then used in automatic room heaters and central heating systems as a direct replacement for traditional central heating systems.

Two demonstration plants have been established in the north of Scotland, one in James Jones and Sons Ltd. sawmill using co-product from the mill, and in Norbuild Timber Fabrication and Fine Carpentry. Both are aimed at the small-scale producer market, encouraging the production (using locally available materials) and the distribution of wood pellets to a local market.

The development will provide a boost for local businesses in the North of Scotland that have been considering investing in this technology, but did not want to take the risk of buying expensive machinery that had not been operated in Scotland before. It is now hoped that small-scale pellet production will be adopted on a commercial basis by Scottish rural businesses as they can learn from the technical and economic lessons experienced in this demonstration project.

Dan Gates, Woodfuel Officer for Forestry Commission Scotland, said: "This has been a very exciting project as we have shown it is technically viable for a small businesses to do this – something that was in doubt two or three years ago when the project was proposed. In some ways, the next step is testing to see if we can make this economically viable. We will have a range of data from this project which we can pass onto businesses so hopefully they can replicate this type of production facility. Ultimately more local production of this fuel will bring customers the confidence to use wood pellets for automated heating.

"Using wood pellets for the domestic heating market in a serious way has been a long term dream for many involved in the biomass sector, and we hope that we can follow the example of numerous other European countries and establish a credible domestic biomass industry."

Billy Bodles, Project Manager from Highland Birchwoods, said: "It was very challenging, and we couldn't have achieved the result with out good support from James Jones and Sons Ltd. We are delighted that this has been achieved in Scotland."

This project lead partner was the Forestry Commission Scotland (£70,000), and involved the support of Aberdeenshire Council (£10,000), Moray Council (£10,000), Highland Council (£15,000), Scottish Enterprise (£30,000) and Forest Research and was funded by the EU Interreg III programme (£135,000).

Royal Agricultural Society of England Awards 2007

The JCB Fastrac 8250 has been awarded the Royal Agricultural Society of England's (RASE) Gold Medal and the Society's senior award, the Sir Roland Burke Perpetual Challenge machinery trophy for a sustained contribution to the potato industry, went to Cambs-based engineering company R J Herbert Ltd (see Inside Back Page for details).

The RASE Machinery Awards are unique in that they are based on a rigorous examination of the performance of the machines in the hands of commercial users. Judges described the Fastrac 8250 as a "huge leap forward" in tractor engineering. Users – large scale arable farmers with experience of a wide range of tractors – noted its versatility, an excellent machine for the full range of field tasks from heavy cultivation to silage-carting, while fast road travelling is "as comfortable as driving an automatic car".

"The Fastracs we saw were heavily used – one had done 2200 hours in a year," comments member of the judging panel Brian Finney. "Yet they had done so without problems and users were completely satisfied. Good weight distribution, excellent transmission, simple controls and all-round suspension deliver very high work outputs in complete comfort – it's what today's tractor drivers are after, and sums up what the RASE Gold Medal is about."

The Burke Trophy, for sustained and substantial contribution in a particular sector of the machinery industry was awarded to R J Herbert Engineering Ltd. Founded in 1972 by Rod Herbert, the present head of the firm, it has been at the forefront of technical development, production excellence and service to the potato industry. Herbert's main products include packing, grading and washing equipment for potato packhouse installations.

"We're extremely honoured to receive this award," comments Mr Herbert. "We're particularly proud to receive an award that recognises the sustained and long-standing contribution the entire staff at Herberts has made to the industry – these are the people that drive the company and some have been with us since we started."

The winners of these two top machinery awards join the RASE Silver Medal award winners, taking pride of place in the machinery area of the Royal Show. Silver Medal winner Richard Keenan UK Ltd also won the Institution of Agricultural Engineers Award (see Inside Front Cover). This is the first year Arch Express has sponsored the awards. The company's 'Through The Night' service is used by many major manufacturers to deliver parts overnight to allow service technicians to repair equipment swiftly, making the difference between profit and loss for many farmers.

The winners of the New Equipment Awards, sponsored by *Farmers Guardian*, are listed separately.

SILVER MEDAL

RDS Technology Ltd – Weighlog 200

The Weighlog 200 uses the well established principle that when a load is lifted hydraulically the weight being lifted is related to the hydraulic pressure in the lifting system. The key feature with the Weighlog 200 is the use of robust electronic pressure sensors which provide good accuracy and repeatability at moderate cost. The relationship between the weight being lifted and the hydraulic pressure in the system varies with the load height. The instrument therefore takes the load at a pre-determined height identified by a position sensor, which can be 'dynamic' when the load is raised through the reference point without stopping. This speeds up the operation and reduces errors from linkage and cylinder friction and 'stiction'. Another key feature is speed of lift compensation where, within broad limits, accuracy is not affected by speed of lift. There is also a compensation feature for machines with hydraulic self-levelling which raise particular problems.

The Weighlog 200 is intended for industrial and agricultural loading shovels, telescopic handlers, skidsteers, trailers and similar applications. There are five display channels which can be calibrated for different trailers or loaders, or used to record five different types of material handled. Text print-outs are an option. Farmer users mostly but not solely used the Weighlog 200 to get a reliable measure of the amount of grain they were putting into store. Accuracy was in every case well within the +/- 2% claimed by RDS, weighing whether dynamic or static never held up operations, and the instrument was reliable, although most users checked the calibration part-way through the harvest season. The advantages of the Weighlog 200 were the modest cost compared to a weighbridge (£1480 including installation by RDS), versatility in use at various points around large farms, accuracy well within requirements for management purposes, and superb support from RDS.

CONTACT

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SILVER MEDAL

The Glenside Group Ltd – Oxygenator

The Oxygenerator consists of steel blades in sets of three on a solid steel shaft in self aligning bearings, the assembly being mounted in a heavy box-section frame with linkage mounting points. The blades can be aligned with the direction of travel or offset to produce increasing soil disturbance. The implement is available as 2.5 m, 3.0 m and 5.0 m width, all with three sets of three blades to the metre of width. The blades are very robust 11 mm thick boron steel. The top of the frame is designed to carry from two to six, depending on the model, 600 litre barrels for water ballasting.

The 3 m and 5 m machines weigh 420 kg and 900 kg respectively and can carry an additional 800 kg and 1250 kg of water ballast. The ballast can be very easily removed when conditions do not require it, or for movement between sites, and can just as easily be replaced.

The Oxygenerator is specifically designed for the alleviation of compacted and anaerobic conditions in intensively stocked grassland. Users reported improved grass growth and an increase in clover in the sward, reduced nitrogen requirement, drier land, and, on some very difficult soils, complete elimination of run-off. The improvements were cumulative: the more the machine was used, the better the results. The Awards judges visiting the farms could see clearly by the enhanced sward and condition of the soil where the machine had been used. Judges felt that improved infiltration and elimination of run-off, with cross-compliance implications, was one of the key features of treatment with the Oxygenerator.

The machine is used under moist rather than wet or very dry soil conditions. Power requirement is low – in one case a 19 kW tractor was handling the 2.5 m model. Blade wear is slight, and the life of the machine should be indefinite. Users said that it very soon paid for itself in improved grass production, and was essential to the farm business.

CONTACT

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SILVER MEDAL

Shelton Sportsturf Drainage Solutions – Shelton Supertrencher 625 and 710

The Shelton Supertrencher is a tractor mounted wheel trencher for laying pipework and secondary drainage systems under fine turf. The pto driven digging wheel is fitted with tungsten carbide tipped cutters to enable precise cutting of trenches from 50m to 125m wide and from 200m to 625m or710m deep according to the model in use. The digging wheel is hydraulically raised and lowered inside a stainless steel hood to adjust trench depth. It can be laser controlled for accurate grading. The machine incorporates a hydraulically driven conveyor to elevate all spoil onto trailers running alongside. Stainless steel is extensively used in the construction of the machine. This gives greater strength and resistance to wear than a similar weight of mild steel, and being non-corrosive reduces the adhesion of soil to the contact surfaces and also generally enhances the appearance of the machine. The digging wheel is mounted on a frame which is raised and lowered by a single ram, making the fitting of laser controls a straightforward operation.

Users commented on the quality construction of the Supertrencher, particularly the use of stainless steel and the tungsten carbide cutting tips. There had been no breakdowns and no replacement parts other than replacement tips. The quality of the work was excellent, with absolutely minimal disturbance to the turf. The users considered it to be the best package on the market – quality of machine, quality of job done, and quality of service from Sheltons. The company have now confirmed that every machine built since 1980 is still in service.

CONTACT

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SILVER MEDAL

Ecorider Ltd – Ecorider diesel

The Ecorider diesel is a two-wheel, low ground pressure, diesel powered all terrain vehicle (ATV). It is classified as a light agricultural vehicle. The engine is the 230 ml Hatz diesel delivering 6 kW on either mineral or biodiesel fuel. The transmission offers high, low and reverse, the clutch is centrifugal, and the top speed is 40 km/h. The weight of the bike is 150 kg, rear rack capacity 30 kg and towing potential 250 kg. The tyres, on 250 mm rims, apply a ground pressure of between 0.75 and 1.5 bar, and there is front and rear suspension. The fuel tank holds 3 litres, sufficient for up to 6 hours operation or an equivalent 40 kilometres to the litre. Carbon dioxide emissions are correspondingly low. The Ecorider is rugged, simple in design, very safe to operate, easy to transport, capable of working in very restricted situations, and it opens up a whole field of potential uses. The list price of the Ecorider Diesel is £2750 + VAT

Users made the point that the Ecorider is a working tool and in no sense a toy. It performed well under a range of tough forest conditions, handling a trailer without difficulty. The driving position, either sitting or standing, gives good comfort and control, and the two-wheeler could well be safer on slopes and rutted tracks than a quad-bike. The wide foot-rests and the rear frame keep the bike clear of the ground, and the driver's legs free, if it should fall. Fuel economy on red diesel exceeded the manufacturer's claims, users suggesting 5 hours use on 1.5 litres, or the tank 'lasts a month'. The high torque of the diesel was useful in the forest, the bike did not run out of power at any time, and the 40 km/h top speed, low in comparison with quad bikes, was not limiting for the users consulted. The users manual covering servicing, safety matters and machine details, was said to be outstanding, as was the support from the company.

CONTACT

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SILVER MEDAL

S W Agriservices Ltd – SUMO Trio

As the name suggests, the SUMO Trio is a three-element cultivator – leading tines for cultivation from 150 mm to 350 mm depth, followed by a double row of 450 mm discs, then a row of 800 mm packer wheels. The sequence is deep disturbance, mixing and tilth formation, and finally consolidation. The result is single-pass seedbed preparation by a low draught implement marketed at a very competitive price.

The staggered leading tines are winged for greater soil disturbance and are easily adjustable for depth. The discs are rubber-mounted in pairs on independently suspended arms for shock-resistance, and depth adjustment is from the pins on the rear packer. The unique packer has notched rings which continue to rotate

when the going is difficult. The combined action of the rings, with the convex shoulder and the plain barrel section, gives a firm and highly weather resistant finish.

Users reported 'huge savings' in running costs and more timely soil working, based on modest capital cost, reduced power requirement, the saving of at least one pass compared with other cultivation systems, and in many cases single pass seedbed preparation. The machine is easy to set up, maintenance is quick, and it does not demand highly skilled labour. Depth of working was as much as 300 mm for remedial work after potatoes, but most users were moving towards shallower or minimal cultivation on a one-pass basis. The 3 m model was generally operated by tractors in the range 134-164 kW, but the range seen was 85 kW (which was working to full depth at 11 km/h) up to 194 kW. Daily output was 12-24 ha for the 3 m machine. Users mentioned the quality of service they received from S W Agriservices, and particularly the fact that they take note of and act on the needs of individual customers.

CONTACT

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SILVER MEDAL

Jones Engineering – Irrigation Hose Reel

The Jones range of hose reels are heavy duty, reliable, and easy to use, with all previously manual tasks at setting up and positioning taken over by hydraulics. A key feature is the lowering and disengaging of the gearbox while pulling out the hose, so cutting out the source of a great deal of wear and stress on the gearbox. The hose reel is controlled by a simple to use computer powered by a solar panel, and telephone contact for remote commands and monitoring is an option. The machines are heavily built, with the main frame and chassis galvanised. There are hydraulic legs to anchor the machine and lift and raise the gun trolley. Power is from a low pressure-loss turbine, and details include a flashing light when only 25 m of pipe remain when pulling out and a lockable steel cabinet for the computer. The information provided by the computer includes time remaining, pull-in speed, pipe length, headland time, alternative speeds, irrigation width, water flow rate and rainfall equivalent.

Users found the economy of the Jones irrigators to be in their simplicity, reliability, and superb support from the company. The ease of set-up with the hydraulic legs was an asset. Telephone contact was important and those that had tried it were adding the option to existing machines. Farm staff all rated the Jones irrigator very highly because of the ease of operation. A very large scale vegetable producer's comment – 'reliability and simplicity put this hosereel in the premier league'.

CONTACT

Mark Clayton, Jones Engineering, 93 Akeferry Road, Westwoodside, Doncaster DN9 2DX Tel: 01427 752171 E-mail: sales@jonesengineering.co.uk Website: www.jonesengineering.co.uk

GOLD MEDAL

JCB Landpower Ltd – JCB Fastrac 8250

The JCB Fastrac 8250 is an agricultural tractor with a 65 km/h legal capability, full suspension, continuously variable transmission, a twin calliper braking system with an anti-lock braking system (ABS) as standard, near 50/50 weight distribution to maximise traction with less additional ballast, joystick control and touch-screen programming. The 8.3 litre Tier 3 compliant Cummins engine gives 185 kW at rated speed with 1100 Nm of torque over 65% of the engine's speed range.

The users consulted were large scale arable farmers with experience of a wide range of tractors and particularly of earlier Fastrac models. They described the 8250 as a 'huge leap forward'. It was not a high speed vehicle that could be used in the field: it was a tractor with a safe high road speed. It was used for a wide range of duties including deep ploughing, power harrowing, heavy cultivating, subsoiling, and fertiliser spreading, as well as grass and maize silage carting and muckspreading. Very high work outputs were attributed to the power and torque available, the traction coming from 50/50 weight distribution, the excellence of the continuously variable transmission, the simplicity of the 'V-Tronic' controls, and the comfort of the all-round suspension. Fertiliser spreading with an 8 t spreader was being done at up to 25 km/h, itself a tribute to the stability and comfort of the ride. Road work in the 'drive' mode, selected from the touch screen, was said to be as comfortable as driving an automatic car, and with the high degree of safety provided by ABS braking. The 8250's we saw were heavily used – one had done 2200 hours in a year – on a wide range of field and road work, and had done so without problems and to the complete satisfaction of the users.

CONTACT

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PERPETUAL CHALLENGE TROPHY

Herberts get top Royal Show honour

R J Herbert Ltd has been awarded the Sir Roland Burke Perpetual Challenge machinery trophy for a sustained contribution to the potato industry.

Herbert Engineering was founded in 1972 by Rod Herbert, the present head of the firm, and have been at the forefront of technical development, production excellence and service to the potato industry ever since. The company is now a leading British manufacturer and supplier of grading and handling systems for the agricultural, food, recycling and logistic industries with offices in Cambridgeshire and Eindhoven.

HRH Countess of Wessex presenting the award to Rod Herbert and his wife, with son Nick in the background

Rod Herbert comments, "I am extremely proud to have received this award on behalf of all the staff at R J Herbert Engineering. We have a loyal and very knowledgeable team who have been with the company for a long time and significantly contributed to its success and retained the quality that have helped the company grow. Everyone here is proud of our farm graders and agricultural machinery and we look forward to serving the potato industry for many years to come".

CONTACT

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