Landwards

Agriculture • Horticulture • Forestry • Environment • Amenity

Meet the President

Manufacturing is in the blood for Richard Robinson

Making Manufacturing Pay

Ian Sayers on JCB's quest for manufacturing efficiency

Braking: the rules

How legislators are tackling issues of trailer braking

IAgrE Professional Journal www.iagre.org Volume 63, Number 2 Summer 2008

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

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THIS ISSUE

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EDITORIAL

A trio of F-Words

How quickly the landscape changes. The political landscape that is. The problems piling up at the door of No 10 can be categorised as a trio of F-words - finance, fuel and food.

You know that something is up when Gordon Brown hosts a succession of meetings with the supermarkets and the NFU. The present Government has done no favours for the farming or rural communities during its term in power. You had the impression that they had decided there were no votes in the countryside. Agricultural research establishments were closed or run down to the point of being starved of sufficient funds to do their jobs efficiently or safely, and the inefficient way bureaucrats handled the Single Payment scheme would have had other industries screaming blue murder.

To its credit the farming sector and allied industries got on with the job - often against the odds. And now that the Government realises that food production, on a worldwide scale, is one of the major challenges to be faced in the coming years, it will realise that it needs to support a strong, efficient and committed agricultural sector.

And unlike the last great challenge to food security in this country during the war, there are so many other factors being brought into play - such as Environmental considerations; climate change; conservation; the bio-fuel debate; technological advances; health and safety; a smaller and fluid work-force.

All of these come under the remit of IAgrE , and probably provides the Institution with the greatest opportunity it has had to influence agriculture's response to the timely production of food.

But it must have a voice. In recent years, along with other specialist agricultural associations it has probably felt that it was something of a lost cause.

So now is the time for it to be heard, in concert with others. The countryside will become something of a battleground in the coming years, as the Government of the day tries to balance the need for sufficient food production, the spread of new housing, maintaining local services to rural communities, recreational usage and the preservation of much of our glorious landscape.

As you will see in this issue, IAgrE represents a fantastic array of talent from innovative students to those who have shaped six decades and more of change and development.

I make no apologies for repeating a phrase from my opening editorial in the last issue, 'this is no time to be hiding our light under a bushel'.

CHRIS BIDDLE
Editor

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

CEO VIEW

WITH both the IAgrE Annual Conference/AGM and the Young Engineers Competition out of the way, it is time to reflect on how they went and what we could have done better.

It is always easy in the heat of 'battle' to think, 'I wish we had done this (or that) differently' but in the end, it is down to time (and in my case - memory) and being grateful that things happen at all. We are grateful to all those who helped to make these events a success.

We should remind ourselves that it is the volunteers from the IAgrE membership who make things happen. All we do at the Secretariat is facilitate and administer.

A case in point was the inaugural meeting of the IAgrE Ireland Branch. Members instigated this and the new committee has already started to map out a programme. As mentioned in the last issue of Landwards, the opportunity was taken, at the meeting, to launch the LTA programme to Ireland.

We are pleased to announce the registration of the first LTA 2 candidate from Ireland. By the time this issue of Landwards is with you, the numbers registered with LTA will exceed 900, pretty good progress in under 6 months.

For those of you who responded to the electronic survey on a possible replacement title for IEng, the overwhelming response was to maintain the status quo. What a relief. Let us hope that common sense prevails across the other professional bodies. The effort required to incorporate (sorry) changes to all of the literature would be daunting.

Christopher Whetnall

Sir Anthony makes it an IAgrE double for Bamford family

SIR Anthony Bamford and Professor Dick Godwin have been awarded IAgrE's most prestigious award - The IAgrE Award of Merit.

Made to those distinguished by their work in agricultural science or e ngineering or one who has rendered outstanding service to the Institution of Agricultural Engineers, these awards are made rarely.

Sir Anthony and Professor Godwin join a list of distinguished recipients including Dr Helmut Claas and Joe Bamford (Mr JCB).

The award was accepted on behalf of Sir Anthony at the conference by Ian Sayers, Director of JCB Agriculture, whilst Professor Dick Godwin was in the audience to accept his awards.

Full details of these and other awards are on pages 30 and 31 and on the IAgrE website.

www.iagre.org/awards2008

Sir Anthony Bamford: follows in the footsteps of JCB founder Joe Bamford with IAgrE award

Andy Newbold takes over as Vice-President

Richard Robinson installed as new IAgrE President

THE Institution of Agricultural Engineers (IAgrE) has inaugurated its new President.

Richard Robinson became President on May 8th at an official ceremony at Harper Adams University College after two years as President Elect.

He is an entrepreneur in the true sense of the word and is Managing Director of Autoguide Equipment. Richard has wide experience across our industry having worked with New Holland in his youth in baler development, ending up as a Senior Test Engineer before moving on to Watveare Overseas as Service Manager and in engineering design and development.

As a past winner of the IAgrE Branch Meritorious Award (Western Branch) Richard has an involvement with IAgrE dating back almost 40 years. He (through Autoguide Equipment) was responsible for the introduction, with Dr Andy Scarlett, of the IAgrE Young Engineers Competition and has sponsored this successful competition since its inception.

As a Chartered Engineer, registered through IAgrE,

Richard is keenly aware of the needs and benefits of professional registration at all levels and is an enthusiastic proponent of the new LTA scheme (Landbased Technician Accreditation) run on behalf of the industry by IAgrE.

Richard said, "I sincerely hope that my Design, Development and Manufacturing experience will allow the Institution to engage more of the many manufacturers in our fields of interest. My strategy as President will be to reinforce the huge efforts made by my predecessors to improve communications with our existing membership and to work together with other organisations involved in landbased engineering. I firmly believe that the IAgrE has much to offer our new, mainly young members and can, in particular, offer them an effective path to achieving the qualifications and level of respect which Engineers so richly deserve".

IAgrE has also announced the appointment of Andy Newbold as Vice President of the Institution. Mr Newbold, a Chartered Engineer, is managing director of technical events company, Fusion Events.

Commenting on his new appointment Mr Newbold says, "Humanity has never been faced with a greater challenge for survival than the current world situation of increasing food scarcity coupled with limited resources. The global issue is to make the most of what we have in a sustainable manner."

"It's very exciting to have a career in agricultural engineering and to have the opportunity to develop the profession, in the role of Vice President at this time," he added.

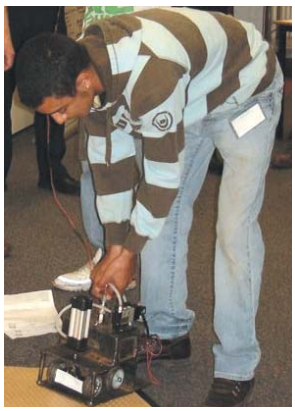
JCB hosts the annual competition to test the inventive skills of engineering students

Young engineers pit their skills

THE JCB headquarters at Rocester was once again the venue for students to come together and pit their wits and skills in the 2008 Young Engineers competition.

A total of 50 students and lecturers made up 12 teams representing four colleges, Myerscough (three teams), Reaseheath (five teams), Plumpton (one team) and Brooksby Melton (three teams).

The overall object of the competition was to create a remote or radio controlled vehicle to produce the best performance on a standard test track given a set of wheels, 12 volt battery and maximum dimensions.



Commenting on the team efforts, IAgrE chief executive Chris Whetnall said, "Projectiles seemed to be the order of the day with no less than 5 entries using no tractive force transmitted through the tyres (a clear breach of the rules) to propel their vehicles."

"Unfortunately, two entries had to be banned at the outset (the use of water as a form of jet propulsion seemed more appropriate for an outdoor arena rather than one of Sir Anthony's plush conference rooms) but three did survive scrutineering albeit in the 'unclassified' section"

"One utilised an onboard air pressure vessel which should have come with a Board of Trade pressure vessel certificate (or today's equivalent at least)."

"The other two used a bungee cord and a steel spring respectively. Good to see entrants thinking laterally (which is the direction many of the vehicles went!)"

He added "An excellent event at an excellent location."

"The afternoon visit to the Backhoe Loader plant showed just how busy JCB are at the moment. Our thanks to JCB and in particular Lee Jankovskis and his team of caterers who did us proud."

The winners of Class 1 (those that met the design criteria), were Dan Higham and Alan Bland of Myerscough College who won a £200 cash prize and £600 Bosch Rexroth vouchers, whilst the team of Richard Cornes, Lee Kilcourse and Chris Coppenhall of Reaseheath College won the £150 cash prize for topping Class 2 (those outside the design criteria).

As ever, the students came up with inventive names for their vehicles. These included Exodus 3, Team America, Baking Tray Mk2, the Friday Afternoon Project, the A Team - and Helga!

On behalf of IAgrE, Chris Whetnall added, "We really appreciate the ongoing support of Autoguide Equipment for their organisational input, Rexroth Bosch for the prizes (a £1200 Bosch tool fund), Steatite for the supply of batteries and Brammer for the supply of wheels - and of course JCB for their hospitality."

Inaugural meeting held in Limerick

IAgrE establish Irish branch

THE initial meeting of the Ireland branch of IAgrE has taken place in Limerick in the Greenhills Hotel on Saturday 12th April 2008.

The meeting was attended by members from:

- Department of Agriculture, Fisheries and Food
- Farm Tractor Machinery Trade Association
- Institute of Technology, Tralee,
- Pallaskenry Agricultural College
- University College Dublin

The meeting started with a welcome and short introduction by Kevin Lynch, Head of School of Engineering, Institute of Technology, Tralee. Kevin outlined the agenda and the objectives of the meeting.

Chris Whetnall, Chief Executive of the Institution of Agricultural Engineers briefed the audience on the advantages of becoming a member of IAgrE. He outlined that IAgrE is an institution that welcomes both scientists and engineers as members.

Peter Leech from John Deere (UK) then gave a presentation on the Land Based Technician Accreditation scheme, which has the support of the main international Agricultural Machinery Companies. The Land Based Technician Accreditation scheme has been successfully introduced in the UK.

Ray Clay, retired Chief Engineer JCB gave a most interesting and well received presentation on his involvement in the design of the Fastrac Tractor.

Following these presentations, branch elections were held, which culminated in the election of the following as officers and committee members of the branch.

Chairman: Kevin Lynch, Institute of Technology, Tralee.
Vice-Chairman: Michael Moroney, Farm Tractor and Machinery Trade Association.
Secretary: Michael Roberts, Pallaskenry Agricultural College.
Treasurer: David Frizelle, Institute of Technology, Tralee.

Turn over a new LEAF

LEAF's IFM Database, which provides evidence of the economic, environmental, social and biodiversity benefits of Integrated Farm Management (IFM), has been updated to include summaries of papers from around the world.

LEAF's Chief Executive, Caroline Drummond says, "Since its launch in 2003, the IFM Database has played an important role in providing evidence to support the case for IFM. The updated on-line database draws on over a hundred research studies from around the world including Europe, Nigeria, India, Australia, Malaysia, California and China to show the economic, environmental, social and biodiversity benefits of Integrated Farming.

www.leafuk.org

Clippings

• AFTER a relatively slow start to the year, tractor registrations for April were 2116 units, an increase of 28.6% over the same month last year. Year to date sales are 5578, 11.4% up on the same period last year. The figures relate to all tractor sales over 50hp.

• **AGCO Corp. had a record first-quarter financial results, boosted by double-digit global sales growth. Net income of $62.3 million on $1.8 billion in sales, compared with net income of $24.5 million on $1.3 billion in sales in the first quarter of 2007. Strong global market conditions contributed to increases in all four of AGCO's geographical segments, with the largest percentage increase in South America. Net sales in the Europe / Africa / Middle East region rose about 20 percent.**

• PERKINS Engines Company Limited has announced plans to build its 1100 Series range of diesel engines at Wuxi in the Jiangsu province of China. Manufacture of the 1100 Series is planned to begin towards the end of 2009 and initial volumes are predicted to be around 60,000 units per annum.

"This announcement confirms our continued commitment to China and our ambition to be the natural choice for Chinese equipment manufacturers," said Jim Tevebaugh managing director of Perkins Industrial Power Sales and Marketing Division.

• **EMAK has expanded its manufacturing interests with the acquisition of Bertolini S.p.A., the manufacturer of a range of powered garden, agricultural and light construction machinery.**

Emak has a long standing association with Bertolini which has for a number of years manufactured Emak's Efco brand transporters and tiller.

The company has also taken the decision to enter into an exclusive strategic alliance to manufacture its own brand of petrol engines.

IAgrE and RASE award Valtra

EcoPower concept scoops Sustainability Award & Silver Medal

THE Institution of Agricultural Engineers has placed Valtra's EcoPower concept under the microscope and granted it their Sustainability Award.

Also, presented at the Royal Show each year, the Royal Agricultural Society of England Machinery Awards recognises the cream of machinery development. This year the EcoPower has been awarded a Silver Medal.

In addition to a presentation made by Valtra the judges visited and interviewed a number of Valtra EcoPower tractor users across the country, discussing first-hand the tractors' operation under different farming regimes.

Following the interviews, judges concluded that EcoPower has; "The potential to make a significant contribution to the achievement of sustainability in Agriculture."

Launched in 1999 EcoPower

is, in simple terms, the ability to operate the tractor at a reduced engine speed (rpm) without compromising output and increasing developed torque. Today, EcoPower is available in both 4 cylinder N111 at 122 /133 hp and the 6 cylinder T151 at 159/173 hp models.

Thanks to the introduction of Tier III engines with electronic, common rail fuel injection systems, EcoPower is today a switchable option allowing the operator to choose the mode - Eco or Power - that best suits the operation in hand. In Power mode rated engine speed is around the universal 2,200rpm. Eco mode drops the rated engine speed to just 1,800 rpm, around 400rpm lower than in most other engines. Despite this speed reduction torque is increased by between 5% and 20% with a wide, constant range. Maximum torque comes in between 1100 and 1200 rpm.

RASE WINNERS IN FULL

GOLD MEDAL

N Sensor, Yara

This can accurately record and deliver precise levels of nutrient according to the crop's requirements. Using this information the crop's nitrogen status can be measured at 50 sq metres of crop per second and the data translated into an application rate

SILVER MEDALS

- **EcoPower**, Valtra
- **Seko Bio Chopper mixer wagons,** Harry West (Prees) Ltd.
- **Scharmuller Ball Coupling System K80**, J H Milnes Ltd
- **BiG X Self Propelled Forage Harvester**, Krone
- **Scotpen**, DCH Farm Sales
- **CS 150/170 ROTA-Power**, Grimme
- **GT 170 potato harvester**, Grimme
- **Telemaster TM310S**, JCB
- **Profilab cultivator**, Techmagri

Farmer fined after using tractor to cut local rugby pitch

Warning over red diesel for amenity use

THE use of red diesel in tractors and certain ride-on equipment previously lawful on public highways while carrying out recreational or amenity grounds work or landscaping is now illegal according to the Institute of Groundsmanship (IOG).

Following changes to 2007/93 The Excepted Vehicles (Amendment of Schedule 1 to the Hydrocarbon Oils Duty Act 1979) Order 2007, vehicles not entitled to the use of red diesel on public roads include those involved with:

- The maintenance of recreational facilities, and
- Landscaping.

Offenders can be fined £250. The term 'recreation' is not fully defined by the HM Revenue and Customs help desk, but a farmer using his tractor running on red diesel en route from mowing a rugby pitch has been fined.

The entitlement to the use of rebated gas oil (red diesel) is restricted to the use of agricultural vehicles engaged in agricultural, horticultural and forestry operations on the owner's land or by his contractor when using the following vehicles on public roads: agricultural tractors – agricultural materials handling vehicles and light agricultural vehicles (not exceeding 1,000 kgs and constructed to seat only the driver).

In addition, agricultural handlers may also use red diesel while cutting verges bordering public roads, and cutting trees and hedges bordering public roads.

Contact HM Revenue and Customs on 0845 010 9000 for details.

NFU take issue with Natural England

AGRICULTURE is playing a key role in shaping and maintaining the state of the country's natural environment and the successes achieved so far should be celebrated say the NFU.

Responding to Natural England's State of the Natural Environment 2008 report, NFU President Peter Kendall said the document recognised the important role already played by farmers and showed there were challenges ahead that agriculture was more than ready to help meet.

Mr Kendall said: "I'm surprised that Natural England has chosen to emphasise the negative which has led to the media portraying the countryside and wildlife as in crisis. It is increasingly frustrating that the benefits of the work being done across all forms of farming are not being recognised by Natural England and this is creating barriers to the progress that we want to see in stewardship schemes."

"This report, which looks at the changing nature of countryside over the last 50 years, recognises that our farms are more productive, our wildlife is better protected, and that 80 per cent of the landscape is in a stable or improving condition. It also shows this countryside is far more accessible for the public to enjoy than it has ever been."

"One of the biggest challenges we face is how we as farmers produce more food while meeting our environmental responsibilities."

"We also need to look at how we protect our most productive land while managing sea level change; how 300,000 new homes can be accommodated without worsening flooding and damaging water capture; and how we as a country develop secure renewable energy across the countryside."

LETTERS to the Editor

Finding funding

CAN I, through you, thank John Matthews for responding to some of my comments in the winter edition of Landwards. I accept that NIAE/SRI carried out useful work but in the end it does not matter what I or John thought but those that paid the bills. The benefits did not justify the cost.

I fully support his proposal for integration and expansion of university research and that the IAgrE is the obvious body to promote such integration. The challenge will be to persuade those that praised the work of the NIAE/SRI, and benefited from it, to find the necessary funding.

Can I suggest that all those with an interest in expanding UK research into Agricultural Engineering contact the IAGRE secretariat.

Geoffrey Wakeham
Member

Biofuels debate

I was disappointed that you published the article by Bill Butterworth on biofuels and global warming in the recent issue of Landwards.

It seems obvious to me, with my limited knowledge of chemistry, that it contains basic errors and inconsistencies. I have set out some of these in a format that I hope is suitable for publication in the next issue.

The things I have pointed out are, I think, matters over which there could be no difference of opinion. There was certainly more that could be criticised, and others with specialised knowledge of the subject may take issue over other points.

I am all for debate when there are well-founded differences of opinion over the facts and their interpretation. However, although Landwards is not a refereed scientific journal, I feel that the Institution may be brought into disrepute if there is not a basic level quality control over what is published under its auspices.

That said, I feel that you have made a good job of the remainder of this your first issue of Landwards which is a well laid out and attractive publication worthy of our Institution.

John MacCormack
Member

You can read John MacCormack's response to Bill Butterworth's article on page 21 of this issue

Togetherness

I like the new Landwards and thought that some additional and perhaps controversial "letters to the editor" may be useful

Engineers have taken a beating in the UK for as long as I can remember and engineers have only ourselves (largely) to blame! The evidence to select committees, the organisation of our links to, and lobbying with farmers is so poor that NFU is in Stoneleigh, IAgrE in Silsoe, and AEA in Peterborough, just as we recover from the withdrawal of funding for N.I.A.E./SRI and elsewhere in Ag.

The reasoning behind our separation is a lack of vision of a coordinated type.

Some years ago, we expected that the big tractor and farm machinery manufacturers would look after our interest, but of course the mergers and takeovers have caused them to look after themselves and so move away from UK.

When N.I.A.E. became Silsoe Research Institute (SRI), it was expected that the Biotechnology & Biological Sciences Research Council (BBSRC) would be so impressed with Silsoe's work that they would look after Ag. Eng interests. The closure of both SRI and much of Silsoe college has followed. These organisations proved themselves to be selfish (tractor majors) or parochial and superior (N.I.A.E./SRI) and, in the event, they were rationalised or gobbled-up by more interested parties or closed because of the failure to be relevant to U.K., let alone be internationally relevant.

Leadership is now needed. It will have to come from the NFU and the farming community but hopefully also with Ag.Eng support. We have an EC vision paper (MANUFUTURE) to help us "think our way out of it" but we also need to have a world-leading vision of our own.

Graham Edwards
Trantor International

The above is part of a longer submission by Graham Edwards which we will carry in full in the next issue.

Landwards

I'm still reading your new issue - which must be a record - as it normally only takes a few minutes.
Personally I am delighted (and relieved!) that you have done such a wonderful job, congratulations to everyone involved.
What particularly impressed is that it is quite different from your other publications, and yet retains the style, which has made it so readable.

Richard Robinson
IAGRE President

I feel that congratulations are in order on your appointment as editor of Landwards, the magazine has gradually become very readable for me, and I am sure that you will enhance it in that direction.

The excellence of the photos, the layout and the articles of interest are all plusses in my book.

I see that Ian Fleming has just beaten me to the post with his 60 years of service last month; I shall have been 60 years with the Institution on 13 May 2008. am wondering how many others have achieved this target?

Don Macmillan

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

Making manufacturing pay

In search of excellence

At the IAgrE Conference 2008, IAN SAYERS, Director & General Manager of JCB Agriculture described how greater efficiencies are used to combat rising production costs

"IN simple language, maximising the efficiency of work practices is about using simple processes, disciplines and practical tools to continuously get more productive," said JCB's Ian Sayers.

"I am going to reiterate that because there are 3 important things here - using **simple** processes, disciplines and **practical** tools to **continuously** get more productive."

"But why should we even bother with it?"

"The truth is that here in the UK, we have no choice. We have seen the demise of so many once-great manufacturing businesses, so we cannot just rest on our laurels, or rely on remembering the history of how-great we once were."

"Almost every modern business is today touched by global competition. And the market place is becoming increasingly more-competitive. Whether you make pharmaceuticals, micro-processors or agricultural and construction machines like me, you will have some very good global competitors, and they are always getting better".

So manufacturers have no choice, said Mr Sayers, but to relentlessly search for better productivity, and deliver it.

They have to get better all the time because input costs are increasing - energy, steel and oil prices are a very good examples of dramatically rising input costs.

As engineers, these rising costs touch everyone, and no manufacturer can just cannot ignore it.

"Our customers simply do not accept that all these price increases are passed onto them and therefore, you have to maximise the efficiency of your work practices to get more productive, and become more competitive."

"There are external factors such as exchange rate fluctuations. We really have zero ability to impact these fluctuations, and unfortunately they seldom go the right way for you."

"As a British manufacturer, take the US dollar for example. For an excavator being sold at $120,000 in the USA, JCB would have received £75,000 for this machine 18 months ago. Today, we would receive £58,600 for the same machine - a reduction of £16,400 or 22%. So, we are receiving £16,400 less for a machine than we did 18 months ago because of the weakness of the dollar - how many manufacturers can cope with a 22% price reduction over 18 months, especially when steel prices have doubled in the same time frame?"

"JCB certainly cannot, so we have to find ways of becoming more competitive."

"There are of course many other reasons why we have to relentlessly strive to maximise efficiency, but I hope my message is clear. You simply have to focus on maximising efficiency, and you have no choice if your business is to prosper."

"SO, how then do we set about improving efficiency," asked Ian Sayers?

There are many methods, he said, but the key was to focus on three key areas

"First, the elimination of waste."

"Second, by having a clear, company wide and process-driven system that ensures you improve. To do this, JCB has developed what we call the JCB Production System."

"Thirdly, you have to invest, and invest heavily. JCB now has 11 factories in the UK and is a true British success story. We are still heavily committed to expanding our UK manufacturing base, but, we also now have an increasing number of facilities overseas, and for both competitive and environmental reasons, this investment in overseas facilities will also continue".

"So maximising efficiency for me is a 3- part story - eliminate waste, use a simple production system to help you continuously improve, and invest heavily in world class facilities."

"But in all this, what we are trying to do is very simple."

"We are simply trying to ensure

For an excavator being sold at $120,000 in the USA, JCB would have received £75,000 18 months ago. Today, we would receive £58,600.

that each manufacturing process makes *only* what the next process needs, and only *when* it needs it. As we do this as engineers, we must constantly keep an eye on the bigger picture, and link all processes from the final customer, back to the production of raw material in a smooth flow, without detours."

"And what are we trying to do? Our ultimate goal is to ensure that all this activity delivers the **shortest lead time,** the **highest quality products**, and at the **lowest cost**."

WASTE

"WHEN I say eliminate waste, I mean we have to work to eliminate anything that serves to increase the cost of production. So, as we eliminate this waste, we reduce our costs."

"That means eliminating defects, controlling inventory, not over producing, not over-processing, cutting out unnecessary transport or motion and eliminating waiting time either by a production machine or operator."

PRODUCTION SYSTEM

"THE second part of maximising efficiency is having a simple, process-driven system to help ensure you improve."

"At JCB, we have developed the JCB Production System, much of it based around well-tested and tried practices developed by Japanese manufacturers."

"The whole western-world has learned much about efficiency from excellent companies like Toyota and in doing so, we now use certain Japanese terms where one word can describes a whole paragraph in English."

"These entail having good foundations in place, making sure that sound safety practices are adhered to, and then to apply basic principles throughout the factory."

"We call them 5S, short for sort, set, shine, standardize and sustain. The aim is two-fold:

- **To have a very high workplace standard that visually appears world class.**
- **To quickly be able to spot abnormalities and problems, so we can fix them fast.**

"In a nutshell then, 5S helps the operator focus on making a good quality part safely, in the standard time, without having to compensate or hunt for his tools & materials."

"This is all about continuous improvement and a Japanese word to describe it - **Kaizen**. Kaizen techniques ensure we are never satisfied with our progress - they make sure we continuously look at what we are doing, and relentlessly strive to do it better."

MAJOR INVESTMENT

"THE third part of our strategy is major investment."

"JCB now has 18 manufacturing facilities, 11 of which are in the UK, and has invested over $200m in world class manufacturing facilities in the past couple of years."

"Our UK facilities have become even more productive, and our overseas operations are focused on supplying local markets - they ensure we have competitive facilities in the right locations for our customers around the world. We are committed to expanding our UK facilities and as such we are currently constructing a new 500,000 square foot excavator facility alongside the A50. However, we will also continue to expand our overseas operations to ensure we maximize efficiency, by not shipping products half way round the world, and instead, manufacturing more locally."

SUMMARY

"MAXIMIZING efficiency is about 3 things. **eliminating waste,** having a **simple, clear system** and tools to help you improve - and a significant amount of this is investment in people and training. And finally, its about **investing heavily** in world class manufacturing facilities."

"These are not the only ways of maximizing efficiency, but they are JCB's way. And it is delivering for us".

"In a world where British manufacturing has declined, JCB is prospering. 2007 was JCB's 5th record year in a row for both our construction and agricultural businesses".

"We have doubled our business in 3 years - from selling 36,000 machines, turning over $2.2bn and with a worldwide construction equipment market share of 8.4% in 2004, to 72,000 machines, a revenue of $4.5bn and a market share of 12% last year".

"Maximising efficiency is not complex, but is a process that you never finish."

Bend it, shape it . . .

EVERY conference needs a sparkling opening to set the tone, and that was exactly what Thomas Mueller of SSAB Tunnplåt AB (Swedish Steel) did by asking delegates to open up their conference packs and take out two seemingly identical strips of mild steel.

In pure Uri Geller style he asked delegates to place the two strips of similar thickness together and bend them simultaneously.His 'party-trick' of course was based on the fact that one of the strips was made of the company's Docol, so that one strip bent easily whilst the other (Docol) was tougher and less flexible.

The point Thomas was making is that Swedish Steel is well-placed to provide steel for agricultural and forestry equipment which is both stronger and lighter, providing considerable benefits to manufacturer and end-user.

SSAB Tunnplåt AB is the biggest steel sheet manufacturer in Scandinavia and one of Europe's leaders in the development and manufacture of high-strength steel grades. Formed in 1988 by the merger of the steelworks in Luleå and Borlänge. SSAB Tunnplåt is a member of the SSAB Svenskt Stål Group, has a turnover of SEK 15 billion (2006), and has around 4300 employees in Borlänge, Luleå, Finspång and Ronneby. In addition, the company has subsidiaries in Finland, Denmark, Italy, the Netherlands and Great Britain. SSAB Tunnplåt has an annual production capacity of more than 2.8 million tonnes.

Cutting Waste

Above: Nigel Cole of Belle Engineering talked about identifying the contributing issues when deciding how to cut waste in the manufacturing process. Where do you start? he asked. The warehouse, the product, the people?

"In manufacturing," he said, "there are always some low hanging fruit we can identify and reduce and eliminate, however to make a bottom line difference we need to approach the situation with more knowledge, techniques and effort."

IAgrE CONFERENCE 2008
was sponsored by:
SSAB Swedish Steel
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Above: The conference was opened by Professor Wynne Jones, Principal of Harper Adams University College

Keeping it lean

MARK Dash (below) of Bosch Rexroth, together with his colleague Andy Minturn described the selection of manual production solutions and their application in lean manufacturing.

He showed plenty of examples of manufacturing stations that could lead to greater efficiency at all stages of the manufacturing process.

Left: Attentive delegates at the IAgrE Conference, *Above:* Roger Lane-Nott, CEO of the Agricultural Engineers Association (AEA) (*on left*) who chaired the conference chats with BAGMA general manager Keith Christian

Landwards editor, CHRIS BIDDLE talks to the new IAgrE president Richard Robinson and discovers a fertile and imaginative approach to engineering

. . . and the problem is?

EVEN at school, the careers master might have had a job 'pigeon-holing' the young Richard Robinson

At Nottingham University, where he studied Metallurgy, he decided 'that's not for me'(somewhat surprisingly in view of his later achievements).

The son of one of the most celebrated breeders of shire horses in the country, Eady Robinson, Richard had the countryside in his blood. At home on a farm in Northants where his father bred a magnificent line of shire horses, mostly for the major brewing companies, the day was often interrupted by the arrival of a Land Rover driven by a head-scarved Monarch on a 'very private and very unofficial visit to see the horses'.

So when he saw an advert for a young engineer to work at the Aylesbury factory of New Holland, one of the largest farm machinery manufacturing plants in the country, he was immediately attracted.

"On my first day, I met managing director Ted Whittaker for two or three minutes, but that was long enough for him to make me the first engineering trainee after a succession of salesman!"

Over the next 18 months, Richard worked in "every department of New Holland, learning the business, getting to know the manufacturing processes, the people and the products".

In those days, New Holland was a thriving UK manufacturer of balers, foragers and hay-making equipment. It produced almost 40 balers a day, and had a strong programme of product development.

The Super 68 Hayliner baler was one of its most popular lines, but when that was upgraded to the 268, the model launch was a disaster.

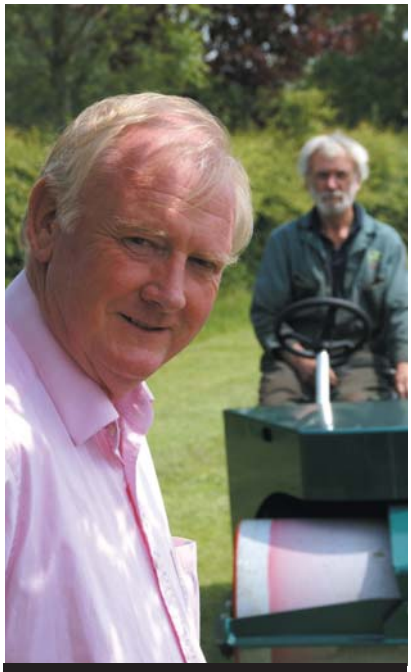
"The farmers were complaining, the dealers were on our back, so at the company dealer meeting, New Holland promised that a new model would be designed, tested and on the market in readiness for the coming year".

So Richard Robinson and a couple of colleagues were dispatched to Johannesburg in South Africa to build and test the new model.

"We had very little in the way of facilities on the municipal farm we used as our base, I think an angle-grinder was about the sum of our equipment!"

It was to be a steep learning curve, and required a high-level of practical engineering skills and ingenuity - and in hindsight probably shaped the way that Richard was to approach his later career.

The new model, the 276, designed and



Richard Robinson: the Auto-Roller can be found at leading cricket grounds throughout the world

tested during the African summer was put into production and regarded as a successful replacement for the 268.

"The only problem then was that the first 50 machines built in the factory went out to New Zealand, not exactly on the doorstep when trying to sort out first builds . . !"

Richard stayed with New Holland for 8 years, before moving, in the early 1970s, to become Service Manager for Watveare, distributor of Fahr tractors and equipment where he was involved amongst other things in designing the cabs then required for new tractors, a new seed drill (which never went into production) and universal pick-up hitches.

THIS all-round experience prompted Richard to leave the 'comfort' of a job with a major manufacturer in order to set up his own company, Autoguide Equipment ("I wanted a company name that began with A because people often pay them first!").

Situated in the depth of rich Wiltshire farming land, the village of Heddington, boasts one pub, The Ivy, a church, a Buddhist Temple and in July one of the foremost steam rallies in the region.

Here, up a neat farm drive, Richard lives next to the shop, surrounded by a number of rural enterprises. His wife, Peggy runs a business services company which helps importing companies process paperwork, licences etc (the paperwork for most of the imported cheese from Canada is handled through her office). And also on-site the local play-group meets daily using spare Portakabin space.

It is difficult to pigeon-hole Autoguide, so wide and diverse are its products and client list. Richard started in the 1980s importing augers from the US, then commenced manufacturing his own. Pick-up hitches were another product line that kept the company busy in the early days.

One of the most visible and profitable products has been a three-cutting unit ride-on cylinder mower, the Turf Trooper, which Autoguide designed and rebuilt from an original model. Marketed through Allen Power Equipment before the Didcot-based company folded three years ago, the Turf Trooper has been brought back in-house, reworked and is now marketed by Autoguide.

The company also designs, builds and supplies cutter decks for leading brands such as Kubota.

And did you know that the roller that trundles up and down the wicket at Lords, the home of cricket, is made by Autoguide at Heddington? The MCC has three Auto-Rollers.

That business started in the 1990s, when Richard took over the roller business from T H White. Today, the company makes around 25 cricket rollers a year, and has in development a further business in 're-power kits' to fit older models that in all other respects would go on and on.

Aside from the farm and grass machinery business, Autoguide also provide many of the country's utilities, BT, electricity companies, with a range of augers used to secure pylons and other major constructions - including the biggest permanently erected tent in the UK.

As you can imagine, ideas are constantly swirling round Richard's mind. At the heart of the business is the ability to solve specific engineering problems, so that virtually no challenge is off-limits to Richard and his 22-strong team at Heddington.

As an example, the company developed the Postmaster, a machine that can install up to 180 intermediate posts in an hour.

With so many branches of land-based engineering coming under the scope of IAgrE, the new president is not only well-qualified to understand the issues across the sectors, he is also well-placed to provide solutions!

Over 1000 individuals registered in six months

LTA scheme gathers pace

IN 2003, the Institution of Agricultural Engineers (IAgrE) hosted a conference highlighting the skills crisis facing our industry.

What became evident was the absence of a clearly defined career path for dealer technicians. And so in October 2005, a group of individuals committed to excellence in technical training, met under the umbrella of the AEA (Agricultural Engineers Association) to discuss how best to address this issue.

At this meeting, the **Landbased Technician Accreditation** scheme was born - LTA for short.

The LTA scheme is a tiered programme of development from the new entrant to the industry's top technicians and provides a set of clearly defined steps accessible to all. Administered by IAgrE on behalf of the industry, the LTA scheme has four tiers.

As technicians progress through the tiers, they will be expected to have attended an increasingly complex and advanced set of specified manufacturers' training courses.

With the exception of LTA1 registrants, all are issued with a photo ID card (see below). There is a nominal charge for the photo id registration card and re-registration will be required at least every five years.

- **LTA1** is for the apprentice (or new entrant). ie those who have not yet been assessed.
- **LTA2** accredits those at the NVQ level 2 and 3, National Diploma or equivalent. ie those who have completed an apprenticeship as well as those who can demonstrate their skill through experience and training. This will be the standard or core tier.
- **LTA3** is for those identified by their dealer and manufacturer to study at advanced level to become experts in diagnostics or specialists in specific products. This will be considered the advanced or diagnostics tier.
- **LTA4** is for those who have progressed beyond LTA3 and considered to be at the top of their profession. They will also be nominated by their dealer and manufacturer to study and be assessed on special high level training. They will lead and mentor others.

Those accredited at LTA3 and LTA4 are required to register as an Engineering Technician (EngTech) with the Engineering Council UK (ECUK) through the IAgrE.

Manufacturers expect all franchised dealers to register all their qualifying technicians under the LTA scheme and also to register their LTA3 and LTA4 technicians with the ECUK as Engineering Technicians through IAgrE.

Licence to Practise

AT this stage, the LTA scheme is not designed to be a licence to practise. Rather, it is a voluntary code whereby industry can demonstrate a commitment to employing only those who are qualified and experienced to work on today's highly complex equipment by training for tomorrow. If, in the future, UK or EU legislation requires licensing of technicians, the LTA scheme will be in place to take on that challenge immediately.

A National Register

DETAILS of all those registered under the LTA scheme will be held by IAgrE on a national register.

These details will be held securely and will be covered by the Data Protection Act. The only information that will be passed to a third party will be the LTA tier under which an individual is registered. All other details will be confidential.

Code of Conduct

ALL those who are accredited at LTA2 or above will be required to sign up to a code of practice This is to ensure that the registrants (and their employers) are committed to improving the registrants' skills during the period of their registration.

Over 15 companies and organisations have signed up to a set of protocols (Memorandum of Understanding or MoU) outlining their role and responsibilities under the scheme. Others are expected to sign in due course.

The organisations are AEA, BAGMA, EurAgEng, FTMTA, IAgrE and Lantra together with those companies shown below.

At an early stage, it was identified that organisations with a Eurocentric approach to their technician training could benefit from a scheme that could have common currency throughout Europe.

By agreement with EurAgEng, those registered as Engineering Technicians (EngTech) through the IAgrE will also show the designatory letters EurAgEngTech.

The LTA logo will become more commonly seen as participating manufacturers start to use it on their letterheads and dealers display the logo on their service vans.

For the franchised dealer networks, the relevant manufacturers training centres will be acting as assessment centres accredited and audited by IAgrE.

For those technicians working in independent dealerships, it may be necessary for those wishing to register on the LTA scheme to "top up" their basic training with additional courses and attend regional centres for the assessments required under the scheme.

In a recent move, an LTA Assessment team has been set up comprising John Neville, Ron Roberts, Richard Trevarthen and Alastair Taylor.

Further information ***www.iagretech.org***

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QUALITY products deserve QUALITY technicians

Braking: the rules

The recent IAgrE Transport Conference addressed regulation issues, with particular emphasis on forthcoming legislation likely to have a major impact on trailer braking
ALAN PLOM, Head of Safety, HSE Agriculture & Food Sector reports

THIS timely and successful conference, held at the East of England Showground, Peterborough on 12 March 2008 was organised by Dr Andy Scarlett on behalf of the Institution, working together with the Health and Safety Executive (HSE), the Department for Transport (DfT), the Agricultural Engineers Association (AEA), and the British Agricultural and Garden Machinery Association (BAGMA).

The Conference set out to answer the question, "*Have the rules and regulations kept pace with the practical requirements and significant changes in agricultural transport during the last 20 years?*" To help answer this question, accident trends, recent research related to agricultural transport and current and future legislation were described.

In short the answer to the question was a qualified "No". Although there are significant design and standards issues to be addressed (which will be forced by new EU legislation), many accidents are related to poor maintenance, which is already well-covered by legislation for both on and off road use. This is a pressing issue for operators now. The debate about introducing tractor 'testing' (a voluntarily industry-led scheme vs compulsory 'MoT') has been widely aired in the press, but the industry should not wait for new legislation.

Operators are already required to ensure that their vehicles are properly maintained, but they should also be specifying (and be prepared to pay for!) more effective braking systems for their trailers and trailed appliances. In this respect, I have to say that the question implied in the subtitle of the Conference - "*Which way forward?*" - was not fully answered, mainly due to the hiatus awaiting the new Directive and Type Approval arrangements, and development of standards. However, the papers and discussion did bring out some of the issues that need to be dealt with.

There is obviously a lot of concern out there as the conference was well attended, with around 120 delegates representing manufacturers, importers and suppliers of tractors, trailers and trailed equipment, farmers, contractors, Government departments / agencies, advisors and others, eg users of 'agricultural' equipment working on and off-road in other industries. It followed a Workshop convened last November by the Health and Safety Commission's Agricultural Industry Advisory Committee (AIAC) Transport Project Group, which involved a number of key stakeholder organisations.

This was the first time such a wide range of interests and businesses had been brought together and the presentations generated some lively debates between the various 'factions'. Andy had a busy day not only chairing the event and refereeing the 'Question Time', but he also made a major contribution by presenting a summary of the early findings of his current research into the design and efficiency of tractor-trailer braking systems. This is being co-sponsored by the HSE and DfT, together with tractor and trailer manufacturers (through the AEA).

Andy reminded us of the "old days", when someone driving their TE20 or whatever were (theoretically) able to reach back to operate the (usually seized) trailer handbrake, whilst careering out of control down a steep slope. I suspect this was probably not the first thing they thought of doing . . . Jumping off seemed a more popular option?

The 80s and 90s saw trailer capacity increase from 8-10t to 11-14t and the wider introduction of 4WD and increases in road speed to 40 kmh. With further increases in tractor mass in recent years to 6t, the reality is that gross train weights are now reaching 30t, ie 25% over the legal weight limit. But that is the least of our problems . . . Even if they do comply with current Construction and Use Regulations, there is a mismatch in braking between tractors and trailers. Combined with increased speed, trying to stop them on wholly inadequate brakes certainly focuses the mind!

Other speakers covered the legislation, reviewed farm vehicle related accidents on and off-road, research on the roadworthiness of agricultural vehicles and other issues, including vehicle maintenance, licensing and use requirements. These all have major implications for design specifications and maintenance regimes for new and existing equipment. Key points included:

FARM VEHICLE CONDITION STUDY

A survey carried out by BAGMA, funded by HSE and DfT.

This confirmed the poor standard of maintenance that we feared. Whilst a number of the faults found might be considered relatively minor, there are some that are basic and

critical to safety. Such as 12% having defective handbrakes. This is a common factor in fatal accidents.

The role that dealers can play in improving the level of maintenance (and compliance) of the existing fleet, through the voluntary Vehicle Health Check Scheme (VHCS) was emphasised. (available from BAGMA or as free download from *www.bagma.com*).

ANALYSES OF ROAD ACCIDENTS INVOLVING FARM VEHICLES

THE Transport Research Laboratory (TRL) described their detailed analysis of investigations of all road accidents which occurred between 2003-05. A long term review of police and media reports of accidents specifically involving farm vehicles has also been ongoing since 2000, looking into the causes of injury and non-injury accidents. This endorsed the findings of the BAGMA study.

TRL had calculated the relative 'Cost Prevention Value' for different types of vehicles and accident causes to help DfT establish their priorities for future attention and publicity. Although accidents involving agricultural vehicles are ranked much lower than those involving cars, HGVs and LCVs (light commercial vehicles) based on their gross cost to 'society', it is believed that cost effective measures are still possible which would reduce the number of people killed and injured in accidents involving farm vehicles.

Key issues highlighted included defective brakes causing skidding and jack-knifing (emphasising the value of ABS), poor visibility of vehicles (to other road users) and collisions - motor cycles hitting tractors and trailers turning right off highways, rear-end shunts by faster vehicles, eg on dual carriageways.

The case for tractor drivers wearing seat belts to prevent ejection during roll-over accidents was also clearly made. Basically, you are more likely to survive if you stay in the cab!

WORKPLACE TRANSPORT SAFETY

HSE provided a breakdown of accidents occurring off-road. 84 people have died in transport-related accidents in the past 6 years. This amounts to >33% of all fatalities on farms each year and agriculture contributes >25% of transport-related fatalities across all industries. For an industry with a small fraction [1.9%] of the UK workforce this shows the extent of the problem. Many hundreds more are seriously injured each year.

Quite a number of these are 'struck by' accidents and often involve the driver being killed by their own machine, eg due to a faulty handbrake as mentioned earlier.

VOSA roadside checks on farm vehicles result in a worryingly high proportion of tractors and trailers being pulled off the road for defective brakes and lights, worn tyres, etc, reflecting the findings of the BAGMA study. HSE's message is simple, "Safe on road, safe off road".

EU AGRICULTURE BRAKING STUDY

TRL had tested different tractors, trailers and braking combinations, including the use of ABS to improve stability. The findings were used to inform the development of the new EU legislation . . . It is now up to draft number 14!

Clearly as tractor speeds and loads increase, there is an increasing potential for accidents.

The problem is the mismatch between tractors and trailers, but the draft EU legislation focuses on braking efficiency, not gross vehicle or train weights. TRL have drawn the EU's attention to the increasing incompatibility between old trailers and new tractors, and advised that the new regulations should not make this worse.

Most modern tractors already comply with the likely new braking standards, but manufacturers point out that warranty claims for 'worn-out' brakes are increasing due to the excessively loaded and inadequately braked trailers they are hauling. Trailer braking efficiency needs to be increased, from the 25% currently required, to a minimum of 50%.

Speakers from brake manufacturers outlined the different systems that are now available and capable of meeting this. Further developments are in the pipeline - both hydraulic and pneumatic - to cope with the demands of increasing speeds and loads.

Although incompatibility is a problem, this will reduce as equipment is replaced and upgraded. However, the higher standards will only apply to new equipment when the EU regulations and Type Approval is introduced (around 2010). As trailers typically remain in use for 15-20 years, sub-standard equipment will still be used legally for many years after. Andy Scarlett's current research is intended to produce practical guidance on trailer braking systems to help operators bring their kit up to 'modern' specifications meanwhile, regardless of the impending legislation. This and other guidance being produced by DfT, HSE and the leading industry bodies working together will be used in a focused campaign to improve safety on the road and on farms.

THE Conference gave us much to think about.

We all need to encourage the industry - manufacturers and users - to take this issue seriously, now. From a self-preservation point of view, whenever I am getting impatient driving behind an overloaded trailer trundling up the road, I hear Andy's typically pragmatic observation, "Tractors are often in effect towing an 18t skateboard behind them". Perhaps it is safer to stay behind than overtake!

Thanks Andy.

A copy of the papers presented at the Conference are available on HSE's website at: *http://www.hse.gov.uk/aboutus/hsc/iacs/aiac/transport/conference0308/programme.htm*

The Directive

Directive 76/432/EEC covers braking performance of wheeled tractors up to 40kph. It is currently being reviewed in order to cover towed items and also for modern equipment's higher speeds. No conclusion has been reached and it may not be introduced until 2011-2012. The rules will apply to new equipment only.

Proposals & recommendations: Tractors

- Greater braking performance (50% braking efficiency* above 30kph travel speed).
- Automatic split brake coupling and wear adjustment, plus ABS for tractors faster than 40kph.
- Revised braking performance for tractors, trailers and trailed equipment. New tractors and trailers will generate the same braking effort.
- Prohibition of user-adjustable trailer brake (predominance) valves.
- One standard combined dual-line air brake connector.
- Industry-proposed dual-line hydraulic braking system, which is compatible with existing hydraulic-braked trailers.

Trailers & trailed equipment

- Substantially better braking performance (50% efficiency rather than the current 25% up to 32kph).
- No design / speed categories - everything with brakes must achieve 50% efficiency.
- Failsafe braking on accidental disconnection, using energy stored on trailer.
- Trailer serivce brake to be applied when tractor park brake applied.
- Brake reaction time to be 0.6sec from pedal / control activation.
- Trailed equipment heavier than 3.5t axle load will require same braking as trailer.
- Trailer / trailed appliance braking systems will require Type Approval before sale, to ensure design complies with new regs.

**Efficiency is the realtionship between total braking force and the static weight on the axle(s), so: Braking efficiency (%) = Total braking force ÷ weight on axle(s) x 100.*

Biosystems Engineering

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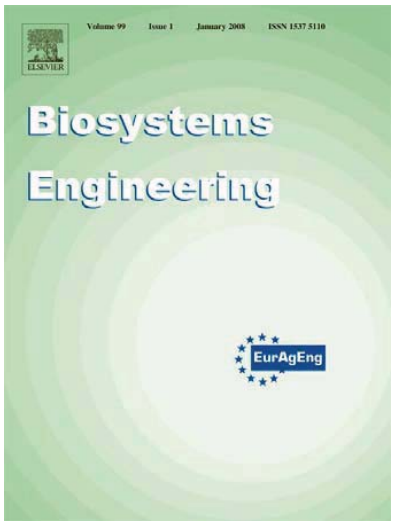

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The Managing Editor of ***Biosystems Engineering***, ***Dr Steve Parkin***, has kindly summarised some of the papers published in the last three issues which he thinks may be of interest to IAgrE members

Biosystems Engineering

Volume 99, Issue 2, February 2008, Pages 171-178

Research Paper: PA-Precision Agriculture

Mechanical within-row weed control for transplanted crops using computer vision

N.D. Tillett, T. Hague, A.C. Grundy, A.P. Dedousis

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Cranfield University, Cranfield, Bedfordshire MK43 OAL, UK

Environmental and commercial pressures are pushing vegetable and salad growers away from a reliance on herbicides. Inter-row cultivation provides a relatively efficient method of removing weeds between crop rows but hand labour is often required to remove weeds within rows. Machine vision guidance has been used to address the problem of mechanically removing weeds within rows. The experimental machine was based on a commercially available steerage hoe equipped with conventional inter-row cultivation blades and two novel shallow cultivation modules acting within the crop rows. Under commercial growing conditions weeds were reduced by 62-87%.

Volume 99, Issue 3, March 2008, Pages 338-347

Research Paper: PM-Power and Machinery

The effect of tyres and a rubber track at high axle loads on soil compaction-Part 2: Multi-axle machine studies

D. Ansorge, R.J. Godwin

Claas Selbstfahrende Erntemaschinen GmbH, Münsterstr. 33, 33428 Harsewinkel, Germany

School of Applied Sciences, NSRI, Agricultural Engineering Group, Cranfield University, Bedfordshire MK45 4DT, UK

The effect of the passage of multi-axle harvesting machines on the soil physical properties was studied. The effect of the rear tyre of a combine harvester on the amount of soil compaction subsequent to the passage of the front tyre/track was investigated. The work was conducted in controlled laboratory conditions to determine the effect of a simulated self-propelled combine harvester with a total machine weight of 30-33 t. The results showed that the benefit of the rubber track was maintained after the passage of the rear tyre. The track results for the 33 t machine were very similar to those of a smaller combine harvester with a total load of 11 t and similar rut width.

Volume 99, Issue 4, April 2008, Pages 496-507

Research Paper: PM-Power and Machinery

Centrifugal spreading of fertiliser: Deducing three-dimensional velocities from horizontal outlet angles using computer vision

S. Villette, E. Piron, F. Cointault and B. Chopinet

ENESAD, DSI-LGAP, BP 87999, 21079 Dijon Cedex, France

Cemagref, Les Palaquins, 03150 Montoldre, France

The quality of the deposit pattern produced by centrifugal spreaders is known to depend on many parameters, making its prediction using models based on fertiliser properties and disc settings difficult. An alternative approach consists of measuring the initial conditions of the ballistic flight of the fertiliser particles as they leave the disc. Measurement methods need to be developed to determine the outlet velocity vector of the particles in three dimensions. Using kinematic analysis of the mechanical system, this paper establishes that the three-dimensional velocity components of the particles are functions of the horizontal outlet angle, the disc configuration and the rotational speed.

Meeting the Global Food Challenge

At the start of her Nuffield Scholarship FWAG's CHLOE PALMER reports on the pre-study conference in Melbourne

IN one of the breaks, my question to Ben, a beef farmer from Western Australia, was simple enough:

"What acreage do you farm?" I asked.

"Ahh, about 1.3 million hectares, that'll be about 3 million acres," was Ben's reply.

I thought for a moment, trying to visualise how many counties in England this might extend to and remembered farms at home that I had once thought of as large. It wouldn't be too many years before my neighbours might find themselves competing on the world market with producers such as Ben, with little or no support payment.

Australia is still in the stranglehold of a terrifying drought. This dominated the conference proceedings for the whole week, and also drives decision making and strategy planning across the whole agricultural industry. Farmers are paying significant amounts of hard cash for their water, and irrigation is a fact of life for the majority. They are also considering alternative options that might provide income in a year when a severe drought could wipe out their harvest. Running an extensive sheep operation alongside combinable crops is one possibility. Risk management is very much the theme of the moment to ensure that businesses can survive years without rainfall.

Australians too are coming to terms with restrictions on waste, animal welfare and other environmental issues, albeit they are not as stringent as those that we in the UK have to endure. A proportion of beef and sheep producers are starting to seek to comply with more rigorous standards over and above regulation in order to secure accreditation that will give them the green light to export to the EU.

The Aussies and the Kiwis are very proud of their largely unsupported agricultural sector and took great pleasure in reminding us Poms and the Irish of our cushioned existence. They certainly believed that they had the moral high ground, and spent most of the week trying to convince us that they were far more business focused than any of their counterparts in the EU.

There is an element of truth in this argument, but I felt strongly that the UK and Irish farmers amongst our group were more than equal to their antipodean colleagues. Perhaps the Aussies and the Kiwis are more aware of their costs and their margins, and bench-marking is something that every business does as a matter of course.

They are very market-focused, but perhaps not so customer-focused as many UK and Irish farmers are now. They export most of their produce and therefore do not have the exposure to consumers as individuals with differing preferences and tastes. Without exception, every farm we visited was aiming its product at the commodity market.

The environment is climbing up the agricultural agenda, but largely because climate change has been brought into such stark relief for all farmers.

Murray River

Farmers discussing the soil following a tomato crop

Issues such as biodiversity, nutrient management and soil protection were alluded to, but are clearly not a top priority. Environmental grants are available in Australia, but they are highly targeted and are locally co-ordinated, either through Landcare or through State departments.

The Landcare concept, where farmer-led groups tackle local environmental issues such as salination, soil erosion and diffuse pollution, has its roots in Australia.

Several of the farmers that we visited had been instrumental in setting up Landcare groups and were keen to extol the virtues of the approach, but the conference programme leaders were not keen to provide time for this theme alongside the more mainstream discussions. I felt that this was a huge opportunity lost, as I think that the Landcare approach has so much to offer to the UK, as a genuinely farmer-led model of landscape-scale environmental management.

The Nuffield Australia conference was a fascinating and stimulating ten days. At the beginning of the conference we were posed the question: 'Has agriculture the capacity to meet societies' demand for food over the next 10 - 20 years?' On the final day we debated this at length, and on balance, we agreed that it does.

In order to do this, however, the industry would need to embrace new technologies but it would also have to work with countries in the third world to ensure that they could begin to feed themselves. Consumers would also have to review their eating habits, and food waste would have to be drastically reduced.

One of our group gave us the 'take home message' that can be applied to farmers across the world - 'be part of the solution and not the problem'.

I hope that at FWAG, we can help you in this objective, as the environmental and economic challenges become more demanding as we move into the next decade.

Chloe Palmer is FWAG's Regional Director, Northern & West Midlands region.

An Oxford graduate, she has recently been awarded a Nuffield Scholarship, sponsored by the Yorkshire Agricultural Society, to study sustainable solutions for the hill farming sector.

Chill out

Basic refrigeration is commonly used in a wide variety of situations including in-tractor air conditioning, milk cooling, fruit and vegetable storage and of course in domestic fridges / freezers. The mechanical system used in each is very similar, although the controls may differ quite widely.

RICHARD LANGLEY of Harper Adams University College reviews the concepts of heat in the refrigeration system together with a discussion on how a system actually functions and the types of refigerants commonly used and how these are changing.

THERMODYNAMICS

THERE are two laws of thermodynamics that must be mentioned at this stage, because they are directly relevant to refrigeration. The *first law* of thermodynamics states that energy cannot be created or destroyed, only transformed from one kind to another.

The *second law* of thermodynamics states that heat passes from a hotter body to a cooler one.

CONCEPTS OF HEAT TRANSFER

- *Conduction* - this is the transport of heat either through a solid body e.g steel, or through layers of fluid without any movement of hot material in the direction of heat flow. In other words, this is direct contact with a hot substance against a cooler one or within the substance itself.

- *Convection* - this is where heat is transferred through a fluid by the motion of the fluid. Natural convection can be initiated by density differences between hot and cold parts of the fluid. For example, hot air expands and becomes less dense and rises, taking heat with it. This is replaced by denser cooler air from below.

- *Radiation* - this is the transport of energy between two bodies (that are not in physical contact), without the assistance of an intermediate heat carrier. An example here might be the Sun beaming down and heating the Earth.

Regarding the second law of thermodynamics, heat travels from a hot body to a cold body and there must be a temperature difference to enable the heat to flow. This heat may be transferred from the hot to cold fluid by the three processes mentioned above.

EFFECT OF PRESSURE ON BOILING POINT

AN increase in pressure on any liquid causes a corresponding rise of its boiling point. An example would be in the pressurised cooling system of a tractor, the pressure is *greater* than atmospheric so that the water temperature may go *above* 100^{o}C without boiling. The same is true if the pressure decreases e.g if you are up a mountain, the boiling point of water is *less* than 100^{o}C.

The effect of pressure on freezing point is only slight and for all practical purposes can be disregarded. By the same token, a vapour (or gas) may be liquefied at a temperature above its atmospheric boiling point if it is cooled whilst under pressure.

LATENT HEAT

THIS is defined as a change in a state of a body without a change in its temperature. There are two phases of this, namely, latent heat of vaporisation and latent heat of fusion.

- *Latent heat of vaporisation* - is the heat energy necessary to change a liquid to a gas without a change in temperature. Conversely, it is the amount of heat extracted from a gas upon liquefaction with a change in temperature.

- *Latent heat of fusion* - is the heat necessary to change a solid to a liquid, without a change in temperature. This is the same as the amount of heat extracted from a liquid upon its solidification without a change in temperature.

REFRIGERATION CYCLE

THE purpose of the system is to remove heat from an area or product e.g from the milk or vegetables that are being cooled. The heat is normally rejected to the air or water; this 'waste' heat may be recovered and used to minimise overall energy costs. This is of course very important in today's climate and could be a discussion in further papers.

Remember, heat passes *from* a warmer substance to a cooler one. A refrigeration system enables heat to flow against this natural gradient, but requires an input of energy. The amount of energy required and the efficiency with which it is used depends on the difference between the temperature of the cooled substance and that of the cooling air / water. Typically in a refrigeration system, the useful output is greater than the energy input (largely because it is being used to move heat).

COEFFICIENT OF PERFORMANCE (COP)

The efficiency of a system is

defined as the ratio of heat extracted to the power input, i.e:

$$COP = \frac{\text{Refigeration capacity (watts)}}{\text{Power input (watts)}}$$

$$COP = \frac{Q(out)}{Q(in)} = \frac{Qo + W}{W} = 1 + \frac{Qo}{W}$$

Where Q = energy; and Qo = heat energy into evaporator; and W = energy input to the compressor.

Under normal applications, the COP can be 2.5-3.5 and in favourable conditions a COP of 4 may be possible. A COP of 3 implies that for each kilowatt of energy supplied to the compressor drive motor, 3kW of heat are made available at the output. E.g a COP of 3.5: evaporating at 0°C, condensing at +30°C. A COP of 2.5: evaporating at -20°C, condensing at +40°C.[1]

BASIC REFRIGERATION SYSTEM

(see the basic diagram below)

- *Stage A* - liquid refrigerant is allowed to evaporate (change from a liquid to a gas). The latent heat required for evaporation is extracted from the surroundings of the evaporator. i.e. this is where the fridge acts as a cooler.

- *Stage B* - the pressure of the refrigerant gas is increased by the compressor. This raises the temperature of the refrigerant, and needs energy.

- *Stage C* - the refrigerant gas condenses to a liquid when it cools below its boiling point. Latent heat is released at the condenser, which acts as a heater. i.e. heat is given off here to the air.

- *Stage D* - liquid refrigerant is passed through an expansion valve and the pressure drops. The refrigerant then evaporates, and the cycle repeats.

COMPONENTS

Two components are worthy of a mention at this stage: the *drier* and the *sight glass*.

- *Drier* - this is commonly silica gel. Moisture is undesirable in the system as it eventually forms as a bead of ice in the expansion valve and obstructs the refrigerant flow.

- *Sight glass* - this is present so that observations can be made of the refrigerant flow. A shortage of refrigerant is indicated by a stream of bubbles.

REDUCING EXTERNAL HEAT GAINS

- It is important to minimise heat gains through the insulation of cold rooms, pipework etc so that energy usage is also minimised.

- Heat load caused by air changes through doors etc is a significant part of the total heat load. Therefore it is important to minimised these.

- The main heat load comprises the heat load of the product being cooled; heat gain through air changes; heat flow into the room via walls, ceiling and floor; heat input by lighting, motors, personnel. It is important to minimise these 'unwanted' sources wherever possible.

- The refrigerant in suction lines is almost always below ambient temperature, and therefore heat (from outside) will flow into the gas. Ideally insulate pipework. This effect is more significant on low temperature applications as the temperature of the refrigerant leaving the evaporator is lower.

- The greater the distance between the evaporator and compressor, the more opportunity there is for heat gain. This is commonly seen on some milk cooling set-ups, or within some vegetable cooling systems. The aim should be to minimise the distances when designing the system.

- The sensing phial of the thermostatic expansion valve and adjacent pipework should be insulated to enure the phial senses the pipe temperature and *not* space temperature. This expansion valve is the major flow regulation device and hence it needs to operate correctly.

- Liquid lines may also need to be insulated in order to increase efficiency.

REFRIGERANTS IN USE

R12 - this was the first widely used artificial refrigerant, yet because of the effects of the ozone layer and the negative influence of greenhouse gases, it is no longer allowed. Production of this refrigerant has stopped.

R22 - this is presently the most widely used artificial refrigerant. The disadvantage is that it still has some effect on the ozone layer (only 5% of R12 though). R22 is no longer allowed for new installations in Europe, and it can only be used to repair an installed cooling machine.

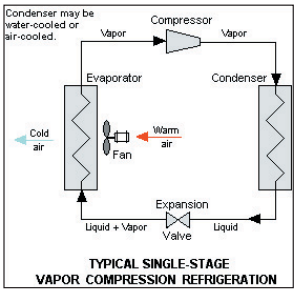
R134a - this is the replacement for R12, with no ozone interference and only a slight greenhouse effect. The disadvantages are that it requires special oil and is rather difficult to change an existing R12 installation to R134a.

R404a - this is the replacement for R22, with no ozone and only a slight greenhouse effect. The disadvantages are that it requires special oil and that it is rather difficult to change an existing R22 installation to R404a.

R407c - this is a replacement for R22, with no ozone and only a slight greenhouse effect. The disadvantages are that it requires special oil and again it is difficult to change an existing R22 installation to R407c.

R507 - Again a replacement for R22, with no ozone and only a slight greenhouse effect. Its disadvantages are, once more, that it requires special oil and it is rather difficult to change an existing R22 installation to R507.[2]

The diagram below shows the basic layout of the refrigeration cycle [3]



References

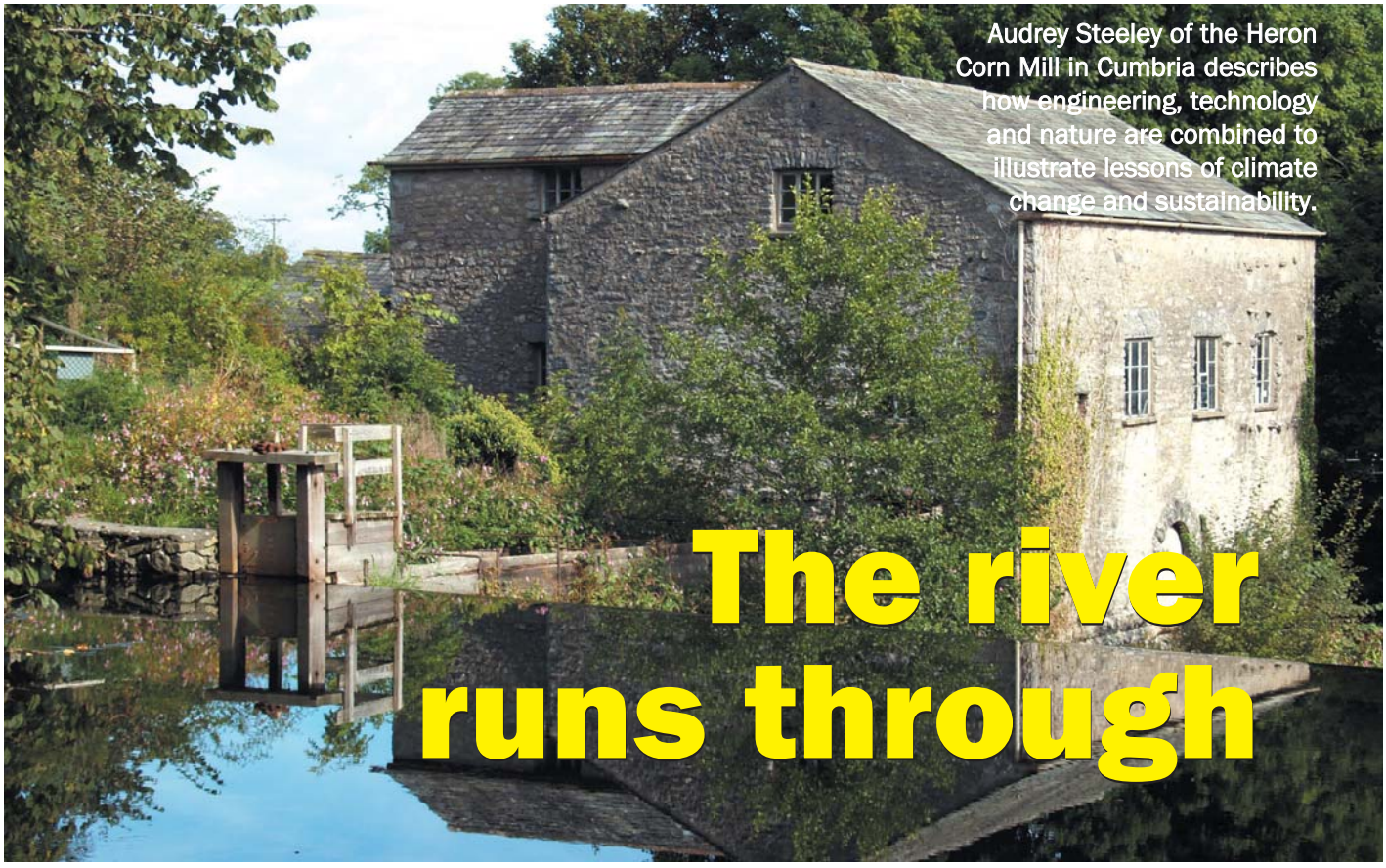
1. Farm Electric Centre. 1987. Heat Pumps and Heat Recovery Techniques in Agriculture and Horticulture

2. http:www.deval.com/dairy_knowledge/efficientcooling/demands_on_cooling_

3. http://en.wikipedia.org/wiki/Image:Refrigeration.png

The river runs through

Audrey Steeley of the Heron Corn Mill in Cumbria describes how engineering, technology and nature are combined to illustrate lessons of climate change and sustainability.



HERON Corn Mill - Beetham Trust is a registered charity (503387) formed in 1974 and located in rural South Cumbria on the edge of the Lancashire border within the Arnside/Silverdale AONB.

The Heron Corn Mill site is owned by Billerud Beetham LTD, a long established paper-making industry based on the opposite bank of the River Bela.

The site comprises of a Grade II listed working 18th century watermill, open to the public as a visitor attraction know as Heron Corn Mill.

The trust is to undertake the installation of a renewable energy hydro-power turbine in the weir at Heron Corn Mill. A full feasibility study was undertaken with the result that taking into consideration the head and flow statistics across the weir, a 100Kw Axial Flow Kaplan turbine would be the most efficient and productive choice for this particular site. The scheme also has huge benefits from being environmentally benign and has a carbon emission saving of more than 200 tonnes per annum, equivalent to the carbon footprint of all the houses in Beetham Parish.

The trust's scheme will also produce enough surplus electricity to provide the paper-mill opposite with green energy, significantly reducing their fuel consumption and affording them the opportunity to become a green-powered industry. The surplus energy sold will bring the trust an annual income in excess of £30,000 (at current electricity prices), through the lifespan of the hydro installation lasting 60 years.

Over recent years we have been in discussion with various organisations, educational establishments and stakeholders including Lancaster University, British Hydro Association and SETPOINT Cumbria (part of the national Science, Engineering, Technology and Mathematics Network, linking schools and pupils).

With the input from these stakeholders we are creating a vision for the future of the Heron Corn Mill site leading to the development of future educational projects and interpretation, furthering the realisation of eco-conscious strategies.

THIS vision redefines the importance of our primary resource - the river, and how this has been the reason why water powered industry has been the mainstay of our location for centuries. In effect, we are diverting the course of this historic river resource from commercial industry to contemporary creative industry.

Consultation with and input from SETPOINT Cumbria has led to the formation of an education programme designed for primary, and in particular, secondary schools at a variety of key stage levels.

We are establishing partnerships with many schools locally and regionally, including special educational needs schools. An outreach programme of education in 2008 deals with awareness of climate change and uses of green energy.

Our programme of creative interpretation permits the viewer to relate to the technology on the poetic and ideological levels that are embedded within its engineered form.

An already established residency with Manchester based artist Nick Crowe, engages with themes of renewable energy and the real-world effects of electricity generation.

The work demonstrates the use of old technologies combined with modern materials, to address a contemporary global problem at a local and comprehensible level. In the long term, ideas for creative projects will extend into artists' engagement with other forms of renewable energy that link back to agricultural industry - for example crop growing for bio-fuel.

Festivals and seminars are planned to create discussion and debate around the issues of climate change, renewable energy, carbon reduction and sustainable communities. In setting these platforms for debate we are demonstrating a model of good practice for other communities.

Local community groups are encouraged to use the re-developed barn as a base for their specific activities, interests and meetings. Environmental and botanical groups are particularly interested in using the space due to the abundance of natural resources on site, such as wildflowers, lichens and insects. The costs to both the user and the trust for the provision of such facilities will be greatly reduced due to the electricity and income the turbine will generate.

There has been an immense amount of support for the scheme from all sectors of the local community and local government.

Global warming & biofuel production

IAgrE member, JOHN MACCORMACK, takes issue with Bill Butterworth's article in the Spring edition of *Landwards*. Here we give him his right to reply

I WOULD like to comment on the article on biofuels: *The most warming time ahead for agricultural engineers* by Bill Butterworth (pages 14-15 of *Landwards* volume 63, number 1, dated Spring 2008).

This presents the case that agricultural engineers are uniquely qualified to enable agriculture to meet the dual challenges of global warming caused by carbon emissions and diminishing reserves of fossil fuels. The article contains several elementary mistakes which unfortunately reduce the credibility of the case that is being made.

1 Twelve tonnes of carbon (atomic weight 12) plus 32 tonnes of oxygen (atomic weight 16) would produce 44 tonnes of carbon dioxide (two atoms of oxygen for each carbon atom) - not 28 tonnes as stated by the author (page 14, column 3).

2 The 30 million tonnes of carbon in wastes that could go to land therefore equates with 110 million tonnes of carbon dioxide, not 70 million tonnes.

3 There is a similar error in calculating the relative masses associated with the equation for oxidation of a large hydrocarbon molecule component of petrol. This should be:

$$C_{36}H_{74}+54.5\ O_2 \longrightarrow 36\ CO_2+37\ H_2O$$

Or in terms of tonnes:

$$506 + 1744 \longrightarrow 1584 + 666$$

4 For 1 tonne of oilseed rape to yield 880 kg biofuel seems to be an unbelievably high figure (see (i) at the top of column 1 on page 15). Paragraph (ii) immediately following has 3 tonnes of oilseed rape yielding 1000 kg of biofuel, about 330 kg/tonne - suggesting that '880' was an unfortunate typographical error.

5 Paragraph (iii) on page 15 continues the case, based on the erroneous figures identified in my point 1 above.

6 Paragraph (iv) implies that when the oilseed rape crop is fertilised by composted wastes rather than manufactured nitrogenous fertiliser, there is potentially a cumulative, year-on-year net increase in the carbon locked up within the soil of 40 t/ha annually. Even under minimal cultivation conditions in temperate climates, this seems very over-optimistic

BUTTERWORTH is trying to build a case for agricultural engineers to use their expertise to enable agriculture to solve a global problem, and he admits to using over-simplified figures. His throw-away line that the argument omits re-emission (first paragraph under '*Reversing global warming*') dismisses, I suspect, a very important factor, not a minor detail.

It took millions of years to build up the carbon locked in the oil, coal and peat reserves that we have squandered in the last two centuries. Most if not all of the carbon that plants or organic fertilisers can put into the soil each year is lost by oxidation (becoming re-emission). So, in agricultural land, soil carbon does not go on increasing indefinitely but rapidly approaches a plateau whose level depends on the management regime.

If as agricultural engineers we are to play a key role in meeting the challenge, we must first take care to get the basic science right, and must do our sums properly.

YOUR RIGHT TO REPLY

If you wish to respond to an article printed in LANDWARDS in order to question or to continue the debate, please write to:
The Editor, Landwards, 25A New Street, Salisbury, Wilts, SP1 2PH
or email *chris@nelsonpublishing.co.uk*
We value members' input

Floodline

GEOFFREY WAKEHAM suggests that as agricultural engineers we should be promoting the adoption of rural land management practices that aid the retention of water within rural land as well as delaying the passage of flood waters down stream

THE following was prompted by contact with a member of the IAgrE and particularly a copy of a letter to him from a government functionary.

This letter was in response to his suggestion that agricultural engineers could provide expertise in reducing flood risk as suffered in the summer of 2007. The letter said "thank you" and that "The contents of your letter have been *carefully noted*" (my italics) As far as I know he has received no other response from the various governmental agencies interested in protecting the UK from flooding.

In older houses flooding was an infrequent problem. Towns and villages were built above areas likely to flood. Flood plains were managed to reduce the short term river flows from heavy rains.

The increase in heavy storms has coincided with increased building on flood plains. These houses and other new developments are often built at very high densities and the roofs, patios and driveways drain straight into the 'town' drains.

The water flowing into the drains from the earlier housing development from a 50mm down pour would be in the order of 80 cubic meters per hectare. A modern layout could produce some 650 cubic meters.

Gary Marshall Chairman of Airmic's environment group says even if present drains are well maintained increasing urbanisation is causing their design capacity to be exceeded and this will impact on both new and older properties. The Association of British Insurers is blaming poor maintenance of watercourses and drains for the devastation caused by the 2007 summer floods. They say revamping of Britain's drainage systems should be the top priority. It is clear that action is demanded.

Sir Michael Pitt, in his report on the 2007 floods, says that flood defences should be given the same priority as terrorism and flu pandemics.

It is clear that deflecting high flow rates away from urban danger spots is important. Upgraded drainage systems and the installation of buffer storage within all new developments and currently vulnerable urban areas is a priority

Reduction of high runoff from rural land could reduce the flooding from many rivers and streams. Few farmers can not be aware of the need to reduce compaction if only to improve crop yields. They have however allowed water meadow management to be abandoned. Ditches, dykes and sluices have been neglected or removed all together. Farm machinery has become larger and demands larger fields.

As agricultural engineers we should be promoting the adoption of rural land management practices that aid the retention of water within rural land as well as delaying the passage of flood waters down stream.

It was suggested to Professor Dick Godwin by a drainage board in the South West that a 5% reduction in peak flow rates could be all that was required. His estimates based upon United States Department of Agriculture methods showed that relatively simple improvements to soil / land management could achieve this.

Plant trees?

IN practice the countryside has significantly more tree cover than 200 years ago and in their submission to the Scottish Parliament the Forestry Commission seemed to be rather equivocal regarding the benefits of planting trees as a way to control down stream flooding. Rapid growing conifers are a better option than native broadleaves which is at variance with the ascetic demands of many.

There are benefits of the generally higher infiltration rates of woodlands over compacted grasslands and they advocate using woodland buffers along lower field edges and close to streams and rivers. The overall scale of forestation does not seem to be important but the way it is managed can have local benefits at the field and hill slope scale.

Flood plain woodlands could offer a way to reduce the impact of extreme flooding events but this has to be tested in practice.

Change farming practices?

MUCH of the water entering water courses after a heavy down pour will have come from land drains or as surface run off. Finding ways to reduce

. . . this requires a major shift in the layout of the countryside and a total rethink in machinery design.

this short term excess flow into streams and rivers could significantly reduce the incidence of down steam flooding.

The present lay out of fields has evolved over hundreds of years and boundaries are often related to old hedge lines. Where these cross slopes they have acted as barriers to water borne erosion. Elsewhere they offer no barrier to run off.

There is a need to realign and reshape fields and their boundaries to conform to contour lines. The use of adjustable width implements pre-programmed to the field dimensions would accommodate small changes in field width. Larger areas with rapid change of slope could be used for amenity / wildlife havens.

Though compaction has been recognised as a cause of poor rain water infiltration we continue to use heavy field machines. Those trying to develop light weight systems or 'reduced passage' machines try in vain to attract worthwhile research money or even interest from UK funding bodies or research organisations.

Down stream land could be managed in such a way as to act as short term storm water storage by installing sluices and dykes. This was common in the past. In some cases land may be better taken out of agriculture and turned over to amenity areas and wildlife reserves able to accommodate frequent short term flooding.

This requires a major shift in the layout of the country side and a total rethink in machinery design. That may be chasing an impractical dream but the Anglo Saxons managed it.

Low cost headwater dams and reservoirs?

TO control the out flow from the upper reaches of rivers it has been proposed by John Gander MIAgrE and others that a series of flood-control buffer dams should be built on tributaries leading to all major rivers prone to flooding. This is common practice overseas.

There is a need to locate all vulnerable upland areas and put in place the necessary structures and subsequent management of each catchment area.

Worcester CCC suffered from severe flooding in Summer 2007

A total strategy

IF the problem is as great as depicted then piecemeal advice and local defensive works is not the solution. There is a need to locate all potential flood zones of social, strategic or financial importance.

The causes of flooding needs to be identified and then ways devised of reducing the short term high intensity water flows. This requires the expertise of among others members of the IAgrE. Only as a last resort should expensive civil engineering defences be built.

Is the Institution pooling its expertise and promoting its members interests with those agencies that only seem to recognise the Civil Engineering option?

Landwards e-Xtra

IN this new section of Landwards, some technical papers will be summarised and be fully available on-line from the e-Xtra section of the IAgrE web site.
www.iagre.org/landwardsextra.shtml

Cultivation trials in cereal field conditions update

by Brian Keeble, CEng. CEnv. MIAgrE
Writtle College

IN Landwards Summer 2007, Brian Keeble provided the initial findings of cultivation trials. This has now been updated together with additional results for crop growth, yield and profitability, weed problems, carbon dioxide production, soil health and soil organic content discussed.

The first article concentrated on the effects of cultivation on rain water run-off. Run-off from tramlines at 82% to 98% was discussed and found to be an acceptable problem providing that the main field area had minimal run-off.

The tillage trial was outlined and methods of measuring run-off were discussed, with the results to 2006 described. Three plots were set up between four tramlines in an otherwise normally farmed field. Plot one was not cultivated for the four years, plot two was minimally cultivated and plot three was traditionally cultivated with a plough based system. Problems met with were mentioned; not least the lack of a suitable direct drill and the poor use of the extra timeliness of the former two cultivation methods, as the same sowing date for the plots was used each year.

In the original article, run-off over the growing seasons of 2003 to 2006 was discussed, and the tables in the article are updated to 2007.

Amongst a number of conclusions, Brian Keeble says that it is widely considered that it takes five years to achieve maximum benefit from no-till farming, during which time in-soil flora and fauna build-up in number and variety to take over from the plough, although this was not fully proven during this four-year trial.

Barley, April 2005

Wheat February 2006

Geoff Freedman, chairman of the IAgrE Forestry Engineering Group with an overview on the group's work during the past year

Growing internationally

IT has been an important year internationally with the 3rd International Forestry Engineering Conference at Mt Tremblant near Montreal.

We had a Spring outing in 2007 to Napier University, a very successful annual conference entitled '*A Bright Future for UK Forestry - Progress Through Innovation*' at Newton Rigg and, although a proposed Master Class in Forestry Engineering (FE) in the South was cancelled, we held a fairly well attended, similar event, in Oatridge College near Edinburgh. This Master Class idea is leading to one of the most important contributions this group will make - a 'Wiki' (Wikipedia) of Forestry Engineering. Finally, discussion throughout the year has helped define FE in the UK and so create a model for other countries with small, but important, forestry industries.

The year began with the transfer of Chairmanship from David Killer to Geoff Freedman. David completed a seven-year spell in office and we are pleased to announce - in confidence - that he will receive a Meritorious Award for his services to FEG at the annual conference of IAgrE in May 2008. This single year of Chairmanship still seems a good idea to end an eighteen-year spell, with only three Chairmen. The motive is to spread influence and ensure life after the founders gradually fade away. Already the proposed Chairmen for the coming years are planning their particular contributions. There has been a large Civil Engineering influence over recent times but I can see a few years of machinery domination on the horizon. This fits with the international professional focus, where more work with less manpower is seen as the key to reducing costs to meet the challenge of cheaper wood from developing countries and alternative materials.

The International Conference at the beginning of October 2007 in Mt Tremblant was an extremely well organised and high profile event. It was very much the same size as our Edinburgh one but presented fewer papers and more posters. Unfortunately, I was the only delegate from the UK. The excursion was a full day from 6.00am until midnight. I gave a keynote address on Green Energy, which was well received. The papers and keynote addresses are all available on the internet.

We were suitably complimented for starting this international movement which has grown to, arguably, greater prominence than IUFRO or COFE. The format and content which we agreed upon in 1997, before our international conference, was the basis of our formation in this very venue, The Black Bull - Moffat, in 1989 for FEG. It was to be a forum for practitioners and applied researchers, as opposed to academic researchers. This has served us well and I fear the international group is being poached by IUFRO and COFE whose focuses are academic and practitioners in North America respectively. They were both sponsors of the 2007 international event and leading personnel in Mont Tremblant were leading lights in those organisation - so there was a distinct feeling of the applied approach being watered down.

. . . we are planning a 'Wiki' entry for Forestry Engineering

The next event will be in Brazil. I am delighted that we started something which has gained so much momentum and I think it will be worth one letter to the Chairman in Brazil to remind him of the original focus.

Last year's Spring event was in the timber research laboratory of Napier University with Professor Abdy Kermani as our host. There was a demonstration of a load test - to failure - of a nail laminated arch bridge module.

This underlined the breadth of the FE subject in the UK and I think in smaller forestry economies throughout the world. In Scandinavia, Canada and the USA, the industry is so big that peripheral activities like sawmilling and timber engineering are separate professional activities because they are so big on their own.

In the UK it is a small enough industry for all of these to be kept under one umbrella, which creates inter-professional understanding and ultimately leads to efficiencies within the FE profession. A debate during the year amongst all of these factions resulted in agreement for UK FE to be inclusive. It was important to clear

this up before the Wiki was planned.

A few years ago the Chief Executive of IAgrE, Chris Whetnall, encouraged me to do a Master Class on FE in the UK. I had always wanted to be forced to write the definitive text because I knew the UK was different and there would be some credit for the Institution. I soon realised that it was a bigger task than I first thought, in order to do the subject justice. I called upon the assistance of David Killer and Jim Christie.

The three of us put together a text for an evening event at Oatridge College in October 2007 and realised that we still had not covered the subject in enough detail to be of use, other than give an overview. That, and because the event in the South had been cancelled due to lack of support, we concluded that what was needed was an electronic Master Class fully covering FE in the UK. We have had a meeting to formulate the index and our model will be to create the all-embracing index and invite authors to fill in a paragraph here and a paragraph there and form a sort of WIKI , but with editorial guidance from Geoff, Jim and David - who will be major contributors. Many of out past conference papers will form part of the content and there will be some requests for authors to re-jig their papers to more relevance to the index.

Last year's main event, the annual conference, was held in October for the second year running. Although it was forced to this date because of circumstances in 2006 it was decided to keep it at that time because the attendance was eighty delegates and a straw poll suggested it was a more suitable time of year for prospective delegates.

The attendance of the 2007 event confirmed this and it is proposed to keep it in October for the foreseeable future.

The event took place at a time of change in the forest industry with rising timber prices and many innovations coming on stream. We therefore took the opportunity to look back and look forward and were very fortunate to have Sandy Brownlee and John Kissock to give papers on these subjects. It really was a reflection of the strength, integrity and standing of FEG to be graced by two of the most respected figures in the industry.

The Committee remains a strong representation of the breadth of the industry. We have always tried to keep a representative of each sector so that the Committee itself has relevant, up to date, information on all that happens in the industry.

We are pleased to have some experts in peripheral fields who may not be regular attendees at meetings because their sector is 'quiet' but their electronic contributions are valued and they will be there if we need them.

We are fortunate to be joined this year by Simon Armstrong from CONFOR and John Turbull from MES to maintain our full coverage of the industry. I would like to thank the entire Committee for their continuing efforts.

I feel it has been a successful year for our Professional body and we look forward to being part of a buoyant industry where timber will rise in value. Certainly there have been innovations by Forest Engineers to add value to timber products on a national and international scale, which reflects well on FEG, UK. I hope our next Chairman expands our influence to Ireland, whose Forest Engineers have always supported us well at conferences and produced some excellent papers in Forest Engineering.

We need a fundamental change of culture, less red tape and a clear policy on biofuel production NFU tells world leaders

The cost of ignoring agriculture

NFU Vice President Paul Temple called for a 'fundamental change of culture that properly values the productive dimension of agriculture' when he addressed world leaders at the Food and Agriculture Organisation of the United Nations summit on the global food crisis and climate change in Rome on 4 June.

He said, "We have ignored agriculture for years and now we are being forced to face the issue due to disrupted supply caused by droughts and floods world wide."

"With agriculture coming back onto the agenda in many countries it is time to highlight the issues central to all farmers".

"There needs to be a clear acknowledgement of the value of stepping up production and this needs to be backed by some serious investment in research and development – accompanied by a genuine attack on red tape, which is holding us back."

"We need to increase our fuel security. Europe, along with some of the most vulnerable countries in the world, is heavily reliant on fossil fuel imports. Finding alternatives to these through the utilisation of biomass will be of great importance."

"Countries in Asia and South America are already seeing their economies start to prosper as a result of biofuels and the alternatives market."

"These emerging markets for farmers, together with higher commodity prices, will allow previously unprofitable land to be bought back into production."

"This will increase the income of those rural poor who were previously unable to make a living off the land because they were forced to compete with subsidised EU and US crops previously being dumped on the market".

"Climate change is presenting us with new challenges and offers agriculture an important opportunity, both at home and abroad, with the push towards renewable replacements to fossil fuels."

"This move for alternative energy sources has not been without controversy but I would like to remind everyone that farmers have always produced crops for food, animal feed and energy."

"The modest targets set means we can meet these goals within our current agricultural capability."

"Biofuel production currently takes only one per cent of agricultural land so when it comes to talking about the global food crisis we need to put the spotlight on other supply factors such as the weather impacting on production and the fact that historic low prices have resulted in lower investment in agriculture and land being taken out of production."

BIOFUEL EXPO

• The 3rd European Biofuels Expo & Conference will be held at the Newark Showground, Nottinghamshire on 15th & 16th October 2008.

The organisers are collaborating with the National Energy Foundation (NEF), The Oil Firing Technical Association (OFTEC) and the Renewable Energy Association (REA) to incorporate other bioenergy solutions.

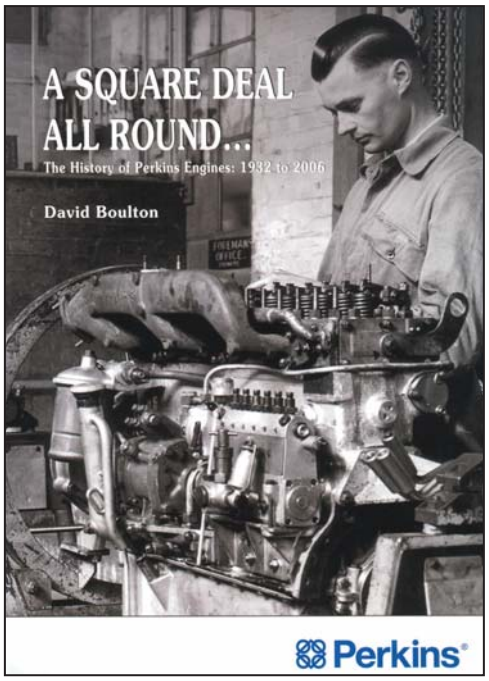
The 2008 event will showcase:

- Biodiesel
- Wood pellets
- Wood burning technologies
- Home Heating Oil
- Biogas - Anaerobic digestion
- New technologies

Exhibitors offer a range of products and services for the benefit of both small and large scale production volumes, everything from homebrew biodiesel through to large scale bio-gas installations are catered for.

For more information on the conference, exhibitors, workshops, New Bioenergy Technology Showcase or attending the event please visit:

www.biofuels-expo.co.uk



Against the odds

WITH 17 million engines sold in the last 75 years, Perkins has been one of Britain's outstanding engineering companies, but this is also a story of survival - against all probability in the early years and in the face of considerable adversity later.

Frank Perkins and Charles Chapman may have started with a clear vision, but even they would not have anticipated the level of success the company enjoyed after the troubled early years.

Produced for Perkins by Landmark Publishing, this book deals thoroughly with the company's engineering, finance and structure. Because the engines have had a wide range of applications, his story includes agricultural, trucking, marine and military applications, among others. A useful appendix gives engine specifications.

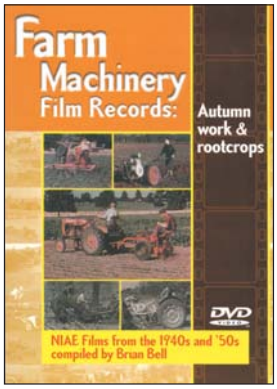
David Boulton's account runs from the visionary founding in 1932, through the M-F years to the early period with Caterpillar. In separate chapters he covers the Brazilian, American and licensee operations.

This is a fascinating and beautifully produced book with many pictures and illustrations from across the years

David Boulton joined Perkins as a student apprentice in 1957. He enjoyed a wide range of experience with the company at home and overseas as a development engineer and in quality control. David Boulton was one of the founders of the Perkins heritage club; he retired from the company in 2002.

ISBN: 13:978-1-84306-349-0
Published by Landmark Publishing
£25:00

DVD: Trials and errors in farm machinery



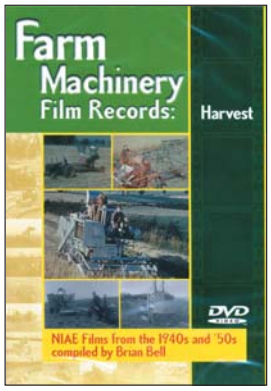
THIS footage from the 1940s and 1950s shows a wide range of farm machinery developed at the time when Britain was going all out to expand agricultural production.

Some of the films record machinery working in the field, others show experimental farm machines designed by the NIAE at Askham Bryan in Yorkshire and from 1948 at Silsoe. Some of the machines went successfully into production; others are rarities whose development was curtailed.

The NIAE's film record was professionally made. The prints from which this compilation has been drawn are in the collection of the British Agricultural Archive Film Unit and are reproduced by courtesy of Richard Watts.

Brian Bell, author of 24 books and DVDs on farm machinery, has researched the footage to provide an informative commentary narrated by Chris Opperman. The original material is silent, some in black and white, though later films are in colour.

DVD Approx 65 minutes each
£15.95
Old Pond Publishing, Ipswich
01473 238200



Launch of sprayer operator magazine

NEWLY launched by Andy Newbold of Fusion Events (and recently elected IAgrE vice-president) in association with agricultural journalist Mick Roberts, *Pro Operator* is the only specialist publication for all registered spray operators in the UK.

***Pro Operator* is the unique technical magazine, which promotes best practice in their field and is circulated to all 20,000 registered NRoSO members.**

Included in the launch issue are features on nozzle selection, advice on sprayer cleaning, how to build an on-farm Biobed as well as a preview of Cereals and profile of an NRoSO member.

Readers are key influencers – farmers, contractors, managers and crop protection application specialists. *Pro Operator* is the only magazine that is precisely targeted to reach this important audience and is published every four months in May, September and January.

Pro Publications Limited, Killington, Lancs LA6 2HA
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www.pro-operator.co.uk

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www.iagre.org

Issue 64 Number 2 Summer 2008
MEMBERSHIP MATTERS

BRANCH REPORTS

NORTHERN IRELAND

The AGM featured a talk by IAgrE incoming President, Richard Robinson on his career and the work of his company Autoguide. entitled 'From tractor hitches to Legoland'.

It was also the occasion for Mr Robinson to present 2008 Branch Meritorious Awards to Northern Ireland Branch members Peter Frost and Terence Chambers.

The awards recognise activities by members to enhance the standing of the Institution within the Branch area. Both individuals are well known locally and have been active members for many years.

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EAST MIDLANDS

Envirobarns:

The East Midlands Branch visited the Envirobarns project in June

In a year where fuel prices are busting the bank accounts of businesses and families alike, what better time to start thinking of alternative energy sources?

Former engineer, Malcolm Paterson has pipped many to the post with a unique project in the heart of the Lincolnshire Fens.

For the last seven months, Paterson and a dedicated team of workers, have been converting a cluster of derelict barns into four fascinating holiday cottages where visitors will experience a taste of future living.

Each cottage has been individually and aptly christened - Earth, Nature, Energy and Temperate.

Exceeding current building standards, the cottages incorporate GSHP (geothermal heating technology). Biotec sewage treatment, rainwater harvesting, low energy lighting systems, low U value argon filled double glazing and much more.

A state-of art heating systems draws heat from the ground and feeds into underground pipes in the cottages. "Nothing new there," Malc reminds us. "The Romans beat us to it!"

A roof area of 370square metres catches rain through gutters and goes into 10,000 litre tank. It is this water that feeds the toilets, washing machines and irrigates the land.

But perhaps the piece de resistance is a 5KW wind turbine. "That's where it all started," recalls Malcolm.

Tired of city life, Malc and his partner Jan scoured the country looking for the right spot to embark on a business venture that wouldn't add to climate chaos.

"Southfields Farm", on the edge of the Haven/Wash estuary, near Boston, offered everything the couple required.

"It almost started as a hobby, but I knew the first thing I needed to do was install a wind turbine - if only to pay our own electricity bills up front," says Malc.

But after careful study and talks with key people, a plan evolved which would enable other families to experience zero CO^2 living for the future.

And the end of April sees the opening of Envirobarns. . . a holiday experience for life.

The turbine will feed Malc's own home, also situated on the Southfield's plot, and the four cottages.

Just three days after the sails were erected, Malc reckons it had generated well over 120kw of electricity. "Around £30 in hard cash", Malc's quick to calculate!

At the end of April, Envirobarns opens its doors to holiday makers who want to escape to a tranquil and eco-friendly environment.

Malc reflected it had been a gruelling few months and not everyone had shared his enthusiasm for the project.

"I knew I had to start thinking about the future in terms of everyday living. The offshore oil rigs are having to dig deeper and differently to get gas and oil. It won't last forever."

"Then we are in serious trouble."

In fact he believes that in less than 30 years in the UK, families simply will not be able to afford to pay their fuel bills.

During working on Envirobarns, Malc and his team realised very early on they were gaining enough knowledge to guide other people in similar ventures.

"We set up 'Enviroeng Ltd' as a support engineering company as well as a dealership for the various technology."

A member of the BWEA (British Wind Energy Association) and agent for Fortiss Wind Turbines Malc is now looking ahead to promote his eco-friendly building services.

www.envirobarns.co.uk

• • • •

YORKSHIRE

The Yorkshire Branch had the last meeting of the winter season on the 9th April at the Buckles Inn with a talk by Martin Phillips of FWAG who spoke about the Renewable Energy Generation on Farms in Bavaria. Martin along with other UK interested parties, had been on a trip to Bavaria to investigate the local farmers experiences in renewable energy.

He had visited farms who were using digesters, wind farms, solar panels and water power for generating energy, and showed slides and gave costings of each application.

One very interesting application was of a farmer who had 'planted' a field full of solar panels and was using the electricity on his own farm as well as selling the surplus to the local electricity company. This crop did not need any energy input after the initial installation.

His final application was using the water to produce energy and showed the use of the Archimedes screw in the reverse, ie the water driving the screw as it flowed through it. This was ecologically sound as regards to the fish as they could go through the screw without any damage against the possible hammering of a water wheel.

He then showed a UK application of this system which is being tried out by a group of volunteers at Howsham Mill in North Yorkshire. Here they are trying to harness both an Archimedes screw and conventional water wheel to jointly produce energy.

24 members and visitors attended and there was a lively discussion after the meeting closed showing how much interest Martin's talk had stimulated.

WREKIN

DEFRA tell us we should reduce fuel consumption, limit soil damage, increase water infiltration rates and increase production levels without damaging the environment. NFU support this approach to farming. My soils lecturer at Writtle in 1960 said the same thing though he may not have been so worried about the fuel.

So why is this still an ongoing matter of concern? Tim Chamen of CTF Europe Ltd. closed the 2007/8 Wrekin Branch lecture season by providing us with some of the answers.

Since the introduction of the little grey Fergie, the weight of vehicles has increased some seven fold and farmers are still driving vehicles randomly over fields. NIAE told us how bad that was 30 or more years ago, yet wheels are still damaging as much as 90% of the surface.

Tim first suggested lightweight multi-unit robots as a solution but felt we may have to wait a long time for them to be commercially available. Many users put their faith in large low-pressure tyres but these lead to deep soil damage that is difficult to rectify as well as larger areas of capped surfaces if field operations are carried out under the wrong conditions and in a random pattern.

His answer is controlled traffic farming (CTF). Most of us are aware of gantry type power units and the advantages they can provide to soil condition but Tim showed how CTF is carried out using existing equipment with minimum adjustment to normal farming practice.

Trials from around the world, on commercial UK farms and within the Unilever R&D Colworth CTF Project have shown improved soil structure, 35% reduction in fuel usage, 10 to 20% increase in crop yields, less deep repair work, 40% less soil erosion, reduction in Carbon Dioxide and Nitrous Oxide (300 times worse than CO^2 as a greenhouse gas) and an increase in worm population.

The availability of satellite guidance systems provides improved adherence to primary and secondary track ways. These systems are becoming more accurate, easier to use and cheaper to own. CTF is not difficult.

Tim's long-term aim is to see the commercial introduction of Gantry Systems using all the advantages of computer based technology. Such systems would fully reap the financial benefits of CTF, put at £58/hectare while meeting many of the aspirations of DEFRA.

The Douglas Bomford Trust has helped Tim in promoting CTF but it would seem that any other assistance or support is hard to find. Fine words are not backed up with financial commitment.

Some farmers are enthusiastic supporters but most seem reluctant to adopt what would seem to be best practice. Perceived problems of capital cost, lack of understanding or possibly their heavy reliance on Contractors were suggested by the audience as reasons.

More information can be found on www.controlledtrafficfarming.com or by emailing Tim@ctfeurope.eu.

• • • •

WEST MIDLANDS

The judging of the West Midlands Branch Awards took place on Thursday, 6th March, 2008 at the Warwickshire College, Leamington Spa. Judging was undertaken by the Branch Chairman, Ian Moore.

The students are all based at Warwickshire College, Moreton Morrell,

and the course is entitled 'Maintenance and Repair of Arable Machinery', and runs from mid-October until mid-March. An important part of the course is Welding and Fabrication, and the students have a free hand to make something to take home. It is these projects that were being judged.

Projects included muck grabs, big bale spikes and two weight boxes.

The winner of the 2007/2008 Award was a big bale un-roller. The idea is to carry the big bale on a tractor-mounted frame, and use a hydraulic motor to turn and un-ravel the bale. The sprockets were taken from scrap machines.

The winning student is Ewan Walker from North Yorkshire who works on a local farm in Yorkshire.

The Second place went to Mark Townsend for his Muck Grab.

IAgrE NEWS EXTRA

Training grants of up to 70% for Yorkshire and Humber

A new programme offering training grants of up to 70% is coming soon to help develop land-based businesses across Yorkshire and Humber.

The LandSkills programme aims to raise the skills levels of farming, production horticulture and forestry business in the Yorkshire and Humber region.

An Industry Advisory Board (made up of representatives from the sector) will steer the programme and commission skills activity and knowledge transfer around the following areas: animal health and welfare, nitrates, pesticides and waste management, risk management, resource efficiency, assurance and traceability, supply chains and marketing, climate change, environmental land management, business management and succession planning.

LandSkills is part of the Rural Development Programme for England (RDPE) and is managed by Lantra, the sector skills council for the environmental and land-based sector, on behalf of Yorkshire Forward.

www.lantra.co.uk/LandSkills

Engineers Against Poverty

The latest edition of the Engineers Against Poverty's Newsletter is available here www.engineersagainstpoverty.org

It contains an interesting exchange of views on biofuels.

The Great Environmental Debate

Three of the Society for the Environment's Member Bodies, the IMechE, IChemE and the ICE along with the IET, are combining in Thames Valley to host the 'Great Environmental Briefing'. This meeting will be open to members of all these institutions and will be an opportunity to collectively discuss the greatest engineering challenge of the next 40 years.

www.socenv.org.uk/latest/great-environmental-debate

Reflections

Professor Paul Miller on his two year term as IAgrE President

TIME flies when you are enjoying yourself! - Well certainly the last two years during which I have been your President have flown by - and yes I have really enjoyed it and thank all concerned for the privilege of being able to work with the Institution in this way.

So - how has it been? I knew when I stepped into the role that had been so ably managed by my predecessors, particularly the outgoing President, Peter Redman, that time was going to be the enemy. My technical colleagues and I had just started work with the then new Silsoe Spray Applications Unit - part of The Arable Group (TAG) and getting this Unit established was going to, and did, take time. Right at the outset Peter Redman and Chris Whetnall offered me help and support with the Institution role and this they subsequently delivered in huge measures. I am extremely grateful to them and all of the staff at the Institution offices for the help and support they have given to me over the two years.

I think we have made good progress - more about that in a moment. For me personally, the most important feature of the last two years has been the people I have been involved with.

I say this not because it is a good thing to say but because I really mean it! The impetus to attend branch meetings and technical conferences around the country has involved renewing old friendships and making new ones. I know that there are difficulties in getting good attendances at such meetings but for me looking back over the last two years these meetings form the highlights.

We must continue to look for ways to encourage the enjoyable and stimulating interaction between those concerned with so many of the diverse aspects of the land-based sector. I have already mentioned those working at the headquarters office - again it has been really good to get to know and work with the great team that are at the heart of the Institution.

So what have we done in the last two years? The main roles of providing professional recognition, opportunities for technical up-dating and for meeting people have continued at the core. I think the main 'happenings' over the past two years can be considered under four headings as follows.

Publications

Both the Biosystems Engineering journal and Landwards have seen important changes in the last two years. For Biosystems Engineering we now have a new editorial team in Prof. Bill Day and Steve Parkin and my sincere thanks go to Bill and Steve for the work they put in to the transition to the new paper submission, editing and refereeing system that is now fully operational. We have a new contract with the publisher and the journal is making a very important contribution to our financial bottom line. Institution members also have access to papers under favourable terms.

Landwards has also seen both a change of editor, of style and content and again my thanks to all who have put work into facilitating these changes particularly through the External Affairs committee of the Institution. I congratulate the new editor, Chris Biddle, on his first edition and wish him well in the future - the success of Landwards does depend on good material and I am sure Chris is always open to ideas and contributions from all members.

Technician Accreditation

The launch of the Landbased Industry Technician Accreditation (LTA) scheme last December was an important development for both the Institution and the industry and I was particularly pleased to see the way in which all parties concerned with the scheme had worked together.

This has strengthened the links between the Institution, the AEA and BAGMA as well as providing a route by which those concerned with an important sector of our industry can get professional recognition.

My thanks go particularly to Chris Whetnall for his drive and enthusiastic input to the development of this scheme.

Staff and accommodation

THE Institution moved from to new offices on the Silsoe Campus to make way for a road being built as part of the housing development on the Silsoe Campus site. The new offices were certainly a step up in terms of the accommodation provided and our thanks go to Cranfield University for their provision of this accommodation.

The situation is however a temporary one and the Institution will have to move again in the future as the Silsoe Campus is completely closed down. As an aside, the company building houses on the Campus at Silsoe is called 'Miller Homes' - nothing to do with me but it was strange to see local signposts to 'Miller@Silsoe' - recognition at last?

We have been joined by Sylvia Harris who has taken on some of the roles previously undertaken by Rachel Mulvanerty and Pat Gage both of whom retired during the last year. My thanks and good wishes to them and a warm welcome to Sylvia who is now an established member of the Headquarters team.

Governance

The way the Institution is run has been changed slightly to give a different role to Council and to ensure that we can demonstrate that the Institution is being appropriately managed.

I hope that the new arrangements will give Council the opportunity to take a broader view of our activities and to consider and debate new ideas. If you think things should change and you have some ideas that should be debated, let us know and we can have an open discussion at Council and more widely. We also hope to have more Council meetings away from Silsoe and involve other organisations and people directly in the work of the Institution.

Getting new, and particularly young, people involved with the Institution is vital for the long term success of the organisation. Dan Mitchell continues to do a fantastic job with student recruitment with financial support from the Douglas Bomford Trust and his work is delivering real results. We all have a responsibility to ensure our Institution develops in a positive and productive way and recruitment is an important part of this.

But I think enough from me. I wish the incoming President, Richard Robinson, good luck and I am sure he will benefit from the same support that I have enjoyed over the past two years from all members and officers of the Institution.

The message that I will take away from the last two years is that the Institution is all about people and being involved with these people gives real benefits and stimulation. Thanks to you all for the opportunities I have enjoyed for the last two years.

IAgrE Award winners for 2007 / 2008

Presented at the IAgrE Conference, Harper Adams College, May 8th 2008

DOUGLAS BOMFORD TRUST PAPER AWARD
RJ Godwin, MJ O'Dogherty and C Saunders (BE)
Ian Yule, Hayden Lawrence and Rob Murray (Landwards)
Pictured above L-R: Michael O'Dogherty, John Fox (presenter), Dick Godwin

JOHNSON NEW HOLLAND TROPHY AWARD
Andrew W Parkinson, Harper Adams University College
Pictured above L-R: Andrew W Parkinson; Mike Hawkins, New Holland

TECHNICAL GROUP MERITORIOUS AWARD
David Killer
Pictured above L-R: New President of IAgrE, Richard Robinson and David Killer

MICHAEL DWYER MEMORIAL PRIZE
Mark Moore, (AGCO)
Pictured above L-R: Carla Gasparin accepting the award on behalf of Mark Moore from Brenda Dwyer

BRANCH MERITORIOUS AWARDS
Neal Dodd (Wrekin Branch)
Richard Trevarthen (EM Branch)
John Sartain (EM Branch)
Terence Chambers & Peter Frost (NI Branch)
Pictured above: Richard Robinson and Neil Dodd
Pictured above right: Richard Robinson and Richard Trevarthen
Pictured right: Richard Robinson and John Sartain

IAgrE AWARD FOR CONTRIBUTION TO THE LAND BASED INDUSTRIES SECTOR
Steve Parkin, Harry Catling, Peter Crossley
Pictured below L-R: Peter Crossley, Steve Parkin, Harry Catling

HONORARY FELLOW
Dan Mitchell
Pictured left, L-R: Richard Robinson and Dan Mitchell

AWARD OF MERIT
Anthony Bamford, Dick Godwin
Pictured left, L-R: Richard Robinson and JCB Agricultural Director & General Manager, Ian Sayers collecting on behalf of Antony Bamford: and below with Dick Godwin

OBITUARY

DAVID MERCER HICKS - 1945 - 2008

It is with great sadness that I have to report that **David Mercer Hicks** passed away suddenly on the 9th May whilst out walking on a holiday in the Lake District *writes Mike Hann.*

It is a great privilege for me to be offered the chance of trying to write a suitable obituary I hope I can do him justice.

David was at school at Kings Rochester leaving at 16 when his family moved to Bedfordshire where his father became an electrician for the London Brick company. From 1961 until he became a student at Mander College he worked as a trainee farm mechanic and tractor driver.

Following successfully gaining the City and Guilds 260 and 261 he joined Rycotewood as a technician in1970. He soon proved his worth and was promoted to lecturer - in my view David had found his vocation.

He served as a lecturer for approximately 28 years finishing off his service spending a further 7 years as an estates manager for Oxfordshire County Council until his retirement in 2005.

During his years at Rycotewood he was able to develop his academic ability. He completed a teaching certificate with Garnett College in 1974, an N.D.Agric.E as an external candidate with West of Scotland College in 1975 and finally an MPhil in the mid 1990s at Cranfield University Silsoe. It was my privilege to supervise his project on the then fairly new technique of sand slits for sports field drainage. In his usual way he made all the necessary rigs to complete his experiments and attacked the subject with all his usual ability and enthusiasm. The result I am pleased to say was an excellent piece of work with plenty of practical solutions. If many who practice the technique today heeded his conclusions there would be far less errors in its employment.

Despite his success in the field of academia I believe his great achievement was as a teacher in that special place Rycotewood.

When David joined the College it was riding high with that great inspiration Curly Turner at the helm. Thousands of students benefited from this outstanding institution which predominantly took so called 'academic failures' showed them they weren't and proceeded to turn them into the cream of Agricultural Engineering.

David was an integral part of this progress, it was not work it was a vocation, much of the fabric and equipment was made by him and other staff. Students were enlightened rather than taught and they thrived on this, producing outstanding results.

Like many others he found the demise of the college difficult but as always was ready for a new challenge as a manager which, as expected, he carried to a high level of competence.

David also was a great supporter of our institution (which he joined in 1970) working on several committees and helping to develop the Southern Branch. His enthusiasm will be greatly missed.

Personally I remember his love of motor bikes and Jaguar cars, and spending time training in the gym. We worked several times together for RSPB carrying out topographic surveys.

A great teacher and a great guy, surely he is still at the other end of the field on the theodolite.

David leaves a wife Jill and a lovely daughter Elizabeth. Our thoughts are with them.

Membership changes

Admissions

A warm welcome to the following new members:

Fellow

R Johnson

Member

A F Xavier (Uganda)
A B M S Rashid (Malaysia)
A Easton (Scotland)
J R P Jordan (Suffolk)

Associate Member

R J Hoare (Scotland)

Associate

B Henry (Scotland)
B E Falconer (Scotland)
F A Omopariola (London)

Student

Sparsholt:
S Dovey
O J R Hopes

Tralee:
S Vaughan

Barony:
R H Anderson
T Arthur
D I Brolly
M Colebrook
I Coltart
A Garside
K Geddes
A E Jamieson
A D Kerr
G J Kerr
C M Lorimer
R McAulay
S A MacLeod
C D W MacMillan
G I Mair
J Nelson
S Nichol
W Rose
C Shaw
P Sidebottom
M J Tait
N S Tennant
M O Thomas
S Young

Cranfield:
L J Hathaway-Jenkins

Greenmount:
J Calderwood
DK Foster
A Smyth
M Campbell
C Blair
T Carville
M Maharg
S Jamieson
A G Watson
D Sloan
J J Metson
E Buick
M S R McConaghie
A J Currie
N Feenan
R J Dixon
M Hutchinson
R N Sloan
M Lyons
R Allingham
K J Garvey
G Gregg
J Bell
J Evans
M K Jones
S R McKean
C O'Connor

Harper Adams:
F J Adams

Omagh:
G L Humphrey
D McKimmon
L Smyth
D McKeron
O Boyd
M McElroy
M Monteigh
B Holland
A Cairns
M Gormley
S Crawford
G L Sproule

Portadown:
R J Doherty
M M Hanna
D Allen
D A Devine
K T Duprey

Readmissions

Member

A D Brawn
D J Massey
S W A Glover

Engineering Council

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

Registrations

CEng

R J D Carter
N J Olley
D A Smith

IEng

B A Roberts

Society for the Environment

Registrations

J W Warne

Academic members

Askham Bryan College
Askham Bryan
York
YO23 3FR

Barony College
Parkgate
Dumfries
DG1 3NE

Bicton College
East Budleigh
Budleigh Salterton
Devon
EX9 7BY

Coleg Sir Gar
Pibwrlwyd Campus
Pibwrlwyd
Carmarthen
SA31 2NH

Cranfield University
Cranfield
Bedfordshire
MK43 0AL

Greenmount Campus
CAFRE
22 Greenmount Road
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

Plumpton College
Ditchling Road
Lewes
East Sussex
BN7 3AE

Reaseheath College
Reaseheath
Nantwich
Cheshire
CW5 6DF

Royal Agricultural College
Cirencester
Gloucester
GL7 6JS

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

Sparsholt College
Sparsholt
Winchester
Hampshire
SO21 2NF

Willowdene Training Ltd
Chorley
Bridgnorth
Shropshire
WV16 6PP

Wiltshire College - Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

Long service certificates

Name	Grade	Date of anniversay
60 years		
Donald **Macmillan**	FIAgrE	13 May 2008
Robert Harrington **Litton**	AIAgrE	14 May 2008
35 years		
John Charles Lewis **Welwood**	IEng, MIAgrE	4 April 2008
Robert **Booth**	IEng, MIAgrE	4 April 2008
Paul Robert **Brooks**	Eng Tech, MIAgrE	4 April 2008
Denis James **Welstead**	MIAgrE	4 April 2008
Stephen John **Hasell**	IEng, MIAgrE	4 April 2008
Terence **Kernahan**	MIAgrE	4 April 2008
Timothy John Haldane **Hannah**	MIAgrE	17 May 2008
David Hugh Charles **Spratt**	IEng, MIAgrE	17 May 2008
Keith Howard **Shelbourne**	IEng, FIAgrE	17 May 2008
25 years		
James Stanley **Price**	AMIAgrE	30 April 2008
Robin Gilanders Ferguson **Jack**	AMIAgrE	5 May 2008
Leigh David **French**	IEng, MIAgrE	15 May 2008
William Arthur **Helen**	IEng, MIAgrE	27 June 2008

Commercial members

Alvan Blanch Development Co Ltd
Chelworth
Malmesbury
Wiltshire
SN16 9SG

Autoguide Equipment Ltd
Stockley Road
Heddington
Calne
Wiltshire
SN11 0PS

Bomford Turner Limited
Salford Priors
Evesham
Worcestershire
WR11 5SW

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

Douglas Bomford Trust
Barton Road
Silsoe
Bedford
MK45 4FH

FEC Services
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2LS

John Deere Ltd
Harby Road
Langar
Nottinghamshire
NG13 9HT

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

Shelbourne Reynolds
Shepherds Grove Ind. Est.
Stanton
Bury St Edmunds
Suffolk
IP31 2AR

SSAB Swedish Steel Ltd
De Salis Court
De Salis Drive
Hampton Lovett
Droitwich
Worcestershire
WR9 0QE

White Horse Contractors Ltd
Lodge Hill
Abingdon
Oxfordshire
OX14 2JD

NEWS ABOUT MEMBERS

Good Karma

Ag Eng student to undertake charity drive across South India

Team Karma Venture - Chris Chapman and Richard Moore

RICHARD Moore, 25, is a final year Agricultural Engineering student at Harper Adams.

He, along with friend of his Chris Chapman, has entered a team in an event called the Karma Enduro. In November he will drive a 37hp Hindu

Ambassador motor car 2000km across remote terrain in South India - including over the Western Ghat mountain range.

Richard said, "It will be a life changing and very challenging experience. I have entered with a friend from school and together we must raise £8500 to enter. By doing this the event will raise at least £150,000 for charity, the two charities being the British registered Rainbow Trust and Adventure Ashram."

"So far we have raised £5000 - mainly through arranging a group sponsored tandem sky-dive and music events."

Prior to university Richard, from near Newmarket, Suffolk completed a four year modern apprenticeship in agricultural machinery in Suffolk and Writtle College. He recently travelled to New Zealand with the agricultural association Agriventure.

The Karma Enduro rally itself isn't a race and there are no prizes for coming first or last - the event is all about the end game, and getting back in one piece.

Participants will be expected to tackle an arduous route of high mountains, hot arid deserts, hectic city stages and wild remote tiger reserves and tribal forests.

For more information visit Richard's website at: *www.karmaventure.co.uk*

NEWS ABOUT MEMBERS

Ian J Fleming FIAgrE

60 years of IAgrE membership

AS a newly de-mobbed REME Captain, Ian was appointed by Scottish Agricultural Industries as manager of a newly opened branch of an Agricultural machinery depot in Haddington, East Lothian.

It was built of a variety of ex-wartime Nissen and Iris huts. Little did he realise that his competitor's principals and salesmen were either related to or had been to school with the majority of his potential customers and had served them well in times of wartime shortage. The other eight SAI dealerships were well established businesses.

Just a year after Ian opened the doors of the Haddington depot, he joined The Institution of Agricultural Engineers on 14 March 1948, still without a major dealership. In 1949 he was fortunate to secure the Claas dealership for Scotland and sold five combines. With a builder next door, he realised that there was an opportunity to design and build grain handling, conditioning and storage installations an East Lothian farms.

Sales of combines doubled in 1950 and again in 1951 and 1952 and SAI Haddington became a more viable concern. In 1953 Ian was appointed to manage another of SAI's companies, William Reid (Forres) Ltd. There, with a staff of 100, its activities covered not only agricultural engineering with a good IHC and Claas dealership but also general engineering for the whisky industry and saw milling for the many forests in Morayshire.

A mobile saw-mill proved popular and an order for six steel ones were sent to the Sudan. Again there was scope for bulk grain handling, conditioning and storage units on farms from Moray to Easter Ross.

SAI sold their eight agricultural machinery ventures in 1960 to finance a major fertiliser manufacturing factory in Leith and Ian was appointed to a job at the HQ in Edinburgh to study 'Work Study in Agriculture'. It was evident that there was still too much hand labour and he preached 'Bulk Handling' ten years before the use of pallets and big bales were introduced.

SAI then saw an opportunity to spread fertiliser by contract and bought a substantial number of ex WD FWD trucks which were modified to carry and spread bulk fertiliser on farmer's fields. The fertiliser was carried from factory to field in 1 ton containers, each of which has four foldable legs to enable the lorry driver to leave as many as were required on farm end rigs. The contractor's spreader driver reversed his hopper below each container and filled his hopper by gravity. That venture enabled SAI to spread 20% of its total annual make.

Ian also supervised the drilling, again throughout Scotland by the same contractors using SAI's machines, of grass seed at 4 inch spacing. the overhaul of SAI's spreaders and drills then had to be overseen during the winter months.

After Ian retired he took a keen interest in the Scottish Agricultural Museum, now The National Museum of Rural Life at Kittochside, East Kilbride and was mainly responsible for identifying, obtaining and restoring its unique collection of combine harvesters. There are many examples of combines which are the only ones in Britain and all are in good working order. there is also a Glasgow 3-wheeled drive tractor which is one of only six in the world.

In 1990 Ian was co-author, with Prof Noel Robertson of Britain's 'First Chair of Agriculture' at the University of Edinburgh. It was founded in 1790 by Sir William Pulteney. Three years later he wrote 'Scotland's first Philatelic Society' which was founded in Edinburgh by five Germans in 1893.

Now after 65 years of happy marriage, Ian and his wife have moved into Sheltered Housing.

Thangavelu Toniappa CEng, CEnv FIAgrE FIE(T)

Tanzanian Reflections

MY 50 years of membership in the Institution of Agricultural Engineers and my service to Tanzania made me reflect on my lengthy career in Agricultural Engineering.

I come from an agricultural family in Sri Lanka. On completion of High School, I entered the School of Agriculture, Peradeniya and obtained a Senior Certificate in agriculture with a distinction in agricultural engineering. Later, I won a Government of India scholarship to do a degree course in agricultural engineering at the prestigious Allahabad Agricultural Institute, Naini, at the University of Allahabad.

On returning to Sri Lanka, I joined, as an agricultural engineer in the Agricultural Division of Brown & Company Colombo, who were the franchise holders for Massey Ferguson tractors.

To further my career and to keep up with the developments in agricultural engineering, I went to the UK, to follow a Post graduate course in Agricultural Engineering at the National College of Agricultural Engineering, Silsoe, Bedford. I also obtained a MSc Agricultural Engineering degree specializing in tropical Farm Mechanization at the University of Reading. I returned to Sri Lanka and continued to work for Brown & Co. I also took up, a part-time post, as a visiting lecturer in Agricultural Engineering at Aquinas College of Higher Education.

I have contributed over 3 decades of service to Tanzania as an agricultural engineer. It all started in 1976 when I joined Lonrho, Tanzania, as an Agricultural Engineer in the Farm Machinery Distributors Division.

When the Government of Tanzania nationalized Lonrho, I joined Tanzania Tractors Manufacturing Company (TRAMA), the joint venture company established for tractor production in Tanzania between the Government of Tanzania and Valmet of Finland.

The programme was further supported with a FINNIDA development grant from the Finnish Government, I actively carried out the national and development programmes, thus linking the profession with the overall national development.

I made a significant contribution in training and capacity building in the field of agricultural engineering. I served as an external examiner for BSc Agricultural Engineering degree course at Sokoine University of Agriculture, Morogoro. I am a member of the Institution of Engineers, Tanzania (IET) since 1978. I am a Council Member and head the Agricultural Engineering Division of the IET. I worked in the implementation of FINNIDA import support to Tanzania for tractors and agricultural equipment for mechanized rice cultivation in Zanzibar.

The Tanzania Society of Agricultural Engineers honoured me by making me a Life Member. Upon retirement, I am working as an agricultural engineering consultant in Tanzania to continue to help in the development of agricultural engineering and the people of the Republic of Tanzania.

Graham Howling

30 years representing members

After nearly 30 years representing members' technical interests from initially David Brown tractors, JI Case et al, and then of late the last 10 years as AEA Technical Director/Consultant, Graham's last day was on the 30 April.

Within this spell he has carried the flag for the UK into many EU meetings and recently received a 25 year appreciation from CEMA of his detailed and diligent work completed on behalf of the Industry.

We wish Graham and Jan every happiness and good luck in the future.

BRANCH EVENTS

Wed 17 Sept 2008, 10.30hrs
Southern Branch
Late summer visit in the South
Venue: Laverstoke Park, Whitchurch, Hampshire
Two venues: a.m - Laverstoke Park, Whitchurch Hampshire Organic farming plus. It is a much more holistic way of farming, a complete system as developed in Germany in 1920 and now practised all over the world. p.m - Milestones, Basingstoke, Hampshire Milestones is an ideal destination. It has a network of historic street scenes inside a massive building. This provides the interest of an open-air museum. Group entrance fee to Milestones - £5 payable on arrival
Tel: 01962 880696
Email: denis@welstea.freeserve.co.uk

INTERNATIONAL EVENTS

Tue 19 Aug 2008 to Fri 22 Aug
UNIMAS and MARDI
International Symposium and Workshop on Tropical Petatland (Kuching 2008)
Venue: Hilton Hotel, Kuching, Sarawak
Jointly organised by the Universiti Malaysia Sarawak (UNIMAS) and Malaysian Agricultural Research and Development Institute (MARDI), the conference will have the theme "Peatland Development: Wise Use and Impact Management
For more information, and / or to register online, please visit: www.frst.unimas.my/iswtp_kch08

National BEN Week

WHAT better way to celebrate BEN's birthday than by getting involved in National BEN Week from 14 - 20 July?

This all important week, which is an intrinsic part of BEN's fund-raising strategy, is the week when companies and individuals from the automotive industry have the chance to let their hair down and get involved in some fun activities to raise money for BEN.

If sky-diving or leg waxing is not your thing, then a simple raffle can be just as successful. Got some crazy ideas, then they'd love to hear about them. If, on the other hand, you'd like a little help in getting this fund-raising week off the ground then contact Laura Redman in the Events Department on 01344 294714 who will be delighted to send you a fundraising pack.

You may have read about BEN's Volunteer Recruitment Campaign. Peter Wilson, who's been in the motor industry for 40 years and is an Events Support Volunteer, says "National BEN Week would be an ideal opportunity for a new volunteer to get cracking and promote the charity's aims and needs whilst having some fun"

"I'll be concentrating my efforts on fund-raising during BEN Week but as an Events Support Volunteer I get to attend motor shows and exhibitions and even give payroll talks. I've met so many interesting people and I think BEN is a great cause."

Adam Hanrahan is BEN's National Volunteer Coordinator. Contact him on 01344 294719.

OTHER EVENTS

JUNE 2008

19-22 Royal Highland Show, Ingliston, Edinburgh
21-22 Shropshire & West Midlands Show

JULY 2008

3-6 Royal Show, Stoneleigh
8-10 Great Yorkshire Show
11-13 Kent County Show
21-24 Royal Welsh Show
25-27 CLA Game Fair, Blenheim Palace, Oxfordshire
29-31 New Forest & Hampshire Show

AUGUST 2008

6-7 Bakewell Show
9-10 Spirit of the Countrysdie, Lulworth Castle
12-13 Anglesey County Show
19-21 Pembrokeshire County Show
31-2/09 Spoga & Gafa 2008, Cologne

SEPTEMBER 2008

2-4 IOG SALTEX 2008, Windsor Racecourse
11 Tillage 2008, Northamptonshire
17-18 Dairy Event. Stoneleigh
20-21 Royal Berkshire Show
21-23 GLEE 2008, NEC Birmingham
25 Tillage 2008, The Borders
27-28 Malvern Autumn Show

OCTOBER 2008

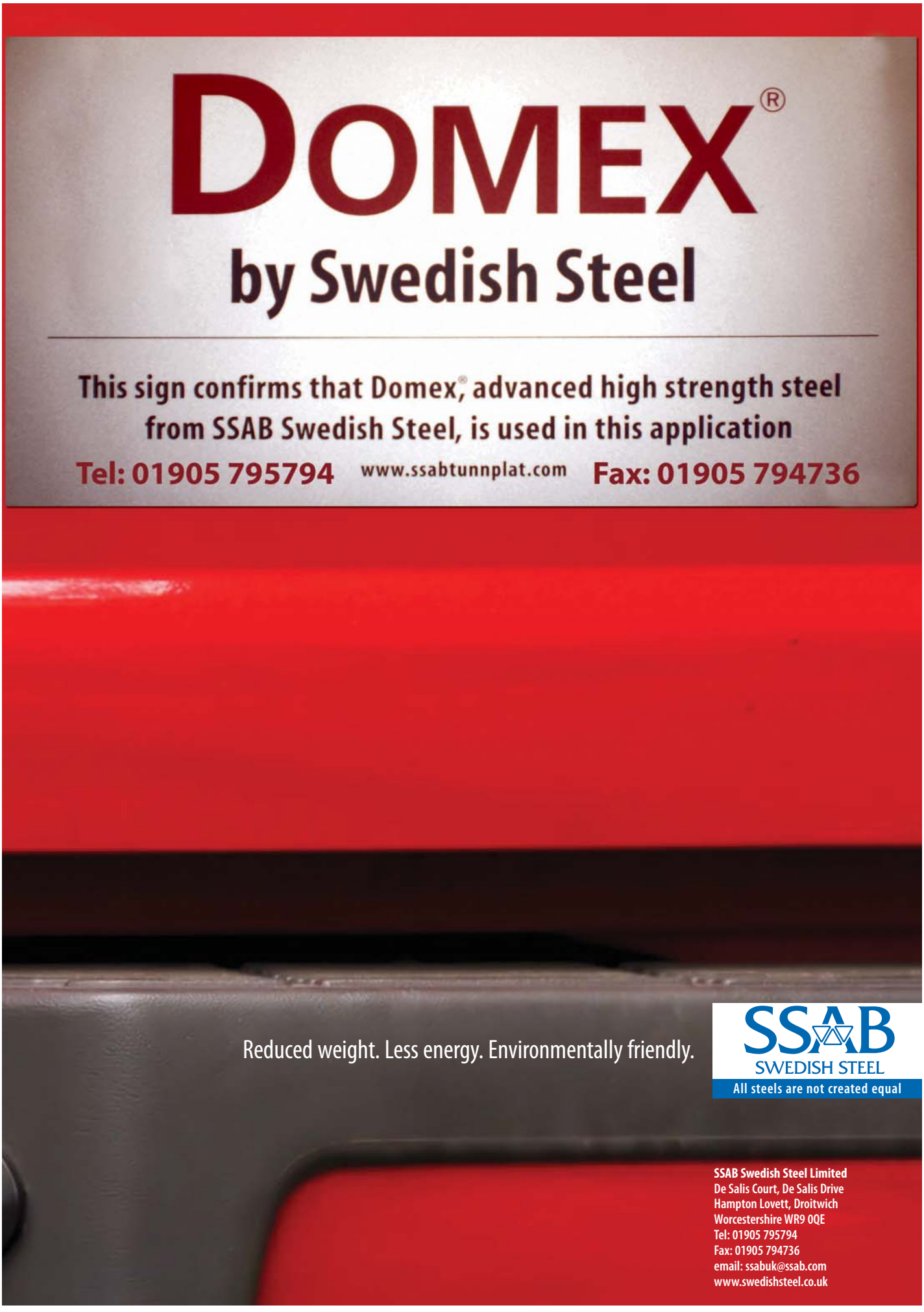
4-5 South of England Autumn Show & Game Fair, Ardingly
12 East of England Autumn Fair
23-25 Green Industry & Equipment Expo, Louisville, Kentucky, USA

NOVEMBER 2008

5-6 IOG Scotsturf, Edinburgh
12-16 EIMA International, Bologna
19 AgriScot 2008, Royal Highland Centre

DECEMBER 2008

1-2 Royal Welsh Winter Fair



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