Landwards

Agriculture • Horticulture • Forestry • Environment • Amenity

Digging In

Children get a taste of technology at Legoland

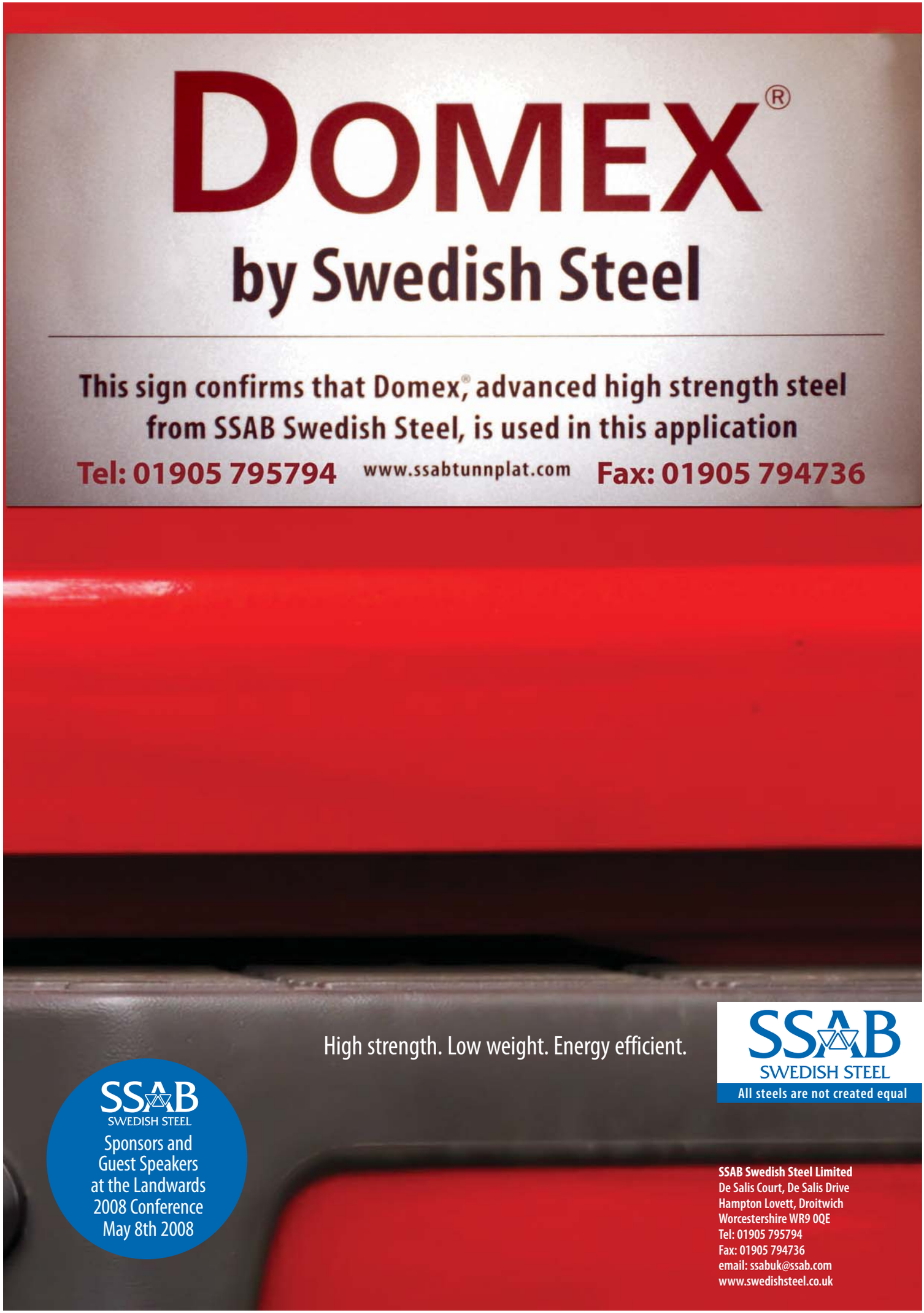
Mr Motivator Steps Down

Richard Trevarthen on a life-time of teaching 'brilliant students'

Warming Times

Agricultural engineers hold the key to reversal of global warming says Bill Butterworth

IAgrE Professional Journal www.iagre.org Volume 63, Number 1 Spring 2008



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

Landwards
Agriculture • Horticulture • Forestry • Environment • Amenity

VOLUME 63 Number 1 2008

THIS ISSUE

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EDITORIAL

Diversity is our strength

A big welcome to a new look Landwards.

This is an exciting, if not, slightly nervous debut issue for me - rather like playing a first night of Hamlet (probably not a good analogy!) or walking out to bat seeing all those expectant faces.

However, first a huge thank you to Brian Witney for his stewardship of Landwards over the past ten years. His commitment to the magazine has been whole-hearted and professional.

I have been publishing magazines for the land-based sector for twenty years, prior to which I worked for manufacturers and dealerships in the farm and horticultural industry - and one thing is certain, I've yet to produce the perfect magazine!

But that is the beauty of it. However good we think a particular issue is - it can be bettered and improved. So that's where I start!

Producing a specialist magazine for such a diverse audience is always going to be a challenge, but there is one constant.

As Bill Butterworth says in this issue, the solutions to many of the challenges faced today, whether they concern the environment, global warming, sustainable food production or the management of open spaces, lies in the hands of the agricultural engineering community.

Gradually the penny is dropping amongst politicians that food security for this country might just be essential, rather than something to which they pay lip-service.

Why even our PM dropped the FS phrase several times into his recent speech at the NFU Centenary Dinner.

We are a small country. Our farming resources, whilst rich and varied are still limited. It will take all the skills and ingenuity of those at the forefront of developing new and innovative ideas in order to maximise our farming output.

> . . this is no time to hide our light under a bushel

Alongside which, is the need for using non-farming land responsibly and with care and consideration.

This is no time to hide our light under a bushel. Engineers and scientists in the agricultural engineering sector will play a major role in finding solutions to serious issues. And that's where the diversity in IAgrE's ranks becomes a strength.

I hope, with help of the many excellent contributors and IAgrE members, that Landwards will challenge and test new ideas, be radical and forward-thinking, and not be afraid to push back boundaries.

So do keep your ideas flowing in, let me know what you think of Landwards, whether the balance is about right - and how it should develop in the future.

CHRIS BIDDLE
Editor

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www.iagre.org

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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 Enviroment***

CEO VIEW

WELCOME to the new look Landwards. What exciting times!

Since the last Landwards went to press, IAgrE has seen the successful England launch (at Gaydon) of the Landbased Technician Accreditation (LTA) scheme, a follow up launch in Scotland (at Barony) in February and seen the first registrants through the system.

Following representations from IAgrE members in Ireland, there will be an inaugural meeting of an Ireland Branch of IAgrE in Limerick in April.

It is planned that in addition to a talk from IAgrE Fellow - Ray Clay, there will also be an Ireland launch of the LTA scheme.

We are pleased that FTMTA (the Ireland equivalent of BAGMA and AEA) have lent their full support to this scheme and, indeed, will be active participants. Follow up LTA launch events are also planned for N Ireland and Wales.

On the publications front, you will see elsewhere in Landwards that we have negotiated a discounted electronic subscription rate for Biosystems Engineering for members.

To assist you in choosing whether or not to subscribe, Dr Steve Parkin will be summarising, in each issue of Landwards, some papers of interest from the previous quarter's issues of Biosystems Engineering.

Please let us know what you think of the "new" Landwards. It is your magazine and only by receiving feedback (and of course contributions) from members can we be sure it is what you want.

IAGRE to regulate and administer scheme

Technician accreditation scheme up and running

MORE than 150 delegates from across the agricultural, groundscare and grass machinery industry attended the launch of the Landbased Technicians Accreditation Scheme (LTA) at the Motor Heritage Centre at Gaydon in Warwickshire on 5 December 2007.

The scheme will create a readily identifiable industry-wide method of recognising the skills levels of service technicians.

"Although we have a relatively stable workforce, dealers are losing around 10% of their skilled technicians every year," said Peter Leech, chairman of the AEA's Training and Education Committee.

"Over 30% of this number move to other industry sectors, some move to another company, whilst some get promotion within the dealership. The reasons why they leave often boil down to seeking better pay and conditions or to advance their career opportunities".

Overall, he said, the scheme is intended to help in the retention of staff by creating new levels of technical staff and the need for the industry to demonstrate to customers its commitment to service excellence through ongoing training.

"Today, we have just one level of qualified technician, nothing higher. The LTA scheme recognises that there are three distinct levels with the pool of qualified and experienced technicians".

"And until now, dealers have had no benchmark on which to base renumeration structures that recognise and reward technicians".

The LTA scheme had been formulated and planned by a cross-industry group, who have appointed IAgrE (Institution of Agricultural Engineers) to regulate and administer the accreditation process.

IAgrE chief executive Chris Whetnall (right) said that as the institution now represents such a wide-range of land-based sectors including agriculture, amenity, forestry, horticulture and the environment, the acronym IAgrE would be commonly used.

He added that IAgrE was a licensed body of the Engineering Council UK and as such is licensed to register Engineering Technicians (EngTech), Incorporated Engineers (IEng) and Chartered Engineers (CEng).

He said that the registration process, which has already started, would be handled online for all applicants from franchised dealerships.

Registration and information is online at **www.iagretech.org**

LTA SUPPORTERS

The following organisations have signed the Memorandum of Understanding which was initially drawn up in 2005 outlining the aims, objectives and responsibilities of the LTA Scheme. Signatories to date include:

AEA
AGCO
BAGMA
Case-IH
Claas
EurAgEng
Hayter
IAgrE
JCB
John Deere
LANTRA
Lely UK
New Holland
Ransomes Jacobsen

Garford Robotic Weeder wins 2008 IAGRE award at LAMMA

IVEL remembered in new award

IAgrE has announced a new award to be presented annually at the LAMMA Show.

IAgrE president, Paul Miller says "The Awards Committee of IAgrE decided in late 2007 that it would be fitting for the Institution to celebrate the name of Dan Albone and the memory of the IVEL tractor by making an annual award using the IVEL name".

In 1902, Dan Albone, a Bedfordshire inventor, designed and patented the first practical and successful light internal-combustion engined agricultural tractor setting up Ivel Agricultural Motors Ltd in Biggleswade in 1903.

This set in motion a revolution in mechanical farming - a decade ahead of Henry Ford and Harry Ferguson and almost three decades ahead of the first Ferguson.

More recently, in 2003, Ivel Tractor No. 131, built in 1903 and now owned by John Moffitt, celebrated its centenary by travelling 100 miles under its own power and, in the process, raised in excess of £100,000 for charity.

Above: One of the surviving IVEL tractors has raised more than £100,000 for charity, Below: 2008 IVEL Award winner the Garford Robotic Weeder

Paul Miller adds, "This committee felt that this award should be for a new product or innovation which will have the most positive impact on the environment."

"I am pleased to say that at the Lamma 2008, the award was made to Garford Farm Machinery of Deeping St James, Peterborough for their Robocrop InRow Robotic Weeder. Building on the success of the Robocrop which utilises computer controlled image analysis techniques for hoe steerage, the addition of the inter row rotating hoes completes the row weeding task."

"The Judges felt that as well as reducing the carbon footprint of the weeding process by removing the need for transporting manual labourers to and from field sites, the reduction in soil contamination typical of other mechanised operations would result in less wastage at the farm gate."

www.garford.com

Remembering

Dan Albone

Dan Albone (Daniel Albone) (1860 - 1906) was an English inventor, manufacturer and cyclist.

Dan conceived a light weight petrol powered general purpose agricultural vehicle. By November 1901 he had completed his tractor design, and filed for a patent and on 12 December 1902 he formed Ivel Agricultural Motors Limited. He called his machine the Ivel Agricultural Motor, the word 'tractor' did not come into common use until later.

About 500 were built, and many were exported all over the world. The original engine was made by Payne & Co. of Coventry.

After 1906, French Aster engines were used. Over time it became heavier and more powerful, but it failed to keep pace with its rivals. The company declined after 1910, and in 1920 it went into receivership. The assets were bought by United Motor Industries Limited.

The 1903 sale price was £300.

Exports rose by 4.9% last year

FIGURES issued by the AEA show that exports from the UK of agricultural engineering and outdoor power products rose by 4.9% in 2007 to £1,408 million.

In fact, exports from the agricultural sector rose by 5.6% to £1,312 million whilst those from the outdoor power equipment sector fell by 3% to £96 million.

Exports of tractors reached £738 million, an increaseof 10.8% on the year.

Total of imports rose 13.7% to £1,390 leaving a positive balance of of trade of £18 million. the EU is by far our largest trading partner taking 67.4% of machinery exports and 63.2% of tractor exports.

Inaugural meeting to be held in Limerick in April

IAgrE to establish Irish branch

IAgrE has taken the first steps to set up a branch in the Republic of Ireland - and will launch the Land Technicians Accreditation (LTA) scheme at the inaugural branch meeting in Limerick on 12 April.

The new branch and the LTA Ireland scheme will be coordinated by David Frizelle, a lecturer Agricultural Engineering in the School of Engineering at the Institute of Technology Tralee.

IAgrE president Paul Miller says, "It is pleasing that the industry felt IAgrE to be the natural choice to run the LTA scheme, and linking the upper LTA tiers to Engineering Technician registration is an ideal way of demonstrating the rigor and transparency of the assessment process".

"Now that we have had LTA launches in england and in Scotland (at Barony College), it is exciting news that the scheme has caught the interest and imagination of the extensive Irish farm and outdoor machinery industry".

"A further enhancement to the LTA scheme is its recognition by EurAgEng, the European Society representing professionalism in land-based engineering," added Professor Miller.

The LTA scheme incorporates a Code of Conduct and requires re-assessment of technicians on a regular basis.

Irish trade association FTMTA (Farm Tractor and Machinery Trade Association) has welcomed the move.

Chief executive Michael Moroney *(pictured)* said "We are pleased to support this industry-wide initiative which can only reinforce the industry's on-going obligation to it's customers to provide not only quality products, but quality after-sales service"

A recent survey by FTMTA revealed that over 3,800 people worked in the agricultural machinery and equipment industry in Ireland.

Clippings

• UK tractor registrations for the most recent year available, 2006, show that out of a total of 14,941 units sold in the UK, John Deere comes out top with 3,861 units sold (25.8%) Next up is CNH with 3,584 units sold and a 24.0% share. This is split between New Holland (2,731 units and a 18.3% share) and Case IH (853 units and a 5.7% share).

Third in the list is ACGO with 3472 units sold, with a 23.2% share. This is split between MF (2, 580 units and a 17.3% share), Valtra (535 units and a 3.6% share) and Fendt (357 units and a 2.4% share).

The tractor statistics appear one year in arrears because a European Commission ruling argues that more recent data would be anti-competitive

• HARRY BARKER, President of BAGMA from 1990 to 1992 has been killed in an aircrash near his home at Bourne, Lincolnshire.

The accident happened on 13 February, the day after his 85th birthday when a light plane he was piloting came down near Empingham in Lincolnshire.

Harry, who had a notable Second World career as a pilot gaining the DFC, was one of a syndicate who owned the aircraft which was based at a farm at Empingham.

He was retired from the family-run Eastern Farming Implements dealership based at Carlby, now run his son Michael.

• The AEA (Agricultural Engineers Association) moved offices during February to a new headquarters, still named Samuelson House.
The new details are:
AEA
Samuelson House
62 Forder Way
Hampton
Peterborough PE7 8JB
Tel: 08456 448 748 (new)

LANTRA launches skills survey

LANTRA is launching a survey of dealers and independent organisations providing technical support to all areas of farming, forestry, ground care and land-based industries.

It aims to identify future recruiting requirements for the land-based engineering sector.

The campaign, says LANTRA, is supported by the AEA and BAGMA, and is a testament to the united approach that industry has adopted to address the challenges of recruitment, training and retention of skilled technicians.

Completing the survey will give an insight into future recruitment requirements, identify specific regional problems, allow targeting of resources to gain maximum effect and assist in the development of qualifications that the industry.

David Kirschner, formerly service manager of Renault Agriculture US is co-ordinating the survey. He says, "As an industry we generalise about the issues and challenges facing us without having the full facts on which to base effective action plans and make best use of the limited resources that are available."

"I need to raise awareness of all businesses in the land-based service industry that employ technicians, mechanics, fitters, apprentices, improvers etc."

"By all I mean all, agricultural machinery dealers, garden machinery dealers, groundcare dealers, used equipment dealers, material handing dealers, dairy, drainage, irrigation, forestry and installation engineers. Small manufacturing or importing companies who recruit technical service staff from the land-based service engineering arena. Large contracting businesses and farming operations that employ workshop or service staff. It does not matter if they are independent man in a van operations or large multi depot organisations."

The survey can be completed online by visiting:

www.lantra.co.uk/businesses/land-based-engineering

Alternatively, for a hard copy of the survey or to complete the form over the phone send your contact details to:
mrdkirschner@aol.com

". . as an industry we generalise about issues without always having the full facts"
David Kirschner

Robert wins Claas Scholarship

ROBERT Fillingham a student from Watton, Driffield has been commended by one of Europe's largest manufacturers of agricultural machinery.

Robert, who is studying for an MEng in Off-Road Vehicle Design at Harper Adams University College, Shropshire has been awarded the prestigious CLAAS Scholarship for Agricultural Engineering.

Robert who is delighted to have been chosen as a CLAAS Scholar commented, "I am so pleased to have been awarded a scholarship from CLAAS who are such a recognised and well-respected manufacturer "

"I am very much looking forward to the opportunity to work for CLAAS in both the UK and Germany and gaining valuable practical experience."

CLAAS enjoys close links with Harper Adams University College and in order to gain the perfect balance between theoretical education and practical experience Harper Adams and CLAAS have introduced the scholarship programme.

Dr Peter Darkins, Senior Lecturer in Engineering said, "The CLAAS Scholarship is an excellent opportunity to work with one of the world leaders of agricultural engineering. CLAAS and Harper Adams have worked in collaboration and awarded this scholarship for several years."

He continues, "Robert is a very worthy Scholar and has shown that he has the ability and the enthusiasm to become a leader in his chosen profession."

As a recipient of the CLAAS Scholarship Robert will receive a bursary to assist his studies and will complete various work placements at CLAAS, including a 12 week placement in the UK and a 15 month sandwich-placement in Germany. Upon successful graduation Robert will go on to work for CLAAS.

L-R: Beate Kral (CLAAS Germany), Sylvia Looks (CLAAS Germany), Robert Fillingham (Winner), Jane Broomhall (CLAAS UK), Trevor Tyrrell (CLAAS UK), Dr Peter Darkins (Harper Adams Senior Lecturer, Engineering)

Professor Wynne Jones wins Farmers Club Award

PRINCIPAL of Harpers Adams University College, Professors Wynne Jones, has been named as the winner of The Farmers Club Cup on the recommendation of the Club Chairman and Committee to a person or organisation that has made an outstanding contribution to British agriculture.

Professor Jones joined Harpers Adams in 1988 as Vice-Principal and Director of Research, becoming Principla and Chief Executive in 1996.

As well as heading a college that employs some 400 people and has a turnover of more than £23 million, Professor Jones is involved with organisations across the agricutlrual spectrum including the Nuffield Farming Scholarships,Trust, LANTRA, BASIS, the Dairy Science Forum and the Trehane Trust.

He is a fellow of the Institution of Agricultural Engineers.

Richard Trevarthen steps down

Richard Trevarthen holding his picture of Brooksby Hall which was given to him from his friends and colleagues at Brooksby Melton College

LANDBASED Service Engineering lecturer Richard Trevarthen has retired from Brooksby Melton College after thirty eight years of working within the education sector.

Richard's colleagues and friends arranged a leaving party at Brooksby Hall where over one hundred and seventy five people attended.

Richard has also worked tirelessly with several important landbased organisations in developing the standards and national qualifications for service engineering. He has worked with City & Guilds, BAGMA, LANTRA, and the Institution of Agricultural Engineers.

PROFILE of Richard Trevarthen on page 8

LETTERS to the Editor

Campaign against bureaucracy!

Welcome to your new post. I trust you find the exercise rewarding and that Landwards continues to provide a valuable link and source of information for members of the IAgrE.

Landwards is, for many, the only direct tangible benefit they can obtain from membership of the Institution. Student members need to see it as a must read publication if we are to retain their loyalty when they no longer have the support of the Douglas Bomford Trust with regards to their subscription.

With regards to a different area, Landwards might campaign on that of governmental bureaucracy and its disinterest in our profession/industry and the expertise available within our members.

In recent weeks I have had lengthy conversations with agricultural engineers with extensive experience in design and manufacture (a fast diminishing industry), basic industry relevant research (who is doing it and who pays) and in flood control (an area of increasing concern to the nation).

This has been in part about their frustration with getting any response to letters and phone calls about matters of concern and areas where they feel they might have a vital contribution to these areas. "You need to talk to some one else, try X" is the best they can hope for. X is never the right person.

I wish you good luck and good hunting for worthwhile material for publication in Landwards. I look forward to 2008 and beyond with Landwards leading our thinking and providing pointers as to the future.

Geoffrey Wakeham
Member

Agricultural Engineering Research

WHILST I obviously share the concern of Geoff Wakeham (*Winter, 2007 Edition*) at the closure of Silsoe Research Institute, I must take issue with his alleged "despair of NIAE research long before it became SRI".

I can assure him that, in contrast, the Governing Body with representatives of the agricultural, horticultural and engineering industries as well as academia, were more than satisfied with the programmes and the progress.

A detailed record of the work and achievements is being prepared for publication in 2008 so I will limit myself to a few examples to prove the 'despair' to be misplaced. The NIAE/AFRC Engineering/SRI:

- Was acknowledged by the tractor industry to contribute in more ways to the machine's development than any other body.
- Developments in tillage led to the appearance of nine implements at a late 1980s Royal Show originated or improved by the Institute.
- Assembled a world class team in crop spraying with facilities and expertise still available at Wrest Park now.
- Developed mower-conditioner technology, licensed and employed worldwide.
- Evolved robotic milking equipment now licensed to and marketed by Alfa Laval.
- Were responsible for more than 100 patents held by British Technology Group.
- Earned approximately £2M from industry contracts in 1989/90.
- Won two Queens Awards for Innovation (how many organisations can boast two?), the McRobert Award (engineering's premier award), four RASE Research Medals (by individual staff members) and a 'special' RASE award for overall contribution to the industry.

For relative brevity, I have omitted crop drying and storage, waste engineering, horticulture, aquaculture and work for developing countries.

As to the future, it is almost unbelievable that the UK who, by common consent, used to lead agricultural engineering research in Europe, should now have no body to match the teams in the other EU major States. Surely, now it has to be up to the universities to fill the gap.

I would propose that IAgrE should sponsor a federation of relevant university departments to develop an increasingly integrated UK agricultural engineering/land-based technologies expertise. This would need to have close links with food processing, bio fuels (in my view the future of a substantial sector of agriculture) and aquaculture.

I would be happy to discuss these ideas with anyone interested.

John Matthews
Hon FIAgrE

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

Mr Motivator

IN December, Richard Trevarthen retired as senior lecturer in land-based engineering at Brooksby Melton College. Landwards editor CHRIS BIDDLE talked to him about his career and plans for the future

You can take issue with the ratios in Thomas Eddison's famous quotation about genius being '1% inspiration, 99% perspiration'.

There is no doubt that land-based service engineering students at Brooksby Melton College provide plenty of the latter - but the inspiration (and far more than 1%) comes from their lecturer, a blunt and humourous Cornishman who has lost none of the West Country burr despite being away from his home county for many years.

When we met, shortly before Christmas, the curtain was not only coming down on the Winter Term, but also on the Brooksby career of Richard Trevarthen, perhaps one of the best known and charismatic lecturers the land-based engineering industry has ever known.

Despite the obvious sadness of the occasion, none of it shows in Richard's manner or in his approach to the students.

Having reached 'a certain age' he is retiring from Brooksby, but whether retirement is fully on the agenda for Richard is extremely unlikely, nay doubtful.

When he retired at Christmas, Richard had clocked up 38 years at Brooksby, during which time he had helped elevate, not only the status of the College helping it become a Centre of Vocational Excellence in Service Engineering and Apprenticeships, but he had inspired hundreds of students to make land-based engineering a chosen career.

BY his own admission, Richard was not a model student at school, in fact he hated it - and left at 15 without any qualifications and no real idea what he wanted to do.

However, he did like messing about with machinery, and loved helping his dad's best mate, a farm machinery contractor, look after a much loved Fergie TE20.

That sparked something in the youngster, and he was offered an apprenticeship at the Hayle branch of local Massey Ferguson dealership, Farm Industries.

That entailed attending Cornwall Technical College but he wasn't immediately hooked. "First year of my course I thought it was a waste of time," he says.

"Then in Year Two something clicked, or rather someone clicked with me. A lecturer called Brian Farrow really fired me up. His sheer enthusiasm rubbed off on me and I began to really enjoy learning".

He emerged with a full City & Guilds 260 and 261 certificate, and then spent eight years at Farm Industries as an agricultural engineer.

But something had stirred in Richard Trevarthen, he discovered that he enjoyed the educational role. He could see himself in a job like Brian Farrow's, rather than a career mending machinery.

Probably because of his 'gift of the gab', he wanted to enthuse others, in a way that Brian had in his early career.

With no opportunity in Cornwall, Richard took a one year teacher training course at Wolverhampton - and towards the end of the course spotted an advert in the local paper for an opening in the Extra-Mural Department at Brooksby College.

"It was a fairly traditional agricultural college with a strong bias towards horticulture" he says "But it did offer a one-year Farm Secretarial Course, and as the 'new-boy' I got the job of teaching machinery to the girls".

In 1973, Richard was instrumental in pioneering a system of education and training that is now standard practice through the UK.

"We had 10 or 12 students at Brooksby on agricultural engineering courses, but they were coming in on day-release".

"That was simply not effective enough, there was no continuity in their education".

So, Richard introduced 'block-release' training, where apprentices came to the college for long spells, first in 24 weeks blocks, before returning to their dealerships.

"However," says Richard, "so they didn't lose touch, we encouraged them to go back on a Friday evening, then work in the dealership on a Saturday morning".

This quickly developed into a 3 year block release programme with each year group attending college for three four-week blocks a year.

It is a system that is now widely used in apprentice training throughout Europe and despite attempts to tinker around with it, is still essentially as it was set up by Richard at Brooksby. “If it ain’t broke, don’t fix it,” he says with a smile.

In the late 1980’s came an opportunity that was to develop in scale and influence over the next two decades.

John Deere and Brooksby Melton College developed a training programme to jointly train John Deere dealership apprentices throughout the UK. JD’s AgTech programme became an industry first, and was quickly followed by TurfTech and PartsTech courses, all of which are regarded as outstanding training models.

The JD AgTech programme won the National Training Award in 1998, the Beacon Award in 1999 and the EDGE Employer of the Year Award in 2002.

To date 11 JD apprentices have won the coveted City and Guild Medal for Excellence.

Since its inception, nearly 250 apprentices have graduated from the programmes.

“The key to its success,” says Richard, “is that we at Brooksby and Deere quickly got on the same wavelength. That’s what makes it work”.

The Government just cannot stop moving the goalposts

THE route to college for aspiring technicians is still paved with pitfalls according to Richard.

“Let’s face it, tractors and mowers are not the first thing on the mind of careers officers,” he says. “We still have a fairly limited route into the industry”.

“I guess that 45% of our students still come from a rural background. perhaps 30% have received some kind of work experience with a dealer whilst at school - whilst the rest ‘just love tractors.”

“We have been successful at Brooksby by organising school ‘taster courses’ where young people can experience at first hand the opportunities we offer”.

An important part of the course is the induction day which Richard instigated a few years ago. As soon as the apprentice starts employment, it is expected that he or she, together with parents and the dealership service manager, attend the college for a day to be introduced to the college and the course

“You have to get everyone on board” says Richard.

“What you don’t want is a high drop-out, which is why for this industry if we have a keen student, it is best that after they leave school in May they go to work for a dealer for the harvest period.”

“‘Scuse the pun, but we need to sort the wheat from the chaff. If they still join us after experiencing one of the busiest times of the year, then there is less likelihood of them dropping out.”

Richard is refreshingly honest about the lack of key-skills amongst many school-leavers these days.

“We get youngsters who look blank when you talk about percentages or ratios”.

“Even simple adding up proves difficult. To improve mental arithmetic, my answer would be to put a dartboard in the classroom - health and safety permitting!”

The ‘politics’ of education is something that Richard is unlikely to miss. “The Government just can’t stop moving the goalposts,” he’ll say.

But for all that, Richard is enthused with the industry he has served so well over many years - and the people who work in it.

“Over my time, more than 700 apprentices have qualified from Brooksby. It’s a fabulous career for anyone.”

“I’ve been blessed with so many brilliant and talented students at Brooksby over the years , many of whom keep in touch- as well as working with great people both at Brooksby and John Deere.

Even in the last few days of his time at Brooksby, Richard was treated with touching reverence and respect. - and you have the feeling that after a short break to re-charge his batteries, that he’ll find another niche or two within the industry.

And that his difficulty will be saying no!

In familiar territory in the well-equipped workshop at Brooksby Melton College December 2007

LIFELINE

RICHARD TREVARTHEN

- Brought up in Cornwall, but left school at 15 without any qualifications
- Apprenticeship at Farm Industries branch at Hayle
- Attended Cornwall College where he gained City & Guilds
- Worked as a technician at Farm Industries for 8 years.
- Gained teacher training qualification at Wolverhampton College
- Joined Brooksby College in 1970
- Started block release courses in 1973
- Appointed Head of Engineering at Brooksby
- Set up AgTech and TurfTech courses in partnership with John Deere in 1991
- Brooksby won UK Skills competition in 1989
- Won STAR Award from Learning and Skills Development Agency in 2004
- 2005 gained City & Guilds Graduateship Award for Engineering
- Richard awarded Highly Commended City & Guilds Medal for Excellence for the delivery of quality training in 2006
- 12 Brooksby apprentices have won City and Guild Medals of Excellence
- Richard is member of IAgrE at Incorporated Engineer status

digger for victory

Autoguide played a key role in the construction of Legoland Windsor's latest hit attraction.

RACHAEL PORTER reports

IT's not every day that an engineering firm is called upon to ensure that children - and grown ups - gasp with delight when they see a theme park ride.

Yet that's exactly what Wiltshire-based Autoguide was asked to do when it was contracted by Greenshields JCB to play a key role in the building of Legoland Windsor's '*Digger Challenge*' ride. This is the newest attraction at the Windsor-based park, meeting the eager anticipation of would-be digger drivers.

Everyone working on the project has exceeded Legoland Windsor's expectations and it has turned into one of the most popular rides at the park.

The idea behind the ride was to develop an attraction that fitted in with the whole 'interaction' ethos of the park, according to Legoland's facilities director Keith Johnson.

The Digger Challenge, sponsored by JCB, comprises of 10 self-contained digger units, arranged in a circle and facing outwards, which also makes it an attraction for spectators, he says.

The challenge is to scoop as many bucket loads of black and grey play pit balls into a hopper. The digger with the heaviest load at the end of the three-minute session is the winner.

Keith Johnson and his colleagues had taken a close look at other theme parks, including Diggerland in Kent, and believed that they could produce a ride that was much more suited to children and one that represented exactly what Legoland is about - 'building imaginations'.

"The idea for a Digger Challenge was very much ours. It spent a year on the drawing board and we wanted it to meet a wide range of criteria and, most importantly, children from the age of five up must be able to operate it."

"We had something that was static, safe, entertaining - and 'real' in mind and we wanted to give visitors the chance to see what it was like to operate a real JCB digger," adds Keith.

He contacted Greenshields JCB's business development manager Andy Moore, who was just as enthusiastic. "We got the call and said yes straight way - it was something that we'd discussed with other people so I knew that the company would want to do it," says Andy.

LEGOLAND already had some plans drawn up and the basic principles and aesthet-

The Digger Challenge being played and LEFT a promotional poster for the attraction

> “One of our objectives was to make the ride as realistic as possible, so all controls work exactly as they do on a real digger”

Richard Robinson, Managing Director, Autoguide

ics stayed the same. “But the engineering changed a lot,” explains Andy, adding that his role was very much to broker the deal and then hand the project over to Autoguide.

The capital cost of the ride was met by Legoland - the equipment that it wanted was far from the norm, although it does represent a standard JCB machine.

Autoguide developed the modifications and Greenshields JCB supplied the base components that make up a ‘normal’ JCB.

“A lot of time went into the project and we picked up some of that cost because the budget was tight, the ride certainly serves to boost our company profile,” adds Andy.

“The diggers were supplied in kit form by Greenshields JCB within a week of our order,” says Autoguide’s managing director Richard Robinson. It was then that project manager Robert Robinson - Richard’s son - and his team could finally get on and make the modifications required to build the ride.

“One of our main objectives was to make the ride as realistic as possible, so all controls work exactly as they do on a real digger. The controls mimic that of a games console - as do the JCB controls - and this fits with a child’s psyche.”

“And to minimise noise pollution the ride runs off a central hydraulic system. With all the diesel engines removed, the diggers run on 10 electric motors. These drive 30 hydraulic pumps that operate the digger units. About four kilometres of hydraulic hose was used to construct the entire ride,” explains Richard.

“The park has a ‘good neighbour’ policy and does everything it can to keep noise levels as low as possible for local residents,” says Keith.

“If we get another chance to build a similar ride, I think that it may be interesting to have a speaker near to the operator with engine noise related to hydraulic system pressure - just to make the experience a little more real,” adds Richard.

There’s a pump house that contains all the high voltage switch gear. Outside that, all electrical services (including the power for the unit used by guests with disabilities) operate at 24 volts, including the control cabin.

In addition to the standard JCB valves each digger has 14 extra valves to control the bucket movement and self-park sequence.

“We have only had four significant problems since its construction, which have all been picked up and quickly rectified,” explains Richard.

“The first was that we found that one type of valve worked much better in one particular orientation. This was easily fixed, once we understood what was happening.”

Another problem was that the warning lights on the diggers were not properly waterproofed. Richard also discovered that the very long sections of hydraulic hose ‘walk up’ the pipe ducts. “Rather like a worm in the ground - we didn’t expect that,” says Richard.

“And we’ve also found that in hot weather the auto-lube pushes out too much grease - you don’t often find an excavator suffering from excessive lubrication.”

ENSURING that people could get to grips with the ride was just as important as the ride itself, to avoid them leaving frustrated and disheartened.

And Ben Robinson, Richard’s son and a super yacht designer, produced the animated *Digger Dug* visuals and the short instructional video that visitors watch before they take their turn on the ride.

“Getting this right was vital to the ride’s execution. We soon realised that it was no good having a great concept if people can’t get it to work for them,” says Keith

“We looked at a lot of options and this proved to be the best way to teach 20 guests how to use the diggers in just three minutes,” he adds.

Autoguide’s expertise really came to the fore when it was asked, with help from Greenshields JCB, to design and develop a unit for wheelchair-users.

Between them they came up with a solution - a platform situated at the end of one digger with a hydraulic lift and control arch. Once the chair is in place the people can operate the digger themselves.

“The design is particularly clever as it means that they can remain in their own chair, unless it is very large. A carer or assistant can help them to match the experience of other guests,” says Richard, adding that the funds for this unit came mainly from Greenshields JCB and Autoguide.

Despite the complexity and problem solving, in just two short months and two days ahead of schedule, Autoguide completed the ride. “Although we did have to return to rectify a builder’s error the following day,” says Richard, modestly.

Nevertheless, completing ahead of schedule was no mean feat.

“We were given the order on January 7, 2006, and Legoland said that it wanted the ride up and running by March 9, 2006, and fully operational by March 15,” says Andy.

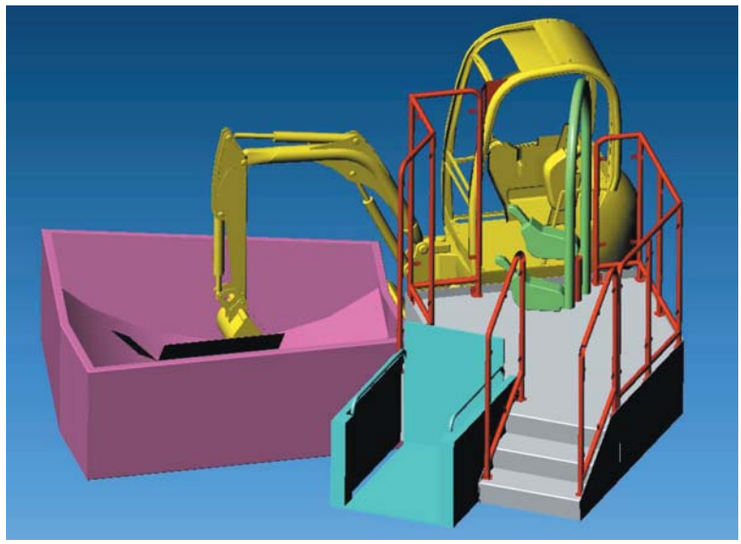
“I still think that it’s amazing that we managed to meet the deadline - in fact we beat it by two days. On more than one occasion I honestly didn’t think we’d do it.”

“There was a lot of heartache. We got hold of the basic equipment early, which helped, and a whole series of events seemed to come together at the right time and Autoguide and the other contractors involved in the project were very committed and proactive in terms of their time,” he adds.

“It was a major project and everyone understood that and got behind it 110%.”

Not only was it ready in time for the new season, but Legolands new main feature ride for 2006 has also proved to be one of the most reliable rides it has ever had.

“It has the lowest downtime of any of the park’s rides,” says Greenshields JCB’s business



Computer design for the Wheelchair Access Platform

development manager Andy Moore, a fact confirmed by Legoland's Keith Johnson.

"Downtime is about 0.16 of 1% - fantastic when you consider that the target was 2%. Everything is so much better than we expected and we're very pleased."

And, as it turned out, it is also one of its most popular rides in the Windsor-based park's history.

"Feedback from Legoland is that the ride is fantastic. They are truly delighted with the end result, so much so that there's talk of building similar rides at the Legoland parks in Denmark and Germany," says Andy.

The ride runs on a three-minute cycle and has a through rate of between 250 and 280 guests per hour. And it attracts boys and girls, as well as mums and dads. "It's far more popular than we ever imagined. We're delighted with the ride. Autoguide did a fabulous job with the engineering," adds Keith.

So popular is the ride that some annual pass holders have started an unofficial league table to see how many balls they can scoop into the weighing pit. "We think that twelve scoops is the highest possible number and that's what the fanatics are aiming for and hoping to beat."

Keith explains that many theme park rides are ordered from the industry's equivalent to an Argos catalogue. "But this ride has never been made before - it's completely unique and bespoke."

And if its success is anything to go by it may well prove to be the first of many such rides to be built by Autoguide and all the other companies and organisations involved in its conception, design and construction.

"It was certainly a break from the norm and it did provide us with a challenge, but it was one we rose to and - dare I say - we very much enjoyed working on the project too," adds Richard.

Other contractors and people involved in the project included:

- **JAMM Architects**, who were he lead architects;
- **Faithful & Gould**, quantity surveyors;
- **BWB Consulting**, who produced all the structural drawings and acted as planning supervisor;
- **RJ Associates**, who ensured that the ride complied with the relevant health and safety legislation;
- **Dyer and Butler**, who transformed the site to what visitors see today;
- **DES**, an electrical company;
- **DMX**, who took charge of the audio visuals;
- **Astley Signs**, who designed and supplied the signage; and
- **Neil Baker**, who is Legoland Windsor's head of projects and worked closely with all the contractors and professionals.

Minister visits Barony's pilot intensive forest machinery training course

A UNIQUE eight week pilot intensive forest machine operator training course has been successfully completed at Barony College, near Dumfries.

The intensive 'hands-on' course was devised by the College and several partners, including the UK Forest Products Association (UKFPA) and John Deere Forestry Ltd in response to increasing industry concerns about the acute shortage of skilled forest machine operators.

The unique pilot course commenced in June 2007 and members of the UKFPA Harvesting & Contracting Committee monitored progress of the course throughout.

The course, which was also supported by Scottish Enterprise, the Rural Development Initiatives EU-funded Forstart HI programme and Forestry Commission Scotland, who provided a harvesting site in the Forest of Ae, gave four contractor nominated trainees the opportunity to improve their skills in forest machine operation and also attain Forest Machine Operator Certification for both harvester and forwarder operations.

During the course, the College was visited by Michael Russell MSP, the Scottish Government's Minister for Environment.

Michael Russell MSP

The Minister spent time with FMO course students and staff and familiarised himself with a forwarder simulator at the Scottish Forestry Industries Technology Centre.

Russell Marchant, College Principal said, "The Minister was impressed with what he saw and learnt about the collaborative partnership which had resulted in the innovative project".

David Sulman MIAgrE, Executive Director of UKFPA said, "This is another success story and we congratulate everyone who has been involved in the development and delivery of the pilot course."

"We are extremely grateful to the various companies and other organisations that have generously supported the course, with both cash and in-kind contributions, without which the course would not have come to fruition."

"We are now discussing with partners how the course can become a regular feature at Barony College. The success of the pilot course is a consequence of the commitment and determination of the project partners and is a great example of the benefits of partnership working".

The four trainees on the pilot FMO course and who attained Forest Machine Operator Certification for both harvester and forwarder operations were; Alistair Dick, Dick Brothers Timber Harvesting, Alex Oleyik, Treetop Forestry, Andrew Young, Elliot Henderson Timber Harvesting and Marcus Van Stone, Harvwest Ltd.

Extreme weather represents increasingly serious social and economic risks

Cranfield University launches extreme weather 'toolkit'

CRANFIELD University has launched a major new research programme designed to help businesses and policymakers meet the challenges posed by increasingly frequent extreme weather conditions.

The £1.6m Community Resilience to Extreme Weather (CREW) initiative is to be funded by the Engineering and Physical Sciences Research Council and will aim to develop a toolkit to help firms and public sector bodies improve resilience to extreme weather events such as floods, heat waves and storms, that are expected to become more frequent as a result of climate change.

The project, which is inviting contributions from businesses and other end users of the toolkit, will bring together researchers from 14 universities and will focus on modelling extreme weather scenarios and devising strategies for limiting the associated costs and business risks.

Initially the project is to focus on the impact on London of the increased likelihood of heat waves, drought, storms and subsidence between 2010 and 2080 and will model a wide range of economic and social impacts, including possible effects on unemployment, house prices and crime.

It will also assess how the uptake of coping measures, such as household flood defenses and building cooling systems, can be best implemented.

Dr. Gavin Wood, from the Natural Resources Department at Cranfield University, said that in the wake of last summer's floods in the UK there was a growing realisation that extreme weather events represent an increasingly serious social and economic risk.

He said that the project would look at a wide variety of potential risk mitigation strategies, ranging from "adapting social norms, such as taking siestas if Britain gets warmer, to full-blown engineering solutions like redesigning whole cities".

The university said that resources developed by the project would be made available online and urged interested parties to contribute to the research.

Flooded soils 'low risk to human health'

THE initial soil analysis results from the Cranfield University Flooded Pitches Survey – funded by the Institute of Groundsmanship's (IOG) 2012 Fund, revealed that the affected sports pitches exhibited a low risk to human health.

Following the floods in July 2007, a number of sites were surveyed -


Flooding at Worcester Cricket Club July 2007

Worcester County Cricket Club, Stratford Cricket Club, Evesham Cricket Club, Bowls Club and Rugby Union Club, and Minster Lovell Cricket Club – where the scale of the problem extended from flood water depths of one to three metres and flood water residencies of seven to 31 days.

Groundstaff at these sites were consulted to determine the flood pathway, the sources of the flood, the extent of the flooding and the mitigation measures taken, and a total of 26 samples of sediments and soils were taken for full contamination land analysis at a contract laboratory. The analysis revealed:

- Sediments did not contain concentrations of heavy metals that are thought to be hazardous to human or plant health;
- Compared to unaffected sites, the tests showed higher concentrations of petroleum hydrocarbons - probably sourced from roads, cars and other machinery, but not thought high enough to cause harm;
- E.coli was identified at a number of sites – indicating the presence of faeces – of human or animal origin;
- Salmonella spp were identified at two sites – a direct risk to human health if ingested.

In addition, the study also recommended that the 'clean up' process should be carried out in line with appropriate health and safety procedures.

A second survey – in Spring 2008 – will revisit all sites to assess whether the contaminants have persisted, though the working hypothesis is that they will not.

Iain James, Cranfield's Lecturer in Sports Surface Engineering, commented, "The clubs were obviously very concerned and needed to determine if there was any potential risk to their groundstaff in terms of the clear-up process and the disposal of the debris, and whether the surface was safe for players."

"This problem has not been investigated before in terms of sports pitches, so we immediately launched the Flood Damaged Pitches Study – and with the substantial financial backing from the IOG we were able to quickly help these grounds professionals."

"Research such as this, where the aim is to offer ground staff accurate help and advice, and to ensure their well-being and a safe playing surface, is central to the aims of the IOG."

As a result of these initial findings, Cranfield has produced an advice sheet – available online at:

http://www.cranfield.ac.uk/sas/pdf/cranfieldfloodsedimentsheet2.pdf

THE Most Warming Time ahead for Agricultural Engineers

*As political awareness of global warming speeds up, the answer lies in the soil, says **BILL BUTTERWORTH,** and agricultural engineers will play a major part in delivering solutions*

BELIEVE it or not probably more than 90% of agricultural engineers who have ever been trained are still alive. That means that the pace of change, enough of a rollercoaster in the last 100 years, will dramatically speed up as the political awareness of global warming takes a grip.

The reason is simple: PCCS in soils and biofuel production is necessarily the only global solution and it will be agricultural engineers who will organise delivery.

PCCS and Bio-fuel Production

Sustainability, productivity and significant reversal of global warming are now real possibilities with technology which is not new, is proven and is sitting right under our noses.

Photosynthetic Carbon Capture and Storage in Soils, coupled to biofuel production from energy crops fertilised with compost made from 'wastes' is the key to real sustainability and reversal to global warming.

There are three figures which are of interest in this discussion and are fundamental to the contribution agriculture may make to sustainability, fuel security and the cost base of recycling.

1. Carbon in "wastes".

In a report for the DTI, back in the mid 1990's, I discussed with Professor Lyne Frostick wastes which could go to land (farming, forestry, horticulture).

We thought that around 100 million tonnes pa (she actually thought "a little more than that").

At that figure, the dry matter content would be over 50 % and the nature of the molecules would give an elemental proportion of over 50 % of that to Carbon. So, the carbon content of that waste would be likely to be in excess of 30 million tonnes pa.

Taking Carbon dioxide and the atomic weights of Carbon and Oxygen, it naturally follows that 12 tonnes of Carbon would, if incinerated, produce 28 tonnes of Carbon dioxide.

So, 30 million tonnes of Carbon would yield 70 million tonnes of Carbon dioxide - nearly 10 % of the UK total production. By the way, it is not just that burning fuels puts Carbon dioxide into the atmosphere, the 'dioxide' has to come from somewhere. Note the following equation which involves burning one of the large hydrocarbons in petrol;

$$C_{36}H_{74} + 54O_2 \longrightarrow 36\,CO_2 + 37\,H_2O$$

and, therefore, in tonnes of each

506 plus 864 gives 1008 plus 370

This clearly produces enormous amounts of Carbon dioxide and consumes enormous quantities of Oxygen. People forget that if we produce Carbon dioxide, as we do when we burn anything, we consume Oxygen and take it out of the atmosphere. We might, not long off in geological terms, find that a bit difficult and so might a number of other species of animal.

2. Biofuels from crops from wastes.

Biofuels from crops which are grown using mineral fertilisers (where the Nitrogen fertiliser is made with electricity) really do not stack up when looking at environmental energy equations.

However, if the crops are grown from fertilisers made from 'wastes' which need to be recycled, then the equations become dramatically attractive. Provided, that is, the proximity principle is remembered.

3. Bio-fuels and the soil as a Carbon sink.

Bill Butterworth is an agricultural scientist working internationally with recycling. He is also Principal Consultant to Land Network the UK farmers consortium recycling wastes to land.
www.landnetwork.co.uk

> “They have stopped making **land** and when the politicians realise it, they will need agricultural experience”

(i) 1 tonne of oil seed rape seed (osr) will yield around 880 kg of biofuel, depending on various factors.

(ii) One ha of osr would generally yield around 3 tonnes, maybe a little more, of seed or 1000 kg of bio-diesel.

(iii) Now, this ha of crop, giving around 1000 kg of fuel will also produce 2.0 tonnes of seed waste, 5 tonnes of dry matter above the ground, and maybe 9 tonnes dm below the ground, i.e. a total of around 18 tonnes dm per ha. That will contain about 12 tonnes of Carbon and that will have taken 28 tonnes of Carbon dioxide out of the atmosphere before the fuel returns significantly less than that back.

(iv) If the Nitrogen plant food required to grow that crop was provided by composting "wastes", then there is a further amount of Carbon which will be locked up in the soil. This will bring the total Carbon lock-up to around 40 tonnes of Carbon dioxide removed from the atmosphere per ha, pa.

Locking up the Carbon in a Soil Sink

(i) Crops harvest sunlight and produce significant lock-up potential.

(ii) Cultivations oxidise the Carbon compounds in the soil. Zero Tillage (usually called "Direct Drilling" in the UK) does work and does reduce oxidation. It also increases Nitrous oxide production. However, overall, there is a major reduction in greenhouse gas production.

(iii) The system could probably lock up the Carbon in the soil sink releasing as little as 10 %, maximum under UK conditions maybe 35 %, with a typical release probably around 20 %, per annum as Carbon dioxide.

REVERSING GLOBAL WARMING

ARE the above figures accurate? No, they are a significant over-simplification. Also, quite important factors of re-emission are completely left out

However, they also leave out the Carbon dioxide saved by not burning fossilised fuels to produce electricity to make the Nitrogen fertiliser and, therefore, they are indicative of very significant savings in greenhouse gas production.

They do raise the wider ability of plants to take Carbon out of the atmosphere and point to practical ways of doing it.

What they do do is point out that is the Carboniferous Era was a natural event and we could mimic it provided we observe the complexities and flexibility of the biological world and exploit the opportunity now available in "wastes".

(i) There is a lot of waste produced by human activity.

(ii) Recycling to land, to crops, to bio-fuels is inescapably attractive.

(iii) Not squandering the advantage by operating locally is fundamentally important.

(iv) Yes, we can conceive of reversal. Maybe not completely but make a big hole in it.

What we need is;

(i) Understanding and active enablement (based on technical knowledge) from government and the regulators.

(ii) Recognition of the skills and responsibility which exist in farming and in the wider bio-fuel industry, plus the organised use of those skills to work with government to deliver in sensible time frames.

(iii) Different Standards to be used in the definition of "recovery" of wastes used to produce composts and fertilisers for a range of uses including for food crops, for horticultural crops, for forestry and for production of bio-fuels.

Do these things and the farming industry will deliver.

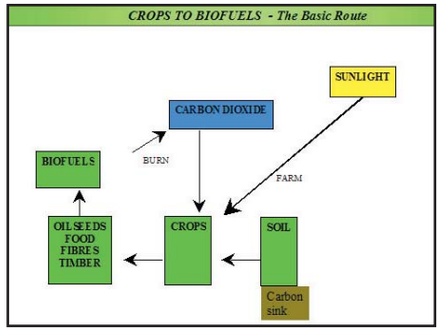


Fig.1. Farmers harvest sunlight but it has been done before. Photosynthetic Carbon Capture and Storage was invented in the Carboniferous Era, some 360 million years ago. Note the Carbon sink in the soil and the size f the blue box.

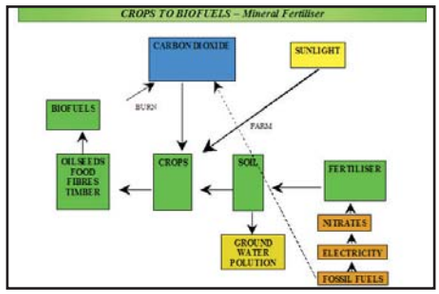


Fig. 2. Mineral Nitrogen fertiliser is made by passing air through a large electric arc. The electricity is probably made by burning fossilised fuel. Note the size of the blue box.

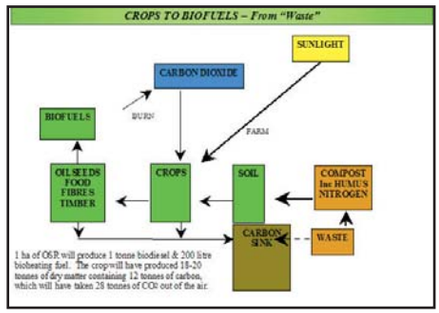


Fig 3. When crops are fertilised with compost made from "wastes", there is no need to burn fossilised fuels to make Nitrogen fertiliser (note the size of the blue box) and there is a double benefit in reducing Carbon dioxide emissions (note the size of the Carbon sink box).

So where is the challenge?

Where is the biggest challenge?

Well, we have not seen the detail but almost all, no - all, we have ultimately come from the land wand will have to go back there.

It is only the agricultural engineer who will be able to see how the technologies tie together in agricultural systems where logistics and proximity operations will fundamentally influence where the economics stack up.

There is one other thing, the trump card; LAND.

They have stopped making it and when the politicians realise it, they will need agricultural experience.

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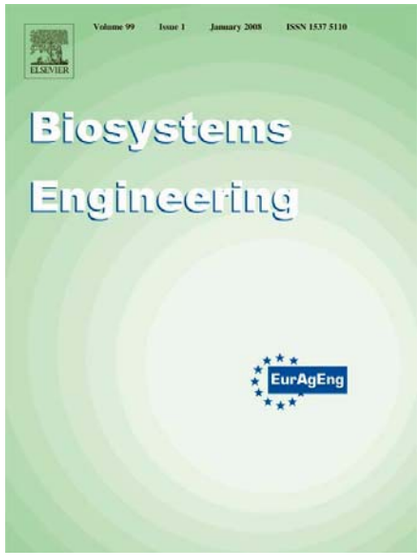

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The Managing Editor of ***Biosystems Engineering, Dr Steve Parkin,*** has kindly summarised some of the papers published in the last four issues which he thinks may be of interest to **IAgrE** members.

Biosystems Engineering
Volume 99, Issue 1, January 2008, Pages 47-55
Research Paper: PM—Power and Machinery

Cruise control on a combine harvester using model-based predictive control

T. Coen' , W. Saeys, B. Missotten and J. De Baerdemaeker
Faculty of Bioscience Engineering, K.U. Leuven, Kasteelpark Arenberg 30, B-3001 Leuven, Belgium
CNH Belgium N.V. — R&D Crop Harvesting, Leon Claeysstraat 3A, B-8210 Zedelgem, Belgium

To comply with the new standards for noise and emissions combines should be operated with the diesel engine speed as low as possible. A nonlinear model of the propulsion system was used to develop a model-based predictive controller (MPC) for a cruise control. This was field tested on a New Holland combine harvester. Experiments showed that the engine speed can be minimised without losing acceleration performance compared to a standard cruise control system.

Volume 98, Issue 4, December 2007, Pages 391-400
Research Paper: PH—Postharvest Technology

Agricultural supply system traceability, Part I: Role of packing procedures and effects of fruit mixing.

A.F. Bollen, C.P. Riden and N.R. Cox
Supply Chain Systems Group, Lincoln Ventures Ltd., Private Bag 3062, Hamilton, New Zealand
AgResearch Ltd., Private Bag 3123, Hamilton, New Zealand

Traceability is becoming an integral component of modern agricultural supply chains. Higher-precision traceability and finer identification of the product offer the opportunity to improve feedback to producers. A mixing model has been developed that can assign probabilities to the origin of individual fruit at the point they are packed into their final packs. The research suggests there is potential to implement high-precision traceability and identification in the agricultural supply system.

Volume 98, Issue 3, November 2007, Pages 347-363
Research Paper: SE—Structures and Environment

Simulation of the effect of windbreaks on odour dispersion.

X.-J. Lin, S. Barrington, D. Choinière and S. Prasher
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To help disperse odours from livestock buildings using natural windbreaks, computational fluid dynamic (CFD) models can be used to define best management practices. A model was used to simulate odour dispersion downwind from natural windbreaks and to test the effect of tree characteristics. A tall and dense natural windbreak, located no more than 15 m downwind from the odour source, minimised the extent of the odour plume, but increased the intensity of the odour immediately downwind from its source.

Twenty years ago, those farmers embracing the embryonic 'farm conservation' movement took pioneering moves towards sympathetic hedge management and the establishment of field margin buffer strips. Then time grant funded schemes such as Countryside Stewardship and the Environmentally Sensitive Area Scheme brought the benefits of conservation management to a wider audience. **FWAG Suffolk Team Leader Tim Scholfield** looks at how times have changed.

Sustainable farming practices

TWENTY years ago those farmers embracing the then embryonic 'farm conservation' movement took pioneering moves towards sympathetic hedge management and the establishment of field margin buffer strips.

There then followed an intense period of scrutiny, during which time grant funded schemes such as Countryside Stewardship and the Environmentally Sensitive Area Scheme brought the potential benefits of conservation management to a wider audience.

How times have changed.

The introduction of the Entry Level Scheme has seen basic conservation measures established across a large percentage of farm holdings. But the farming industry is being encouraged to aim higher - sustainability is the target. Increasingly, customers want to be assured that anything leaving a farm has been produced 'sustainably'.

However, the more a word is used and accepted, the greater the risk of mis-interpretation. Using the words sustainable and agriculture in the same sentence present a huge potential for confusion, depending on your individual viewpoint.

Sustainable agriculture can be described as the ability of a farm to produce food indefinitely without causing irreversible damage to environmental or ecosystem health. In achieving sustainability, many individual strands can be teased out as important.

For the sake of clarity the two main strands can be identified as biophysical and socio-economic. From a biophysical point of view, sustainability needs to embrace the long-term effects of crop production upon soil properties and the processes essential to crop production.

In examining socio-economic factors, agriculture needs to determine the long-term ability of holdings to obtain inputs and manage resources such as labour.

This all sounds fairly remote from the mechanics of everyday farming but it is becoming increasingly clear that a sustainable form of agriculture can bring econom-

ic, environmental and social benefits to farmers, communities and even nations.

So where do you start?

Soil is as good a place as any, in fact, soil health can be seen as the cornerstone of sustainability. Soil invertebrate communities need to be maintained as the ground floor to the food chain.

Little else can function in the absence of a healthy invertebrate population and in situations of poor soil conditions, useful natural predators can be lost.

The presence of soil bacteria can give an indication as to the relative health of soils; really healthy soils can support as many as 600 million bacteria per gramme, while poorer examples can drop to 100 million bacteria per gramme.

Any examination of individual farm soil health needs to take into account the prevalent cultivation requirements.

Where soil conditions and cropping allow, conservation tillage can provide soil health benefits in comparison with plough based systems. There are clear benefits in the potential reduction of run-off and soil-erosion, non-inversion tillage is known to increase the soil organic carbon content of the surface layer and there can be a measurable increase in biomass production.

There are, of course, situations in which soil type and crop requirements necessitate ploughing. In such situations, non-inversion systems become, by nature of the problems they pose, non-sustainable.

There is a sobering parallel to draw regarding sustainable soil management as much effort is directed towards producing a marketable product free from blemishes.

De-stoning and painstakingly careful harvesting have become part of a regime aimed at meeting the high expectations of consumers.

As an industry, we may have to emphasise the fact that field produce does not grow uniformly and accepting some variation in size and physical appearance might allow the grower to deliver further sustainability benefits in return.

While soil health can de described as the corner stone of sustainability, clearly it does not complete the picture.

There are a number of pathways to achieving full sustainability and a piece by piece approach may be preferable, given the constraints on time, labour and cropping.

For example, introducing a more extensive hedge management regime by trimming on a three-year rotation can build up populations of over wintering invertebrates. Some beneficial insects spend the winter tucked into the forks towards the ends of branches, particularly upon hawthorn.

Creating tussocky field margins against extensively managed hedges can provide further valuable over wintering habitat. Dense tussocks of grasses such as cocksfoot offer a relative micro-climate at their base

As an industry, we may have to emphasise the fact that field produce does not grow uniformly and accepting some variation in size and physical appearance might allow the grower to deliver further sustainability benefits in return.

and beneficial species such as ladybird and lacewing are able to spend the winter in safety.

The invertebrate interest is only part of the picture. Uncut grass can allow small mammal numbers to increase, thus providing prey for raptors and owls.

Maintaining populations of farmland birds is of national importance and well managed margins, even within the most intensively managed field, can contribute towards sustaining many of our key species.

Although some of our key farmland species, such as corn and reed bunting are predominantly granivorous as adults, they need to find sufficient invertebrate prey to ensure the survival of fledglings.

Sawflies and their larvae can provide much of this invertebrate matter, one sawfly larvae being equivalent to 20 aphids to a hungry chick.

Sawflies particularly favour softer grasses and spring sown crops, and in areas dominated by winter sowings, the annually trimmed sections of 6 metre margins can provide the softer growth.

It is possible to view margins, field corners and bird covers as 'quick fixes' in taking a sustainable approach, but one cannot ignore the positive visual impact and improved public relations issue. More increasingly, breakthroughs in plant breeding are offering hard re-enforcement to the rather obvious measures detailed above.

The introduction of wheat varieties that offer tolerance to Orange wheat blossom midge must be having a positive effect on invertebrate survival within arable fields.

Many growers have felt uneasy regarding the application of summer insecticides, tolerant varieties provide a valuable piece in the sustainability jigsaw.

In central Suffolk, there has been a visible increase in the number of reed bunting and yellow wagtail seen feeding within large blocks of cereals.

Cereals are not the only crop to be considered as the increasing use of shorter strawed oilseed rape varieties is also adding weight to the sustainability story.

The trend towards desiccating or direct combining crops results in crops standing in situ for around ten days extra compared to swathing. This relatively simple change in management can greatly benefit birds that choose to nest in oilseed rape crops - those ten days could make a huge difference to fledgling success.

Putting it in to action

The idea of putting all these ideas into practice can be daunting, but it is worth taking note of the experiences of those who have already committed time and effort to improving overall sustainability.

The Helmingham Estate lies north of Ipswich and comprises of 900 Ha of arable, woodland and parkland. The arable rotation includes cereals, pulses and oilseeds. A

"Is there another way?" has been the Estate's catalyst to bringing about change.

decision was made 7 years ago to switch to a non-inversion system and the Estate has current Entry and Higher Level Stewardship agreements. Estate manager, Glen Buckingham has healthy soils at the forefront of his approach and taking a long-term view on stewardship of the land has emphasised the value of management plans, particularly regarding soil.

At the outset, Glen questioned the ability of the soils to withstand excessive cultivations and still maintain control over issues such as diffuse pollution.

Examining whether a particular market demands management that growers do not feel comfortable with is a purist approach, but it brings with it an exploration of alternative markets, crops and techniques.

"Is there another way?" has been the Estate's catalyst to bringing about change.

Glen observes that many world crops are established without the use of a mouldboard plough and in fact we inherited ploughing in this country from a pre-chemical farming age.

Seven years on, some key points are reenforced by experience as non-inversion methods do encourage the build-up or organic material, retaining root mats and allowing worms to develop a natural structure.

It is also worth bearing in mind that compaction damage takes time and money to remove successfully. One further positive sustainability aspect is a significant reduction in overall fuel usage per hectare. Clearly such changes can only be made in the light of potential complexities regarding soil type.

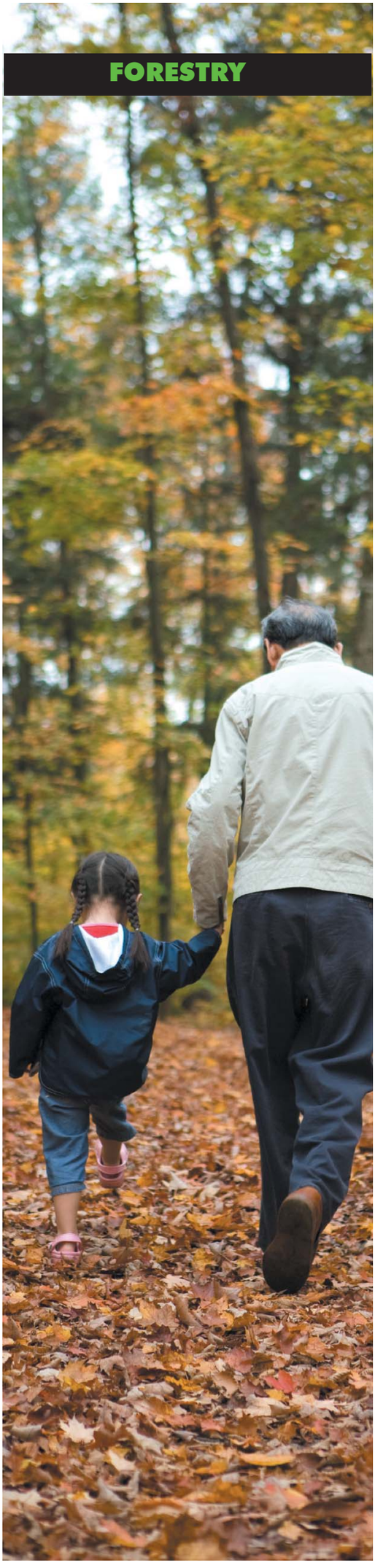
Environmental Stewardship options under management at Helmingham include florally enhanced buffer strips, field corners, wild bird mixtures and extensive grassland and hedgerow management.

Undoubtedly the less frequently trimmed hedges and larger field corners hold the greatest diversity of wildlife and Glen is in the process of instigating a recording scheme which should allow interesting comparisons to be made in years to come.

The widespread uptake of the management plan options within the Entry Level Stewardship Scheme, together with initiatives such as Catchment Sensitive Farming have really focused growers minds on what, when and why operations are carried out.

There have been some pleasant surprises, some practices have been routine for many years, we just hadn't written them down, or realised how central they were to the sustainability story.

Article reprinted by kind permission of FWAG from a recent issue of *Farming & Wildlife* magazine



Woodlands give great pleasure, particularly when carpeted with wild flowers in Spring and early Summer. JIM CHRISTIE describes how a woodland can be created on agricultural pasture land using a deep ploughing technique

Total inversion

of woodland establishment practice

ONE of the Woodland Trust's objectives is to create 'natural woodlands.' Since this is something of a contradiction in terms for if a woodland is created it cannot be natural, the Trust concentrates on that which is achievable, and aim to create woodlands that give visitors the same pleasure as does natural woodland.

Can we have flowers as well as trees?

IT is clear that many visitors particularly enjoy their visits to the Woodland Trust's woods in spring and early summer thanks to the carpet of wildflowers that appear in real natural woodlands and so the Trust, having mastered the tree-planting aspect of creating 'natural' woodlands, have turned to creating 'natural' woodlands with flowers.

One such site where this objective is being carried out lies in an area known locally as 'Geordie's Wood' on the Ochil Hills near the village of Muckart.

The work is being paid for through a grant from the Biodiversity Action Grants Scheme (BAGS) funded by Scottish Natural Heritage, the Scottish Forestry Alliance and the Scottish Executive.

Trees and Flowers - how?

IF a flower carpeted woodland is to be created on what was previously agricultural pasture land that has lain un-ploughed for perhaps as much as one hundred years, then establishing trees is not a problem in that a mounding preparation followed by hand planting is a well tried and tested method, and easily done on this type of terrain.

However, the addition of wildflower seeds into the package makes the approach more complicated.

Two apparently obvious options are as follows. Blanket cultivate the site, broadcast the flower seed then plant the trees.

Alternatively, mound and plant the trees straight onto the pasture prior to cultivating strips between the mounds with pedestrian controlled cultivators, then broadcast the strips with the wildflower seed.

Accepted wisdom is that both these options will result in the trees growing well but due to the fertility of the soil the common agricultural weeds such as willow herb, thistles, creeping buttercup and dockens will also thrive and smother any wildflowers that have been subsequently introduced.

Specialist Advice

THE Woodland Trust has therefore decided to adopt an approach that has already been successfully evaluated by an organisation known as Landlife a registered environment charity specialising in the preservation of wildflowers and whose objective is to bring nature and people closer together by working mainly in urban and urban fringe areas.

By using simple wildflower mixes, based on common core species, they aim to create wildlife areas which have sustainable links to their communities.

The original Landlife project that developed the approach was funded by Defra's Environmental Action Fund and supported by the Esmeé Fairbairn Foundation had, in the mid nineties, introduced the concept of soil inversion as a means of preparing land for tree planting and wildflower establishment.

This was done with a minimum of herbicide usage by deep ploughing to expose weed free sub-soils.

Historically, deep ploughing had been used in Denmark and Lithuania as a forestry technique to reduce weed competition. The technique, however, was not widely adopted since some sites were at risk from soil erosion.

For the Woodland Trust to emulate their similar success then the 'good' agricultural soil would have to be buried under a layer of poorer sub-soil. The wildflower seed, selected on the basis of sub-soil analysis, could be broadcast prior to the trees being planted through the layer of poor soil.

How can complete inversion of the soil be achieved ?

CONVENTIONAL ploughs invert the furrow by 135 degrees and therefore, even if set to plough deeper than normal, do not com-

pletely bury the topsoil with a layer of subsoil.

However, there is a plough manufacturer in Denmark who has made a prototype plough that does, and Landlife were able to arrange for it to be made available to the WT at the right time to carry out the necessary cultivation.

The Bovland Dybdeplov Type 64-D med 24" is manufactured in Denmark by the Bovlund company, now part of the Loft group

When the plough arrived on site the local contractor, John Drysdale of Fife who had a range of tractors available to pull the plough, was engaged to carry out the necessary work.

Fortunately for the Woodland Trust John Drysdale was also able to supply extremely patient and competent tractor drivers who were able to keep the plough operating in the stony conditions that were frequently outside its rather fragile design envelope.

How does the plough work?

It can be seen from the photograph that the leading body is the subsoil plough and the second body is the top-soil plough.

Since it is in effect only a two-furrow plough it was well within the capability of the MF 7495 tractor's 190 hp SisuDiesel 6-cyl engine, in spite of the extremely stony conditions encountered below the depth of previous ploughing.

When the tractor approaches the previous furrow the off-side wheels are aligned to run on top of the inverted topsoil furrow from the previous pass of the rearmost plough body. (T4 in the diagram.)

This ensures that the topsoil is firmly buried. This alignment ensures that the leading plough body lifts and inverts the subsoil slice (S4 in the diagram) onto the top of the topsoil slice T4.

Thus the topsoil is effectively buried. On the same pass, the trailing body engages topsoil slice T3 and flips it into the trench left by S4. The cultivation process is then completed by heavy duty disc harrows to establish the final seed-bed tilth.

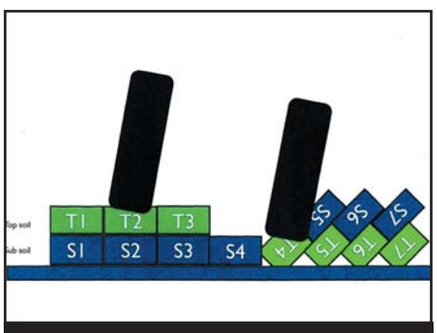


Diagram of ploughing profile

After the topsoil has been rolled down, ground preparation is completed by a six metre Knight Triple Press cultivator pulled by a 320hp Caterillar Challenger

Broadcast seed then plant trees

IN the late summer the site was prayed with herbicide to kill off any weeds and grasses that had survived the cultivation, then the woodland edge flower seeds such as red-campion, corn-poppy and wild grasses were sown in time for them to establish before winter.

The seed selection had been refined to suit the particular growing conditions by the supplier Scotia Seeds who are well known for their specialist knowledge in this area. Early the following spring soil-sampling pits were to be dug before the tree-planting regime was finally decided.

The flower seed planting was carried out in part by the local residents of Muckart who had adopted the project to create a Community Woodland, and because of the dry spring there were some anxious days as the initial green flush of growth began to fade. By July, the project was being hailed as a great success.

Jim Christie.

Woodland Trust.
www.woodland-trust.org.uk
Landlife.
www.landlife.org.uk
Scotia Seeds.
www.scotiaseeds.co.uk

Wild flowers as requested, July of the same year.

GEOFFREY WAKEHAM argues that the concept of the countryside as an extended leisure park, and the need to collect, store and transport more water for urban needs provides an ideal fit.

The country side is seen by the urban majority and many commuting rural residents as an amenity area for their personal pleasure or it is zoned by the state for the collection and storage of rainwater or dispose of sewage.

The constraints and limitations on farming systems are such that farmers are stuck in a time warp and become little more than an educational or entertainment DVD on a year long loop.

They are made to farm in economically unsustainable ways for the pleasure or convenience of the urban masses. There is increasing pressure to extend the areas of free access to the general public and to put further constraints on farming systems.

Leisure Park UK a subsidiary of UK Water plc

They may have a point. It is possible to make the case that the countryside should be there as a leisure facility designed to attract overseas and urban tourists. This could produce a higher per capita income to both the nation and the rural working population than is possible from the production of food and raw materials.

This would lead to a more heavily wooded countryside with easy access tracks, camp sites and areas for 'activity' holidays and short breaks as well as managed open spaces.

The New Forest could be extended to cover a large percentage of the land currently farmed. Holiday complexes as well as short let cottages would need to be integrated into the extended 'wild' country side.

NZ has 34% natural forest and natural cover and 10% planted forest and its main export is happy holiday makers.

The concept of the country side as a leisure park and the need to collect, store and transport more water for the urban population and for industry need not clash with one another.

More water courses and surface storage reservoirs will be required and these can be designed so they are available for recreational purposes.

Rutland Water is a fine example of how the water industry requirement for water storage can become a major tourist amenity.

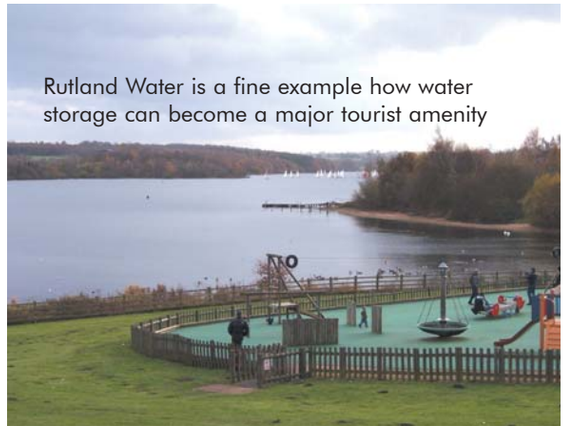
There will be a loss of land.

To contain this loss to reasonable levels urban users should be required to collect all their non drinking water from their own urban space. (Some 150 square meters per person will produce more than an adequate supply).

Disposal of sewage waste and a rural 'pleasure park' do not fit together well. However with correct treatment, the continuing use of areas of the land as visually pleasing vistas (and a source of organic food), sewage can provide a useful quantity of organic fertiliser so saving on costs.

Materials production facility, Raw Green Mining Ltd.

Adapting the country side into a production facility to provide raw materials for



Rutland Water is a fine example how water storage can become a major tourist amenity

. . . urban users should be required to collect all their non drinking water from their own urban space. (150 square meters per person will produce more than an adequate supply).

manufactured goods presents few technical challenges. To compete in a world market many of the constraints placed on current production systems would need changing. Urban populations would need to pay directly all the production costs and these would need to match competitors from around the world.

Water collection and storage and sewage disposal would be paid for at a cost that matched the market value. Car factories, coalmines and supermarket storage warehouses are not expected to maintain ancient ponds or hedgerows within their working areas nor are they constrained on their production layout.

They have to pay for raw materials. Why should production facilities for fuel oil, clothing fibres and bread flour wheat be expected to work in production facilities laid out some one hundred years ago?

Why should free under ground water storage facilities be provided for the water companies without payment for the water they extract? If the general public have to pay £45 per tonne to dispose of solid waste material how do the sewage companies get away with charging to dispose of their waste.

For a single family to produce an acceptable income from a block of rural land the nature of the end product is clearly important.

For the major outputs of cereals, potatoes or milk it is unlikely that a profit, including a basic salary, in excess of 10% can be obtained on a year by year basis as large scale producers willing to accept a lower return will enter the market.

Using figures for the price of milk, milling wheat and potatoes as examples then it is necessary to farm some 400 hectares of arable land or milk 250 head of cattle to achieve sufficient turnover to generate a reasonable income.

The demand for bio fuels on prices is reducing the farm size necessary for economic sustainability.

Even so such farming enterprises need to minimise labour input and are therefore likely to use high capacity contractors machines. To maximise the output and minimise travel time then blocks of work need to be of a size that keeps a team working for a day. This indicates field sizes in excess of 30 hectares.

Fields should be rectangular, relatively long and thin so minimise turning time and headland area. Hedges should be removed.

Ownership should not be scattered over the landscape and should surround the farm buildings. There is a need to rationalise ownership of land. Because of existing infrastructure and geographical features then there will be areas of land that fails to conform to the desired "efficient" shape.

These should be used to provide areas for public access and be managed to encourage wild fauna and flora as well as maintaining a pleasing overall visual experience for residents and visitors. This should be undertaken by an independent body paying commercial rent for the land managed on at least a twenty year agreement.

The first of these options may come about by natural development. The second, where basic survival becomes more important than idle pleasure, calls for a radical realignment of the countryside on the scale of that enforced by the Anglo Saxon state.

Let us hope we never get to that.

BEN is the Automotive Industry's own charity and has been helping men, women & children connected to all the allied trades, including the Agriculture industry, for over a Century now. Employees past & present and their immediate family can turn to BEN in times of need & crisis.

Sometime ago the Institution of Agricultural Engineers adopted Ben as its national Charity and have been ambassadors for promoting its work and financially supportive when it is able to carry out fund raising activities. We do hope that some of you, as members, might know something of the help & support BEN offers, but do you have all the facts?

BEN's National Welfare Team is currently helping over 15,000 people in the community, 55% of whom are of working age. This often means that the help offered to an individual has an impact on an entire family, improving their quality of life. Help is provided in many ways including financial grants in times of hardship, advice and guidance regarding benefits and of course support and befriending during times of personal or family distress.

There is also a confidential National Helpline (01344 876770), which individuals can call in a crisis.

In addition, BEN has four residential and nursing centres, providing a home to over 350 people of differing needs & ages. These Centres offer a variety of types of accommodation for the elderly ranging from sheltered housing, residential care, 24 hour nursing care and in some instances, dementia and end of life care. Also, Town Thorns, the residential centre in the Midlands additionally houses a Young Disabled Person's Wing.

Currently BEN is providing help and support to over 100 beneficiaries in the agricultural industry and in some cases we are providing financial assistance with a cost to BEN to date of well over £100,000. However, it is not just about providing financial support: it can simply be about offering advice and friendship.

Town Thorns

However, caring for and supporting all of BEN's beneficiaries requires funding of over £11 million a year, that's a staggering £200,000 a week, all of which is raised from within our industry. BEN receives no Government nor Lottery Commission funding and relies on the support of the industry to ensure we can continue to help our colleagues and their dependents in times of need.

To find out more about the work of BEN or if you would like to get involved and help raise much needed funds, please visit our website www.ben.org.uk or contact Alfred Friday, Assistant Director of Fundraising, on tel: 01344 294717

Chelsea academy built on solid foundations

DR JAMES WELSH, consultant at TurfTrax Ground Management Systems describes the process of laying turf for future footballing stars.

ONE of the wealthiest football clubs in the world, Chelsea Football Club is investing heavily in making sure its future players are at the top of the game.

The club's youth academy, whose alumni include England and Chelsea captain John Terry, is nurturing the talents of some of the brightest young stars from all over the world. These young players will soon have even more space to flourish when the club completes a new youth training academy, which is being built at the existing training ground in Cobham, Surrey.

Once completed, these facilities will include a state-of-the-art pavilion designed by AFL Architects - who also designed the recently completed first team pavilion.

The ground will include eight natural turf training pitches, a floodlit natural turf match pitch and goalkeeper training area, a large floodlit third-generation (3G) all-weather pitch that will include four 55x36m training pitches, as well as a main pitch of 103x67.5m - the same size as Stamford Bridge, the club's home ground.

Finally, a lake will provide additional storage capacity for irrigation water, as well providing habitat for local wildlife.

These extensive facilities are not only designed to accommodate Chelsea's own youth academy squads. They will also be available for wider community use.

As part of its on-going relationship with Chelsea FC, TurfTrax Ground Management Systems was commissioned in January 2007 to design the pitches and to administer the construction contract. The brief encompassed two key elements.

Firstly, the pitches should replicate the quality and playing characteristics of the first-team pitches as well as those of high-level stadium pitches, so junior players will be able to experience the playing conditions of the senior game.

Secondly, the development should not just have a minimal environmental impact, but should actively promote a positive contribution to the local environment.

With this brief in mind, TurfTrax began detailed design work.

Flood mitigation

PART of the site for the new development was located within the floodplain of the river Mole, so particular attention was paid to ensuring the any earthworks undertaken would not affect the rate at which the floodplain would receive or discharge water.

Because of its proximity to the river, the soils tend to be sandy loam in texture and have relatively good natural drainage rates. However, the ground-water table is also relatively high at just 0.75 - 1.0 m below ground level.

The natural turf pitches encompass a variety of designs, depending on the age group and standard of play required.

Big match simulation

The match pitch was designed to replicate the surface of Stamford Bridge. The root-zone, a 10cm deep mixture of sand and soil, was laid over a drainage system consisting of piped slit drains 2m apart.

The aim was to allow the grass to take root into the underlying topsoil in order to reduce the need for intensive irrigation and fertilisation, as compared with the more widely-used sand-based constructions.

The big match pitch also includes floodlighting to allow evening matches. The goalkeeper area was designed using very similar principles to the match pitch but included plastic fibre reinforcement of the surface to improve wear resistance.

Managing surface water

All of the training pitches combine natural soil and sand-ameliorated topsoil, along with a more traditional drainage design of lateral drains and sand slits.

This provides excellent surface water drainage performance. The aim was to provide a balance between water and nutrient retention whilst maintaining the ability to remove excess surface water rapidly.

An automatic irrigation system was also designed for the academy pitches so that water could be applied in an accurate and timely manner while minimising wastage.

The facility's 10,000 cu m lake was

designed by BWB Consulting to provide additional storage capacity for irrigation water as well as providing diversity in habitat and a visually interesting feature.

The lake will be fed with surface and roof water run-off from the pavilions, car parks and all-weather pitch. This not only helps to minimise the costs associated with using mains water for irrigation but also helps to attenuate drainage rates into the ditch network that feed into the river Mole.

A carpet for all seasons

THE design of the all-weather pitch included the latest 3G synthetic carpet from Desso, the Challenge Pro 60, which meets the highest FIFA 2-star standard.

This carpet has a 60mm deep pile that provides considerable flexibility with respect to the relative depths of sand and rubber backfill, allowing the performance of the pitch to be adjusted. This pitch also includes a floodlighting scheme.

The first phase of construction

ONCE the design was complete, the project was tendered to a number of specialist contractors. White Horse Contractors was appointed to the task in August 2007. As White Horse constructed the first team pitches in 2003, they were very familiar with the site.

The construction phase of the project started towards the end of August 2007. The earthworks became pivotal to the project since large volumes of soil material would be excavated as part of the lake, match pitch and all-weather pitch constructions, as well as material derived from the pavilion construction project.

In total, approximately 15,000m^3 of material would need to be removed. Clearly, the cost and environmental consequences of haulage, noise and disruption involved in sending this material to landfill was unacceptable to the club. And so plan was needed to utilise this material on-site as much as possible.

AUGUST 2007 Top soil strip on all-weather pitch area

SEPTEMBER 2007 Drainage installation on match pitch

In order to achieve this, it was decided that a number of the training pitches that were not located within the floodplain should be raised.

Not only would this provide a suitable way of disposing of excavated material, but it would also add to the overall aesthetic appeal of the site by breaking up an area that is essentially flat.

The emphasis on reuse didn't stop there. During the regular major renovation of the first team's sand-based pitches, which occurs every three to four years, approximately 1,000 cu m of sand and organic matter are stripped off and the pitches are re-surfaced. In its untreated form, this material is difficult to re-use because of the quantity of organic matter present within it.

To overcome this problem, a rotary screener was employed to separate the sand

OCTOBER 2007 3.5m deep pumping chamber for lake de-watering and under liner drainage system

from organic matter. The organic matter was placed in a very thin layer beneath the raised pitches. The intention is that the sand will be integrated into the topsoil to improve natural drainage rates.

The use of organic matter in a different form was also included for the construction of the match pitch.

Because sand-based pitch constructions drain very freely and are characterised by a poor capacity to hold nutrients, managing these surfaces can be difficult. Introducing organic matter in the form of green waste compost can help to improve both water and nutrient retention while maintaining good drainage rates.

Incorporating organic material can also help to reduce the hardness of the playing surface, which can be a problem for constructions with high sand content. A root-zone blend that incorporated green waste compost and lignite was prepared by WBB minerals for this project.

The construction of the lake was complicated by the high groundwater table and non-cohesive subsoils, as the river terrace comprised flint and cobbles.

This meant that the subsoil became unstable following excavation. In order to overcome this, drains were installed to locally dewater the site so that excavation works

NOVEMBER 2007 Laying synthetic carpet on all-weather pitch

could proceed. These drains would also serve to prevent pressure from the groundwater table forcing the lake's lining up .

While the majority of material excavated from the lake could be re-used on-site as fill, there remained a considerable quantity of flint and cobbles which could not be used. Following lengthy negotiations with local aggregate companies, this material was eventually sent for recycling as ballast.

On track

The scheme progressed very well towards the end of 2007 and the academy is currently on track for opening in July 2008. The grass on the match pitch has begun to establish and the synthetic pitch is expected to be available for use by the end of 2007.

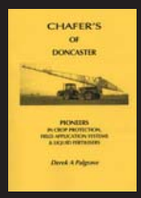
Overall, many of the aims of the project have been met with respect to minimising the environmental impact of the construction works as well as developing first class pitches. Most of the excavated soil material has been used on-site, while the majority of the remainder has been recycled for other uses.

This project has involved working closely with the football club to very challenging timeframes. The successful delivery of this project will result in excellent and sustainable sports facilities for the youth training academy and the wider community.

BOOKREVIEW

CHAFERS OF DONCASTER
Pioneers in Crop Protection, Field Application Systems and Liquid Fertilisers
by Derek Palgrave
128pp 60 illustrations A5
£7.50 ISBN 0 9505335 9 9

THE story began with James William Chafer, a member of the Pharmaceutical Society, who in 1901 sold copper-based fungicides for potato blight control in and around Doncaster. From the outset he realised that the effectiveness of the fungicides depended on the way they were spread over the crop. He set about designing and patenting sprayers of his own



In 1915, he showed them at Smithfield Show at Islington Agricultural Hall. There he displayed both wet and dry sprayers and also a range of agrochemical formulations that he had manufactured in Doncaster.

The commitment to continue the manufacture of sprayers remained an integral part of his business and both he and his son, Charles, developed a design philosophy based on the experience of the customer. Throughout the 1920s and 1930s, Chafer was involved in the contract spraying of sulphuric acid to control a wide range of weeds.

The post-1945 period was one of considerable agricultural expansion, Between 1947 and 1960, Chafer's turnover increased almost twenty-fold and a dozen new depots were established. Chafer's went onto invest in a network of distribution plants and it's success attracted the attention of ICI, which then acquired majority stake. However, by 1984 the UK fertiliser market had reached its peak and within three years, they and other ICI subsidiaries in the fertiliser sector, were combined into an entity.

In 1991, it was purchased by Norsk Hydro. Ten years later, the Chafer Machinery segment became independent but continued to manufacture high quality applicators Hydro recently became Yara and the liquid fertiliser manufacturing and distribution functions are now in the hands of Yara Chafer Ltd.

Strong line up for 2008 conference

KNOWLEDGE is power, and for engineers working in the land-based sector, or indeed anyone interested in learning about new developments in manufacturing or how UK suppliers are using innovative manufacturing techniques to help them stay competitive and ahead of the market, then the IAgrE Conference, *Making Manufacturing Pay,* to be held at Harper Adams University on 8 May is an unmissable event.

From Materials Selection, through Cutting Waste, Supply Chain Management to handling the Supplier/Customer relationship, the conference will be packed with information and detail.

And of course it will be an essential opportunity to network and meet fellow professionals.

The conference will be chaired by Roger Lane-Nott, chief executive of AEA, and will be introduced by IAgrE incoming President, Richard Robinson, managing director of Autoguide Equipment.

There will be presentations by JCB, Rexroth, Akzo Nobel, Belle Engineering, Bystronic, and SSAB Swedish Steel.

Main sponsors of the event are SSAB Swedish Steel with support from Akzo Nobel, Bystronic, Belle Engineering, and Rexroth Bosch Group

Full information from IAgrE secretariat 01525 861096 or e-mail: conferences@iagre.org

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David Want of SSAB commented, "We are committed to working alongside customers to aid them in the selection of the steel that is best suited to improve competitiveness. Our strength lies in the quality of our products, our reliability of supply and our flexible technical customer service."

Docol Wear is a cold-reduced, abrasion resistant steel suitable for components subject to abrasive wear by hard particles such as stones, sand and grain. The material is annealed, hardened by quenching and then tempered in a continuous annealing line. The Domex hot-rolled sheet steel range comprises low-alloy steels suitable for engineering and automotive industries. Domex products are available with specific properties to meet corrosion-resistant, wear-resistant and other applications.

SSAB Swedish Steel are guest speakers and sponsors of the Landwards 2008 Conference, May 8th 2008.

For more information please contact:
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NFU rejects biofuels moratorium

THE NFU has rejected a call from the House of Commons Environmental Audit Committee for a moratorium on the Government's biofuel targets, and criticised the Committee's report as illogical and badly informed.

"Biofuels represent the only renewable alternative for replacing fossil fuels in transport and a way of tackling the one quarter of UK carbon emissions which transport is responsible for," said NFU President, Peter Kendall.

"UK Biodiesel reduces greenhouse gas emissions by 53 per cent and UK wheat bioethanol by 64 per cent compared with their fossil fuel equivalents."

"Those savings can and should be improved. But for the Committee to conclude that, because the savings are small, they are not worth having at all, is illogical and ill-informed."

"Of course, biofuel crops must be produced sustainably, both at home and abroad, and of course we should be developing more efficient biofuel technologies and encouraging motorists to take other measures to reduce transport emissions."

Currently the UK is helping lead the way on sustainable biofuels with requirements published by the Department for Transport earlier this month detailing the strong standards which will need to be reached under the UK legislation.

"But motorist behavioural changes are notoriously difficult to achieve, the waste cooking oil by which the Committee sets such store is already being fully utilised, and if we don't do something to kick start a biofuel industry in this country we will be left hopelessly behind and never have the chance to develop second and third generation biofuels."

"To criticise biofuels for using land that could otherwise be growing food when the Committee then calls for land to be taken out of food production and given over to forestry and habitat creation shows just how muddled their thinking is."

Young Engineers Competition set for JCB again

THE 2008 IAgrE Young Engineers Competition returns this year to JCB on 15 May. The Rocester-based manufacturer has again kindly agreed to host this event and a factory tour of the JCB Excavator plant will form part of the day.

Autoguide Equipment has again kindly agreed to sponsor the competition with support from Swedish Steel and Bosch-Rexroth.

Part of the Institution of Agricultural Engineers' (IAgrE) continuing 'Raising the Profile of the Industry Campaign' the competition is designed to raise the awareness among young engineers as to the width and vibrancy of our Industry.

As usual, there will be a cash prize fund and other prizes. A buffet lunch will also be provided.

There will be two classes, one for those meeting the design criteria issued (Class 1) and one for those outside those criteria

The competition is not restricted to engineering departments; indeed all disciplines

within the land based colleges will be welcomed. We also welcome entries from Sixth Form Colleges (Class 2).

Please note these are slightly modified rules from last year. The rule changes relate to the battery (now 12 volt) and the wheels.

Brief details of the competition are:

Object

Given a set of standard wheels, a battery and maximum dimensions, create a remote or radio controlled vehicle to produce the best performance on a standard test track.

The track is made from 2 sheets of pegboard arranged to give a quarter circle (like a skateboard ramp) 1.55m radius.

Equipment

A kit of wheels and a battery will be supplied FOC to registered groups, from any discipline, together with a drawing of the test track which is made from 2 sheets of pegboard and a wooden frame.

Classes

- Class 1 – for those entries meeting the design criteria.
- Class 2 – for those not meeting the design criteria.

Register with the IAgrE secretariat at the address below who will arrange the dispatch of kits. These will be on a maximum lead time of 7 days.

IAgrE Competition
Barton Road, Silsoe, Bedford MK45 4FH
email: yecompetition@iagre.org

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

Study of the granular fertilisers and the centrifugal spreader using Discrete Element Method (DEM) simulations

by Paul Van Liedekerke, E.Tijskens, C.Bravo, H Ramon
DEM Research Group, MeBioS
and
Vlaams Netwerk voor Particle Technology, VNPT
Kasteelpark Arenberg 30, 3001 Heverlee, Belgium
paul.vanliedekerke@gmail.com

The need for accurate and uniform fertiliser spreading

Mineral fertilisers are used to supply the natural balance needed for good crop yields. For the past few decades, there has been growing concern about the environment associated with the use of soil fertilisers.

Environmental problems such as water pollution and the decline in bio-diversity are known consequences - and over and under application leads to yield losses and ecological devaluation.

For these reasons, accurate spreading is absolutely necessary to minimise costs and maximise profit.

In Europe, over 90% of the fertilisers are distributed using spinning disc spreaders.

Fertilisers particles are dropped onto a disc on which they are accelerated and distributed onto the field forming a spread pattern.

Usually two discs, rotating in opposite directions are used to improve symmetry of the spread pattern - and a doubling of the working width.

The performance of the machines is highly dependent on the particle properties (eg friction coefficients, shape etc) and the quality of the fertiliser.

This can result in huge differences in spread patterns depending on fertiliser type as well as prevailing weather conditions.

The authors say that performance tests conducted indoors can be time consuming, costly and require huge amounts of fertiliser.

To reduce costs, there is a need to describe the functioning of the spreader by modelling which will help to understand the complicated relationship between the properties of the fertiliser and the spreading pattern for given machine settings.

They then describe the model known as Discrete Element Method (DEM), a numerical technique suitable for computing the motion of particles, adding that the agricultural industry may have a good potential for DEM, given that up to 5% of fertiliser may be wasted during application.

View the full paper online at:
www.iagre.org/landwardsextra.shtml

Landini supports the art of ploughing

AN initiative to help train novices in the art of ploughing - and maybe discover future competition ploughing champions - is being supported by Landini through the loan of a new tractor.

The 68hp, four-wheel drive Landini Powerfarm 75 is being used by the Society of Ploughmen for its Ploughing School training sessions, when past champions share their ploughing knowledge and skills with a new generation. The schools are put on for people who want to improve their every-day ploughing skills, as well as those keen to do well in ploughing competitions.

"There's a long-standing tradition of match ploughing, not only in Britain, but in many countries throughout the world," explains Ken Chappell, executive director of the Society of Ploughmen. "British ploughmen have had tremendous success in competitions, winning eight European and seven World championship titles in the past 10 years. But that level of achievement requires particular skills that novices can learn and experienced ploughmen can develop through our Ploughing Schools."

Adrian Winnett, Landini UK sales manager, applauds the Society's efforts to improve ploughing skills.

"Match ploughing is a wonderful art that demands precision, concentration and a keen eye to produce class-winning work," he points out. "I'm delighted we can play a part in helping novices acquire and polish these skills by making available one of our popular Powerfarm tractors."

The courses are run over two days and start with an introduction to the implement, its working parts and maintenance. Then it is out into the field to learn how to plough a plot to competition standard with straight and even furrow slices laid neatly against each other.

"The courses are very popular, attracting both men and women and not just from farming backgrounds - past trainees include an accountant, a school teacher and a pilot," notes Ken Chappell. "They've attended from all over the UK and one trainee even travelled from North Carolina in the United States to attend the school."

The Society's Landini loan tractor is also used for ploughing judge refresher courses and is available to help coach ploughmen who quality to compete as part of the Society of Ploughmen's European and World Championship teams.

Ken Chappell (right) Society of Ploughmen

AGCO marks 50 years of Massey Ferguson

ON 19th November 1957, the famous Triple Triangle made its distinguished debut, in advance of the creation in 1958 of the new 'Massey Ferguson' company, born of its then 110 year Massey Harris Ferguson pedigree.

Fifty years later Massey Ferguson has celebrated a unique landmark in its history by the inauguration of new facilities at its Beauvais European Operations,

It also marks the beginning of an anniversary year that celebrates fifty years of one of the world's most famous and outstanding brands and its contribution to the advancement of farm machinery technology and innovation throughout its history.

At the opening Martin Richenhagen, AGCO's Chairman, President and Chief Executive Officer said "The quality, performance and reliability of the total new range of MF tractors are truly representative of a global brand. Massey Ferguson continues to move forward with a vigour and vitality that resonates throughout the entire company and would make its founders proud. As AGCO's global brand, Massey Ferguson has played a major role in enabling us to become not only one of the world's leading farm machinery manufacturers, but the fastest growing - by far. AGCO has made huge gains across every sector and is set to increase its net sales this year by $1 billion - through internal growth alone."

"Beauvais is the global home of AGCO's global brand - Massey Ferguson," said Richard Markwell, Président Directeur Général, AGCO S.A.

The transformation of the Beauvais factory began in 2003 with a $130 million cash injection to prepare the facility for production of the new 4 Series.

The inauguration marks the beginning of a year when Massey Ferguson will acknowledge landmarks in its heritage, celebrating not only the 50th anniversary of the creation of Massey Ferguson, but also its plans for an even greater future.

"We are preparing to celebrate in style during the coming year. These celebrations will not only acknowledge Massey Ferguson's proud heritage, but will also focus on the future plans of the dynamic and invigorated Massey Ferguson brand," said Mr.Markwell.

MEMBERSHIP ENQUIRIES
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www.iagre.org

Issue 63 Number 1 Spring 2008
MEMBERSHIP MATTERS

BRANCH REPORTS

NORTHERN IRELAND

THE pre-Christmas meeting of the Northern Ireland Branch of the Institution of Agricultural Engineers consisted of a technical update on the running gear and braking systems on heavy goods vehicles. The same axle equipment is used on many of the larger agricultural trailers ? slurry tankers and the increasing road speeds of agricultural tractors means that trailer braking systems must now also meet higher standards.

The main speaker was Mr Brian Walsh, Sales Manager, Toughline, Naas, Co Kildare. The company manufactures and supplies the Granning axle range to all major UK and Irish trailer manufacturers as well as building their own range of HGV trailers. He was joined by Mr James

Campton and Mr Alan Turner from WABCO braking systems. They described the latest technical features and how these improve the braking performance and safety of heavy goods vehicles..

The key points which emerged during the talks and discussions were -

Air brakes

For safety reasons modern heavy goods vehicles and their trailers use dual line air brakes with the second line providing emergency back-up. By contrast, the majority of trailers drawn by agricultural tractors still use a single hydraulic or air supply line without back-up. However this is changing for the larger trailers being towed by high speed tractors like the JCB Fastrac which are already equipped for dual-line systems.

Air braking systems are simple and reliable so long as they receive regular basic maintenance.

ABS, EBS and RSS

An Anti- Lock Braking System (ABS) is required on HGV trailers and those towed by fast tractors. It senses wheel lock-up during braking and moderates air pressure to prevent skidding.

The EBS (Electronic Braking System) goes further by sensing the loads at the suspension air bags and adjusting the braking pressure at individual wheels.

The system electronically monitors all aspects of brake and suspension behaviour on the trailer and can sense defective parts, worn brake linings and inadequate tyre pressures. RSS (Roll Stability Support) further uses this information to sense when there is risk of the trailer overturning and it will automatically apply the brakes to slow the vehicle to maintain stability.

This option is especially useful for road tanker trailer operators to warn them of the unstable effects of speed during sudden lane changes or tight corners. It also gives early warning if a trailer has been unevenly loaded. As this information can be electronically downloaded the trailer performance on regular routes can be mapped and fleet operators can use it during driver training.

WABCO is an international company and has separate test tracks in Germany, Finland and India where it develops and tests its products.

Drums v Discs

Although the advantages of performance, heat dispersion, and ease of servicing of disc brakes in preference to drums is well established for cars and light vehicles their widespread adoption on heavy goods vehicle trailers has been much slower. The haulage industry still likes drum brakes because they are so well understood and reliable compared with the earlier disc brake designs which had problems and were more expensive. Drums are still preferred for the muddy, wet conditions experienced by HGVs in the construction sector. However the latest, much improved ,disc types are fitted on most new heavy trucks and being most suitable for use with the EBS systems referred to above so their popularity on trailers is set to increase.

NI group at Agritechnica

WREKIN

THE first 2008 meeting of the Wrekin Branch was held at Harper Adams in front of a diverse audience. The topic title was Agricultural Waste Plastic Recycling, an area of concern to the industry and for the rural environment.

The presentation started with Julia Brereton Managing Director giving a short introduction to SASTAK the ONE STOP SHOP farmer's cooperative that had carried out a project on setting up a plastics collection and recycling business with support from DEFRA.

David Baldwin SASTAK's "Bag it and Bin it" project coordinator introduced the audience to some of the intricacies of Agricultural Waste Regulations and Hazardous Waste Regulations and how it is possible to live within the constraints and limitations imposed. He then proceeded to describe some of the problems of recycling agricultural plastics including the range of incompatible materials and contamination by water, chemicals, soil, stones, bricks, hard core, tyres, metal waste and lost machine components.

By careful storage and segregation it is possible to reduce these to a more acceptable level than the 60% often found in deliveries of farm waste plastic to recyclers. Chemical containers present a particular problem as they are classed as Hazardous waste. By triple washing they can be converted to non hazardous waste and Mr Baldwin offered a number of novel ways to achieve the necessary level of cleanliness and to ensure total drainage of liquid.

90% of farmers claim they are interested in being involved in recycling schemes and there are a number of schemes running around the country.

SASTAK started out by visiting a number of schemes prior to setting up the project to obtain data for DEFRA and to test out the business model.

The Project was centred on Shropshire but spilled over into adjoining counties and Country. Four collection Hubs were set up at the centre of 10 mile radius circles and a single collection day organized for each Hub. Co-op members were contacted and details were circulated to other farmers via the press. A cross section of types and size of farms was specified by the sponsoring body. Interested parties were given unloading slots at the most convenient hub and given details of rules of engagement regarding how material was to be delivered with special reference to Chemical Containers.

On the four days details of material types and weight were recorded along with types of transport, distance travelled, containers used and times to turn round delivery vehicles. They collected 68 tonnes of material, 42 % of which was Bale Wrap. The materials were delivered to the recycling factory in Kidderminster using a standard side loading lorry, this was unsatisfactory. In future a specialist bulk waste collection vehicle will be used. Once the material reaches the recyclers there are major problems of handling agricultural waste and there is a need for research into better machinery and systems.

Mr Baldwin warned farmers to choose their recycling partner with care and advised any one with an interest in this area to go into the web sites agwasteplastics.org.uk or wasterecycling.org.uk.

SASTAK's future plans are based on the results of this project and in the long run they will provide a full waste management service to their members. See www.sastak.com for details.

During question time it became evident that some doubted the environmental benefits of collection and recycle schemes. Converting the waste into energy was suggested as a better option. Storing plastic waste (until there is a change in political directives) for later recovery as a fuel was proposed.

Some farmers are more interested in having paperwork showing they are recycling than in the recycling. It is therefore important that systems are simple and cheap to the farmer. If the material is so valuable it needs to be recycled then it should have value at the point of disposal. This may change in the future if alternatives to oil can not be found.

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EAST MIDLANDS

In with the Old and Out with the New

From a presentation to IAgrE East Midlands Branch by Richard Millar and Tony Golland of Caterpillar on 17-10-2007, organised by Paul Skinner and Mark Andrews, attended by 20 members and guests. Report by David Roe

Remanufacture is not re-build, reconditioning or repair. It means to bring to at least new condition.

Remanufacture uses an inbound logistics core that is essential to provide the base stock and information of future potential stock.

When, for example, an engine comes in it is stripped & cleaned, checked for defects, machined and material is added as required before final machining. Addition of materials may be by one of a range of techniques which include: puddle welding, wide arc spray welding, friction welding, laser cladding and selective re-casting.

To ensure adequate supply of components for remanufacture a core deposit is taken from the client and refunded when the worn unit is returned. Setting the core deposit value at an effective level is key to maintaining the supply of units for remanufacture. Clients pay the deposit when purchasing a remanufactured unit and may reclaim it by returning their worn unit within 12 months.

Remanufacture satisfies a number of needs where modern product complexity often excludes local repair. Greater sustainability is achieved with a reduced environmental cost of manufacture and reduced financial cost of ownership and longer service life with replacement parts available beyond new part obsolescence.

Products are now increasingly designed to be more suitable for remanufacture.

Sustainability is defined as "Meeting the needs of present without comprising the ability of people to meet their own needs in the future". Concern being driven by population growth, limited resources and strained Eco systems.

Typically 70% of the product is remanufactured, saving 85% of the energy required to produce a new replacement.

Remanufacturing began in the 1970's for Ford and progressed into Cat products. The benefits are being realised in industrial, marine, military, agricultural and rail applications. Some rail engines are going through remanufacture for the 5th time after 400k miles of service each time.

A dedicated remanufacture company provides advantages resulting from investment in cleaning and salvage tenuous and core information management facilities.

The key is in the intellectual property of the techniques. Bore spray welding, for example, allows honing to original size allowing use of original equipment manufacture's pistons which are often of better quality and a lower cost than aftermarket oversize products.

Remanufacture is applied to all sizes of engines from skid steer loaders to large marine. Clients are corporate, mainly original equipment manufactures. Products are often under original equipment manufacturers warranty when received and go out with 12 months RM warranty.

Typically it takes 150 engines to produce 100 remanufactured. Time available between receipt of faulty unit and delivery of remanufactured is usually 11 days, after that penalty costs begin.

In addition to the remanufacture fee, there is income from scrap, for example automotive plastics can earn £15-20/t.

Cat operates 8 remanufacture facilities around the world.

East Midlands Engineering and Science Professionals (EMESP)

The Twentieth Annual Joint Institutions Prestige Lecture: The Aston Martin DB9 "Under the Skin of the Bond Car"

The car was the star of this year's sold-out Twentieth Annual Prestige Lecture, 'Under the skin of the Bond car' held at East Midlands Conference Centre, Nottingham and attended by over 850 people from twenty institutions and organisations.
Steve Young, Andy Syvret and Roland Snell from the Aston Martin team concentrated on their specific roles in making one of Aston Martin's latest vehicle designs, the DB9, so special. Aston Martin, famous as the marque of choice of successive James Bond characters, has recently been voted the UK's coolest brand. The audience was told that a team of 300 people had been involved in the development of the vehicle which had been tested across the world from Dubai to Northern Sweden.
A short video was shown, which included the famous roll in Casino Royale - a real stunt, not 'computer generated imagery'. The whole lecture demonstrated the enthusiasm and enjoyment of the Aston Martin engineers when testing and seeing the results of their work, beating the design criteria for the car in every field - acceleration, speed and power

OBITUARIES

PROFESSOR BRIAN MAY

Brian May was a member of the Institution for almost 50 years joining whilst an NDAgrE student at the then Essex Institute of Agriculture, Writtle in 1958.

During this long period he undertook many roles at both branch and national level. His major interest in the early 70's was the Institution journal '*The Agricultural Engineer*' which he edited in the period 1971 to 1975 resigning when appointed Head of the National College of Agricultural Engineering.

In the period 1976 to 1979 he was successively Treasurer, Vice Chairman and chairman of the South East Midlands Branch. In 1981 he was appointed a Vice-President, becoming President-Elect in 1983 and President in 1984 for a two year period. He then remained on Council until his retirement from Cranfield University in 1991. His later contributions to the work of the Institution were mainly in the fields of education and recruitment.

Brian's early years were spent in East Kent where he attended Faversham Grammar School leaving in 1953. He worked on a large mechanised farm for a year prior to National Service as a vehicle mechanic in REME where he had his first introduction to overseas travel serving in Kenya and Malaya. This was followed by more farm work plus part time education at ONC level and then NDAgrE at Writtle.

Employment with Massey Ferguson in Coventry followed, firstly as a Design Draughtsman and then Design Engineer combined with more education at Birmingham CAT (later Aston University) at degree level.

Brian (right) meets the Queen in the 1980's

In 1963 Brian was appointed to the staff of the fledgling NCAE at Silsoe as an Engineering Lecturer and Senior Warden. He quickly made an impression and rose to be the Head of the Environmental Control and Processing Department in 1975.

Following the move of the college into the Cranfield Institute of Technology in 1975 Brian was appointed a Professor of CIT and Head of college, a post which he held (with various changes of title) until his retirement in 1991.

Brian's 15 years at the helm of Silsoe College marked a most successful period in its history with growth in student numbers, research output, consultancy and short course income. He was always eager to project the influence of the college and travelled extensively and lobbied hard to this end.

He held from time to time, a number of external appointments including Council Member of the Royal Agricultural Society, Governorship of the NIAE/SIAE, Trustee of the Douglas Bomford Trust and Membership of the Agricultural Research Council Grants Committee. He was also elected a Fellow of the Royal Academy of Engineering.

Following retirement Brian and his wife Brenda moved to Ramsgate where Brian was a leading member of the local civic society 'The Ramsgate Society' for which he produced '*The Ramsgate Millennium Book*' a beautifully prepared 650 page volume covering all aspects of life in the town. Brian was also the Chairman of the Governors of Thanet College, a post he enjoyed very much.

More recently they moved to Yardley Gobion to be nearer their family of three sons and seven grandchildren. Unfortunately by this time Brian was suffering from cancer which he bore with great fortitude and typical resilience over several years.

He died peacefully on 17 November 2007.

COLIN BRUTEY

Colin Brutey was a former vice-president of IAgrE,and was made a Fellow of the Institution in 2001.

He was IAgrE representative on the EngTech board of the then Engineers Resgistration Boad (now Engineering Council UK)

When he left the engine room branch of the Royal Navy he joined MAFF in the late '40s, and joined IAgrE in the 1950s.

It was whilst working in Nottinghamshire that he acquired his taste for track-layers and "Cats".

He wrote in Landwards in 2005 "I think their highly engineered construction matched what I had been used to as a Royal Navy engineer. We also had some Fowler-Marshalls, with their sinlge cylinder, 2-stroke diesel with cartridge starting. How far can you get from the current, sophisticated tractor?"

In 1962, after a few years with Ford-Ransome dealers, he joined the NFU as Machinery Officer and Secretary of the Machinery Committee. Thus began a rewarding 20 years association with NIAE. In the NFU he was responsible for safety, health and welfare"

He adds "The formation of the Ergonomics Division at Wrest Park was very satisfying. This sprung from a series of meetings called initially by my opposite number in the NUAAW and myself, culminating in a meeting at NIAE when the Agricultural and Medical Research Council gave their blessing to the formation of the new department. It went on under Richard Stayner to make a lasting contribution to the well-being of agricultural workers"

"When the Finniston Committee was looking into the future regualtions of the engineering profession, I was chairman of the Engineering Registration board and gave evidence to 'Finniston'. It was a source of enormous satisfaction that we defeated Finniston's efforts to exclude Technicians from the proposed regulatory body, to become the Engineering Council. I think that history has proved us right!"

In the sphere of education he had a long association with Rycotewood College, as a member of the Engineering Advisory Committee and, later, as a Governor.

Membership changes

Admissions

A warm welcome to the following new members:

Member

I Sunwar (Nepal)

Associate Member

O J Adeleye (Northamptonshire)

Associate

J D G Hancock (Carmarthen)
M Alberdi (Manchester)
E Deryagina (Hull)

Student

Bicton College:
C J Allin
O Burgess
B A Clark
S P Heard
A J W Howe
S Jones
R Masters
W E G Morton
J S Salisbury
S P Swinney
M D Westcott

Myerscough College:
D Atkinson
A Beetson
D Birch
J A H Bowker
J R Bowling
R Briggs
RT Byram
J Cornall
B J Edge
J J Fawcett
M Griffiths
T J Harrison
M Lund
J E McIvor
J Olde
A P Scott
A Shuttleworth
D Taylor
M J Watson
P Whitfield

Plymouth University:
D Franklin

ColegSirGar:
A Bodfish
B A S Bray
O R Evans
A R Harries
S T Harrison
T Jenkins
A J Jones
D A Jones
H E Jones
R Jones
R D Jones
M McAndrew
O J Martin
D P Murphy
C Phillips
D Powell
D Price
R Price
M B Thomas
T Walker

Reaseheath:
W H Allan
S T Allman
T Bargh
P A Batchelor
J Beetham
O Booth
S R Bowen
C T Brandrick
P Brereton
C J Brown
S W Bunting
M D Churchman
K Coker
O Cole
C Corkill
J P Crow
W K Crowe
H S Dakin
A Dawson
T Dodd
J Doherty
D W Drever
G Dunbar
J Evans
M Evans
M Forrest
D P Gates
D J Geary
A Gibson
B Gilhooly
M J Gray
D Griffin
N Griffiths
R P Heanes
J Hedgecock
A W Hopkins
M Hough
J Hughes
T Hutchinson
L James
T Lawton
J Leeming
J Lomas
C McCrory
A J McGregor
F McNicoll
T Molloy
D J Morris
K Morrison
P A Moss
J Murdoch
M Nelson
M Nichols
S O'Leary
S J Palmer
D Parke
D Perry
R L Pickavance
A D Quirk
G E Raven
C Rout
N G Scott
G A Slater
A J Smith
J P Smith
T Spriggs
R D Stancliffe
G Stanhope
A Stobbs
A Syson
R Taylor
B Thomas
R Thomasson
A E Tollett
D J R Usher
J Wetton
K Wheeler
A J Wainwright
C Walsh
D W Williams
M J Williams
M C Willner
N Wal
IA R Young

Harper Adams University:
I Bourke
J R Daniel
C P Donnell
C Evans
W Goligher
G A Harris
B Lea
C Lloyd
D J Martin
S E Pierce
J Relf
J Richardson
O PSimpson
G Sneath
C P Taylor
T J Taylor

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

A L Thomas
W J Wainwright
T C Whatley
R Williams

Salesian College / Pallaskenry Limerick Institute of Technology:
A Acheson
M Breen
A Brett
P Brosnan
D J Cahalan
C Carton
S Clohessy
M Collins
N Connors
N Considine
J Cullen
A Cunningham
J Esan
P Flood
J Harnett
K Healy
N Irwin
R J Jennings
F Leahy
S McGovern
S McGuinness
F Maher
D Mooney
P Mullane
P G O'Keefe
J P O'Neill
C Roche
K Shanley
T J Stack
M Walsh

Institute of Technology, Tralee:
P Bermingham
D Brennan
D Carroll
A Cassells
N Conway
A Cooke
P Delahunty
B Duane
P Duffy
R Fitzgerald
E Gerety
F Griffin
B Hanley
T Harney
D Kincaid
N Maher
J Moyniham
P Murray
M O'Grady
T J O'Neill
R Shaw
L Tobin
J Twiss
D Waldron

Readmissions

N R Hardie (Roxburghshire)
A J Cochran (Nottinghamshire)
M R Oldham (Bedford)

Deaths

B A May (Northamptonshire)
H Morgan (Lancashire)
R R Gladden (Australia)

Transfers

Member

E J B Greenwood (Sussex)
C Jaworski (Devon)
D Wulfsohn (Denmark)
A J Cochran (Nottinghamshire)

Associate Member

D Ansorge (Germany)
J German (Leicestershire)
W J Olley (Berkshire)
M A M Elnijomy (Sudan)
B A Roberts (West Midlands)

Associate

D J Cousins (N. Ireland)
T G Norman (Derbyshire)
A D Rhodes (Lancaster)
H W Thomas (Gwynedd)
P F Wilson (Monmouthshire

Engineering Council

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

Registrations

IEng

J A McMorran (Peebles)

EngTech

J Almond (Norfolk)
M L Butler (East Sussex)
C Doyle (West Yorkshire)
M Hodson (Lincolnshire
A White (Norfolk)

Long service certificates

Name	*Grade*	*Date of anniversay*
60 years		
Ian Johnston **Fleming**	FIAgrE	16 Mar 2008
50 years		
Thangavelu **Toniappa**	CEng, IAgrE	14 Jan 2008
Martin Gervaise **Clough**	FIAgrE	18 Feb 2008
35 years		
Philip Edwin Alfred **Rickman**	CEng, MIAgrE	23 Jan 2008
Peter William **Waggitt**	IEng, MIAgrE	25 Jan 2008
Francis John **Butcher**	CEng, MIAgrE	25 Jan 2008
John **Gough**	IEng, MIAgrE	25 Jan 2008
Stuart Mackenzie **Miller**	IEng, MIAgrE	25 Jan 2008
Geoffrey Russell **Freed**	MIAgrE	25 Jan 2008
25 years		
John Anthony Cecil **Steel**	MIAgrE	11 Jan 2008
Charles Denver **Diggens**	FIAgrE	13 Jan 2008
Roy Trevor **Howland**	EngTech, MIAgrE	18 Jan 2008
Edward Alexander **Smith**	MIAgrE	2 Feb 2008
Joseph Osei **Darko**	MIAgrE	2 Feb 2008
Richard John **Percival**	AMIAgrE	3 Feb 2008
Martin Reginald **Holcombe**	MIAgrE	13 Feb 2008
Roderick Ewan **McGovern**	CEng, MIAgrE	5 Mar 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

BRANCH EVENTS

Wed 09 April 2008, 19.00hrs
East Midlands Branch
Renewable Energies in Action, Closing the Circle
Speaker: Speakers from Strawsons Energy and Hoval Bio-Mass Boilers
Venue: Strawsons Energy, Manor Business Park, East Drayton, Retford, Notts, DN22 OLG
Strawsons Energy and Hoval Boilers work together to heat homes, offices and a school with willow pellets and produce fertiliser from the ash. Attend this event for an overview of applied best practice in the supply of renewable energy technologies, systems and fuels, including wood pellets, solar heating and heat pumps. Meet at 19.00 hrs for buffet and a 19.30 hrs start.
For more information and to book a place, please contact:Sandy Donald Tel: 07977 521231
Email: email sandytd2000@tiscali.co.uk

Wed 09 April 2008, 19.30hrs
Yorkshire Branch
A Year in the Antarctic
Speaker: Adam Eckesley
Venue: Buckles Inn, Askham Richard, York
Following last year's talk by Martin Bell, Adam will give his experience of a year working at Halley.
Contact Branch Secretary, Gordon Williamson for further details Email: gordon.williamson@ntlworld.com

Thu 10 April 2008
Soil and Water Technical Group
1-Day Workshop: Soil and crop responses on a trafficked and non-trafficked Hanslope clay soil
Speaker: Bob Palmer, pedologist and soil surveyor
Venue: Unilever R&D Colworth, Sharnbrook
A hands on appoach to looking at how the soil has responded to 2+ years of zero traffic. The demonstration is designed to show the benefits of controlled traffic farming and is managed by a Focus Group of farmers and industry partners. Soil structure and function will be explored by Bob Palmer. There will also be presentation from Rothamsted's Sustainable Soil Function group on the relationship between soil strength and crop performance. Contact Peter Leeds Harrison (peter@2ndOrder.co.uk) with copy to tim.chamen@btclick.com if you have any suggestions or something to contribute. Posters also welcomed.
Email: peter@2ndOrder.co.uk

Mon 14 April 2008, 19.30hrs
Wrekin Branch
The Future of Farming - Food or Fuel Production
Speaker: Speaker from Leckford Estates
Venue: Lecture Theatre, Harper Adams University College
The speaker will be putting the arguments for growing energy crops for food.
Contact: Branch Secretary: Graham Higginson
Email: wrekin@iagre.biz

Tues 15 April 2008, 19.00hrs
South East Midlands Branch
Triumph Motorcycles
Speaker: Stuart Wood, Triumph Motorcycles
Venue: Millbrook Proving Ground, Millbrook, Bedford, MK45 2JQ
This is a joint meeting with IMechE Luton Automobile Branch.
Contact: Branch Secretary, John Stafford.
Email: john.stafford@silsoe-solutions.co.uk

Wed 16 April 2008, time tbc
Scottish Branch
Branch AGM and presentations by:
IAgrE on the LTA Accreditation Scheme
John Deere on diesel engine technology
Fuchs on lubricants from renewable sources
Venue: tbc
Contact: Branch Secretary Allan Langley
Email: allan.langley@sac.ac.uk

Mon 28 April 2008, 17.30hrs
West Midlands Branch
A Presentation on Hovercraft by Jim Line
Speaker: Leamington Rugby Football Club, Kenilworth Road, Blackdown, Leamington Spa
Venue: Leamington Football Club
Still to be confirmed.
Contact: westmids@iagre.biz

Thurs 08 May 08
IAgrE
IAgrE Annual Conference - Making Manufacturing Pay
Venue: Harper Adams University College
This conference is aimed at those engineers interested in the latest ideas in all aspects of Manufacturing for Land Based Engineering. Speakers from well respected suppliers will present a wide range of topics including case histories from companies that have effectively implemented positive changes.
The Conference will be chaired by Roger Lane-Nott, Director General of the AEA, include an introduction by Richard Robinson, Managing Director of Autoguide Equipment and IAgrE incoming President, and presentations from Swedish Steel, Bosch, JCB, Akzo Nobel and other leading manufacturers.
For further information see www.iagre.org
Email: conference@iagre.org
Web: www.iagre.org/lwconf.shtml

Thurs 15 May 2008
IAgrE
IAgrE Student Competition 2008
Venue: JCB Rocester
This event is part of IAgrE's 'Raising the Profile of the Industry' campaign and is designed to raise the awareness among young engineers of the width and vibrancy of our industry. Given a set of standard wheels, a battery and maximum dimensions, create a remote or radio controlled vehicle to produce the best performance on a standard test track. There will be a generous prize fund. Click on the web link for details of how to enter.
Tel: 01525 861096
Fax: 01525 861660
Email: youngengineers@iagre.org
Web: www.iagre.org/yecomp.shtml

Tues 03 June 2008, 16.00hrs
South East Midlands Branch
Visit to PX Farms hosted by James Peck.
Venue: PX Farms Ltd, Dry Drayton, Cambridge
For further details contact Branch Secretary, John Stafford.
Email: john.stafford@silsoe-solutions.co.uk

Thurs 12 June 2008, 16.00hrs
Herts & Essex Branch Branch
Visit to Greensted Farm, hosted by Chris Butler
Venue: Greensted Farm
Chris Butler is ex Chair of FWAG, East Anglia and a LEAF Farmer. The farm has a restaurant which will serve a meal. This visit will be open to family and friends.
Contact Branch Secretary Malcolm Carr-West
Tel: 01371 850416
Email: Malcolm.Carr-West@ceme.co.uk

Thurs 19 June 2008, 19.00hrs
East Midlands Branch
Visit to EnviroBarns.
Speaker: Malcolm Paterson
Venue: EnviroBarns, Fishtoft, Boston
A sustainable environment whilst offering a holiday with a difference, demonstrating prudent use of currently available renewables and energy saving technologies.Attend this event if you are interested in the application of currently available renewables and energy saving technologies in a home styled environment. Facilities on display include: Wind Turbine, Geothermal Heating, Rainwater Harvesting, Aerobic Sewage Treatment, Low Energy Lighting Systems. Wives and partners are invited to this event.
Meet for a 19.00 hrs start - a buffet will be provided during the evening.
Contact: Branch Secretrary Paul Skinner
Tel: 01205 480431/353754
Email: paulskinner57@btinternet.com

OTHER EVENTS

APRIL 2008

22	A.E.A AGM & Outlook Conference, Institution of Civil Engineers, London

MAY 2008

4-5	Spring Garden & Leisure Show, South of England Centre, Ardingly
13-15	SED 2008, Rockingham Motor Speedway
17-18	Royal Welsh Smallholder & Garden Festival
20-24	Chelsea Flower Show
21-22	Grassland & Muck 2008, Stoneleigh

JUNE 2008

5-7	Royal Cornwall Show
5-7	South of England Show
11-12	Cereals 2008, Leadenham, Lincolnshire
11-15	BBC Gardeners' World Live, NEC
13-15	Three Counties Show
19-22	Royal Highland Show, Ingliston, Edinburgh

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
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
21-23	GLEE 2008, NEC Birmingham
25	Tillage 2008, The Borders

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CONFERENCE 2008

Making Manufacturing Pay

THIS years' conference is aimed at engineers who are interested in, or need to get up to date with, the latest ideas in all aspects of Manufacturing for Land Based Engineering. Speakers from well respected suppliers will present a wide range of topics, including case histories from companies that have effectively implemented positive changes.

For those running smaller companies, there are challenges keeping abreast with new developments. This conference is intended to provide an opportunity to network with experts in many aspects of manufacturing. The intention is that everyone will leave with information that can be put into immediate effect and give increased margins as well as increasing production from existing resources.

Although there has been a dramatic reduction in the UK manufacturing base in recent years, paradoxically, a number of small companies seem to be able to expand profitably by exploiting design and manufacturing skills without the need to utilise offshore suppliers. We hope to show how this can be done economically and effectively.

PAPERS WILL INCLUDE:

- **Materials selection**
- **Making change work**
- **Laser cutting and press forming**
- **Corrosion protection**
- **Supply chain management**
- **Cutting waste in manufacturing**
- **Customer/Supplier relationships**
- **Maximising the efficiency of work practices**

Poster and product displays on view during the day

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LANDWARDS CONFERENCE
8th May 2008

Queen Mother Hall
Harper Adams University College
Newport, Shropshire

CHAIRMAN
Roger Lane-Nott
Director General AEA

INTRODUCTION:
Richard Robinson
MD Autoguide Equipment Ltd
IAgrE Incoming President

PRESENTATIONS BY:
JCB
Rexroth
Akzo Nobel
Belle Engineering
Bystronic
SSAB Swedish Steel Ltd
and other leading manufacturers

Further information please contact IAgrE secretariat on 01525 861096 or e-mail: conferences@iagre.org

IAgrE
Barton Road,
Silsoe
Bedford MK45 4FH

The professional body for engineers, scientists, technologists and managers in the agricultural and allied industries including food, forestry and biological systems
IAgrE is a licensed body of the Engineering Council UK and a founding constituent body of the Society for the Environment





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