Agriculture • Horticulture • Forestry • Environment • Amenity

LANDWARDS

Summer 2007

- CROP CULTIVATION
- AWARDS

SPACE EXPLORATION

IAgrE JOURNAL Volume 62 No.2 www.iagre.org

Sowing the Seeds...

In March 2007 the Young Engineers Vehicle Performance Competition was held at the CNH facility in Basildon in their International Training Centre. This competition was open to all land based colleges who upon registration are supplied a kit of wheels plus battery free of charge, along with a drawing of the test track. This event was being run by the Institution of Agricultural Engineers and was also a registered event under the National Science & Engineering Week.

For 2007 this event was co-sponsored by Bosch Rexroth along with Autoguide Equipment who has supported the event on previous occasions.

The pictures below show the test track with its laser beam measuring system designed and supplied by Autoguide with some of the competition vehicles.

In previous competitions, it has been necessary to divide the field into two classes based upon whether the entrant had used material and dimension restrictions supplied (Classified) or had augmented their design with a few additional devices (Unclassified).

After the competition, CNH kindly arranged a tour of the New Holland Tractor & Engine plant, an opportunity for the entrants to see tractors with slightly more power than they were allowed during the competition tests.

As part of our sponsorship, we supplied a total of £1200 in Bosch Power Tools which were split into £600, £400 & £200 values, this is in addition to the cash prizes supplied by Autoguide.

As co-sponsors both Sean & myself were introduced to the world of invigilating which allowed us to split the entrants into two fields (Classified and Un-classified). In total, we had 16 entrants which were split 13 & 3 respectively in each category. These teams had come from four colleges from around the UK (Brooksby Melton College – 2 teams, Myerscough College – 2 teams, Plumpton College – 2 teams & Reaseheath College – 10 teams).

The object of the trial was to get your vehicle up as high on the ramp as possible in order to break the laser beam, having set the beam at a desired marking. You had three attempts to meet this setting at which point if successful you then moved to next marking. However, three fails and your competition was over.

At the end of the competition the results were as follows:-

First Prize Winner in the Unclassified section of the Young Engineers Competition – 'No-messin' entered by Nick Tomlin and Aydin Newton from Reaseheath. Note the extended grappling iron is now retracting and will pull the vehicle up over the measuring bar.

The winners of the Unclassified section, Nick Tomlin and Aydin Newton with sponsors Richard Robinson left (IAgrE President Elect and Autoguide Equipment) and Craig Grant in the centre (IAgrE member and Bosch Rexroth).

Classified

1st Mech-la-maniacs from Myerscough (£350 cash & £600 Tools)

2nd Turbo Division from Reaseheath (£250 cash & £400 Tools)

3rd Trotters Independent from Plumpton (£150 cash & £200 Tools)

Unclassified

1st No Messin' from Reaseheath (£300 cash)

2nd The Hopper from Reaseheath (£20 cash)

3rd The Black Pearl from Reaseheath (£10 cash)

The winning team from Myerscough in the Classified section were Dan Higham, Oliver Skoczen, Alan Bland, James Garnett, Matt Lumb and Richard Freeman. The student's tutor, Laurie Boyle, a Lecturer in Motorsports and Mechanisation said of their win: "The students were up against some of the best young engineers in the country and have come out as leaders in their field. They worked really hard in preparation for the competition and applied what they learnt on their course, and this award is a credit to them and the teaching at Myerscough."

Top marks for ingenuity went to the winner of the Unclassified (No Messin) who in addition to using tracks had also augmented their design with a grappling iron mounted to a car aerial. By using the grapple and retracting the aerial they achieved the highest marker ever set in the history of the competition (just don't get too close as it could have had an eye out quite easily).

All in all a most enjoyable day was had by all and optimism surrounds the plans for the competition in 2008.

Craig Grant – Bosch Rexroth

Volume 62 No 2, **2007**

LANDWARDS

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

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Origination: David King

Printing: Barr Printers Ltd

Publisher
Landwards is published quarterly by:
IAgrE,
Barton Road, Silsoe,
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Fax: +44(0)1525 861660
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Front cover: *Baling quality forage (courtesy: AGCO)*

ISSN 1363-8300

INTEGRATING ENGINEERING AND BIOLOGY – THE FINAL FRONTIER

D. Delahunty, T. Delaney, G. Kennedy, N. Lacey, C. McNestry, T. O'Connell, D. O'Hanlon and J. Spollen

Dr Tom Curran (University College Dublin), Daniel Delahunty, Gerrard Kennedy, Terence Delaney, Domhnall O'Hanlon, Ciara McNestry, Joseph Spollen, Timothy O'Connell and Nicholas Lacey

BIO NOTE

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This paper was selected as the runner up of the UNACOMA Vision Award 2006 and presented at the AgEng 06 Conference held in Bonn, Germany, in September 2006. The Italian Machinery Manufacturer's Association (UNACOMA) sponsored the Vision event.

Abstract

As space exploration prepares itself to launch manned missions deeper into our solar system, the need for more and more self-sufficient living environments increases. Among the key components of any autonomous system is an efficient and inexhaustible recycling system. Biosystems engineering is at the cutting edge of environmentally friendly recycling and is therefore well equipped to provide a solid foundation for such a sustainable habitat. This paper outlines how engineering and biology may be integrated to support key activities in a space station, namely eating, working, regeneration and controlling the environment.

Introduction

Standard intergalactic economics dictates that as the distance from Earth increases so do the time and financial costs for refuelling. It is therefore necessary to create an autonomous living environment that would not require such costly refuelling.

This paper looks at how biosystems engineering methodologies can be used to create and exploit symbiotic relationships between different biological systems to facilitate such an autonomous extra terrestrial mission. The aim of the recently inaugurated Biosystems Engineering Design Challenge (BEDC) for first year students at University College Dublin is to design, build and

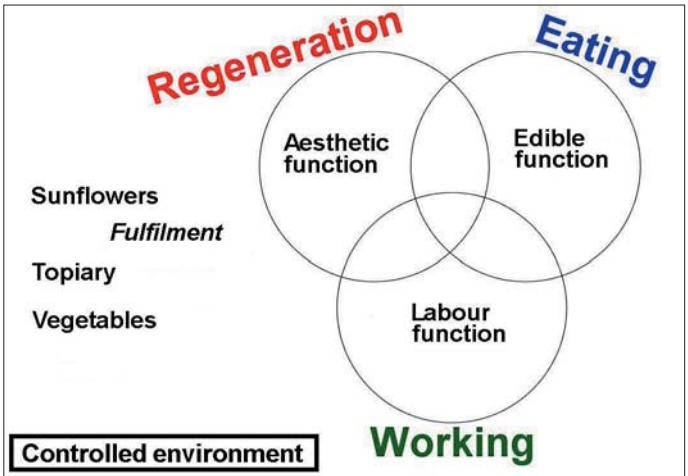

Fig. 1 Example illustrating how the C. R. E. W. system takes overlapping elements from each module to provide inhabitants with a safe environment and a sense of fulfilment

operate biologically based bench-scale models that solve practical engineering problems. The problems targeted to date have been to recycle grey water from domestic sources and to treat malodorous air from food waste. By drawing on the findings of these challenges and applying them to the existing suggestions from National Aeronautics and Space Administration's (NASA) Environmental Control and Life Support Systems (ECLSS) (NASA, 2004) and sociological necessities for life to flourish (UN, 1948), a unique vision of how to facilitate deep space missions has been developed.

Objective

This paper focuses on how biosystems engineering can be best used in the design of an autonomous space station. Therefore, certain other assumptions have been made such as the provision of anti gravity or getting the habitat into space.

The ideas set forth here are to be viewed as an overall framework for maintaining life once it is in its desired location rather than a definitive engineering solution to every aspect of long range space expeditions.

The aim is rather to cater for both the body and mind of inhabitants by implementing ideas outlined in 'The Hierarchy of Human Needs' (Maslow, 1943), social horticulture, the ECLSS and applying the knowledge from the field of biosystems engineering in order to reach our proposed vision for supporting life in an extra terrestrial unit.

Proposed vision

The model contains four components with the emphasis in each being on macro rather than micro. The general headings for the life support system are C.R.E.W., namely:

- Controlled environment;
- Regenerating and resting;
- Eating and drinking; and
- Working and energy production

Each module should specifically cater for one need but also provide overlap for other regions to maximise recycling potential between modules.

Controlled environment

This module has two primary tasks. Firstly, to identify and exploit areas of overlap that exist between other modules and secondly to operate and maintain a non-invasive, computerised monitoring system to regulate all conditions on the mission.

By exploiting the symbiotic relationships between modules (Fig. 1), it is envisaged that self-sufficiency can be attained in the habitat. The computer-controlled environment is the software engineering at the heart of the controlled environment system. It regulates ambient temperature, pressure and air quality; water temperature, pressure and quality; and biofilter integrity.

Since the focus in this project is on macroscopic rather than microscopic planning, this framework simply calls for an automatic system to regulate such necessities as:

- air and water quality for the crew;
- number of hours of light exposure that crops receive; and
- internal and external communications systems.

Regenerating and resting

Following a hard day's work, this module aims to cater for the inter and intra personal needs of those on board. Emphasis is on aesthetics and making the inhabitants as content and calm as possible.

It may be hard to comprehend how the sense of social fulfilment can be found when in an extra terrestrial place of residence but it can be done. In order to do so, it is necessary to utilise the surroundings so that the occupants get more than just nutrition from the specially selected flora in their advanced life support system.

Living in a remote location and having limited prospects for social interaction will result in the inhabitants becoming socially disadvantaged. Social inclusion can be achieved through a practice known as social and therapeutic horticulture (Anon, 1999). It is the process by which individuals may develop well-being using plants and horticulture. This is achieved by active or passive involvement.

In order to achieve a sustainable living environment, horticulture is essential and it makes practical sense for another sector of horticulture to be used to facilitate social needs. This will not only be resourceful but an effective means of growing, cultivating and producing food.

Eating and drinking

This module focuses on how to provide sustenance in the form of both food and water for inhabitants and how to do so in a cyclical manner with minimal losses of energy and resources.

Since water is such a precious commodity in space travel every effort should be made to conserve initial water reserves (NASA, 1988). To this end, purified humidity

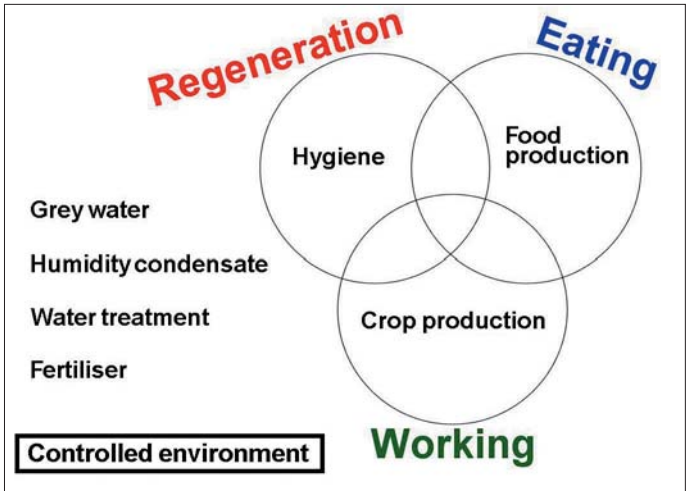

Fig. 2 Example illustrating how the C.R.E.W. system takes advantage of several overlapping areas of water usage to improve recycling and conserve resources

condensate can be stored for drinking, washing food and personal hygiene needs. Recycled grey water can be used for oral hygiene, hand washing and food preparation. Urine can be distilled to produce water and fertilisers or used to produce oxygen by electrolysis (Fig. 2).

Plant growth and food production in a confined area such as a spacecraft is a highly specialised process. It involves the production of artificial light, recycling water and nutrients and controlling humidity and temperature levels. The main plants required are those for human consumption but there is also a need for plants that help improve social fulfilment. Humans and plants are ideal travelling companions; humans release carbon dioxide and take in oxygen while plants work in reverse. Humans can consume any edible plants while human waste can be used to fertilize growing plants. The main input required to keep this system going is light. As there is no natural light in space the use of ultra violet light is proposed. Plants must be grown in gravity-controlled chambers otherwise without gravity geotropism becomes a major obstacle. In addition, without gravity water will not spread out evenly throughout the soil and this would lead to moisture stress in plants and crop failure.

The growth conditions are closely monitored and controlled for optimum growth, air filtration is used to remove any unwanted pollen particles and pure seed of the highest quality is used from the start.

Crops can be grown by hydroponics; this reduces the need for soil in some crops. Young plants are planted in water tubes and all the required vitamins and minerals are pumped through them. Reeds are an ideal crop to grow in this environment, grey water from sinks and showers can be filtered through their root system and mature reeds can be used for furniture making. Most crops can be grown in this chamber with the green waste being used as compost for plants.

Water is the most important factor for both the survival of humans and the growth of crops and therefore a clean and constant supply of water is essential for success. Water treatment itself is an important task in the work module and is therefore explained more fully in the following section.

Working and energy production

The key aim of this module is to give those on the mission a day-to-day purpose. Energy and food production, maintenance and even expansion of the habitat are also envisioned objectives.

Given that a clean and constant supply of water is essential for almost every aspect of the mission many of the tasks the crew occupy themselves with, in some way or another, involve water. In this context, it is our intention to integrate the first BEDC challenge solution for treating grey water. The design produced during that challenge resulted in a chemical oxygen demand reduction of 98% using reed beds, which utilise the nutrients in grey water. The reeds produced can be used in furniture production, a task which would also have valuable social benefits and contribute to the general well being of the crew.

The solution for the second BEDC can be implemented in on-board waste processing facilities. The biological filter can treat malodorous air and then any CO_2 emitted can be used to promote plant growth. This in turn releases O_2 and also provides food for the crew. When the food is excreted, waste is produced for the filter and the cycle is complete (Schonning *et al*., 2004). Simple is always best and therefore that food waste management could be dealt with by using a composter, subsequently using the composted matter as fertiliser for plant growth.

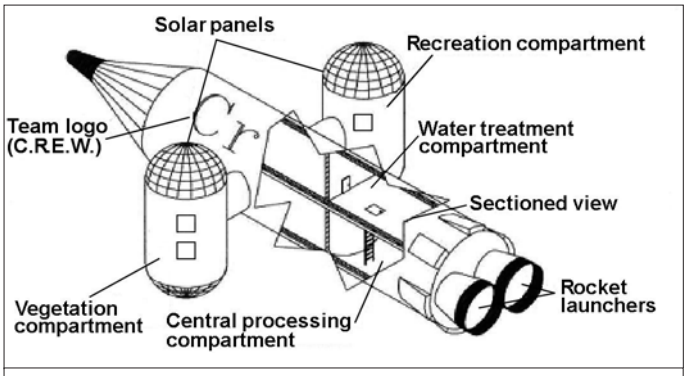

Fig. 3 Overall view of the station incorporating modules for specific tasks and human needs

The production of energy is a very important aspect of creating a sustainable environment. Renewable energy such as solar, biomass and hydro can provide a cheap means of creating energy and a continuous cycle in an enclosed environment.

Biomass will be collected but it takes very large amounts of biomass to produce adequate energy. Hydropower, however, will work as one can use the continuous flow of water that will be created in grey water treatment to power a micro-hydro system. An average micro-hydro turbine can produce anywhere from 1 kWh to 30 kWh per day.

Conclusion

Controlled environment: this compartment regulates all temperatures and pressures throughout the other modules.
Resting: crew members relax, sleep and bathe in this area that is designed for an optimal level of aesthetic pleasure.
Eating: food energy is produced in the vegetation chamber and drinking water is processed in the treatment compartment.
Working: electrical energy is harnessed through the solar panels (Fig. 3) and from the flow of water throughout the ship.

Acknowledgements

The authors would like to thank Greenstar, University College Dublin, Dr Enda Cummins, Dr Kevin Mc Donnell, Dr Nick Holden and especially Dr Tom Curran for all his hard work in selecting the team and liaising between the conference organizers and ourselves.

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SOCIAL DEVELOPMENT

The National Forest is boosting local pride

Local people have strong, positive perceptions of England's National Forest and closely associate it with improving environmental and economic conditions in the area, according to the over-riding conclusions of recent research. *Growing places: a study of change in The National Forest* was undertaken by social scientists John Urry and Jake Morris from the Social Science Department of Lancaster University. It was commissioned by Forestry Commission England with support from the National Forest Company, in response to the Forest's reputation as a place 'on the up'.

The research examined the ways in which the creation of the 500 km² National Forest in the Midlands is changing the lives of people who live, work and spend their leisure time in the area.

Jake Morris lived among the communities in the National Forest for almost six months. His 'compressed ethnography' took him into the everyday life of the Forest: planting trees, working on farms, attending meetings, doing volunteer work. His data gathering also included interviews with a wide range of people living in the National Forest.

As well as looking at the ways in which this area of 'deprivation' is being turned into an area of 'opportunity', the study explores how a healthier, green and more economically diverse environment can improve the quality of life of local residents and visitors to the area.

Susan Bell, former chief executive officer of the National Forest Company, wrote in her foreword to the research report, "*Growing places* is a very timely piece of research, because it will help to inform the social development of The National Forest over its next 10 years. Its conclusions confirm our early aspirations by clearly demonstrating how creative and purposeful landscape change has been a positive force in shaping a new sense of place and identity in the area now known as The National Forest."

> "*Growing places* is a very timely piece of research, because it will help to inform the social development of The National Forest over its next 10 years."

Austin Brady, Forestry Commission England's Conservator for the East Midlands, added, "It's great news that this research confirms our belief that well-designed woodlands don't just look good, but that they also really do improve local people's sense of well-being, as well as enhancing their sense of pride in their local area.

"Local people also recognise the contribution of trees and woodlands to local economic development opportunities. It all goes to show that the hard work and investment by the many partners in the National Forest have been well worthwhile in terms of improving people's lives, and giving new encouragement to all of us as we look to continuing this work into the future."

In addition to the positive perceptions of the Forest, the report concludes that:

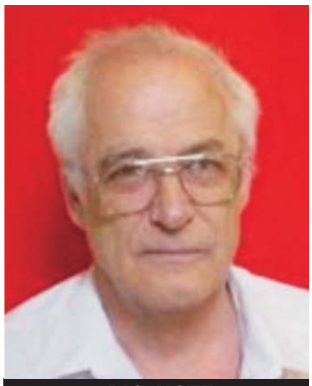
- there is a close association between the Forest and the very noticeable improvements to the area's environment: cleaner air, cleaner places and increasing biodiversity and evidence of wildlife;
- the Forest has become a 'social glue' that is binding individuals, groups and organisations together to form new partnerships and networks, engendering these new forms of 'social capital' being one of the most significant achievements of The National Forest;
- an improved economy is indicated by an increase in Forest-related businesses encouraging business re-location and buoyant house prices as more people are attracted to live in the area;
- businesses are using the Forest brand to market their products, using its 'green', 'local' or 'national' connotations;
- local authorities are using the forest as a brand to communicate a common sense of purpose and strengthen their connections with other organisations working in the Forest;
- the Forest is redefining how people see the area and although local history, such as the mining heritage, is still important, but a strong sense of a 'future' Forest is also shaping people's views, for example, how they feel about their impact on the environment, and company's views on greener approaches to energy consumption and office waste; and
- the Forest is having a positive impact on the agricultural economy, enabling farms to diversify, increasing employment and creating more business through the purchasing of services and equipment.

MORE INFORMATION

***Growing places: a study of change in The National Forest* can be downloaded from www.forestresearch.gov.uk/peopleandtrees. Paper copies, priced £11, can be ordered from Forestry Commission Publications, PO Box 25, Wetherby, West Yorkshire, LS23 7EW; tel: +44 (0)870 121 4180, quoting stock code FCRP010.**

CULTIVATION TRIALS IN CEREAL FIELD CONDITIONS

Brian Keeble



BIO NOTE

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Introduction

There have been many 'muddy floods' in recent years, defined as flash floods that affect only a relatively small area, full of soil and lasting only an few hours. Many studies have demonstrated that these usually come from farmers fields and that the farming of those fields has changed as the floods have increased. Study of fields where muddy floods started shows that the water flowing off the field has often done so down the tramlines, at least for a part of the journey off the field or during a concentration phase. Study of the history of these fields shows that many of them were classed as too steep, too shallow of soil or else too poor to be arable and so were grassland. Often the now large field was also broken by hedges and/or ditches in the past.

The runoff potential from tramlines is evidently high and these form waterways and frequently show signs of runoff (Fig. 1). In 1994, measurement of runoff from tramlines was started and discovered to be an average of 82% and sometimes 98% of the rainfall on silt loam overlying clay (Ashmore, 1995).

Discussion with colleagues, farmers and others has led to the consideration of overall field strategy rather than just the tramlines. The necessity of tramlines – or their global positioning system (GPS) equivalent – for accurate applications means that they should be treated as a necessary evil and, indeed, packed tightly to support wheels during the growing year to minimise tractor problems. Far from sub-soiling the tramlines, farmers should be encouraged to maintain them as roads for crop working and for harvest. This would enable the farmer to treat the major part of the field as a no go area, so ensuring the minimum of compaction.

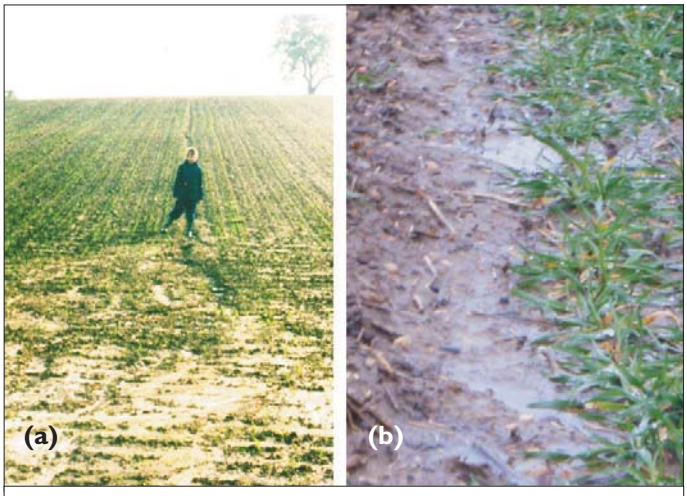


Fig. 1 (a) A tramline in a field in 2001 and (b) detail (Feb '06)

It was a short move from the above to consider what benefit is brought by either ploughing or minimum tillage. With the tractor power and coulter construction materials now available, drills are able to cultivate just enough soil for establishment without an overall tillage process – always provided that rotations and chemicals can then control pests.

What effect would such treatment have on runoff, yields, timeliness and profits?

Tillage trial design

The aim of the trial is to demonstrate that tillage is not necessary for combinable crops and is as profitable as when using tillage equipment. To do this, the areas between four tramlines of a college farm field have been selected for special cultivation practice.

- Plot one receives no cultivation, direct drilled (DD) with typical treatment – direct drill, roll.
- Plot two is minimally tilled with heavy discs and required other cultivation (Min till) with typical treatment – heavy disc, roll, combination harrow, drill, roll.
- Plot three is ploughed and

Fig. 2 The Väderstad drill at work

Fig.3. The Claydon, used for 2006/7

otherwise normally tilled (Plough) with typical treatment – plough, roll, power harrow, drill, roll.

The soil is a calcareous pedosol in the Hanslope series. A textural analysis classes this soil as a clay loam, (nearly a loam), with 33% sand, 41% silt and 26% clay.

The trial area has an average slope of less than 2.5% (1:40 or 1.4°).

Instruction to the farm staff is to treat the plots the same with the exception of the cultivation and as far as possible that is what they have done. Treatment is varied by the farm staff according to the conditions, e.g. rolling was omitted in the autumn of 2004 due to the late wet conditions.

Runoff measurements were recorded during the growing seasons of 2003/4, 2004/5 and 2005/6.

Limitations

- Timing of drilling is held to one date – necessarily after cultivation of all plots. This would not be the case with normal direct drilling as seeding could be earlier and possible in wetter conditions.
- Cultivation of three plots in Gravelpits field is necessarily tied up with the normal farm work to keep costs down.
- Plot one (DD) tends to be trafficked more than is liked, especially near to the gateway to the field.
- Straw is baled off for use on the college farm so disadvantaging the untilled plot in terms of attraction of soil wildlife.
- Seed drilling has been completed with a heavy duty disc and pneumatic tyre press wheel drill (Väderstad, Fig. 2) which struggles to achieve a constant depth or a good cover for the seed in the untilled clay soil, though it works well on the tilled plots. In 2006, a purpose built direct drill (Claydon, Fig. 3) was used and did a more consistent job.
- There is some weed problem with the untilled soil that only a re-designed rotation would reduce, though extra spraying is holding the levels for the moment.

Measurement of runoff

The runoff measurement sub-plots are established after all cultivation and drilling is complete, so that each runoff measurement sub-plot is a representation of the whole field plot. The comparison of the effects of cultivation method on runoff has resulted in differences being measured. Note the difference in establishment to be seen in Fig. 4.

The quantity and timing of rainfall affects the runoff measured. Direct drill cultivation leads to better water retention than either Minimum tillage cultivation or plough cultivation. In all years, direct drilled soils have retained either the most water or the same as the other cultivation methods. In a 'normal' year, minimum tillage retains more water than ploughed soil. In a year when there are heavy rains interspersed with longer dry spells, the minimum tillage can retain as much as the untilled soil. In a dry year not only is there less runoff but the ploughed soil retains as much as the minimally tilled soil.

Runoff

For each of the three years, plots within the cultivation treatment areas were laid out after all groundwork for the crop was complete (Figs 4 and 5). Each plot therefore represents the cultivation type in that field condition. The sub-plots were 10 m long and one metre wide aligned with the slope of approximately 2½% and edged with 100 mm boards to prevent ingress or egress of water. The plot position was changed each year to maintain accurate representation of the field condition. Note the precautionary bunds to prevent running water from the field from floating the tank!

Measurement of water

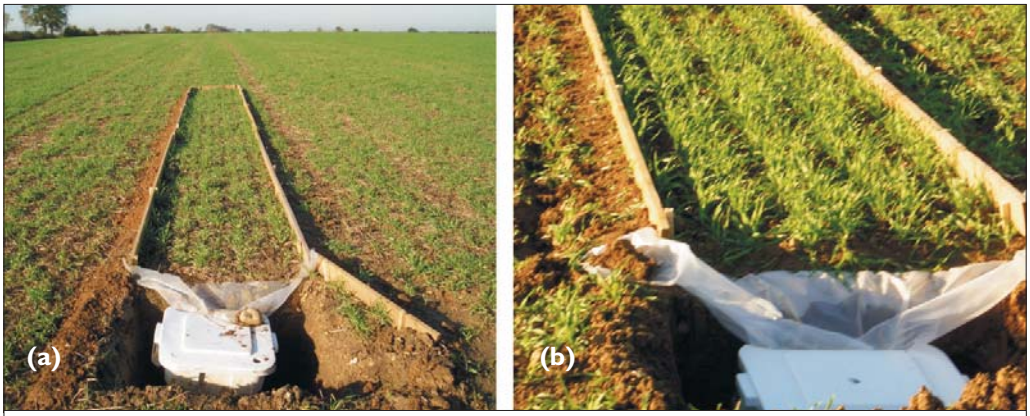


Fig. 4 (a)Väderstad drilled catchment Nov 2005; and (b) Normal cultivation plot Nov 2005

Table 1 Measurements of runoff

Date / season	Rain, mm	Runoff, mm			Runoff, % of rainfall		
		DD	Min till	Plough	DD	Min till	Plough
Nov 2003 – March 2004	247	4.8	9.1	11.1	2.0	3.7	4.5
Mar 2005 – May 2005	73	1.9	1.9	4.4	2.6	2.6	6.0
Nov 2005 – May 2006	239	4.3	4.6	4.5	1.8	1.9	1.9
Total	560	11.1	15.5	20.1	**1.99**	**2.77**	**3.59**

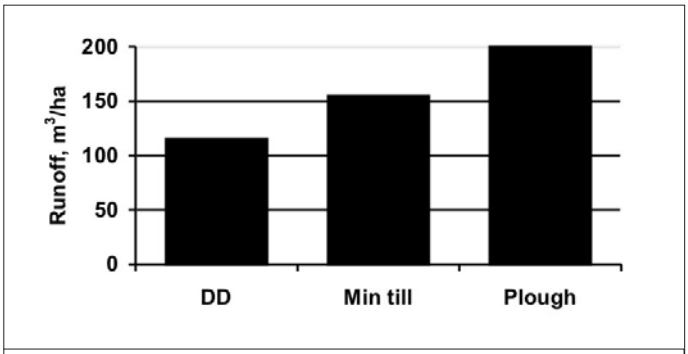


Fig. 5 Volume of measured runoff 2003 to 2006

for rainfall, 2004/5, a dry year though with two heavy rain events and 2005/6 an extremely dry season followed by a wet May (81 mm, 40 mm above normal).

Water running off the plots was recorded as litres per square metre and converted to percentage of rainfall. This is presented below as Fig. 5.

The total of rainfall over the measured cropping periods was 560 mm, or 5,600 m³/ha.

runoff and for these figures to become statistically dependable.

The annual figures for runoff as a percentage of rainfall are to be seen in Fig.6 and the monthly variation is shown in Fig. 7.

An example of the field observations is as follows for the 2004/5 season. Immediately after drilling in November 2004 the plots appeared to be quite rough. Due to very wet weather conditions it had not been possible to roll the field after drilling. Numerous small clods covered the ploughed plot, while clods after minimal tillage showed a greater variation in size. The direct drilled plot showed signs of surface compaction and smearing of the seed slots. A surface cap was beginning to form in some areas on the

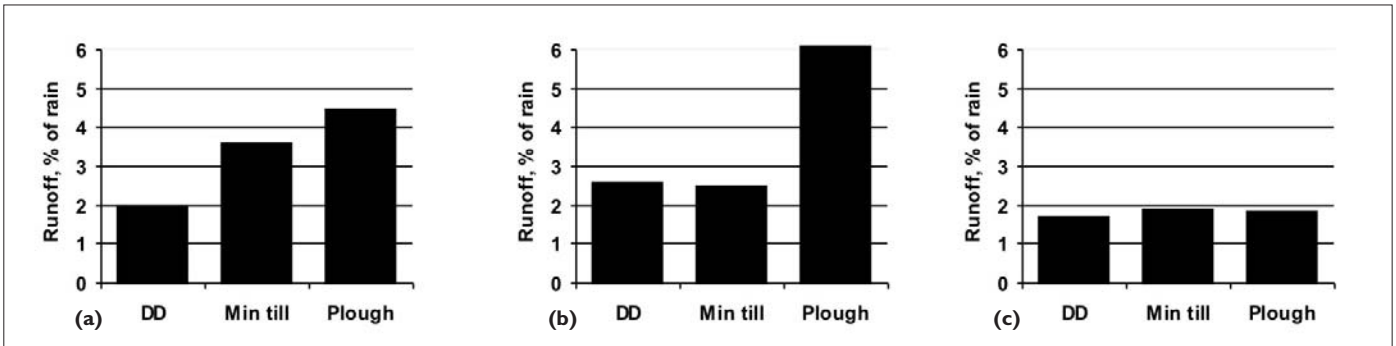


Fig. 6 (a) Runoff in 2003/4 with 'normal' rainfall; (b) runoff in 2004/5 with heavy showers; and (c) runoff in 2005/6, a very dry season

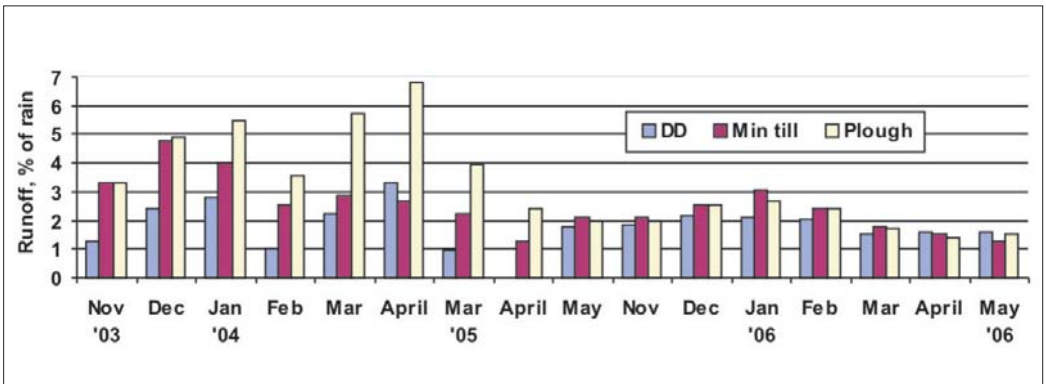


Fig. 7 Runoff as a percentage of rainfall – monthly totals

collected was made after each rain event rather than on a daily basis, at which time the rainfall gauge on site was also read.

Runoff from the commercially farmed field plots in Gravelpits was measured over a period of four months in 2003/4, three months in 2005, and six months in 2005/6 (Table 1).

2003/4 was a normal year

The results were measured in three very different rain seasons so the total does not present the full picture. Several more years of study are needed to be predictive regarding

ploughed plot in late November 2004 (see Fig. 8).

Infiltration measurement using the double ring test was difficult to measure being very fast on the ploughed land, less so on the minimally tilled land and slowest on the untilled land though they all settled at a similar rate after 3 hours, once the upper profiles were saturated. The tests were taken in very dry conditions in November, 2004 (Fig. 9).

Conclusions

Three crop years into a projected five year trial demonstrates that 'No till' farming is viable and competes effectively with 'Minimum

Fig. 8 Surface of ploughed plot (a) in mid-November 2004 after drilling, and (b) at the end of November, showing surface cap beginning to form (Paul Rogers project report)

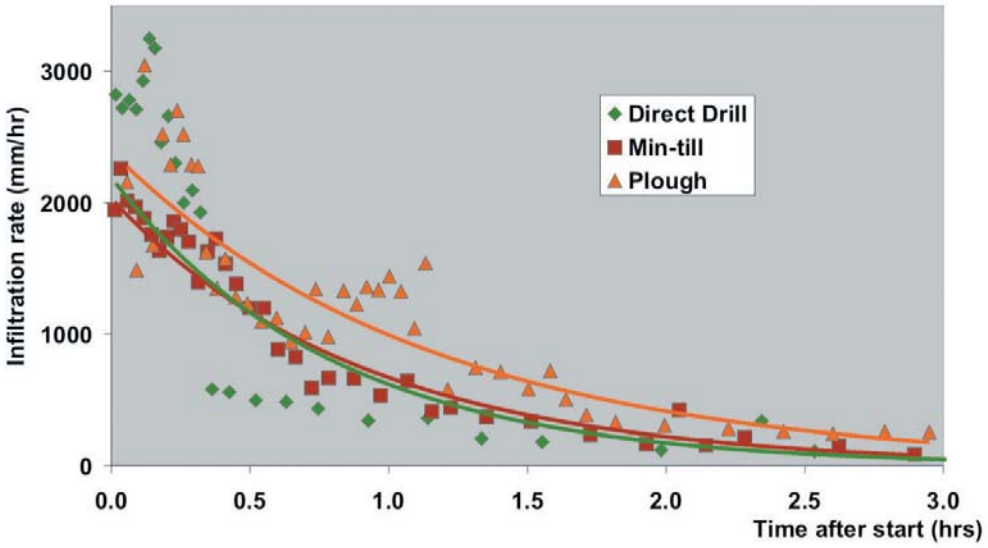


Fig. 9 Infiltration rates of the three trial plots

tillage' and 'Plough based' cultivation systems in the production of crops, with average profit values of £348/ha, £358/ha and £333/ha (grain value less cultivation input).

The environmental effect of farming is least with non till (direct drilling) methods in terms of less CO_2 emission, less water running off the field and also in sequestration of organic carbon and soil structural integrity. More worms are to be found in the non ploughed plots.

For the three years of the trial, rain and runoff has been measured over parts of the growing seasons to a total of 560 mm of rainfall (or 5999 m^3/ha); (Nov to April '04, 247 mm; March to May '05, 73 mm; and Nov to May '06, 240 mm). Runoff has been most from the ploughed soil at 4.02% of rainfall (201 m^3/ha), followed by the minimum tilled soil at 3.08% (155 m^3/ha) and least from the untilled soil at 2.06% (111 m^3/ha). This does vary with differing seasonal weather conditions but at all times the untilled soil has the least runoff.

STRATEGIC FUNDING

University transfer risks research loss

The Biotechnology and Biological Sciences Research Council (BBSRC) has revealed plans to transfer the Institute of Grassland and Environmental Research, with the exception of its North Wyke research centre in Devon, to the University of Wales Aberystwyth and to seek a university partner for the Institute of Food Research.

Responding to the announcement from BBSRC that it plans to transfer key agricultural and food research establishments to the university sector, Sue Ferns, head of research for the scientists' union Prospect said: "Prospect has called on Science Minister Malcolm Wicks to cease all transfer discussions until a rigorous review of the scientific justification for change in each case has been established, including any review of the Institute of Food Research.

"We believe these are further examples of quick-fix solutions to questions regarding organisational change rather than taking a step back and examining the best approach for science.

"One of the key questions is whether all the capability – and all the jobs – will be maintained. Past experience at Horticulture Research International and the Natural Resources Institute demonstrates that once the government has transferred an organisation to a university it rapidly divests itself of responsibility for whole areas of research.

"A stated benefit of moving to a university is the increase in 'critical mass'. But experience has shown that academics work on whatever projects they can get funded. Obviously if it is a choice between closing an institute or moving it to a university, moving is the lesser of two evils. But Prospect believes that true, themed research will never be achieved without long-term strategic funding, since the research will follow the pots of money."

ENGINE TECHNOLOGY

Proposed CO_2 emission targets are arbitrary and too severe

The European car industry cannot agree with the proposals made by the European Commission on CO_2 emissions from passenger cars. The proposals are unbalanced and damaging to the European economy in terms of wealth, employment and growth potential. The European vehicle manufacturers call on the European Union (EU) Member States and the European Parliament to take the lead in the current debate and start a broad and fair discussion based on sound facts and figures.

"We ask the EU governments and the European Parliament to design a reasonable and level-headed strategy to reducing CO_2 emissions from cars towards the EU target of 120 g [CO_2]/km by 2012, involving efforts from all relevant parties and including both existing and new cars on the road", says Sergio Marchionne, President of the Brussels based European Automobile Manufacturers Association (ACEA) and Chief Executive Officer (CEO) of Fiat Group. "The ideas put forward recently by the European Commission focus too much on vehicle technology, denying the fact that a broad range of means is available to reduce CO_2 emissions in a far more cost-effective way to the benefit of equally the environment and the economy."

The Commission has formulated arbitrary targets, not sustained by a valid assessment of all facts and consequences involved. Putting the burden mainly on the car industry is the most expensive and least cost-effective method possible. It will lead to a loss of jobs and the relocation of production outside the EU, severely affecting several European regions. "Reality will not just go away by denouncing it", says Marchionne. "This is not the time for an ideological debate. The automotive sector forms the backbone of the European manufacturing industry, with thousands of smaller companies depending on a dozen major players. At least 12 million EU workers and their families count on a balanced policy on CO_2 emissions from cars. The car industry does not want to be part of an experiment. If left unchanged, the Commission proposal would erode the economic strength of Europe."

The European automobile manufacturers are fully ready to engage in a constructive dialogue with EU legislators about making further progress in reducing CO_2 emissions. The industry shares public concern about global warming and is contributing conscientiously to tackling this global problem. Following the 1998 agreement to decrease CO_2 emissions from passenger cars, continuous improvements in vehicle technology have resulted in an important 13% CO_2 emission reduction and helped significantly to the EU strategy to meet its Kyoto goals. This achievement has been made in spite of a trend towards consumer demand for larger cars and despite EU regulations, which have made cars heavier. The car industry demands a full evaluation of the current agreement as stipulated in the 1998 Commitment. Any future measures or policies cannot be designed without a transparent and thorough assessment of their impact on both the environment and the European economy.

Further progress in reducing CO_2 emissions from passenger cars can and should be made through an integrated, cost-effective approach, combining on-going technological innovations from the car industry with the efforts from policy makers, consumers and the fuel industry. This will result in cost-effective CO_2 reductions, safeguarding employment and the competitiveness of the European automotive industry. An important element of such an Integrated Approach is a harmonised effort to increase demand for fuel-efficiency through CO_2-related taxation of cars and of alternative fuels.

The Commission's communication on CARS 21, which has separately been published, does not fully incorporate the recommendations of the High-level Group CARS 21 of December 2005. This group, which included the Commissioners Dimas, Verheugen and Barrot, six national Ministers, five car industry CEOs, Members of the European Parliament (MEPs) and representatives of consumer groups, explicitly called for "better regulation" and following an Integrated Approach to important policy fields such as road safety and CO_2 emissions. CARS 21 dealt with balancing economic and environmental issues in a cost-effective and sustainable way. "It was an example of coherent and responsible industrial policy", says Marchionne. "We ask EU legislators to cherish the positive contributions of CARS 21."

Traffic of passenger cars accounts for 11% of CO_2 emissions in the EU. Globally, passenger car traffic emits 5% of all man made CO_2. The European share of this is 1.5%, thanks to advanced European technology.

ACEA represents the thirteen major European vehicle manufacturers. At the heart of the European industry, the automotive sector is the leading employer in manufacturing in the EU. The car industry provides increasingly high-skilled jobs to 2 million Europeans and indirectly supports another 10 million employees in related industries. Europe is the world's largest vehicle producer. Of the 46 million passenger cars produced globally, 38% are manufactured in the EU. The ACEA members yearly invest 5% of turnover (20 billion) in R&D. Members are: BMW Group, DAF Trucks, DaimlerChrysler, Fiat, Ford of Europe, General Motors Europe, MAN Nutzfahrzeuge, Porsche, PSA Peugeot Citroën, Renault, Scania, Volkswagen and Volvo.

Quarterly SUMMER 62(2)

MEMBERSHIP MATTERS

THE NEWSLETTER OF THE INSTITUTION OF AGRICULTURAL ENGINEERS

Honorary Fellowship 2007
John Weir

John Weir has made an outstanding career contribution to Horticultural Engineering and has made a unique contribution to the effective functioning of The Institution of Agricultural Engineers.

John was trained at Harper Adams where he was President of the Students Union. He is a Member of The Farmers Club and Fellow of The Institute of Horticulture. He was commissioned as a Captain during his National Service and remained a Captain in the Territorial Army (TA) for some years. He started his career first as an Assistant Farm Manager in Devon then as an Assistant Area Supervisor for the Potato Marketing Board. In May 1959, John started his career with the electricity industry first as a Group Advisory Officer for South Western Electricity Board. In 1964, John joined the Electricity Council, which at this time was responsible for research and development across 15 regional electricity companies. He started as an Assistant Engineer then in 1971 became the National Horticultural Engineer. In this role, John was responsible for a national research and development programme, together with the dissemination of the output to growers and colleges via publications, papers, lectures, conferences and exhibitions. This position developed through John's enthusiasm and drive until he became National Horticultural Engineer for the Electricity Industry. In this role, he was responsible for both the strategy and market development. This involved training and leading a national advisory service, a detailed research and development programme at horticultural research centres, universities and on leading growers premises and close liaison with related centres worldwide. It also carried with it the responsibility for technology transfer, principally through the production of a range of national publications used by both growers and lecturers in agricultural education and general industry wide representation. John's work helped to establish an international reputation for the Farm Electric Centre and he also became consultant on horticultural engineering to the South African Electricity Company ESKOM.

John Weir (right) after receiving his Honorary Fellowship from IAgrE President, Paul Miller, at the ceremony held at the Annual Conference.

John has produced a wide range of papers on his lead specialism, artificial lighting and production lighting in horticulture and was Editor of the Electricity Council's National Horticultural Handbooks. John is known throughout the world for his expertise and still remains the leading authority in his field

John has been a member and Fellow of the Institution of Agricultural Engineers throughout his career. He has been Honorary Secretary of South Western Branch 1962-1964, Chairman of London/Kent (South Eastern) Branch from 1984-1988. He has been a member of Council for more than twenty years, an active member of the Membership Committee, a Vice President and Chairman of the Horticultural Engineering Technical Group for more than ten years. He has been Honorary Treasurer of the Institution on two occasions from 1987-1990 and 2004-2007. Some years ago John encouraged the Institution to invest its money in the stock market which means today the investments are at least double what they would have been without John's investment expertise.

Outside work John has a very wide range of interests including music, art, architecture and ornithology and many friends. He is a highly respected engineer with great personal modesty.

Award of Merit 2007

The Award is made to a person distinguished by work in the agricultural engineering profession.

Jake Vowles FIAgrE

Following studies at Reading University followed by the Royal Agricultural College, Jake commenced employment with International Harvester at Doncaster in 1964 as a Demonstrator/Sales Engineer. Over the following 20 years, his career developed on the commercial side of the organisation in both its agricultural and construction equipment divisions, culminating as Marketing Manager, Construction and Industrial Equipment – Europe, Middle East and Africa, based in Paris.

A short sojourn out of the machinery business, although back into mainstream Agriculture, saw him move to Norsk Hydro for 3 years firstly within Marketing and latterly as Head of Public Affairs, a role involving considerable contact on the company's behalf with government agencies.

This gave him critical experience to take on the role in 1987 of Director General of the Agricultural Engineers Association (AEA), the body representing the interests of the manufacturers and importers of farm machinery in the UK, a post he has held to this day. Jake joined IAgrE in 1988 and shortly after this became a member of the Education and Training Committee on which he has served continuously through to his retirement. His work has involved the maintenance of the interests of the AEA membership through a diverse range of activity. As joint sponsors with the Royal Smithfield Society of the Royal Smithfield Show, over the past 20 years Jake has been an influencing figure in the mounting of the show. Changes in legislation, and particularly those brought about following the UK's entry into the European Union have brought a demand to remain continually abreast and involved in the legislative process as it applies to the construction and use of Agricultural machinery. He has maintained close communication with trade and professional associations such as the British Agricultural and Garden Machinery Association (BAGMA), the European Committee of Associations of Manufacturers of Agricultural Machinery (CEMA), the National Farmers' Union (NFU) and the IAgrE as well as numerous government departments. The AEA, under his guidance, has actively promoted the export efforts, particularly of the smaller members of the AEA.

Jake Vowles (right) being congratulated by the President Paul Miller

The pressures on UK farming over the past 15 years have brought significant difficulties to the machinery industry which supports it and have demanded diverse strategic changes in activity on the part of the AEA. These have included the incorporation of manufacturers of Outdoor Power Equipment into the AEA membership, creation of the National Sprayer Testing Scheme and active involvement in the mounting of two major machinery demonstration events, Tillage and Scotgrass. Latterly, the manufacturers of Power Generating Systems have also been embraced by the AEA.

Throughout these changing and sometimes difficult times, Jake has led the AEA with energy and enthusiasm. Whilst the views that he has expressed have at times been strident and at odds with some around him, he has constantly fought to further the success of the AEA membership and the Agricultural industry which it serves. He is a worthy recipient of the IAgrE Award of Merit in recognition of a lifetime's contribution to the industry.

Douglas Bomford Trust Award

The Douglas Bomford Paper Award is presented to the author(s), at least one of whom is an Institution member, who demonstrate originality and technical excellence in a scientific paper published during the previous year in either the Institution Journal *Landwards* or in *Biosystems Engineering*. Assessment criteria include: engineering content; potential for practical and commercial use; relevance to the current problems and needs of industry; as well as quality of presentation and the authors' authority in the subject material.

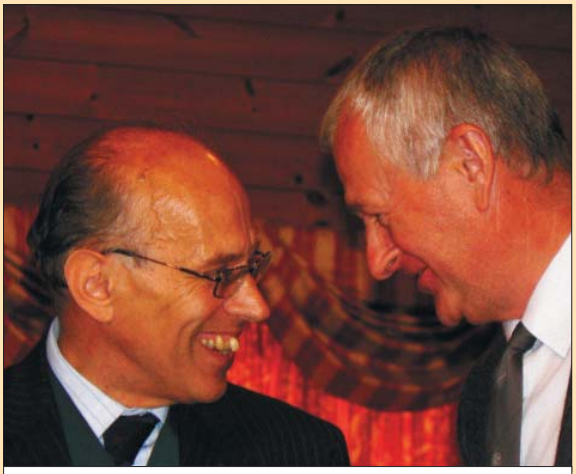
The award winners this year are **David Pullen** MIAgrE and **Peter Cowell** FIAgrE for their paper *The Effect of Implement Geometry on the Hoe Path of a Steered Rear-Mounted Inter-Row Weeder.* Biosystems Engineering, **94**(3), 373-386.

David Pullen (far left) and Peter Cowell (near left) receiving their awards from Jonathan Bomford, Chairman of the Douglas Bomford Trust.

Awards for Contributions to the Land Based Sector 2007

The Awards are made to IAgrE members who have made sustained contributions to the land based sector throughout their careers.

Bill Basford FIAgrE



Bill Basford (right) with the President Paul Miller at the Awards Ceremony

David Frizelle (right) receiving his award from the President Paul Miller

Bill Basford began his professional life as an Agricultural Engineer by studying for and obtaining the National Diploma in Agricultural Engineering (NDAgrE) at Writtle College. His first professional position soon followed with a stint working for Evers and Wall spraying specialists and machinery dealers in Kent. Since those early beginnings in spray application technology Bill has gone on to advise, be consulted on and design systems for spraying just about everything to anything in agriculture, horticulture, amenity and land management situations.

Later Bill joined the National Agricultural Advisory Service (NAAS) as a trainee Mechanisation Adviser at Reading, then Wolverhampton and finally with the Agricultural Development Advisory Service (ADAS) at Nottingham where he spent the majority of his career.

Efficient application of all the major inputs to arable farming and horticulture have characterised Bill's career. Bill was always the spraying guru in ADAS in particular for new and novel application techniques and new technical challenges. He was also closely involved in better environmental techniques for accurate fertiliser spreading at wide bout widths of difficult materials such as prilled urea and dried sewage sludge to name but two products.

In his home patch of Nottinghamshire, irrigation was always going to be a huge technical area. Bill has developed a wide knowledge and experience base on all aspects of irrigation technology but in particular efficient water use and minimising water loss through inaccuracy and run off. He has spent many happy hours measuring and improving the design and operation of rain guns, boom irrigators and trickle systems. In recent years, the environmental pressure for more efficient irrigation has increased immensely and Bill is now widely consulted by most of the main organisations and agencies involved with irrigation.

Other technical areas and activities which should be mentioned include organising the annual Agricultural Engineers Association (AEA) Tillage demonstrations, development and testing of filter beds for chemical spray residue disposal, experimental plot mechanisation and bed system for potatoes and bulbs.

Throughout his career Bill has always been an active and supportive Institution member. With virtually continuous service on the East Midlands Branch committee Bill has held most of the committee positions, including Chairman, Secretary, and currently branch Publicity Officer. Bill is always helpful, positive and constructive whoever the enquirer or the nature of the request. A trusted, reliable and widely respected colleague prepared to look forward and enjoy the challenge of innovation and change provided that it is based on common sense.

Although now retired from ADAS, Bill is still active as an independent mechanisation consultant, and he fully deserves this award in recognition of his past and continuing contribution to the industry.

David Frizelle MIAgrE

David Frizelle graduated from Queens University Belfast in 1969 with an Honours degree in Mechanical Engineering, then went on to Reading University where he graduated with an MSc in Agricultural Engineering in 1972. He then went on to become a Chartered Engineer (CEng) and has been a member of the Institution of Agricultural Engineers for over 23 years.

From 1969 to 1971 he worked as a Construction Plant Engineer in the Gambia West Africa. From 1972 to 1979 he worked as a Development Engineer for Alfa Laval working on the development of rotary milking parlours and automatic feeding systems.

From this very practical background in industry, David joined the Institute of Technology at Tralee as Senior Lecturer and has continued in this position to this day. In this position David has been lecturer in Agricultural and Production Engineering within the School of Engineering, which also includes courses on Mechanical and Civil Engineering. He has been responsible for course development and for developing a very effective team of lecturers and technicians. Recently he has also helped to develop degree courses in Agricultural Engineering and Agricultural Engineering and Management and is seeking accreditation of these courses though the Institution of Agricultural Engineers. He has developed wide ranging commercial and farming contacts both in Ireland and overseas to support student projects and career potential and has been an outstanding mentor for students on his courses over many years.

David has enormous enthusiasm for Agricultural Engineering and a unique holistic approach to both his teaching and management of both staff and students. The College is the only one to date that has a student chairman of the Douglas Bomford Trust (DBT) student group.

The staff at Tralee, from the Head of the School of Engineering to the security man on the gate, all marvel at David's commitment and energy. This has resulted in the development of student numbers and courses during a time when similar courses in England have collapsed at two centres.

Without David's dedication, commitment and hard work it is possible that there would be no courses on Agricultural Engineering at Tralee Institute of Technology. He has opened doors in industry right across Ireland and is so well known in the industry that it is said by his ex students that he never has to stay in a hotel!

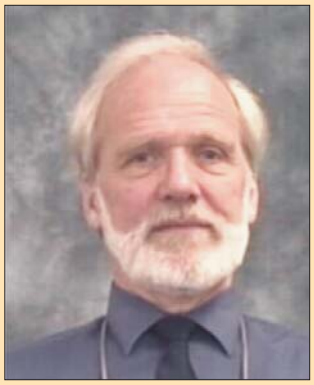
David cares for people in depth and always puts others first. For his own development he thinks nothing of travelling 600 miles to an IAgrE meeting in Belfast and being back at work early the next morning.

For his unique contribution to agricultural engineering education David richly deserves this Award. He is a modest unsung hero of this Institution.

Branch Meritorious Service Awards

The Award is made to a member who has consistently rendered outstanding service to a Branch of the Institution over a number of years.

Jim Christie FIAgrE, Scottish Branch



Jim Christie has been a member of IAgrE since 1964. He is a long serving member of the Scottish Branch being supportive throughout his career. He is an active Committee member, regularly attends evening meetings and arranged this summer's visit.

Jim started his distinguished career as an apprentice fitter in the private sector and eventually became Plant Engineer with the Forestry Commission.

He started his career with British Leyland Tractors at Bathgate and the National Engineering Laboratory where he worked on design, assembly line production, test rigs and the electronic control of hydraulic systems. The job included operator and mechanic training, safe repair procedures, risk assessments, compliance with environmental legislation, measurement of machine performance, specification of lubrication requirements, year 2000 compliance and IS09002 accreditation. He undertook special projects, such as the design and build of customised drill rigs and first excavator based harvester. He also held the position of Fleet Engineer in the Forestry Commission, which includes all vehicles, machines and mechanical engineering equipment with a replacement value of £70 million. He specified road-going vehicles, including customised vehicles for wildlife rangers, timber transport and forest machine transport. He is now a freelance forestry consultant.

He is a founder member of the Forest Engineering Specialist Group, which organises seminars and conferences on forest engineering topics. He has held the post of Information Officer since the Group's inception.

He advises the Forestry and Arboricultural Safety and Training Council (FASTCo) on drafting of safe working procedures for operation and repair of forest machines and on Codes of Practice.

He produced the forest industry's skills demonstration in the Main Arena at the Royal Highland Show over a period of three years.

As a forestry consultant he advises on the safe working practices, investigates accidents, gives lectures to field inspectors on advanced forestry courses and advises on the ergonomics of cab design, control systems and seating.

Regularly contributing to the Forest Machine Journal and other forestry magazines, Jim has, throughout his career, been responsible for the publication of literature relating to a variety of forestry and civil engineering topics, including *The Use of Biodegradable Hydraulic Oils in Forestry Machines* (2000), *Machine Repair Regimes for UK Forestry, Forestry Engineering for Tomorrow* at the first ever International Forestry Engineering Conference (1999), *Fast Tractors in Forestry – Have they a Place?* (Landwards 1997, **52**(3), 17-22,) and *Fault Diagnosis on Lako Harvesting Heads* Forestry Commission (1996).

Nigel Penlington MIAgrE, East Midlands Branch

Nigel Penlington joined IAgrE as a student in 1989 and has been a member for over 17 years.

Nigel has been a member of the East Midlands Branch Committee since 1993 and has held a post on the Committee continuously since then. He served as Branch Secretary for several years from 1993. He was Vice Chairman 2000/2001 and Chairman from 2001/2002 until 2005/2006. Last year in addition to the Chairman's role he also did a major part of the secretarial work.

He remains a member of the Branch Committee, always willing to provide advice and support to Branch activities. Nigel has been instrumental in encouraging people to join IAgrE, in welcoming new members to participate in the Branch and maintaining contact with existing members, including those whose ill health prevents their active participation.

As formal recognition for his contribution to the IAgrE, we therefore propose his service to the IAgrE in the East Midlands is formally recognised by a Branch Meritorious Award. Support for this Award to Nigel has been unanimous amongst the current Branch Committee and other members consulted. In particular, those longer serving members of the Branch who are most able to appreciate his sustained contribution have been particularly active in proposing this Award.

Michael Dwyer Memorial Prize 2007

The prize is to a mid-career engineer who has made outstanding progress in the agricultural engineering industry.

Pat Naylor MIAgrE receiving the Michael Dwyer Memorial Prize from Mrs Brenda Dwyer during the Awards Ceremony at the Annual Conference.

Pat Naylor MIAgrE

Following the award of HND in Mechanical Engineering (Agriculture) from Harper Adams Agricultural College, Pat joined JCB Special Products as a Development Engineer. He quickly gained a reputation as a capable 'hands on' engineer who had a good feel for the requirements of the customer as well as a practical approach to problem solving.

His career developed quickly and he worked on broad range of JCB product from Rough Terrain Forklift Trucks to Wheeled Excavators to Skid Steer Loaders.

A highpoint at this stage of his career was the design and development of the 1CX, a novel compact backhoe loader which was based on an existing skid steer loader design. It was Pat's conviction that his idea had merit that convinced Mr J C Bamford that the necessary investment should be made in the project. Suffice to say, the 1CX has been a successful product for the JCB Group.

In 1996, he moved discipline to become Marketing Product Specialist within the Mini Excavator business unit and in 1998 was asked to become Project Manager overseeing the development of a brand new range of Midi Excavators. Following a successful development programme, Pat was appointed to run the newly formed Midi Excavator business unit.

In 2001, he was appointed Product Manager with Marketing and Engineering responsibility for all machines designed and built within the Compact Products Division of JCB. This company, as its name suggests, manufactures a broad range of small but very diverse products employing a huge range of technologies from wheels to rubber and steel tracks, from mechanical to hydrostatic transmissions, from conventional to skid steering systems.

Pat has always sought to further his career and successfully passed the Engineering Council top up exams necessary to enable him to apply for CEng status. He gained this through the IAgrE in 2005.

He is currently applying his considerable engineering knowledge gained to the development of yet smaller machines as Development Manager within the newly formed Groundcare division of the JCB Group.

Johnson New Holland Trophy Award

The Award is presented annually, with the object of encouraging and recognising innovation by younger students, to the best final year project submitted by a student or group of students, as part of a First Degree, Higher National Diploma or Higher National Certificate course in Agricultural Engineering. The College submitting the prize-winning project will receive the trophy to hold for one year.

John Gittins with his award, together with the trophy held by the College, following the presentation by Steve Lyddon of CNH UK, the sponsors

The winner was **John Gittins** AMIAgrE, Harper Adams University College for his final year project entitled *The Design of a Rotating and Telescopic Dipper Arm for a Backhoe Loader.* The objective was to design a telescopic and rotating dipper arm which could perform the same functions as a standard backhoe, could be locked in various angles of rotation, and would improve excavator productivity especially in landscaping and grading roles. However, tilt and rotary mechanisms can place greater loading on excavator booms, so a study was undertaken to determine the safest angle of trench wall 'battering' and hence bucket rotation needed to suit UK soils. Key findings showed that a bucket rotation of 70° from vertical would create a stable slope for approximately 75% of British soils. Applying this outcome to a number of specific loading cases, the worst scenario was identified and investigated fully using Finite Element Analysis and validated by manual calculations. The dipper arm has subsequently been developed for Lewis Equipment's Badger II backhoe digger.

Rural Skills Academy opens doors for young unemployed

Unemployed young people living in even the remotest of Scottish communities are to be given the chance of formal training to help them into jobs in the rural industries. They will be offered free places at a new Rural Skills Academy, under a scheme devised by Oatridge College in West Lothian and Access to Industry and funded partly through the European Union.

During a 13 week course, the students will be given training in the basic skills needed for a range of landbased sectors, work experience placements and help in a number of other key areas which employers say are vital in the rural workforce. These include literacy, numeracy, marketing and communication. There will be help with travelling expenses and some students may qualify for assistance with accommodation.

Des Martin, Assistant Principal at Oatridge College, says: "The creation of the Rural Skills Academy is recognition of the fact that young unemployed people living in rural parts of Scotland are often overlooked when issues such as exclusion and deprivation are being addressed.

"Many of them want to continue to live and find work in their own communities, but until now getting formal training has been difficult. The Rural Skills Academy is open to any young person who is unemployed. They don't need formal educational qualifications, just a desire to learn and a readiness to get their hands dirty.

"At Oatridge, we see it as our mission to help all students to achieve their full potential so that they can move in to meaningful, rewarding careers and play their part in strengthening the rural economy. We have a good track record, with 98 percent of our students going into jobs or on to further education."

The Rural Skills Academy offers two distinct programmes. The first is for young people interested in working with horses and leads to a Level 1 Scottish Vocational Qualification (SVQ) in Horse Care. The second leads to a Landbased Operations Level 1 qualification and is for anyone interested in agriculture, conservation, greenkeeping or landscaping and covers a range of units on machinery, hard landscaping, maintenance of grass surfaces, movement and handling of animals and habitat management. Both of the programmes contain mandatory units on health and safety.

After the initial 13 weeks at Oatridge, it may be possible to progress to work experience placements for a further 13 weeks. The next start date for the second of two programmes is in September 2007.

Oatridge College stands in its own 383 hectare estate amid the lush, rolling West Lothian countryside. It has its own commercially-operated mixed farm, a pay-and-play nine-hole golf course and is home to the recently opened Scottish National Equestrian Centre.

Although it is a campus in the country, it is within easy reach of most of Scotland's major cities, thanks to the nearby motorway network.

The College has accommodation for 200 live-in students at a time. A new Learning Centre provides state-of-the-art classrooms and lecture rooms, a laboratory and information technology (IT) suite.

Anyone interested in obtaining further information or an application form can do so by contacting Oatridge College on +44 (0)1506 864800.

Letter to the President

Dear Sir

It was a very pleasant surprise to receive my 35 year certificate from you.

I am not a very active member now, but feel proud to belong to such a progressive and active Institution of which I hope to be part for many years to come.

My wife and I have retired from farming, but I still have my old tractors and workshop where I make windmills to generate electricity.

May I express my sincere thanks to you all for my certificate and your kind words. I now look forward to the next magazine.

Repeated thanks,

John Adlard AIAgrE, Lincolnshire

Letter to the Editor

Dear Sir,

Entrepreneurial Agricultural Engineers

In recent discussions about the future of agricultural engineering in the UK, the consensus view was that there would be a steady out flow of manufacturing facilities to Eastern Europe or the Far East as well as the loss of home and world markets to companies not regularly seen in Western Europe.

Many design and development engineers currently being trained in the UK will either end up in marketing and customer support as predicted by Jake Vowles twenty five years ago or have to go overseas if they wish to be employed in development or production functions.

This will be a sorry loss to the country and a further decline in the long term future of the industry.

There is little chance of a return of the traditional manufacturers to this country but there is a core of small innovative companies still trading and exporting. These will employ a proportion of the graduates but what is needed is a new breed of entrepreneurs willing to seize the opportunities being thrown up by pressures on all of us to reduce carbon dioxide production, the loss of natural habitat and the expanding expectations of an exploding world population.

Higher Education needs to produce engineers willing to become involved in growing businesses or starting their own enterprises. Group and individual projects should be undertaken that step beyond design, prototype build and test into the area of build and marketing through a start up company. These should be an integrating activity in each year. Without new and expanding small companies there will be no future for agricultural engineers beyond sales and so no engineering courses and no Institution of Agricultural Engineers.

Yours faithfully

Geoffrey Wakeham MIAgrE

Obituaries

Geoffrey E. Lawson (3 February 1926 - 11 April 2007)

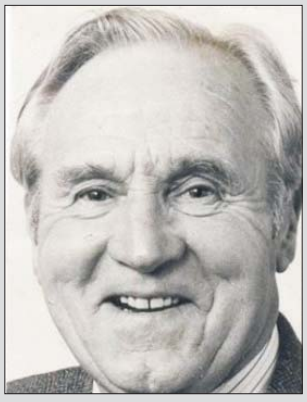
Circumstances that bring together the ideal person for the job, at the right time and place, are not common in any profession. Agricultural Engineering is certainly no exception in this but we do have one such example which resulted in a particularly fruitful career for one of our members.

Geoff Lawson's working life started as a pupil on a Kentish farm in the early 1940s and it was there that his taste for agriculture, soon to be followed more specifically by agricultural engineering, was first developed. While undergoing training in 1944, he was accepted as a Student Member (one of the very first) of the IAgrE. An initial few years employed in servicing and sales for general suppliers of field equipment in the SE, proved an essential start to his career in agricultural engineering which led to his appointment as Research & Development Engineer for Lundell (GB) Ltd. It was while working at Lundell that Geoff had the opportunity of broadening both his experience in and knowledge of a wide range of agricultural equipment: making him an ideal candidate for the post of Lecturer in Farm Machinery at Plumpton Agricultural College, E. Sussex. By merit of its location, Plumpton had a strong Horticultural Department which gave Geoff the opportunity to extend his professional remit into this particular field of engineering in which he became a recognized authority.

It was in the early 1970s that our commercial horticultural industry, faced with increasing labour costs, had to meet the challenge of intensifying competition from overseas producers. The 1972 energy crisis dealt a further blow to horticulture's major branch of protected cropping. To survive, the industry needed to invest in a whole range of newly developing engineering technologies: specialised mechanisation, automation, robotics and computerised climate control. The late John Bloom, editor of *The Grower* at the time, realised that the horticultural press had a key role to play in passing on such information to growers and knew he required a journalist with an engineering background who could critically appraise this emerging technology. Geoff, John's clear choice, was appointed as Machinery Editor – a post held until his retirement.

During the 20 years spent in journalism, Geoff gained a name for fair and accurate reporting with both manufacturers and agents who regarded his comments as setting a distinctive standard for evaluating equipment and systems; which also led to involvement in numerous consultancy projects. His reputation was not confined to our shores as *The Grower* enjoyed an international circulation and with this went Geoff's good name. The IAgrE Horticultural Engineering Technical Group owes its existence to Geoff, as it was his persistence in the mid 1990s which ensured its inception and, as an active member of its committee, he organised a number of very successful meetings while producing some excellent reports of its activities for *Landwards*. But, undoubtedly, the most valuable part of Geoff's journalistic career was the legacy of his writing which proved so beneficial to his readers throughout horticulture.

Robert John Hart (1920 – 2007)



Born in Stirling, Bob commenced his career in the Agricultural Engineering Industry in 1936 on joining the locally-based McNeil Tractors as an apprentice mechanic. Enlisting in the RAF in 1939, his skills were put to use as a Flight Mechanic, before he undertook his pilots training in 1941. Commissioned in 1943, much of his war service was spent in the Far East flying a wide variety of aircraft. On de-mobilisation in 1946, Bob returned to McNeil Tractors where on their acquisition by Robertson & McLaren in 1948, he became Workshop Manager. After moving into sales and demonstration, he moved to Edinburgh in 1954 to join the Leith Works of Gillies & Henderson Ltd. Following a period in Sales covering Central Scotland, Bob was instrumental in developing the firm's capabilities in the growing area of grain handling, drying and storage. On the move to larger premises at Sighthill, Edinburgh in 1961, he was appointed a Director of Gillies & Henderson.

Joining the IAgrE in 1962, Bob served on the Scottish Branch committee from 1967-1970 prior to becoming Chairman in 1973. Elected to Fellow in 1977, he continued to be active within the Institution until his retirement from Gillies & Henderson Ltd in 1986.

On retirement, Bob maintained his links to the Agricultural Engineering Industry, through his role as Secretary of the Scottish Branch of the British Agricultural and Garden Machinery Association (BAGMA). Throughout a healthy retirement he enjoyed fishing and golfing and maintaining his links with flying colleagues established throughout his spell as an RAF reserve pilot which he continued until 1982. Over his 20 years in retirement, Bob never missed a Highland Show and looked forward to the opportunity to meet some of the many friends he had made throughout a 50 year career in the Agricultural Engineering Industry in Scotland.

Bob is survived by his wife, Bussie, and their five children.

Membership Changes

Admissions

A warm welcome to the following new members

Member

R A Holt (Leicestershire)
I Lewis (Warwickshire)
P J Lockhart (Norfolk)
B Turner (Norfolk)
D Wilson (Co Armagh)

Associate Member

R Aves (Cambridgeshire)
A Maughan (Kent)
A Wilton (Devon)

Associate

P Brereton (Shropshire)
J A McMorran (Peebles)

Student

Barony College:
W J Anderson
D Barnes
M D Bennett
K A Buchanan
D Cotgrave
A J Cowan
S Douglas
A Evans
A Fisher
C T Gibson
S Green
M Herdman
C W Hume
P Hunter
R Jardine
D T Kennedy
S King
D J McCarragher
R Noonan
C Patterson
C R Rankin
M T Shields
S D Skachill
M J Smith
D Stevens
T A Twist
A Tyler
S Wigham
S Woodward
S Young

Cranfield University:
T Nyord
S Peets
C Pegurara Gasparin

Greenmount College, Northern Ireland:
P B Crothers
D Elder
J Faloon
N Gourley
S Hamill
R Hayes
A R Hunter
C Hunter
E Hunter
A Kinnaird
G Lennon
M McCarney
R J McCartney
R W McCormack
D Madden
G Murray
A Stewart
B Taylor
S S Wallace
D Watterson

Harper Adams University College:
O L Williams

Myerscough College:
S D Travis

Wiltshire College Lackham:
L Arnold
T Bryne
M S Cheeseman
A Collins
R Craddock
A Harris
J Hitchings
E Hopkins
J R Jackson
P Long
C Manners
A Morrison
A Mullins
S R Ritchie
M P Temple-Fry
A Thomas

Re-admission

Associate Member

L A Jagun (Nigeria)
G W Winters (Northern Ireland)

Re-instatement

Member

A C Mwitwa (Zambia)

Transfers

Congratulations to members achieving a further phase of their professional development

Member

A J Becvar (East Sussex)
S J Hanney (Essex)
C T Nyongo (Cameroon)
D R Shankland (Ayrshire)

Associate Member

O G White (Somerset)

Death

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

W S Reid (Canada)

Engineering Council

Registrations

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

CEng

J S Garner (Buckinghamshire)

EngTech

R Aves (Cambridgeshire)
L R Bright (Norfolk)
M G Cann (Norfolk)
T J Cooper (Suffolk)
S J Curtis (Norfolk)
P H Fairhead (Norfolk)
J P Gooderson (Norfolk)
S J Hall (Suffolk)
P E Harvey (Norfolk)
T G Hinchley (Norfolk)
R W Hudson (Suffolk)
D Kent (Nottinghamshire)
D R Shankland (Ayrshire)

Commercial Members

Autoguide Equipment Ltd
Stockley Road
Heddington
Calne
Wiltshire
SN11 0PS

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

Bomford Turner Limited
Salford Priors
Evesham
Worcestershire
WR11 5SW

John Deere Ltd
Harby Road
Langar
Nottinghamshire
NG13 9HT

FEC Services
NAC
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2LS

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

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

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

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

White Horse Contractors Ltd
Lodge Hill
Abingdon
Oxfordshire
OX14 2JD

Academic Members

Askham Bryan College
Askham Bryan
York
YO23 3FR

Barony College
Parkgate
Dumfries
DG1 3NE

Bicton College
Budleigh
Budleigh Salterton
Devon
EX9 7BY

Coleg Sir Gar
Pibwrlwyd Campus
Pibwrlwyd
Carmarthen
SA31 2NH

Cranfield University Silsoe
Bedford
MK45 4DT

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

Harper Adams University College
Newport
Shropshire
TF10 8NB

Institute of Technology, Tralee
Clash
Tralee
Co Kerry
Ireland

Myerscough College
Myerscough Hall
Bilsborrow
Preston
Lancashire
PR7 0RY

Oatridge Agricultural College
Ecclesmachan
Broxburn
West Lothian
EH52 6NH

Pallaskenry Agricultural College
Co Limerick
Ireland

Pencoed College
Pencoed
Bridgend
CF35 5LG

Plumpton College
Ditchling Road
Lewes
East Sussex
BN73AE

Reaseheath College
Reaseheath
Nantwich
Cheshire
CW5 6DF

Royal Agricultural College
Cirencester
Gloucester
GL7 6JS

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

Sparsholt College
Sparsholt
Winchester
Hampshire
SO21 2NF

Willowdene Training Ltd
Chorley
Bridgnorth
Shropshire
WV16 6PP

Wiltshire College - Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

Writtle College
Chelmsford
Essex
CM1 3RR

Long service certificates

Name	*Grade*	*Date of anniversary*
50 years		
Avtar Singh **Rana**	FIAgrE	15 Apr 2007
Cedric Lucas **Hill**	IEng MIAgrE	17 Jun 2007
35 years		
Thomas Wilson **Robertson**	IEng MIAgrE	26 Apr 2007
Rupert Frederick **Hill**	AIAgrE	27 Apr 2007
Peter William **Haw**	EngTech MIAgrE	27 Apr 2007
David Mercer **Hicks**	IEng MIAgrE	27 Apr 2007
Richard Edward **Hughes**	CEng FIAgrE	27 Apr 2007
John David **Stephenson**	EngTech MIAgrE	27 Apr 2007
Andrew **Murison**	MIAgrE	27 Apr 2007
Jeffrey **Burr**	IEng MIAgrE	27 Apr 2007
Stephen Benjamin **Paddock**	EngTech MIAgrE	27 Apr 2007
25 years		
Bryan Arthur **Morgan**	FIAgrE	8 Apr 2007
William Stuart **Cragg**	EngTech FIAgrE	16 Apr 2007
Simon Alexander **Kenny**	IEng MIAgrE	19 May 2007
John **Woffenden**	IEng MIAgrE	17 Jun 2007
Charles Benedict **Potts**	AMIAgrE	17 Jun 2007
Timothy Frank **Stephens**	IEng MIAgrE	18 Jun 2007
William Charles **Adams**	CEng MIAgrE	18 Jun 2007

2006 Dealer of the Year Awards

John Barrett, pictured here with his wife and his son Steve who is also an IAgrE Member, receiving their award from Jake Vowles, outgoing Director General of AEA with Chris Biddle of Service Dealer magazine at the podium.

Winners of the 2006 Dealer of the Year Awards were announced at the Agricultural Engineers Association (AEA) Outlook Conference at the Savoy on 17th April.

The competition, organised by *Service Dealer* magazine, and sponsored by Briggs & Stratton, Hayter, Husqvarna, John Deere and Kubota is run in four categories. The award *for* ***Farm Machinery Dealer of the Year*** went to Hamblys Ltd and was presented to IAgrE Member and Hamblys Managing Director John Barrett.

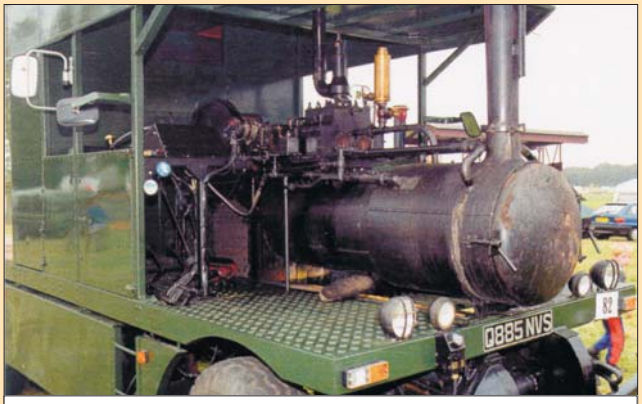
50 years in Agricultural Engineering – John Kilgour FIAgrE

Preface

It is always good for the President to get some feedback from members of the Institution (both good and not so good) and I was particularly pleased to receive the article below from John Kilgour that was prompted by his receiving his 50 year membership certificate. I first met John when I started as an undergraduate at the then National College of Agricultural Engineering when he was my personal tutor and I still remember, and heed, some of the advice that he gave to me. Thanks John for an interesting article. It would be good to hear from other members in a similar way.

PCHM

My interest in Farm Machinery started at an early age after we were bombed out of our house in East Sheen and went to live in a caravan behind *The Horse and Groom* Public House in Bracknell. Bracknell was then a little village out in the sticks and I spent most of my spare time working at the farm at the top of the road. I decided at an early age that Farm Machinery was a very interesting subject. As it turned out, this interest lasted a lifetime. I worked on a farm for a year after leaving school before I went to Reading University to study Agriculture specialising in Farm Machinery. Ian Gibb and Keith Morgan put me on the right track to become an Agricultural Engineer. On leaving Reading, I married Trish who I had met at a school dance when I was sixteen. We then moved to Durham University to study the MSc in Agricultural Engineering. Here I met Alan Reece. He was an amazing person who awakened my interest in design, build and test of engineering things.



Spider MK2 steam powered vehicle designed and built by John Kilgour. The vehicle requires coal or wood as its fuel and will generally carry 1.2 tons of water and 1.5 tons of coal. The boiler is based on a 3:4 scale Foden working at 225 psi and delivers sufficient power to propel the vehicle, based on modified Bedford RL chassis, at a cruising speed of 25 mph

On leaving Durham I went to Ford Motor Company to the Tractor Group where I began my career as a graduate apprentice. This led to working in the test department at Tuddenham on testing the hydrostatic tractor. Viv was born in Dagenham. I did not get the promotion I thought I deserved, so I left and moved to work at the National College of Agricultural Engineering (NCAE) at Silsoe as a lecturer in Engineering Drawing and Design. Rob was born in Gravenhurst. It was most stimulating working for a team led by Peter Payne and Frank Inns developing this new college into an internationally recognised area of higher learning and research.

My first project was developing the harvest thresher stripper harvester for grain crops and in this particular case for rice. John Howard put up the money to productionise the machine in a form suitable for mechanisation in developing countries. This led to other projects, many in the old colonial countries around the world. The projects were implemented by the staff who had wide experience of design, testing, manufacturing and economics, etc; the system being to choose the specialist staff who had particular interest or knowledge in the subject. This led to the setting up of the Design Consultancy Unit working with industry when Brian May became our leader. The unit was staffed by a number of full time ex BEng and MSc students and had four technicians to build the machines in the College workshops.

Many new machines were developed over the years – too many to be listed here (but could be looked up in the publications which resulted from the work). Three of my favourite machines should be mentioned.

The tea harvester machines were sponsored by Mitchel Cotts for use in Kenya and Uganda, a total of five machines were built and were a significant input to the rehabilitation of the tea estates. The machine's output was equivalent to 300 workers and could work two shifts a day.

The small tractor for developing countries was sponsored by the Overseas Development Authority (ODA) to provide a low cost, build it yourself design, to help develop Malawi's industry and food production. It was code named *SPIDER* by Peter Crossley.

The third machine was the date harvester for King Saud University in Saudi Arabia. The machine could be described as a 4 wheel drive, 4 wheel steering, 4 stage telescopic masts, rough terrain, lamp post inspection machine. Two or four men could be elevated 14 metres into the trees to pick the dates either as single ripe dates or as complete bunches. The machine could also be used for other work in the date orchard, e.g. pruning, spraying, pollination.

Towards the end of my career at Silsoe College, I took part in several Scrapheap Junkyard Wars programmes for Channel 4 TV. The Tractor Pulling and Mine Clearing machines were the most spectacular – being big, noisy and fast. The Mine Clearing machine resembled a large prehistoric animal bashing through the field leaving no stone unturned.

Upon retirement, I passed my Private Pilot's Licence in a Cessna 152 and thoroughly enjoyed this experience – regrettably short lived due to the drugs I take for Parkinson's Disease being prohibited substances for pilots.

My engineering skills have enabled me to design and make equipment for disabled people through the REMAP organisation.

My main interest, design challenge and enjoyment is now my steam engine Mark 2. The steam engine is big – 11½ tons, can travel at 25 mph and was built in our back garden. I am currently working on the annual maintenance programme and fine tuning the design in the process.

I would finally like to thank the IAgrE. This organisation has provided an excellent source of technical knowledge; great contacts with like minded people and during the past fifty years enabled me to make many firm friends.

Who needs science 'A' Levels?

The more relevant question might be: "who can do 'A' Levels after studying for the General Certificate of Secondary Education (GCSE)?" From evidence gained from exam invigilation at a local secondary school and 2006 league tables, it appears that many children do not have the skills or attitude required to pass any exams let alone 'A' levels. Some 10 to 15%, usually boys, fail to turn up for the exams or after writing their names on the paper go to sleep. Well within the first half of the allotted time, 30% or more will have stopped working. In most cases, this is not due to the difficulty of the exam although that may be a major factor when set against the knowledge displayed in the answers being provided. A small percentage can barely write and in multiple choice exams some take ten seconds to just mark the selected answer. This is 20% of the available time. Only one or two percent will use the full time available.

It is difficult to judge how difficult the examinations are but it seems to be very easy to amass a solid foundation of marks. In multiple choice exams, 25% would seem to be available by selecting the same answer each time. In some papers, the multiple choice questions are grouped so that getting one question right produces a mark of 50%. Questions often need no prior knowledge to get the correct answer. Short blocks of text, tables or photographs will contain the one word answer. Maths questions ask the student to draw a simple diagram or carry out simple calculations without asking for comment or analysis. Physics topics are covered with the minimum of Maths content. Papers appear to be designed for easy marking rather than intellectual challenge. Some papers contain more difficult questions that demand prior knowledge and evidence of understanding as there are three available levels at GCSE. I believe that all can result in at least a 'C' grade being awarded.

Having obtained adequate grades at GCSE level, the challenge for many students is to cope with the demands of 'A' Levels. It is assumed and asserted by the Department for Education and Skills (DfES) that these are as demanding as ever. Talking to students, it is evident that they do work hard to obtain their grades and that the transition from GCSE to 'A' Level is difficult. I am told, however, that there has been significant grade inflation in Mathematics to partly accommodate the weak starting point and that in Physics the number of mathematical/intellectual steps required to arrive at an answer has been reduced from five to three. The Qualifications and Curriculum Authority is now encouraging exam boards to produce science courses for 'A' Level that "demand no prior knowledge". 'A' Levels must now test different skills from the past.

To enter University, one needs points and in some cases it does not matter where they come from. Many science/engineering faculties are struggling for students and if applicants can show 'potential', points and relevant 'C' grades at GCSE then places are offered. This is seen as an enlightened policy to make up for the inadequacy of the secondary education system. Having enrolled the students from a diverse educational background many are unable to cope with higher education's academic requirements in the scientific subjects. As the gap between higher education's expectations and the students acquired skills and knowledge has widened then, by necessity, Year One has become one large remedial class.

> "An industry specific qualification should be seen as the preferred route to employment in agricultural engineering."

Year Two can accommodate some reduction in engineering skills as deficiencies in understanding and use of mathematics and physics can be masked by the manipulative skills of the computer. However when the answer provided is clearly wrong, students have no understanding as to why. They will question reality before they question their computer models. By Year Three (or Four if a sandwich course) students must reach some acceptable minimum standard in the core subjects if they are to be awarded a degree. Due to the pressures in earlier years the development of soft skills may be sacrificed to an unacceptable degree.

So who needs 'A' Levels? The universities manage with a rag bag of qualifications from eighteen year olds and pull courses into coherent qualifications. Sandwich courses mitigate some of the shortcomings but fail to provide for the restricted technical skills and knowledge.

So let us abandon 'A' Levels?

At present some of the best agricultural engineers obtain their degree via further education qualifications gained at establishments such as Askham Bryan and Reaseheath. These students often chose this route to Higher Education (HE) as an afterthought. They have found secondary school not to their liking or at the time felt that they did not want to undertake further academic studies. These courses give a solid foundation in the nuts and bolts of agricultural machines as well as a practical understanding of the science involved. Recent moves back to stronger mathematical content are to be applauded but students who do take this route to a degree often find the science *challenging*.

What is required is an integrated six year programme that starts post GCSE based on Advanced Vocational Certificate of Education (AVCE). This needs to use the first two years providing the relevant science and maths to ensure that there is no chance of failure in later years when transferring to HE level work. The practical skills and knowledge should be seen as a solid foundation for the sandwich period and more importantly provide reality to theoretical and modelling work. The activities should be designed as part of a specific HE course or suite of courses.

Industry, HE and Further Education (FE) colleges need to get together to design, run and market a fully integrated route from school at 17 to a degree in agricultural engineering at 23. This should be financially supported by the big names in the industry. Such an industry specific qualification should be seen as the preferred route to employment in agricultural engineering while developing all the transferable skills and knowledge needed to work across a wide range of industries.

Geoffrey Wakeham

Attenuating climate change – IAgrE and SocEnv warm to renewable energy

IAgrE members are getting up to speed with the rapidly emerging renewable energy technologies and organized two events attended by over 70 people.

First, the East Midlands Branch Event held on the 28th February, hosted by Melton Brooksby College, organised by Bill Basford and John Sartain, attracted twenty members and guests to benefit from the experience of Fred Walter from Coppice Resources Ltd **www.coppiceresources.co.uk** and from branch chairman, David Roe from IEP Ltd **www.iep-environment.com**.

Fred illustrated the story line of producing and using biomass fuels from willow, miscanthus and rapeseed with the wit and irony that comes only from experience.

David Roe gave an overview of the European renewable energy industry, with illustrations from Germany, Belgium, Denmark and Lincolnshire.

Facilitated by the accomplished chairmanship of Bill Basford, the evening started with a members buffet and closed with a sincere vote of thanks by Branch Secretary, Paul Skinner.

The next day, 1st March, saw the third in the Society for the Environment's series towards producing a unique policy on sustainable energy. Held at the Royal Institution of Chartered Surveyors (RICS) building on Parliament Square in London and attended by 50 Chartered Environmentalists, Phillip Wolfe, Chief Executive Officer (CEO) of the Renewable Energies Association, and Oliver Harwood of the Country Land Owners and Business Association, made presentations; along with Ed Brewster from the Institute of Chartered Foresters (ICF), David Hickey from the Society for the Environment (Soc Env) and David Roe from IAgrE, the main designer of the event.

How can renewable energies meet or exceed the target of 20% by 2020?

Enough sunlight reaches the earth in a day to provide the energy needed for a year; the pull of the moon produces massive tidal power. These energies join with the natural forces of the Earth's growth systems and internal heat to provide a vast energy potential. That energy potential combined with human ingenuity could dwarf the 20% target long before 2020.

Replacement is immediate for energies from wind, wave and solar. Replacement takes up to three years in the example of biomass energy from coppiced willow. Natural systems joined with man made technologies could provide clean renewable energies for human use in a very short time as priorities shift in reasoned response to the inconvenient truth of climate change, and the step forwards in consciousness that it indicates.

By 2005, the rapidly growing European renewable energy industry had a 15 billion annual turnover and provided jobs for around 250,000 people. Europe has positioned to excel in its role as world leader in renewable energy technologies.

Whilst beginning to think differently about energy usage, it is important to separate heat and electricity as energy types. Electricity is a very inefficient means of providing heating and cooling services in buildings.

Optimum supply in any situation requires a mix of renewable energy services. For example, solar thermal collectors combined with ground source for heating and cooling of buildings and water with additional heat from a boiler fuelled with biomass solids, liquid or gas. A minimum of electricity is then required to power control systems, light and electronic equipment.

Generating electricity from wind, waves, hydroelectric or photovoltaic panels produces no greenhouse gasses. Whether the generator is large scale, micro or in between, the resultant energy displaces power from inefficient fossil-fuelled power stations.

Energy from biomass fuels is more carbon neutral than fossil fuels. Biomass consumes greenhouse gasses whilst growing, which offsets the emissions produced by fossil fuels used in farm machinery, fertiliser production and processing plants. The balance will continue to improve as more renewable fuels are used to power engines and alternative husbandry displaces fossil derived fertilisers.

Gas energy from organic waste digestion provides multiple benefits. There is a 23:1 reduction in greenhouse concentrate when burning methane for energy compared to allowing it to escape into the atmosphere. The remaining sludge provides a fast acting nitrogen fertiliser.

It is important to move away from fossil-fuelled power stations, which lose over 60% of the energy held in the fuel and produce a significant proportion of the greenhouse gasses considered responsible for excessive climate change. Carbon capture and storage will reduce the emissions of fossil-fuelled power stations and increase generating costs. The cost of capturing carbon dioxide is around £5 per tonne; the costs of transport and secure storage are much higher. It is possible to co-fire biomass with coal in fluidised bed power stations until more systems that are efficient are in place.

To achieve maximum efficiency of generation and transmission, micro and macro renewable energy systems are incorporated as combined heat and power into regional, community or individual projects.

Biomass fuel from coppiced willow, miscanthus, grain straws or amenity pruning is most suitable for burning close to the place of harvesting. Automated feed of pelleted biomass or wood chip provides a boiler management regime comparable to an oil-fired boiler. Burning consumes the majority of the fuel and the small amount of remaining ash is a phosphate rich fertiliser.

End of life issues are manageable within existing systems with no heritage toxicity issues. Many components in renewable energy systems are suitable for re-manufacture or recycling.

Renewable energy is not a substitute for good energy management and any project should begin with evaluating and reducing energy needs through behaviour change, insulation and efficiency savings. A performance specification can then be prepared and used to identify the most suitable equipment.

Costs for installation and operation of renewable energy systems compare very favourably with fossil-fuelled alternatives. There will be a continuing comparative reduction in costs as the political and market attitudes shift to recognise the real value of finite natural resources and services.

Report by David Roe

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

PLANT BASED FERTILISERS

Exclusive supply agreement boosts organic fertiliser production

Plant Health Care plc, the leading provider of natural products to the agriculture and landscaping industries is pleased to announce that it has secured from Tate & Lyle an exclusive agreement for the use of a by-product of Tate & Lyle's European molasses fermentation process in North America and Mexico. This forms the base for Plant Heath Care's non GMO certified organic fertiliser, Organic Plant Food (OPF).

Plant Heath Care also announces its first US distribution agreement for OPF with ADG LLC, a California based agricultural distribution company. The agreement specifies an opening order for over US$1 million, the single largest order in the company's history, for immediate delivery. ADG is a newly formed distribution company owned by David Griffin, a principal in Salinas based Shamrock Seeds.

OPF is one of only a very few organic plant based fertilisers in the world that contains a high nitrogen content, making it a real alternative to the more traditional animal fertilisers. Importantly for the farming community, the OPF formulation contains almost 100% more nitrogen than the current plant-based products on the market, which the company believes will allow the yield of organic crops to approach that of conventional crops. The Board believes that OPF will offer the lowest price per unit of nitrogen for any liquid organic product currently on the market.

This distribution agreement marks the start of PHC's strategy to capture a major share of the rapidly growing US organic agricultural market. OPF has already seen steady growth in demand in Europe over the past two years, and the Board is confident of a similar success in North America. Not only does the North American market boast one of the largest vegetable industries for organic crops in the world, but, as a result of the recent E.Coli outbreak in the US, there is an enormous demand for non-animal based fertilisers.

John Brady, CEO of Plant Health Care, commented, "We are delighted to sign our first US distribution agreement for OPF and receive the largest order in the company's history. It is a great opportunity for Plant Health Care to become one of the dominant players in the organic fertiliser market which is worth around US$7 million to US$8 million a year in California alone. We are confident that OPF can gain a major market share as it offers the farming community a safe alternative, whilst fulfilling all their requirements and at a low cost.

"We are already in discussions with a number of other distributors in the US, Canada and Mexico."

CONTACT

John Brady, Chief Executive, Plant Health Care plc. Tel: +1 603 525 3702.

DURABLE LOCATIONS

The UK's first plastic 100% recyclable Ordnance Survey OS Select™ map

The inventive outdoor mapping specialist, Chartech International Ltd, has launched the UK's first plastic 100% recyclable Ordnance Survey OS SelectT Explorer® and Landranger® maps with its Aqua3® Evolution series. This evolution in map technology has been achieved by using lightweight but tough polypropylene plastic paper, resulting in maps: "So clear you can see where the cows have been", remarked one visitor upon inspection of the print quality.

Aqua3® Evolution OS SelectT Maps were specially designed to meet demanding requirements that regular paper maps just cannot meet; these are the ultimate maps for the serious outdoor enthusiast:

- 100% waterproof;
- awesome durability;
- incredibly compact, lightweight & flexible;
- available folded, flat or framed; and
- 100% recyclable.

The Aqua3® website enables users to order maps exactly to their own specifications, using Ordnance Survey data. They simply enter a postcode, place name, grid reference or x/y coordinates to choose the exact centre point and edges of their own Aqua3® Evolution OS SelectT Map.

CONTACT

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Website: www.aqua3.com

NETWORKING

Conferencing services core to a carbon neutral business

CentraCall re-launches its conferencing services and website to continue to help businesses cut travel costs and carbon emissions. Audio and Web Conferencing are core to enabling businesses to cut their carbon emissions through reduced travel without compromising their ability to communicate and collaborate.

This was highlighted in a report published earlier this year which notes that conferencing can be an important part of combating climate change and should be engaged because it is a sector that is used to rapid changes and employs the latest in technology advances. The report, *Saving the climate @ the speed of light*, was a joint initiative by the association of European Telecoms Network Operators (ETNO) and the World Wildlife Fund and addresses the opportunity for Information Communications and Technology (ICT) services to reduce CO_2 emissions.

ETNO has collected the results from some third-party verified projects and come up with the following examples of how conferencing can help to reduce CO_2 emissions:

- *video conferencing* – if 20% of business travel in the 25 EU countries was replaced by video conferencing, this would save 22.3 Mt [CO_2]
- *audio conferencing* – if 50% of EU workers replaced one meeting with one audio conference a year, this would save 2.2 Mt [CO_2]

This combined with the fact that the average return flight from Heathrow to New York produces an estimated 1.54 tonnes of CO_2 per person (Climate Care) shows that there is a huge opportunity for businesses to reduce their carbon emissions.

By adopting the right mix of web conferencing, audio conferences and face-to-face meetings, business can still maintain an efficient enterprise whilst drastically cutting their carbon footprint and benefiting from the huge cost and time savings of reduced travel.

CentraCall is a leader in audio and web conferencing services and with the full refresh of its services and re-launch of its website, it continues to be dedicated to making conferencing the viable and environmentally friendly alternative to face-to-face meetings. Businesses can conduct any scale and complexity of meeting over our audio and integrated premium web services without the time, effort and carbon costs of employees, partners and customers leaving their offices.

Our reservationless audio conferencing provides the ability to conduct a conference call at anytime without needing an operator or reservations. Its feature rich, with the ability to record your conference call, mute all participants bar the call leader, roll-call, lock the conference from further participants and the ability to hold sub-conferences. Our prices are set as low as 6.5p per minute and are available to all companies regardless of size or usage.

Our premium web conferencing services allows for small collaborative working sessions to large online presentations and interactive webinars. Additional features include audio controls, desktop sharing, reporting tools, recording options and print to portable document format (PDF) ensure CentraCall web conferencing provides the ultimate collaborative platform for your day-to-day communication needs.

CONTACT

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INTELLECTUAL PROPERTY

Patent attorneys to offer free advice to small businesses

In response to Science and Innovation Minister Malcolm Wicks' announcement that free intellectual property (IP) audits are to be offered to small businesses up and down the country, patent attorneys have pledged to support the initiative by offering free initial advice to any small firm interested in applying for the scheme.

Under the new initiative, announced on 1 February by the Department for Trade and Industry (DTI), up to 40 small firms will benefit from a three-day 'IP audit' being piloted from March by the Patent Office, in collaboration with four Regional Development Agencies.

Matt Dixon, a spokesman for the Chartered Institute of Patent Attorneys, welcomed the new government initiative. "Intellectual property is fast becoming a cornerstone of the country's economic activity," he claims, "but its high potential value can often be overlooked by entrepreneurs who have many other issues to worry about. The DTI's new innovation support strategy, which was proposed in the Gowers review of IP, will help create an improved understanding of the value of IP and the benefits of protecting it. There is also a misconception that getting IP protection – such as patents – is expensive. In reality, it's failure to protect your IP that can cost you dearly. Members of the Chartered Institute of Patent Attorneys (CIPA) are offering to give free initial advice to any small business who approaches them. We are also talking to the Patent Office about how our members' expertise can be made available – at no charge to the companies – to the 40 enterprises who qualify for the three-day pilot IP audit."

Any small firm interested in an initial free consultation with a patent attorney should contact CIPA, by phone on +44 (0)20 7405 9450 or via the website, **www.cipa.org.uk**. CIPA can provide them with the details of patent attorneys in their area, most of whom will give an initial consultation of up to half an hour free of charge. Individual inventors can also apply to attend one of CIPA's regular 'IP clinics', held in London and other cities throughout the UK.

Life source for agricultural economy or a regional rubbish dump?

Dr Neil Ward of the University of Surrey, an internationally recognised expert in environmental pollution problems, recently carried out a chemical pollution evaluation of the Grande Canal, Rio Neuquén and Rio Negro (Alte Valle). Dr Ward was inspired by the previous work of Arribére and co-workers from the Barriloche Nuclear Research Institute who in 2002 completed an assessment of the chemical contamination of canal sediment, aquatic weeds, lichens and fish liver and muscle samples collected from the length of the Canal Grande and other water bodies in the area. One of the main objectives of the 2002 study was to determine the contamination status of a closed down chlor-alkali plant, and the possible distribution of mercury into the canal.

Whilst there is local concern over the historical discharge of mercury and other chemicals into the Canal Grande at Cinco Saltos in Argentina, there are many modern-day practices that provide hot-spots of chemical pollution throughout the Rio Negro Valle. Many of these waste disposal practices are regulated by municipal authorities and others are illegal, relating to human habits where it is better to 'pollute someone else's garden'. In some cases, this means local communities depositing their waste (human effluent and domestic waste) into the local canal or stream at the bottom of their garden. Unfortunately, when the river or canal floods they are exposed to their own waste. Moreover this is the environment in which their children play. It is basically a matter of education. The problem is not mercury but the chemical and physical waste (paper, plastic, tins, etc) that everyone is constantly dumping into the environment of the Rio Negro Valle today.

The University of Surrey study was planned around the fact that the upper Rió Negro Valle region, whose economy is based on agriculture – mainly fruit production, is artificially irrigated through a system of channels fed by a main canal, the Canal Grande. The canal, which is sourced from the Neuquén River, passes through numerous towns. Fruit production and the associated processing agri-industry (cold storage plants, fruit packaging, fruit juice, and wine and cider production) are the predominating commercial activities in the Alte Valle. This has lead to the settlement and expansion of the local towns with the founding of associated secondary industries, such as, ceramics production, chemical industry, paper and battery factories and a disused chlor-alkali plant located in Cinco Saltos. This disused plant is an important part of the study due to the potential release of mercury, as large quantities of mercury were used historically as a liquid cathode in the chlor-alkali process. Arribére and co-workers reported elevated levels of mercury in the sediment of the Grande Canal, with a maximum level of 5.4 mg/kg [Hg] compared with background levels below 0.05 mg/kg [Hg]. These levels reduced with increasing distance from the disused factory to levels similar to the non-contaminated levels.

Dr Ward has an international reputation for having been involved in investigating the impact of many major chemical incidents and major pollution problems, including the Chernobyl nuclear reactor incident, the Camelford water treatment works aluminium sulphate poisoning incident in Cornwall, England, and the impact of chemical works in Iceland, New Zealand, Greece, Scotland, Nigeria, Canada and Mexico. For the last 30 years, he has been a major researcher in the field of chemical pollution from motorways and has been involved in many studies assessing the impact of metal contamination of roadside environments, especially storm water drainage systems and the accumulation of chemicals from motor vehicles in drainage pond and discharge stream sediments, aquatic plants and fish.

> "The University of Surrey project in the Alte Valle has provided an excellent opportunity to enable the local Rio Negro authorities to obtain chemical data using our internationally recognised expertise in the field of environmental and analytical chemistry research, such that they now have a more revealing picture of their local chemical pollution problems."

Dr Ward comments: "The University of Surrey project in the Alte Valle has provided an excellent opportunity to enable the local Rio Negro authorities to obtain chemical data using our internationally recognised expertise in the field of environmental and analytical chemistry research, such that they now have a more revealing picture of their local chemical pollution problems. Moreover, the study provided the opportunity for a postgraduate researcher at the University to carry out a project for his MSc where there were both challenges in analysing the samples for a range of chemical pollutants and in providing data for public evaluation. The Rio Negro newspaper released the report as an eight page supplement, the first time a scientific study has been published in this style. The supplement will be circulated to local schools to be used as an educational aid in addressing local ecological and chemical problems."

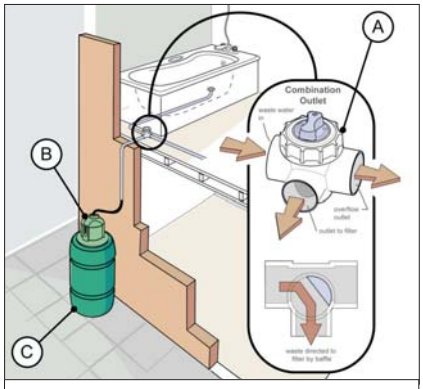
WATER ECONOMY

Unique water recycling system launched for UK gardeners

A unique new water recycling system which turns used bath, shower and sink water into crystal clear water is set to save gardeners across the UK from having to use thousands of litres of mains water on their lawns and flower beds every year.

The launch of the Aquastore Garden System, a unique filter system which turns grey water completely clear and free from contaminants and chemicals, enables gardeners to carry on watering even in drought affected areas where hosepipe bans are in place. Developed by Managing Director Michael Burton over the past five years, the key to the effectiveness of the system lies in a processed sea-water and carbon solution which is contained within the filter and which cleans any grey water passing through it.

A unit (A) attached to the bath, shower and sink waste pipe, diverts the used water down through the filter system (B) where it is cleaned. The water is then deposited in a 225 litre water butt (C) which the system is housed on. The simplicity of the Aquastore system means that – unlike other grey water filtration methods – it effectively rids used water of soap, hair, contaminants and bacteria without the need to add chlorine or other chemicals or without the need for a separate power unit.



***A schematic of the Aquastore Garden System**

"This exceptionally dry summer has given gardeners across the UK the problem of having to water their gardens more frequently – often with hosepipe bans in place. With the Aquastore Garden System, not only will gardeners not have to worry about hosepipe bans but, by using crystal clear recycled water, they will also benefit from significant cost savings by reducing the amount of mains water they use in addition to being much more environmentally friendly.

"We have spent five years developing and perfecting the filter system and we are delighted with the results that it provides for the UK's gardeners. The quality of the water that is recycled is exceptionally high, with grey water going in and crystal clear water coming out through the filter and into the water butt with no pollutants left in it. Even for those gardeners who do not live in hosepipe affected areas the Aquastore Garden system is extremely environmentally friendly and cuts garden water usage costs, considerably," said Mr Burton.

CONTACT

The Aquastore Garden System will be available for sale at £199.95 including VAT. Tel: +44 (0)1288 359994. Website: www.recycle-water.co.uk

FERTILISER CONTROLS

First companies receive accreditations under the Fertiliser Industry Assurance Scheme

Farming Minister, Jeff Rooker welcomed the news that the Fertiliser Industry Assurance Scheme, (FIAS) has fully accredited its first three companies.

Over 75 fertiliser supply chain companies have applied to join the Scheme and the next approved accreditations are expected shortly. Jeff Rooker urged companies that have not yet applied to join FIAS to register as soon as possible.

FIAS was launched in January 2006 to address security concerns within the fertiliser supply chain. Anyone involved in the manufacture, importation, storage, merchanting or transport of fertiliser are encouraged to register with FIAS now. Failure to do so could result in alternative measures such as legislation to improve fertiliser safety, security and traceability issues.

David Stacey, AIC Fertiliser Sector Chairman, said "FIAS is a robust mechanism to ensure security from factory to farm. Although industry have now launched FIAS there is no room for complacency as Government are looking to us to embrace FIAS with enthusiasm."

"Manufactured fertiliser is a valuable product for farmers and growers," said Jeff Rooker. "But it is vital that the industry maintains robust control and traceability of fertilisers throughout the supply chain from manufacture or import right through to the end user. I encourage companies within the supply chain to 'do their bit' and join FIAS," he said.

CONTACT

The Scheme is open to all organisations involved in the manufacture, importation, storage, merchanting and transport of fertilisers. Companies that apply for registration will be added to the FIAS Register and will be subject to annual audit and certification. Website: www.agindustries.org.uk
Fertiliser security will be included in farm assurance inspections from the autumn. The National Counter Terrorism security Office (NaCTSO) has a website dedicated to encouraging fertiliser security on farms. Website: www.secureyourfertiliser.gov.uk

BIOLOGICAL SAFETY

Biosafety of genetically modified plants

Does genetically modified maize have an impact on beneficial insects? How does genetically modified oilseed rape affect pollen-collecting bees? How can transgenic pollen and seeds be prevented from spreading in the environment? These are just some of the questions being investigated in biological safety research worldwide. Answers and research findings, which are otherwise usually made public only at scientific conferences and congresses, are now accessible to the public.

An information portal was commissioned by the German Federal Ministry of Education and Research (BMBF) and over recent years has become the central information hub for everything to do with biological safety research in Germany. Now the website is also available in English, which enables interested laymen, journalists and politicians to find out what effect the modification of plant DNA has on the ecological interaction between plants and their environment. The primary focus of the site is on crops – maize, oilseed rape, potatoes and cereals. Other topics include the development of more accurate tools for plant genetic engineering and concepts for post-market monitoring. A comprehensive database provides clear information about current and completed research projects, their aims and results. The research information is supplemented by background reports, interviews and insights into the day-to-day work of researchers. The site also presents major international studies on the environmental safety of GM plants.

The website accompanies the BMBF's support programme for biosafety research into genetically modified crops, which was launched in 2001. The ministry's aim is to create greater transparency and to offer the public the opportunity to form an informed opinion about the opportunities and threats of transgenic plants.

CONTACT

The GMO-Safety.eu internet portal provides up-to-date, clear information about the research projects funded by the German Ministry of Education and Research (BMBF) on the biological safety of genetically modified plants. Web: www.gmo-safety.eu.
Sandra Wilcken, GMO-Safety.eu Team, Genius GmbH, Wissenschaft & Kommunikation, Robert-Bosch-Str. 7, D-64293 Darmstadt, Germany. Tel: +49(0) 6151 872 41 04. Fax: +49(0) 6151 872 40 41. Website: www.genius.de

RISK MANAGEMENT

Rising threat of flooding to UK "more effectively addressed"

The Government has successfully put in place a series of measures which will help to reduce our exposure to flood risk according to a new report. The developments follow the 2004 Foresight Report on future flooding which found that climate change will increase the risk of flooding and planning is one of the key mechanisms to deal with it.

Dr Iain White from The University of Manchester said recent changes to the planning system will mean that the rising threat of flood to the UK can now be more effectively addressed. The measures will increase the likelihood that the 4.8m new houses needed by 2026 – according to Government figures – will be built in areas of lower flooding risk, unlike many previous developments. He said: "Quick progress has been made in response to catastrophic recent flood events. The challenge now will be to implement these policies effectively. Some of these policies may not have been purposely designed with flooding in mind. But they can actually be very effective at controlling the location and nature of development at both local and strategic scales."

"The Foresight Report was a major response to the catastrophic floods of Easter 1998 and Autumn 2000 and the realisation that this would be worse in the future. The research shows that politicians in Europe and Westminster responded constructively to these events. Now it's up to the planners to implement it."

He added: "The planning measures are technical and don't trip easily off the tongue, but already more forward thinking planners have utilised these tools. "For example, planners can now assess and manage flooding by steering development away from higher risk areas and instead allow house building in low risk areas of the flood plain. Potentially, this more strategic view can also facilitate the use of methods such as man-made lakes and wetlands which reduce flood risk to an area as they absorb flood water. Therefore, one part of the catchment can offset the impact of development elsewhere."

The research was an eighteen month study as part of the Engineering and Physical Sciences Research Council (EPSRC), Natural Environment Research Council (NERC), Department for the Environment Food and Rural Affairs (DEFRA), Environment Agency (EA) and Scottish Executive (SE) Flood Risk Management Research Consortium (FRMRC). The planning measures are:

- Planning Policy Statement 25: Development and Flood Risk
- Strategic Environmental Assessment Directive
- The Planning and Compulsory Purchase Act

CONTACT

Mike Addelman, Media Relations Officer, Faculty of Humanities, The University of Manchester. Tel: +44 (0)161 275 0790 E-mail: Michael.addelman@manchester.ac.uk

CHARITY

Myerscough College students get dirty for the Muckathon!

Participating students together with some of the equipment on loan for the charitable event

Myerscough students 'mucked in' for charity for a 24 hour muck spreading event at the College.

Fifty Agriculture and Mechanisation students spread 2500 tonnes of manure for the annual 'Muckathon'. They took it in turns to do 2-4 hour shifts over 24 hours non-stop from 9.00am Tuesday 27th March to 9.00am Wednesday 28th March. The manure is from College livestock and was to be spread over the College's own land. All the equipment used for the event was on loan from agricultural dealers and contractors, who were happy to help with the charity work. This includes 8 tractors, 8 spreaders, 2 diggers and 2 loading shovels. The hard working students got sponsorship from local companies, staff and students at the College to take part in the Muckathon and have raised around £3000 for North West Air Ambulance.

Students also came up with some other novel ideas to raise money for the cause including a Farmers and Milk Maids fancy dress night in the campus bar, the Stumble Inn. The Muckathon attracted much media interest, with Radio Lancashire attending the event and conducting two live interviews and it has also featured on GMTV, Granada Tonight and Sky News.

Steve Slater, a Lecturer in Mechanisation at Myerscough College, said: "Its great to see the industry backing such a fantastic charity event, a lot of planning and organizing has taken place by both students and staff. Thanks to all the suppliers who have donated so generously towards this event, without your help, and the hard work of the students we could not have raised this amazing amount of money."

Myerscough College would like to thank local dealerships for lending equipment and supporting the event including Agco Ltd, Bryan Hoggarth Ltd, Whittingham Farm Supplies, F G Rowland Ltd, Rickerbys, Harry Wilson, Clayton Farm Machinery, M J Wilkinson, W.J Sanderson, Harrison Oils Ltd, J P Oils Ltd and many more. The photos show the students with the donated machinery used for the Muckathon.

CONTACT

For further information about Agriculture and Mechanisation courses at Myerscough College, please contact Course Enquiries on +44 (0)1995 642211, or e-mail enquiries@myerscough.ac.uk

EDUCATION

UPM brings the forest to you

UPM's new website **www.upmforestlife.com** takes you on a walk through the forest while you sit at home in front of your computer. You explore the forest with your mouse to see modern forestry in action. You can see and feel that the forest is full of life. However, the site is not only for watching. You can also listen and relax: the birds are singing and the brook is rippling.

"It's not possible to take everyone to the forest to see how UPM operates or to show all the wildlife living there, so we decided to take the forest to them", explains Robert Taylor, Customer Communications Manager, Environmental Forestry Affairs. "Using different techniques, we try to capture the forest spirit and create a real forest experience for the visitor."

Visiting the website, you meet the different people who work in the forest or enjoy it for recreation. You can watch as a trained operator precisely cuts and processes the tree or berry pickers gathering their winter vitamins. You can also take a bird's eye view to see the constantly evolving forest or you can go to the bird tower to watch the cranes doing their spring mating dance.

"Through a Finnish example, the website shows how UPM operates in its forests today", says Jaakko Sarantola, Senior Vice President, Forestry and Wood Sourcing. UPM is one of the world's leading forest product organisations with Group sales in 2006 of 10 billion, and it has about 28,000 employees. It owns and manages forestry land in Canada, Finland, Russia, the UK and the USA. The largest forest properties are in Finland (920,000 ha) and the USA (79,000 ha) and the main products include printing papers, converted products and wood products. The company has production plants in 15 countries and its main market areas are Europe and North America.

WEIGHING EQUIPMENT

PM launches 1155 indicator for bulkweigh and wasteweigh

PM Onboard is launching its new PM1155 indicator. The indicator is used in conjunction with the company's BulkWeigh and WasteWeigh equipment which now include tipping stability (TipWatch) and axle loading (AxleWatch) programmes as standard for bulk tipper and remote control vehicle (RCV) applications, respectively.

PM1155 indicator and audio warning: flags where axle loading or gross weight is exceeded and indicates safety risks e.g. sloping ground

The PM 1155 indicator features an enlarged liquid crystal display (LCD) display, fits neatly into the DIN (radio) slot in the dash and provides precise weight information for maximum payload control (to within 0.5%), optimum operating efficiency and safety.

It flags up when axle loading or gross weights are exceeded and indicates safety risks such as sloping ground, uneven payload distribution and moving with the body raised. Safety critical conditions are accompanied by an audible warning.

Also, the PM1155 automatically recognises and operates without the need for recalibration when a tractor is coupled to an alternative trailer fitted with PM weighing equipment.

Calibration and truck specific settings and alarm trigger points are protected through the use of passwords. Also, the use of analogue and digital CANbus provides a powerful diagnostics facility.

A comprehensive range of options includes printers (thermal or heavy duty) to record weights on the spot, and the 511Freeweigh – a palm size hand held unit that provides for remote display of indicator readings.

Additional options for WasteWeigh include intelligent barrier and compactor plate shutdown for RCVs – for greater flexibility in avoiding axle overloads during a duty cycle.

CONTACT

Trevor Longcroft, tla Communications. Tel: +44 (0)1564 775078 E-mail: Tlongcroft@aol.com

SHREDDERS

Tomahawk dual chop straw shredder

Teagle has solved a problem that has been irritating cattle farmers ever since cubicles and loose housing were invented. Cubicles need short chopped straw for maximum bedding economy, whereas loose housing requires long straw which has been lightly shredded for best results.

Unfortunately, there isn't a machine on the market to do both operations – or at least there hasn't been until now.

Teagle has introduced the Tomahawk Dual Chop, which can spread long straw or chop straw into short lengths at the flick of a switch. The secret is a set of hydraulically retractable knives, which when engaged interact with teeth on the cross beater to produce a chopping effect. The chopped straw then passes through a screen into the discharge rotor. Straw which is too long to go through the screen is recycled back into the bale chamber for more chopping.

The Tomahawk 8080 dual chop can chop straw long (pictured) for loose housing or short for open cubicles, poultry, etc., at the flick of a switch

To produce long straw, the bank of knives is withdrawn, allowing the unchopped but lightly shredded straw to pass straight through into the impeller for spreading. Movement of the knife system is carried out by twin hydraulic rams, operated from the tractor seat via the electronic controls – standard on the Dual Chop.

The Dual Chop system is fitted into the Tomahawk 8080SC layout, producing a machine which can dispense straw to either side, close to the tractor in a cubicle situation, or blow straw up to 20 metres in loose houses. With the swivel giraffe, bedding down the end cubicle in dead end passages is no longer a problem – even if the cubicle is at the front end of the tractor!

Teagle is the market leader of UK produced bale shredding and silage feeding machines and the Dual Chop is manufactured alongside the rest of the range in its modern UK factory.

CONTACT

Teagle Machinery Ltd, Blackwater, Truro, Cornwall, TR4 8HQ. Tel: +44 (0)1872 560592.

CHAINSAWS

STIHL introduces next generation chainsaw technology

STIHL has always set standards when it comes to chainsaw. Now in its 80th year, the innovative new STIHL MS 441 professional chainsaw heralds yet another significant advance in chainsaw technology, characterised by more power, environmental friendliness, economic efficiency and convenience. The re-designed two-stroke engine with four channel technology and stratified scavenging is powerful as well as economical on consumption and the emission directive (Stage II). The new MS 441 chainsaw sees this world market leader once again raise the standard for chainsaws and consolidate its reputation as a premium manufacturer. This innovative chainsaw has been specifically designed and built for the extreme demands of timber harvesting, for example when thinning medium stands. Innovative technology and exemplary attention to detail have created a machine that is quick, economical, environmentally efficient and effortless in use.

The STIHL MS 441 chainsaw sets new standards in terms of power and handling, environmental friendliness and economic efficiency

innovative air filter system with pre-separation ensures long filter life and a new anti-vibration system provides outstandingly low vibration levels. Already praised by professionals who have previewed the chainsaw's exemplary new features, the STIHL MS 441 is set to become a firm favourite with users in sectors from forestry and agriculture to horticulture, municipal contracting and landscape gardening.

Heralding its next generation in chainsaw technology, STIHL's

High power for minimal consumption

With a re-designed 4.1 kW two-stroke engine, the MS 441 is impressive in terms of its very high power, smooth torque over a wide speed range and excellent lugging performance. Four-port technology optimises fuel combustion to ensure a high level of efficiency, giving the sufficient reserves of power to cope with even the most demanding use in big timber.

A technical refinement ensures that unburned fuel emissions emitted to the environment with the exhaust, due to the scavenging losses typical of two-stroke engines, are now a thing of the past. 'Stratified scavenging technology' is the term for a layer of air which separates the spent charge in the combustion chamber from the fresh working fluid that follows in the crankcase. What escapes, as the scavenging loss with the exhaust emission, is thus not fresh fuel but this fuel-free air barrier. As a result, the exhaust contains fewer pollutants and the strict requirements of the future EU exhaust emission directive (Stage II) are met. What is more, the new power unit reduces fuel consumption by up to 20 per cent compared to a conventional two-stroke engine. That's good news for the environment, as well as for the wallet.

Long filter life

Another technical detail to back up the new STIHL MS 441's claims to leadership of the professional league is its innovative new long-life air filter system with a pre-separation system. This uses centrifugal force and a 3-dimensional air flow to remove larger, heavier particles of dirt and route them away from the intake air. The largely particle-free air is then directed to the filter via a pre-separation channel, thus relieving the downstream filter elements. The result is a markedly longer filter life compared to a conventional filter system and extended intervals between filter cleaning, so even hard-working professionals will benefit from more efficient and economic workflow. Indeed, the STIHL had the new MS 441 reviewed by a professional contractor, who put the machine through its paces on a milling machine: "The filter stays much cleaner than usual…" he commented; "…which is handy – there's nothing like chainsaw milling to clog your air filter!"

Perceptibly less vibration

Also premiered in this model is a new anti-vibration system from STIHL. Using a combination of Cellasto AV elements and special springs between the engine unit and handles, the system reduces the vibration caused by the engine and saw chain extremely effectively, even at high speeds. The result is a remarkably low vibration level for a machine in this power class. Comfortable, effortless operation is ensured, as well as optimum guiding behaviour. This is further helped by the high-performance STIHL 9.5 mm RSC comfort saw chain which is fitted as standard and which provides impressive plunge and cutting performance with very low vibration levels.

Convenience all the way

For optimum convenience, all

engine functions, such as cold and warm starting, run and stop are simply and reliably controlled via the single lever master control.

Comfortable starting of the powerful, economical two-stroke engine is ensured with the ElastoStart starter grip which has buffer elements that work with a decompression valve to reduce the jerks that occur when starting. And ease of starting with no kick-back, is assisted by the microprocessor controlled ignition system which also ensures excellent smooth running characteristics in all operating modes. The see-through fuel tank allows the fuel level to be checked at a glance and topping up is a simple matter, thanks to the fuel filler cap which opens without tools and the readily accessible tank openings. The company has considered, in minute detail, the development of this new chainsaw. When mounting the cutting attachments, for example, even the collar screws have been given an extended shaft to facilitate fitting of the guide bar, while a stepped screw thread makes it easier to fit the nuts that fasten the chain sprocket cover in place.

Professional praise

The STIHL MS 441 is set to become a firm favourite among professional users from sectors ranging from forestry and agriculture to horticulture, municipal contracting and landscape gardening. Indeed, if the response to a preview of the new chainsaw by the tree team at Westonbirt Arboretum is anything to go by, this new chainsaw is set to really take off: "We have used the MS 441 at The National Arboretum to help us manage our collection of specimen trees. It is a good looking, robust, mid-range saw and a lively performer with lots of power, ideally suited to felling trees." – Mark Ballard, Works Supervisor.

"I am impressed with the developments on this next generation saw and enjoyed that for a powerful machine it has high revs. The throttle response is instant, there is an effective anti-vibration system and it is easy to maintain with a good ergonomic design." – Richard Townsend, Tree Team Arborist

The STIHL MS 441 chainsaw is available with 45, 50 and 63 cm guide bar lengths – from servicing dealers nationwide.

MS 280 model

This is the World's No. 1 chainsaw brand and presents the World's first chainsaw with built-in intelligence. An innovative regulating system electronically controls the full load mix and maximum engine speed. That automatically ensures engine power is always optimal, as well as providing even greater convenience and environmental friendliness. The innovative STIHL MS280 with Intelligent Engine Management underscores the company's position as the leading chainsaw brand.

Intelligent Engine Management automatically optimises the carburettor setting in every situation. That makes incorrect settings a thing of the past and also eliminates potential damage and downtime due to incorrect carburettor settings. At the same time, automatic setting optimisation cuts fuel consumption. That benefits the wallet as well as the environment.

The STIHL MS 280 chainsaw with integral intelligence is fitted as standard with the STIHL Rapid Super Comfort (RSC) high-performance saw chain. This is characterised by low vibrations, smooth cutting and excellent cutting and plunge performance.

CONTACT

For further information on the extensive range of STIHL chainsaws and outdoor power tools and for details of local authorised dealers, Freephone: +44 (0)800 137574 or visit www.stihl.co.uk

TYRES

Challenge: St Austell lays claim to UK's oldest working tyres

Oldest working tyres: strong contender, John Sweet's Ferguson FE35

A farmer from St Austell has thrown down a challenge to other farmers; he believes he has the oldest set of original tyres on a working tractor. John Sweet's Ferguson FE35 has been used every day on his 8 ha market garden, since it was bought on July 31st 1957. It still has the original Firestone 'Champion Ground Grip' tyres that it came supplied with. They have never had a puncture and have still got the original air in them.

John's late father, who used to drive it even on road occasionally to a rented field two miles away, bought the tractor. John, who is now a retired lecturer, still uses the tractor to mow his grass and has the original equipment that was bought with the tractor, including a three-furrow plough, a chiseller, a ridger and a harrow. Commenting on John's long lasting tyres, Barry Coleman, Firestone's Marketing Manager said, "These tyres were manufactured at the old Brentford plant by a process known as 'gum dipping' which strengthened the nylon cord. They were about 90% rubber. These days, tyres are much more complex to meet the more demanding and varied needs of farmers. The fact is that modern tractors are more powerful and that extra horsepower is transmitted to the ground via the tyres. They will also work longer days and be exposed to more roadwork. Tyres like our R9000 Evolution tyres are specially constructed to give longer life for use on roads whilst still giving excellent field performance."

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RESEARCH FACILITIES

AGCO's Valtra brand R&D Centre in Finland

Investments worth more than €7 million have been made at Valtra in Suolahti. The investments include a new 4000 m² Engineering Centre and machining centres for transmission production.

Valtra's engineering operations moved from Jyväskylä to Suolahti at the beginning of August. The new 4000 m² Engineering Centre includes office space for around a hundred R&D personnel, laboratory facilities for testing in extreme cold conditions, as well as facilities for testing hydraulics, measuring power and acoustics, chassis testing and design work. The centre's cold lab can recreate -25 °C conditions for developing the famous cold weather performance of Valtra tractors. The centre also houses a powerful chassis test bed that can be used to test the durability of tractor chassis structures. The new acoustics lab is a completely quiet and echo-free room used to measure cab and drive-by noise levels. Valtra's internationally award-winning design can meanwhile be further advanced in the brand new design lab.

Altogether around 100 people work in R&D operations at Valtra. In addition, approximately 100 people work full-time on Valtra's R&D projects among suppliers, at universities and research institutes, and engineering partners. The new Engineering Centre is a major milestone in AGCO Corporation's strategy program to renew the Valtra tractor range within the next couple of years.

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GROUNDCARE MILESTONE

Ransomes Jacobsen: 175th year of mower manufacturing at Ipswich

2007 sees a major milestone in the grounds care industry with Ransomes Jacobsen Ltd, a Textron Inc. (NYSE:TXT) company, celebrating the 175th anniversary of mower production at Ipswich.

Edwin Budding's historic lawnmower design was patented in 1830 and JR & A Ransome were the first company to obtain a licence to manufacture this remarkable invention. The first Ransomes manufactured machine for domestic use was produced in 1832 and this signalled the beginning of commercial mower production in the UK.

Contrasting yesteryear's technology with today's: Ransomes Marquis' c. 1961 (inset) which this year's Ransomes 'Commander'

Although the company no longer produces domestic lawnmowers they are one of the leading commercial mower manufacturers supplying equipment to golf courses, local authorities, landscape contractors, sports clubs and major sports stadia around the globe.

David Withers, Managing Director of Ransomes Jacobsen Ltd commented: "This is a hugely significant milestone in the history of our company; from this small beginning we are now one of the leading grounds care machinery manufacturers in the world. Ransomes mowers have been supplied to monarchies and nobilities across Europe and Asia and the Ransomes name has become a by-word for quality British engineering. Over the years the company has had its ups and downs, but today it is a vibrant market leader, with a modern manufacturing plant providing employment and career opportunities to the people of Ipswich.

"If you look at the groundcare manufacturing industry today, you'll find a huge number of people who either began their careers in Ipswich or have worked for the company and this has been the case for decades. On a personal basis, I am delighted to be heading a dynamic management team at this significant moment in the company's history and thank everyone, past and present, for their contribution."

Ransomes Jacobsen is a subsidiary of Textron Inc., a US$10 billion multi-industry company operating in 33 countries with approximately 37,000 employees. The company leverages its global network of aircraft, industrial and finance businesses to provide customers with innovative solutions and services. Textron is known around the world for its powerful brands such as Bell Helicopter, Cessna Aircraft, Jacobsen, Kautex, Lycoming, E-Z-GO and Greenlee, among others.

CONTACT

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ChipPE chops container disposal costs

An entirely new concept to shred used plastic containers which could cut farmers waste disposal costs by over 80% has been launched.

The ChipPE, designed and manufactured exclusively by Techneat Engineering, quickly and efficiently reduces plastic cans and bottles to a fraction of their former size and deposits them directly into containers, for collection by licenced waste disposal contractors.

The equipment was produced just in time for the forthcoming ban on pesticide container incineration in spring 2007, reports the systems designer, Tom Neat. "Growers should be seeking an alternative, approved disposal route now. The ChipPE will provide a reliable and cost effective solution."

The machine incorporates a geared bank of specialist knives, driven by powerful electric motor, to smoothly shred containers in seconds but without creating risk of splashback. In trials, the ChipPE has shred the entire plastic container packaging from a typical day's spraying across 200 ha in less than ten minutes.

The shredder is designed to compress packaging volume by a factor of up to four or five – significantly reducing on-farm storage requirements and helping enhance the viability of recycling operations by cutting transport costs for waste contractors.

"A waste recycling contractor's bag that will typically hold around 25 kg of hand-crushed containers, could hold at least 100 kg of chipped plastic. Since charges are around £30 per bag, the cost of disposal could be reduced from £1.20 per kg to 30 pence," according to Mr Neat. Arable farms produce an average of over half a kilo of waste containers per hectare in the course of the season, so disposal costs could be reduced from 67p/ha to less than 17 pence, he calculates.

The ChipPE smoothly and safely shreds plastic containers to a fraction of their former volume in seconds, reducing waste contractors' collection charges for growers up to 80%

With the ChipPE expected to sell for around £4000, the cost makes it a viable proposition for individual growers or groups of smaller farms.

"We would advocate operators locate their shredder or any container handling activity, within a bunded sprayer operating area, with a self-contained drainage system that will minimise any risk of environmental loss," advises Mr Neat.

It is essential that operators are chipping clean and dry containers, advises Mr Neat. The ChipPE is offered with a self-bunded drainage tank, into which triple-rinsed containers should be left to drain fully. Any rinsings are collected in the tank and can be safely removed for disposal through the farm sprayer, in the same way as tank washings.

"The tank also includes an integral compartment for a hazardous waste, which operators can use to store and safely dispose of lid foils before chipping. The whole thing is self-contained to reduce any danger of environmental loss," he added. Growers can store empty containers on-farm under existing exemptions to the Waste Regulations, until they have appropriate disposal operations in place. The burning of other farm plastics is already prohibited.

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