Agriculture • Horticulture • Forestry • Environment • Amenity

LANDWARDS

Late Spring 2003

- CAN-bus
- Eden Project

Fauna Protection

IAgrE JOURNAL Volume 58 No.2 www.iagre.org

SPREADERS

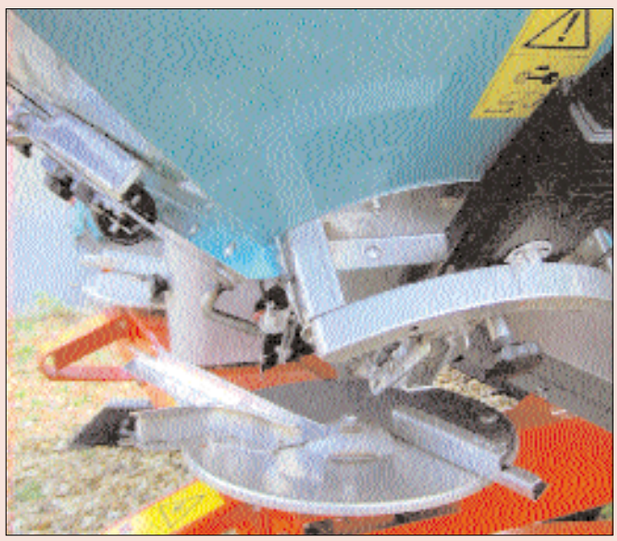
New spreader system with in-cab border control

A new border spreading system with convenient in-cab electric control is, available on the Sulky DPX fertiliser spreaders, distributed in the UK by Rustons Engineering.

The Sulky Tribord system gives very clean cut-off at field edges without changing discs or manual resetting, so tractor drivers can quickly adjust spread widths on one side to take account of ditches, hedges, watercourses and other sensitive areas without leaving the cab.

The application system on standard DPX spreaders consists of a movable spout and a disc with two vanes, the spread width being determined by the point on the disc where the fertiliser is dropped. With the Tribord system, an electric actuator moves the spout to feed fertiliser to a special third vane on the disc, which results in a shorter throw with exact cut-off while maintaining the application rate.

The system is easy for the operator to use and includes a visual indicator. The patented spout and spreader mechanism are made from stainless steel in order to maintain long-term accuracy, and the electric actuator has a protective casing.



The new Tribord system now available on Sulky DPX fertiliser spreaders distributed by Rustons Engineering (RECO)

CONTACT

Rustons Engineering Co Ltd, Brampton Road, Huntingdon, Camridgeshire, PE18 6BQ. Tel: +44 (0)1480 455151 Fax: +44 (0)1480 52116 E-mail: sales@reco.co.uk Website: www.reco.co.uk

Volume 58 No 2, **2003**

LANDWARDS

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

Editor
Eur Ing Prof Brian D Witney
PhD CEng FIMechE HonFIAgrE MemASAE FFCS
LAND TECHNOLOGY LTD
33 South Barnton Ave,
Edinburgh, EH4 6AN
Tel/Fax: 0131 336 3129
E-mail: landwards@landtec.co.uk
Website: http://www.landtec.co.uk

Advertising
All enquiries to IAgrE
Tel: 01525 861096
Fax: 01525 861660

Origination: David King

Printing: Barr Printers Ltd

Publisher
Landwards is published bimonthly by:
IAgrE,
West End Road, Silsoe,
Bedford, MK45 4DU
Tel: 01525 861096
Fax: 01525 861660
E-mail: secretary@iagre.org
Website: http://www.iagre.org

President
Dr Dan Mitchell
CEng FIAgrE FRAgS

Chief Executive & Secretary
Christopher R Whetnall
IEng MIAgrE MemASAE

CONTENTS

Feature Articles

Front cover: *Daffodils (Photo: Land Technology Ltd)*

ISSN 1363-8300

Double knife mower causes less damage to grassland fauna

PROTECTING GRASSLAND FAUNA DURING HARVEST

A. Prochnow, D. Kraut and H. Jacobs

Summary

Several times a year mechanised grassland harvest leads to injury and death of large numbers of invertebrates, amphibians, birds and mammals. Measures for protecting the grassland fauna during harvest include:

- use of oscillating instead of rotary mowers;
- cutting at a height of at least 100 mm; and
- mowing the fields in special patterns from the inside outwards to facilitate the animals' escape.

Field investigations, carried out over 6 years, show that in most cases the 'double knife' mower causes significantly lower damage, to invertebrates, than the 'disc mower' or 'flail mulcher', with these last two machines being less clearly distinguishable. An example of this is with carabid beetles. It was found that the growing population during the year, could compensate the short-term impacts of the mowing machines. For all types of mowing machines raising the cutting height to 100 mm is a simple, effective and low cost way of protecting grassland fauna.

Process costs, calculated for mowing with several working widths, decrease with rising field size for all working patterns considered, even when consistently mowing in stripes from the inside outwards. If it is possible to mow from one field side to the other or in spirals from the field centre to the periphery, then using fauna-friendly patterns may even reduce costs. Thus fauna-friendly mowing patterns can contribute to fauna protection at little or no additional costs to other practices.

BIO NOTE

This article was first prepared as EurAgEng Paper No 02-SE-046 and displayed at the Poster Session held at AgEng2002 in Budapest, Hungary. Contact Dr Annette Prochnow at the Institute of Agricultural Engineering Bornim, Max-Eyth-Allee 100, 14469 Potsdam, Germany. Tel.: +49 (0) 331 5699 213 E-mail: aprochnow@atb-potsdam.de

Purpose

Several times a year mechanised grassland harvest leads to the injury and death of large numbers of invertebrates, amphibians, birds and mammals, thus endangering whole populations (Meierhöfer, 2002). As far as protecting the species group is concerned, several technological and technical measures are recommended.

- **Using oscillating instead of rotary mowers**

  Results have been obtained, from various investigations referring to impacts of mowing machines on invertebrates and

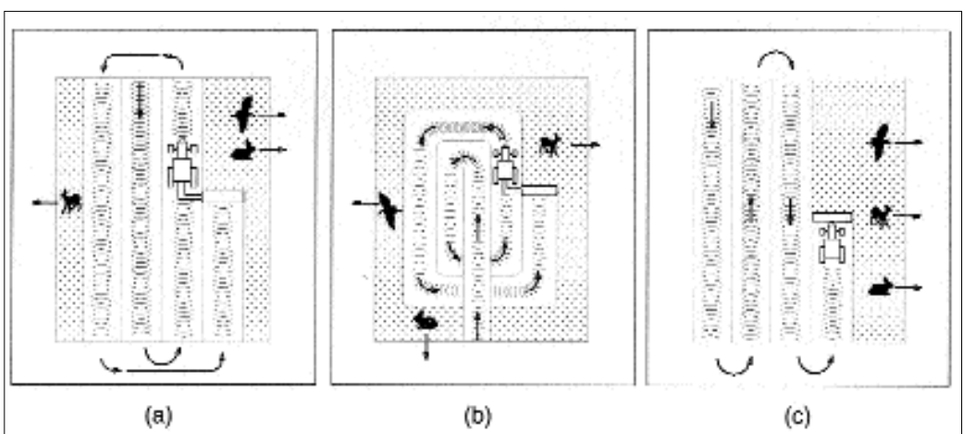


Fig. 1 Special mowing patterns for the protection of grassland fauna

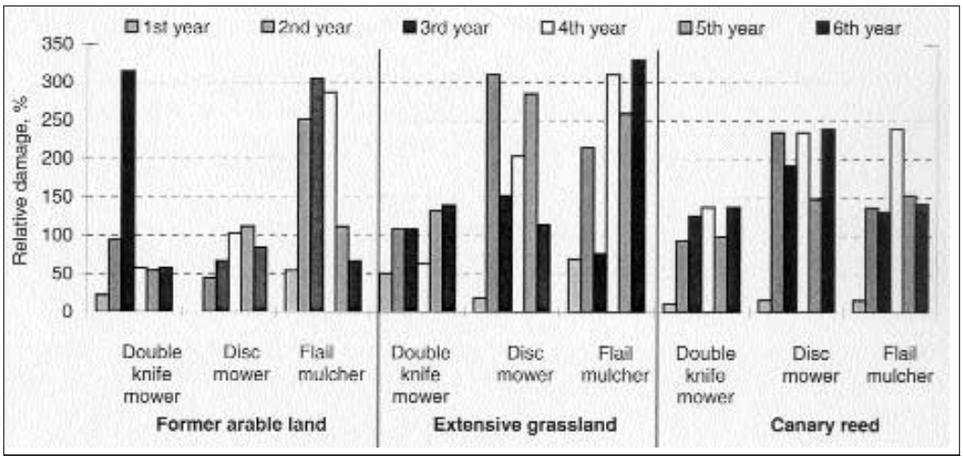


Fig. 2 Damage to grassland invertebrates caused by different mowing machines (Kraut et al., 2002), in relation to the average damage caused by the double knife mower

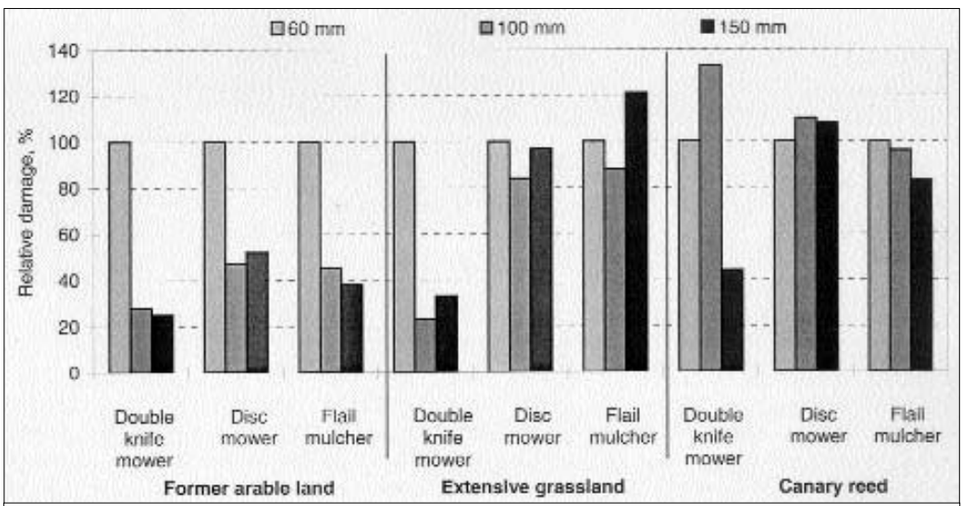


Fig. 3 Damage to grassland invertebrates caused at different cutting heights, in relation to the damage caused at a cutting height of 60 mm

amphibians which show that rotary mowers cause significantly higher damage to the animals than oscillating mowers (Claßen *et al.*, 1996). There is, therefore, a strong call from nature conservationists in support of the use of 'double knife' or 'finger bar' mowers in place of rotary mowers. However, to date, there have been no field experiments covering varying site conditions and different years, nor are the long-term impacts on the grassland fauna known, from the use of different mowing machines.

- **Cutting at a height of at least 100 mm**
  Experiments with artificial invertebrate models indicate that damage to small animals can be reduced by increasing the cutting height of the mowers (Kraut *et al.*, 2002) and thus providing a sheltering zone in the stubble. This refers to all types of mowing and mulching machines. It is questionable whether results from experiments with artificial invertebrate models can be applied to field conditions because the escape behaviour of mobile animals cannot be taken into account. However, results from field experiments are not available so far.

- **Mowing the fields in special patterns**
  Conventional mowing patterns subdivide the fields into several plots. Fleeing mammals and ground birds that instinctively do not leave the cover of the standing vegetation gather in the remaining grass strips and are seized there by the mowing machines. Special mowing patterns are therefore recommended to facilitate the animals' escape; mowing the field in stripes from the inside outward [Fig. 1 (a)], spiral mowing from the field centre to the periphery [Fig. 1 (b)] and mowing from one side of the field to the other, with front-mounted mowers only [Fig. 1 (c)]. The influence of the mowing patterns on mowing capacities and hence process costs have not been calculated yet.

Further technological and technical measures for protecting the grassland fauna is harvesting after the reproduction season of birds or other sensitive species and mounting game savers on the mowing machines.

However, knowledge in this area is insufficient; short and long-term impacts of working with different mowing machines and cutting heights on the invertebrate grassland fauna have to be investigated. A second focus that must be considered is the calculation of costs for mowing in fauna-friendly patterns.

Approach

Extensive field trials have been carried out in a large nature reserve near Berlin since 1992 (Kraut *et al.*, 2002). On three typical grassland biotopes there are permanent plots, each of them being mowed annually with a double knife mower, disc mower or flail mulcher. Additional experiments using cutting heights of 60 mm, 100 mm and 150 mm were also completed in one year.

Dead and injured invertebrates on the ground and in the grass are counted immediately after mowing. In order to determine long-term effects, the populations of carabid beetles are investigated before mowing.

Process costs are calculated for the following mowing patterns which use varying field size and working width:

- conventional pattern subdividing the field into several plots;
- mowing the field in stripes from the inside outwards [Fig. 1 (a)];
- spiral mowing from the field centre to the periphery [Fig. 1 (b)];
- mowing from one side of the field to the other using only front mounted mowers [Fig. 1 (c)].

The fields are assumed to have a rectangular shape with a length to width ratio of 2:1.

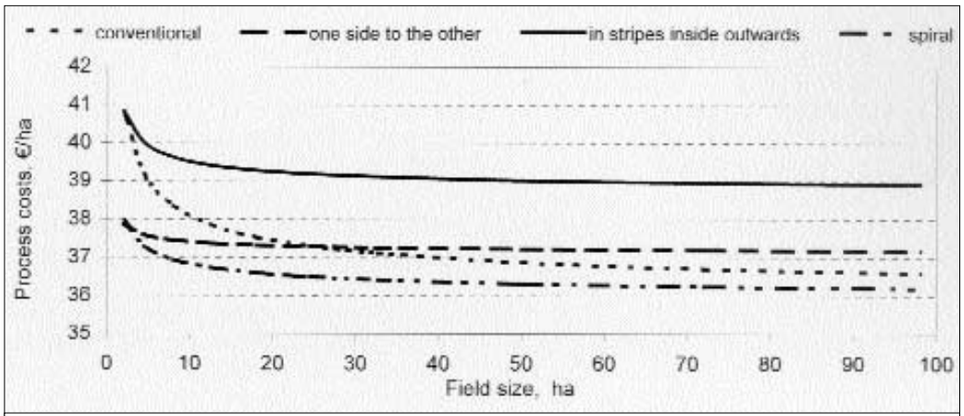


Fig. 4 Process costs for mowing and turning times with different working patterns with a working width of 2.7 m (Meierhöfer, 2002)

Results

Field investigations over 6 years show that in most cases the double knife mower causes significantly lower damage to invertebrates than the disc mower and flail mulcher, with these last two machines being less clearly distinguishable (Fig. 2). The absolute number of killed or injured invertebrates varies widely dependent on factors such as weather and site conditions.

Cutting at a height of at least 100 mm provides a sheltering zone for the grassland invertebrates, thus reducing damage caused by all mowing machines which were investigated. The level of damage, however, still remains higher for the machines with rotating tools (Fig. 3) than for those without.

The carabid beetle populations of the plots, as a long-term, indicator are not differing significantly from each other (Kraut *et al.*, 2002). This means that the populations during the year can compensate different short-term impacts, of the mowing machines on the individuals. However, at the current state of investigation this statement can only be applied strictly to the carabid beetle species.

Process costs for mowing, with a given working width, decrease with rising field size for all working patterns regarded (Fig. 4), even when consistently mowing in stripes from the inside outwards. This fauna-friendly pattern is the most expensive one but additional costs, in relation to conventional mowing, account for no more than 5%. If it is possible to mow from one field side to the other or in spirals from the field centre to the periphery, costs may even be reduced by using fauna-friendly patterns.

Conclusions

In areas with a sensitive fauna, double knife mowers should be used in preference to rotary mowers. For all types of mowing machines raising the cutting height to 100 mm is a simple, effective and low-cost way of protecting grassland fauna. Fauna-friendly mowing patterns can contribute to fauna protection at little or no additional costs.

Despite the new results obtained, knowledge about impacts of technological and technical measures on fauna and on expenditure still remains insufficient. There is a high demand for complex and interdisciplinary research on this subject, particularly including long-term effects, the combination of fauna-protecting measures and all operations of the harvest machinery chains.

References

Claßen A; Hirler A; Oppermann R (1996). Auswirkungen unterschiedlicher Mähgeräte auf die Wiesenfauna in Nordost-Polen (Impacts of different mowing machines on grassland fauna in North-East Poland). In: Naturschutz und Landschaftsplanung, Bd. 28, H. 5, S. 139-144

Kraut D; Jacobs H; Linke F; Prochnow A (2002). Auswirkungen von Landschaftspflegeverfahren auf Boden, Vegetation und Fauna von Niederungsstandorten (Impacts of landscape maintenance procedures on soil, vegetation and fauna of fen sites). Forschungsberichte des Instituts für Agrartechnik Bornim, H. 2002/3, 220 S

Meierhöfer J (2002). Aufwendungen für faunaschonende Befahrmuster bei der Grünlandmahd (Expenditures for fauna-friendly mowing patterns on grassland). Studienprojekt, Humboldt-Universität zu Berlin, Fachgebiet Agrartechnik

Long service certificates

Name	*Grade*	*Date of anniversary*
50 years		
Peter **Hebblethwaite**	CEng MIAgrE	24 Mar 2003
Philip Anthony Laughton **Orbell**	EngTech MIAgrE	24 Mar 2003
William **Haywood**	IEng MIAgrE	24 Mar 2003
35 years		
Thomas **Cochran**	AIAgrE	9 Apr 2003
Duncan George Barclay **Riddell**	EngTech MIAgrE	9 Apr 2003
John Anthony **Earley**	IEng MIAgrE	9 Apr 2003
Peter Lawrence **Redman**	FIAgrE	9 Apr 2003
James Rollo **Robinson**	IEng MIAgrE	9 Apr 2003
Paul Thomas Delecroix **Turner**	IEng MIAgrE	9 Apr 2003
25 years		
William James Hope **Ramsay**	IEng MIAgrE	9 Mar 2003
Peter Robin **Mason**	CEng MIAgrE	9 Mar 2003
Thomas Alexander **Copland**	CEng MIAgrE	9 Mar 2003
Patrick Warren **Bailey**	AIAgrE	26 Mar 2003
David William **Russell**	IEng MIAgrE	26 Mar 2003

Mechanical Engineering degrees feature in top ten that offer best employment prospects for graduates

Degrees in Mechanical Engineering offer the seventh best employment prospects for graduates, following on the heels of subjects including Civil Engineering, Accountancy, Business and Management Studies and Media Studies and ahead of Electrical and Electronic Engineering.

According to the latest annual '*What Do Graduates Do*?' report, 67.7 per cent of the 2001 graduating cohort found work within six months of graduation, with nearly a fifth, 18.4 per cent, of graduates opting for further studies. Nearly two thirds, 65 per cent, of graduates in work secured professional employment (*i.e.* a job requiring a degree or equivalent).

Nearly four fifths, 79.2 per cent, of Civil Engineering graduates found employment within six months, as did 78.2 per cent of Accountancy graduates. Employment amongst Information Technology (IT) graduates, which has enjoyed a rapid ascendancy in recent years, fell by 7.3 percentage points from 79.9 per cent in 2000, to 72.6 per cent in 2001 and has been usurped by Business and Management Studies (75.7 per cent), Media Studies (74.1 per cent) and Building (73.3 per cent), as subjects offering the highest employability rates. Mechanical Engineering came in at 70.7 per cent while Electrical and Electronic Engineering was 68.9 per cent.

The decline in the IT industry accounts largely for a rise of just under one percentage point in graduate unemployment which increased to 6.3 per cent in 2001 from its all time low of 5.5 per cent of the previous two years, and reversing a ten year downward trend.

"We predicted last year that graduate unemployment had levelled out and was unlikely to dip any lower," commented Mike Hill, chief executive of CSU, the higher education Careers Services Unit. "This current increase follows two years where graduate unemployment remained at an all time low and is still a long way from the highs of 8.2 per cent five years ago and around 12 per cent ten years ago," he continued.

Published by CSU, the Association of Graduate Careers Advisory Services (AGCAS) and the Universities and Colleges Admissions Service (UCAS), *What do graduates do?* 2003 tracks the career destinations of first degree and HND graduates and examines the employment market by occupational sector and subject of study.

Graduate employment trends often mirror popular culture and the 2001 cohort is no exception. Numbers of female graduates studying Law increased by nearly 400 over the five years from 1996, the largest increase across all degree subjects covered. This was followed closely by Media Studies and Psychology. Overall, the most popular subject for women was Business & Management Studies.

Commenting on these findings, Margaret Dane, chief executive of AGCAS, said:

"Higher education Careers Services, which collect data on graduates' first jobs, find that student course choices can be influenced by popular culture. When these graduates chose their degree subjects, Cherie Booth enjoyed a positive media profile as a high achieving barrister, and Ally McBeal, the story of a Boston law firm dominated by successful female lawyers, was a popular television show so it's not surprising that Law became a very attractive career for women."

"Women's study and career choices also show an appreciation of the need to consider long-term job flexibility which will enable them to have families and keep their career options open. It is these well organised, forward thinking women who are the most regular visitors to their university Careers Services," she added.

Male students too are widening their study choices, their three most popular subjects being IT, Business and Management Studies and Design Studies. Engineering subjects such as Mechanical Engineering and Electrical and Electronic Engineering are still over ninety per cent male.

"What is striking about '*What Do Graduates Do*?' this year is the extent to which female graduates are exploring historically male dominated career paths," said Mike Hill.

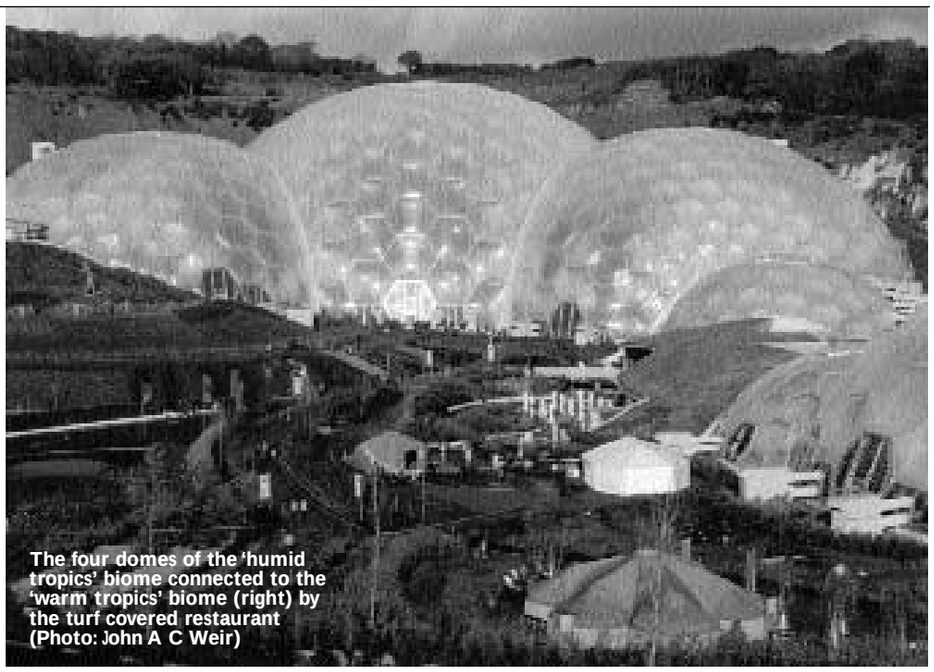
"We have seen this in the medical field where an increasing number of women are qualifying as GPs, and now in Law. It reveals the impact of sound careers advice at all stages of their education which is encouraging students to think through their long term aspirations and make better informed choices."

Tony Higgins, UCAS chief executive, added: "It appears that the women who choose to enter traditionally male professions could be influencing those who are currently applying to higher education and we are seeing evidence of this in application figures for UK universities and colleges.

"For example, UCAS' first figures for 2003 entry show an increase of 1,800 in the number of women applying to medicine compared with last year, and there are rises too in the number of women applying to dentistry and veterinary science/medicine. It will be interesting to see, as the application cycle progresses, whether other subject areas show similar growth."

MORE INFORMATION

CSU, the Higher Education Careers Services Unit, works in partnership with AGCAS to maximise the opportunities and support available to all school-leavers and students. The CSU service includes over 800 different career guides, graduate marketplace reports and the Prospects Series of recruitment and post graduate course directories and magazines, career planning software, web and online options to enhance the careers advice provided in higher education careers services. Web: www.prospects.ac.uk



The four domes of the 'humid tropics' biome connected to the 'warm tropics' biome (right) by the turf covered restaurant (Photo: John A C Weir)

EDEN PROJECT

John A.C.Weir

Introduction

As a result of the two fascinating papers presented on the Eden Project at the IAgrE 2002 Annual Conference, by David Hamilton of Anthony Hunt Associates and Geoff Fanham of Arup, the Horticultural Engineering Specialist Group resolved to go and see it at the earliest possible opportunity. Our visit, combined with members of the Southwest Branch and, advisedly, out of season, took place on the 4th November 2002.

The St. Austel landscape, where the Eden Project has been constructed, is pockmarked with 'mines' large quarries from which china clay (kaolin) is extracted, to be used mainly by the ceramics and paper industries. The approach to the town from the Cornish spine route (A38), cuts through what has been aptly described as a 'moonscape' of craters. The Eden Project is located in one of these craters, known as the Bodelva Mine which by the mid 1990s was running out of its workable clay reserves. There are a number of worked-out mines in the area but the location and size of Bodelva which is approximately 22 ha in area, with each mine in the area varying between 30 m and 70 m in depth, most closely matched the requirements of Tim Smit' and his team.

The Eden Project's official opening to the public, following completion, took place in March 2001; between this date and the day we if our visit, the Eden Project had attracted over 2 million visitors, more than twice the number planned!

The biomes

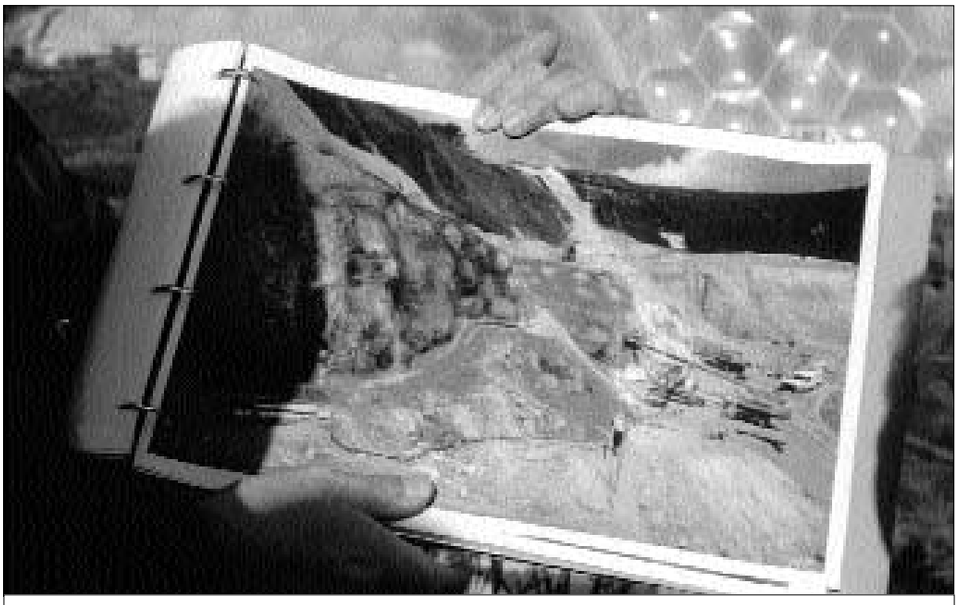
The Eden Project consists of seven domes clustered in two groups which are connected by a turf-covered corridor and restaurant. Our first full view of the complete panorama of the aptly named 'biomes', glistening in the morning sunlight, was from a balcony at the southern lip of the crater. However, due to The Eden Project's uniqueness, it was difficult at this point to visualise the sheer magnitude of the structures. Our guide, Martin Jones of Anthony Hunt Associates, put this into a meaningful perspective when detailing the overall dimensions of the structures.

The larger 'humid tropics' biome has a maximum width of 110 m, length of 240 m and maximum height of 55 m. The height of this biome required to be generous due to the fact that many humid tropics' tree species are capable of attaining heights of 50 m in relatively short periods of time!. The second, 'warm tropics', biome has maximum dimensions of 65 m wide, 135 m long and 35 m high. The combined plan area of these two biomes, amounts to 2.2 ha.

The basic architectural concept, as defined by the principal architects Sir Nicholas Grimshaw and Partners, was, initially, to build two large greenhouses free of internal supporting members, thus establishing their stability and durability with a structural framework but allowing for maximum light transmission. This was a particularly tall order calling for innovation in the extreme on the part of Anthony Hunt Associates, the consulting structural engineers. Fortunately,

BIO NOTE

John A C Weir, FIAgrE, is Chairman of the Horticultural Engineering Specialist Group. E-mail: putney.john@virgin.net



'Before and after'; initial excavation work in progress on the site of the biome shown in the background. (Photo: John A C Weir)

A general view in the 'humid tropics' biome from the top of the cascade (Photo: John A C Weir)

considerable advances in the development of plastic film materials, with high transparency, have been made in recent years. This enabled the designers to move away from traditional glass cladding which would have imposed severe constraints on what could be achieved in terms of structural geometry, presenting an opportunity for substantially reducing supporting elements in size and number. After several basic designs were considered, the one finally selected was a geodesic framework of hexagonal modules. The modules were designed varying in size up to 11 m across, and clad with ethyltetraflouroethylene (ETFE) film, in the form of triple-layer inflated 'cushions'. The ETFE film combines high transparency with high durability, being free from ultraviolet (UV) degradation and therefore giving it a long useful life.

Preparation of site

Preparation work on the site commenced in 1998, with a mandate of minimising the import and export of fill material. This consisted of grading the whole area to accommodate car parks, service roads, administrative zones and water storage lakes, in addition to the actual biome locations. This formed a major operation under the supervision of land use consultants assisted by the use of digital ground modelling and aerial surveying. In this process, approximately 0.8 Mm3 of material was moved to create the desired landscape, without the need to export any from the site as surplus to requirement. Some of the inherent advantages of adopting this unconventional design became apparent in the construction of the biomes which was carried out by the main contractors, McAlpine Joint Venture. Apart from a much lower structural loading, approximately one fifth of an equivalent glass structure, the geodetic framework of hexagonal sections lent itself to ensuring the biomes' stability on an uneven foundation. This foundation varied from a clay rich scree material to granite bedrock, profiled from the horizontal to the near vertical! Excessive groundwater combined with appalling weather conditions at the biome construction phase, made their completion, on schedule, a major achievement. The scaffold rig, comprising approximately 320 km of scaffold poles which was required for the erection of the humid tropics biome, has found a place in the *Guinness Book of Records* as the world's tallest freestanding scaffolding structure.

The biome environment

A further objective, central to the spirit of the Eden Project, was that of achieving maximum economy in the use of resources for environmental support; in particular water for both recycling and rainwater collection, imported soil and soil substitutes and energy. This was a key mandate for Arup who were the main contractors responsible for the project's environmental systems. However, in the two

Looking out through one of the ground level louvred air ventilators, with one of the climate–control transducers (aspirated screen containing wet and dry bulb sensors) visible to the left of the small tree (Photo: John A C Weir)

biomes, such economies had to be balanced against the overriding requirement of matching the design's climatic conditions, based on plant physiology models developed by Silsoe Research Institute. Andrew Marchant, a member of our Horticultural Engineering Specialist Group Committee who had worked with Arup on the project, guided us through the main features on the biome environmental systems.

The primary objective in the biome design was to maximise daylight penetration into their planted zones. This was achieved by:

- giving the biomes their east to west orientation with a general north to south downward slope forward from the cliff base;
- minimising the elements of the supporting structure; and
- using the ETFE cladding which has a daylight transparency factor superior to that of glass.

The inflated triple layer ETFE cushions which formed the two biome envelopes, satisfied the requirements of maximum light transmission with the added advantage of good heat insulation – an improvement on double-glazed glass cladding in both respects. It was pointed out that the light coloured rock face, forming the internal northern walls of the biomes, reflected useful incoming daylight back onto the plant canopy. This also served as a useful heat 'sink', helping to control biome temperature by absorbing and storing incoming radiant heat during the daytime, then releasing that heat as temperatures fall at night.

Regulating atmospheric temperature and relative humidity to within design limits, avoiding undesirable spatial 'zoning', posed a major challenge in the environmental design of such large structures. With the aid of extensive computerised modelling, a hybrid system combining convective air movement with directional forced air jet streams, from 'climate control' units, was developed to cover ventilation, air circulation and heating. The climate control units, situated around the periphery of the biomes, each consist of a fan unit and airflow heater supplied by hot water from a central boiler system. After considering heat supply options such as biogas, combined heat and power or solar collection, natural gas was the preferred source; a decision made on the grounds of initial cost and reliability.

The atmosphere in the humid tropics biome, maintained at minimum temperatures within the band of 18 – 20oC but rising under solar radiation to a possible temperature of 35oC, has to be kept at a relative humidity of at least 90 per cent. This results in an excessive atmospheric water demand – particularly at the higher temperatures – which cannot be satisfied solely by the natural transpiration of the growing plants. Under such circumstances, 'fogging' systems provide the best solution and in this particular case a network of atomising nozzles has been located within the bed area to ensure an even distribution of fog. Here, run off rainwater, collected from the biome surfaces which is then filtered and disinfected by silver ionisation, is circulated at very high pressure (125 bar) via a ring main to the nozzles. This produces a fog of microscopic sized droplets which is instantly taken up as vapour to maintain the design's atmospheric relative humidity (RH).

Maintaining the desired degree of atmospheric control, when ambient conditions are subject to very rapid changes, demands a sophisticated climate control system. This must be capable of rapid and accurate response from the environmental system, while achieving an energy efficient operation. For this the VanVliet Automation Horticultural Management System, well known in commercial horticulture, is used in both biomes.

Introduction of the Horticultural Engineering Specialist Group and the Southwest Branch to the biomes; Martin Jones facing the camera (Photo: John A C Weir)

Watering Lane Nursery

Any successful show always

depends on a well run, behind the scenes, back up and The Eden Project is certainly no exception to this. The nearby village 'Watering Lane Nursery', was purchased by the Project Trust shortly before work on the main site commenced in 1998. It was extensively modified, largely under the direction of Andrew Marchant, and has amply fulfilled the important role of maintaining the large collection of plant species required for the biomes and amenity planting of the whole Bodelva complex.

Our afternoon tour of the 6 ha site, guided by James Treseder, the assistant curator, gave us a glimpse into the running of this essential facility involving an ongoing production schedule of plant species, replacements, growing on of specimen trees and other plants, acclimatising and quarantine of imported specimens, etc. The shear diversity – from mature trees to minuscule mosses – of plant material has necessitated a widely differing range of suitably equipped glass and plastic film clad greenhouse structures which is the distinguishing feature of the nursery. One example of the latter is its modified Venlo greenhouse, with a 6.5 m eaves height, expressly to house the taller plant material. Botanically speaking, Watering Lane Nursery, where we concluded our day's visit, was really where it all started and here it seemed a fitting moment to thank our guides for providing such an excellent insight into the Eden Project.

The Eden Project is regarded by many as having been the most successful of all the millennium initiatives. What impressed us was not only that it had been on the firm foundation of a clearly defined objective, from concept to full reality but also that it was a particular complement to the achievement of the engineering profession.

Further reading

Jones, Alan; Hamilton, David; Jones, Martin. The Design and Construction of the Eden Project. Anthony Hunt Associates Ltd, Gloucester House, 60 Dyer St, Cirencester, Gloucestershire, GL7 2PF.

Arup. The Arup Journal 1/2002, pp. 4-12. Arup, 8 Fitzroy St, London, W1.

Smit, Tim. Eden. Bantam Press 2001 (Corgi edition 2002).

APPOINTMENT

Forest Research Agency to get new Chief Executive

A leading microbiologist is to take the helm at Britain's principal forest research establishment. Professor Jim Lynch (57) has been appointed new Chief Executive of the Forestry Commission's Forest Research Agency. The agency supplies research, development, surveys and other services to the forestry industry and provides scientific advice on the formulation of Government forestry policy.

Employing some 300 staff the agency has main bases at Alice Holt in Surrey and at Roslin just outside Edinburgh, as well as a number of smaller offices and fieldstations throughout Britain. The organisation has carried out ground-breaking work in areas such as Dutch Elm Disease and is internationally renowned for the quality of its research. One of Professor Lynch's first tasks will be to implement the recommendations of the agency's first quinquennial review which is due to report shortly.

Professor Lynch graduated in industrial chemistry from Loughborough University of Technology in 1968 and then gained PhD and DSc degrees from the University of London, which led to a distinguished career in agricultural research at universities and research institutes in the UK and USA. He is currently Professor of Biotechnology and Head of the 5 star, 'A' rated, School of Biomedical and Life Sciences at the University of Surrey, a post he has held since 1993.

Since 1989 he has been Co-ordinator of the Organisation for Economic Co-operation and Development (OECD) Programme on Biological resource Management and in 1993 he was awarded the UNESCO Microbiology Prize for his contributions towards the development of the ground and scope to allow the modification on the population balance of soil to the benefit of man. He is a fellow of the Royal Society of Chemistry, the Institute of Biology, the International Institute of Biotechnology, and the Royal Society of the Arts. He is also a director of the University of Surrey Environmental Body; Beacon Bio and Phytobial Technologies Inc.

Commenting on his appointment, Professor Lynch said: "From the days when I taught microbiology to agriculture and forestry students in Oxford, I realised the scope for the natural science approach to forestry research. However, with the recognition today of the societal value of forests and the potential of forestry as a clean technology capable of reducing environmental contamination, it is clear that a fully interdisciplinary approach is needed to realise the full potential of forests.

"It is also clear from my experiences in OECD that the scope for international co-operation is enormous. I feel very privileged to be leading an organisation which has already demonstrated its competence at a time of such great opportunity, and also look forward to retaining my association with the University of Surrey as a Professor where the academic and entrepreneurial spirit is so strong."

Professor Lynch is married with four children. His personal interests include Victoriana, canoeing, sailing, cycling, gardening, walking and music. He will take up his new post in July.

EDUCATION

New MSc Degree in Forest Protection and Conservation is underway at Imperial College

Forest Protection and Conservation, the latest addition to the suite of targeted MSc Courses in Applied Biological Sciences is underway at Imperial College. With the increasing worldwide threat to the integrity and well-being of trees, this brand-new and unique postgraduate course taught in the United Kingdom, with a global perspective, is timely indeed. The one-year MSc in Forest Protection and Conservation comprises taught courses and a research project. It is based at Imperial's Silwood Park Campus in Berkshire to the West of London, with some teaching at the Wye Campus of Imperial College located in Kent in the countryside to the south-east of London.

The specifically targeted and intensive course has generated considerable interest from foresters, agroforesters, arboriculturalists and conservationists from around the world in USA and Canada, the Far East and Africa including Ethiopia and Malawi. As a one-year Masters Degree, the course is proving of particular interest to those who would otherwise need to devote two years of study to obtain an equivalent experience and qualification.

Roe deer, Capreolus capreolus, a major pest of establishment forestry in Britain and Continental Europe

The course is designed to be 'hands-on' and very practically orientated. There are visits to appropriate forest and conservation areas, organisations and commercial companies on a weekly basis, and longer field trips and courses to key forest and conservation areas, such as The Peak District National Park (Derbyshire) in the United Kingdom.

The MSc Course in Forest Protection and Conservation is attracting participants from a wide range of backgrounds and experience. It will bring together recent graduates and seasoned professionals with expertise in policy and economics as well as 'hands-on' forestry and conservation in a wide range of countries, climates and ecosystems.

The first-year intake includes participants from a wide diversity of backgrounds, including female students. Focus is on natural forest and woodland, plantation trees and tree crops (with the exception of estate grown beverage crops – coffee, cocoa, *etc.*), with due regard to amenity (shade) trees, in a truly international context and setting.

The wide range of biotic and abiotic factors that threatens the

future sustainability of trees and forests (pests, diseases and weeds, stresses caused by climate change, the impacts of climate change itself – notably storm events and droughts – and international trade) is reflected in the comprehensive taught component of the course.

Established courses in Application Technology, Pesticide Science, Biotechnology, Decision Tools, Statistics and Experimental Design, which are a current feature in the 'MSc Applied Biological Sciences' suite of options, are complemented with brand new courses. These include Forest Resources, Forest Pathology and Forest Pests, Soils, Sites and Nutrition and Forest Ecology, Management and Conservation.

The taught component is assessed through continuous coursework during terms 1 and 2 and oral and written examinations which take place in January and after Easter. During term 3, students independently conduct a tree or forest related research project based at Imperial College (Silwood or Wye Campus), a research institute or commercial company in the United Kingdom or overseas. Students write a 20,000-word dissertation, which is submitted in early September, marked independently by the project supervisor and a second approved marker and moderated the External Examiner.

The course presents a unique opportunity for students interested in management of sustainable forest, woodland, plantation and amenity trees and to focus on protection and conservation in local, national and international contexts rather than take a traditional course in forestry.

Students graduating in Forest Protection and Conservation will be well equipped for employment in: forest services, forest research institutions, forest management and consultancy companies (especially where there is a strong plantation focus), overseas aid and development programmes, international non-government organisations (NGOs), environmental groups, local authorities and arboricultural companies.

The course has the enthusiastic support of The Forestry Commission and DFID (Department for International Development) and will attract additional support from large local authorities, multi-nationals and companies with strong positioning in forestry either from the forest production or harvesting/processing/manufacturing (*e.g.* timber, woodworking, pulp and paper) standpoints. A BBSRC (Biotechnology and Biological Sciences Research Council) studentship (full fees plus stipend) is available plus Departmental Bursaries.

This brand-new MSc option in Forest Protection and Conservation is administered through the current MSc Applied Biological Sciences Offices at Silwood Park, with full-time secretarial/administrative support. The Course was rated as 'excellent' in the 2000/2001 GSLSM (Graduate School of Life Sciences and Medicine Review) and as 'outstanding' following an onsite review by the BBSRC in 1997.

MORE INFORMATION

Further information from the Course Director: Dr Simon Leather, Biological Sciences Department, Imperial College, Silwood Park, Ascot SL5 7PY. United Kingdom. Tel: +44 (0) 207 594 2316. Fax: +44 (0) 207 594 2339. E-mail: s.leather@ic.ac.uk Web: www.bio.ic.ac.uk

APPOINTMENTS

New wood at the Forestry Commission

The Forestry Commission has appointed new Directors for England, Scotland and Wales. The Directors will assume responsibility for all the Forestry Commission's activities in the relevant country, in particular policy making, grant-aiding, regulation and the management of the public forest estate. The move follows the outcome of a wide-ranging interdepartmental review of the administrative arrangements for developing sustainable forestry policies post-devolution.

The aim of the changes is to achieve greater integration of forestry with other rural policy work in England, Scotland and Wales whilst retaining desirable opportunities for a collaborative approach to common issues. The appointments are effective from 1 April, 2003.

Scotland: Dr Bob McIntosh

Dr McIntosh joined the Forestry Commission in 1973 as a trainee District Officer and after 18 months in the Thetford District, spent 3 years as Assistant District Officer in the West Galloway District, based in Newton Stewart. This was followed by a six year spell in Forest Research, based in the Silviculture (North) branch at the Commission's Northern Research Station and with responsibility for work in nutritional problems and fertiliser use. On leaving Research, he spent a year as Forest District Manager (FDM) in the Rothbury District before transferring to Kielder Forest District, initially as Harvesting Officer, then as FDM. He moved to the Commission's headquarters after nine years at Kielder, to become Operations Director within FE and became Chief Executive of Forest Enterprise, and a Forestry Commissioner, in 1997. His interests include rural land use policy/issues, fishing, shooting, rugby, and cricket.

England: Paul Hill-Tout

Mr Hill-Tout joined the Forestry Commission at Northampton in 1980 and held eleven subsequent posts in Hampshire, Kielder, Dumfries and in the Commission's headquarters. He became the Commission's Chief Conservator for England in 2000. His major professional interests are in planning at the corporate and woodland level. Paul is married with six children and enjoys gardening, hiking and camping.

Wales: Simon Hewitt

Mr Hewitt joined the Forestry Commission as a land agent in the New Forest in 1976 following periods working for the Ministry of Agriculture and in the private sector. He has since held posts in Thetford, Edinburgh, Bristol and Aberystwyth. He is married with three children, two of whom have now flown the nest, and enjoys walking and outdoor pursuits. He was appointed Chief Conservator, Forestry Commission Wales in 1996 and was closely involved in the process of change resulting from devolution and the creation of the National Assembly, which is responsible for the Commission's activities in Wales.

Farmers laying the foundations of a new stone bund

SUSTAINABLE SOIL AND WATER MANAGEMENT IN SUB SAHARAN AFRICA

Vaughan Redfern

The semiarid area of northeastern Ghana and northwestern Togo supports a predominantly rural population, mostly dependent on rain fed subsistence agriculture. In spite of a landscape that is generally flat or very gently sloping, soil erosion is very much in evidence; the fragile soils washed away by the high intensity rain falling during the one, short wet season. Farmers in the region have long been aware of the need for soil and water conservation and traditional agriculture features the use of stone bunds as a soil and water management tool. The bunds work by decreasing the velocity of overland flow and increasing water infiltration. However, the crude construction of these bunds limits their usefulness and, the fact that often they are not correctly aligned along the contour, means that they can actually intensify soil erosion by concentrating overland flow.

It was the recognition of the need to improve traditional soil management techniques that prompted a group of former Silsoe College students to set up TRAX Program Support in Ghana in 1989. Known commonly as TRAX, the group started work with individual farmers to improve the construction of the traditional bunds.

Appropriate technology

To improve the positioning of the bunds along the contour, TRAX introduced the use of the 'A' frame as a simple levelling device. The 'A' frame is a marvellous example of

BIO NOTE

Vaughan Redfern is a rural development consultant and a member of the board of trustees of TRAX Program Support. If you would like further information on the work of TRAX, or would like to support its activities, especially if you could supply new or used spirit levels, then please contact Vaughan. E-mail: redfernvp@iagre.biz Website: www.traxafrica.250x.com

Stone bunds protecting the soil on sloping land

appropriate technology. It consists of three pieces of wood fastened together to form an 'A' approximately 1.5 m high, with the horizontal bar marked at its centre. A plumb line is suspended from the apex and the 'A' frame is level when the feet of the 'A' are on the ground and the plumb line touches the centre mark. The 'A' frame is 'walked' along the contour with sticks being planted at intervals to show the line along which the stone bund should be constructed. This is a slow and painstaking way of marking the contour level and has provided the incentive for the development of an alternative method. This new method uses a small spirit level fastened in the middle of a 10 m length of string which is then tied to a stick at each end. One stick is planted in the ground with the line then stretched across the slope and where the spirit level shows it's level, there's the contour!

The only problem with this method is that spirit levels are not available locally. In fact the only way to make them available seems to be to import them from the UK which of course involves a cost to TRAX on top of the existing cost of supplying the farmers with tools such as pick axes, spades and wheelbarrows.

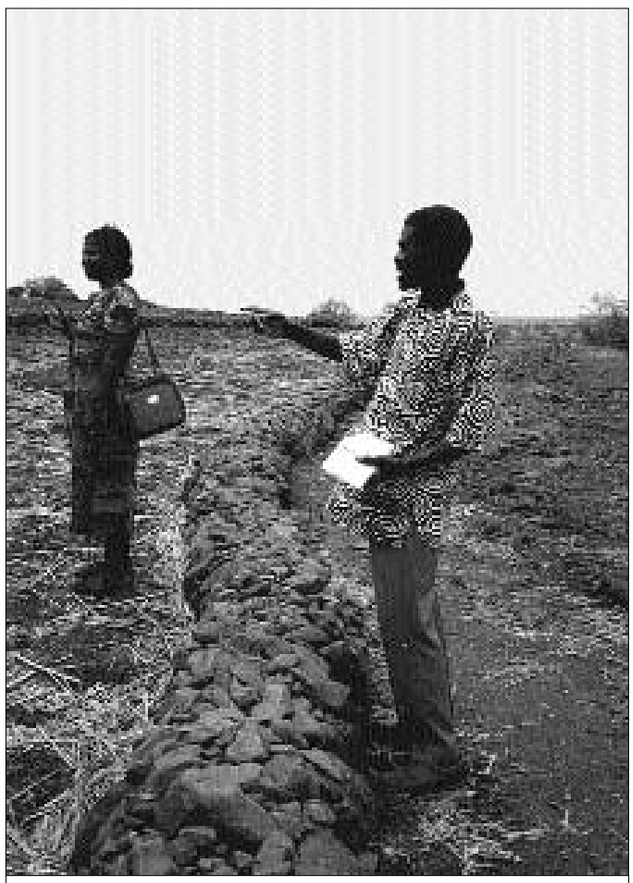
Sustainable agriculture

TRAX has gained a high reputation in the region for the promotion of Low External Input Sustainable Agriculture (LEISA) and now works with whole communities rather than individual farmers, moving into an area at the request of the community. The work is carried out under three programme arms, the largest of which is the Sustainable Livelihoods Programme. With soil and water conservation at the core of this programme, the promotion of improved stone bund construction continues to be an important activity. It is a proven intervention developed from a traditional and familiar technique and usefully forms the basis for developing a range of soil and water management techniques appropriate to each area. The other techniques developed with the communities include crop residue management, agroforestry and composting. In addition, general agricultural advice is given on such subjects as organic pesticides, the cultivation of fruit trees and livestock production.

An important intervention has been the development of 'dry season' gardens; vegetable plots sited near to a reliable water source and fenced against livestock. These gardens help to maintain a food supply during the dry season when food is scarce, with any surplus produce sold in the local market. Their development is promoted as an income generating activity, aimed primarily at women, and along with activities such as grain milling, shea butter processing and soap manufacture, they bring a much needed cash injection into the community.

Sustainable communities

The technical skills required to undertake these activities are developed through the Training Programme. Designed initially to extend the technical skills of TRAX field staff and farmers, this programme now also runs courses for other Non-Governmental Organisations (NGO) and government agencies in subjects as diverse as seed storage, book-keeping and leadership skills.



TRAX staff inspect a recently completed stone bund

The third programme arm is the 'Resource Centre' which maintains a library of books, journals and videos, primarily on rural development issues. These materials are available to any member of the public. The Resource Centre also assists communities with the preparation of funding proposals and offers an advisory service on community development services.

The three programme arms have a common aim of developing sustainable livelihoods amongst resource poor communities. This means not only improving food security and raising income levels but also promoting community development and effective leadership. The use of a participatory approach to agricultural and community development facilitates this process but the fact that TRAX only works with communities who have invited TRAX to help them is perhaps the key to success. This community led and participatory approach has helped to stimulate the widespread uptake of LEISA by communities in the region. Approximately 13,500 people have benefited from the activities of TRAX and the programme is currently looking to expand into neighbouring Burkina Faso. At the heart of this success though is a simple improvement to a traditional form of soil and water management.

Whilst the long-term goal of TRAX is to be self-financing, TRAX currently depends on the generosity of private and public donors, such as the Department for International Development and the UK National Lottery Charity Board. The development of sustainable livelihoods is a slow process; bringing financial sustainability to an NGO is even slower.

ENVIRONMENT

A neighbourly nuisance – the true cost of landfills

Environment Minister, Michael Meacher, has announced the publication of a report that looks into the disamenity (nuisance) costs of living near a landfill site in the UK.

The study was undertaken to identify and estimate those costs associated with the local nuisance caused by landfill activity – as distinguished from other environmental impacts including green house gas effects and the risks to human health. *'A Study to Estimate the Disamenity Costs of Landfill in Great Britain'* aims to identify and estimate the disamenity (drawback) costs of landfill in Great Britain, that is those local nuisance costs experienced by households living close to landfill that are associated with it such as odour, dust, litter, noise, vermin, and visual intrusion. The study uses landfill data made available by the Environment Agency and the Scottish Environmental Protection Agency together with individual house price and ward-based socioeconomic data drawn from Cambridge Econometrics' AHPD database (the AHPD Geographical Information System was developed by Cambridge Econometrics to explain differences in house process on the basis of their characteristics and location).

The study covers Great Britain, except for small parts of the North West and East Midlands where data are not currently available. Data for Northern Ireland are not yet available on a comparable UK basis.

The database identifies a core data set of 11,300 GB landfill sites (some 6,100 licensed as operational in 1993/94) and the study has associated these sites with 592,000 housing transactions from 1991-2000 inclusive.

Controlling for both physical and socio-economic factors there remained a statistically significant stock disamenity effect for houses located closer than 0.5 miles to a GB landfill site. This gave an average reduction of about £5,500 in the value of houses lying within the zone of 0.25 miles from operational GB landfill sites and about £1,600 for those between 0.25 and 0.5 miles of such sites. Taking house prices at their 1995 values, but updating for consumer price inflation, this generated a mean estimated total present value of fixed disamenity of £2,483m at current prices, with a 5% margin of error. Transferring this 5% margin to the present value of fixed disamenity effects of landfill provides us with £334,350 and £478,990 per landfill site in GB.

This corresponds to a nominal measure of fixed disamenity cost of between £1.52 and £2.18 per tonne of landfill at current prices for an assumed average flow of 100 million tonnes pa for 28 years at a 6% discount rate.

Analysis showed considerable regional differences in the impact of landfill disamenity, with Scotland showing the strongest and most robust effect on house prices of proximity to landfill. There is evidence that different types of waste site have different fixed disamenity effects.

Co-disposal of mixed waste has been the main management approach in the UK accounting for 55% of operational sites in 1994/95. Sites taking 100% bio-degradable material and those with 100% inert material display no statistically significant landfill disamenity effects on house values, while sites taking high rates of hazardous waste show similar size negative disamenity impacts as the average sites.

While hazardous waste sites showed some evidence of negative effects over a larger distance from site than average landfill, these were not statistically robust results.

MORE INFORMATION

Department for Environment, Food and Rural Affairs, Nobel House, 17 Smith Square, London SW1P 3JR. Tel: 020 7238 1133. Fax: 020 7238 5529. Web: www.defra.gov.uk

Bimonthly LATE SPRING 2003

MEMBERSHIP MATTERS

THE NEWSLETTER OF THE INSTITUTION OF AGRICULTURAL ENGINEERS

RASE'S AWARDS SCHEME SAVED FOR FURTHER YEAR

The Royal Agricultural Society's Machinery Awards Scheme has won a reprieve for at least one more year. It was axed when Lloyds TSB decided not to renew its sponsorship agreement, which ended at this year's Royal Show. Operating costs were funded by the sponsorship deal, said to be worth £10,500 a year, plus entry fees of £150 for companies exhibiting at the Royal and £300 for non-exhibitors.

When efforts to attract an alternative sponsor failed, the Society decided to abandon the awards and concentrate on alternative ideas to focus interest on machinery at next year's show.

Brian Finney – who runs the awards scheme and is the RASE honorary consulting engineer – plus members of the scheme's judging panel, helped to win the reprieve. "The RASE has been testing and assessing farm equipment for more than 150 years, and some of us feel that the Machinery Awards Scheme was too important to lose," says Mr Finney.

"As there is no immediate prospect of sponsorship, we need to make the scheme self-financing. One way to raise extra income is from the entry fees, and we have proposed a flat rate of £300," he says. "I contacted a number of machinery companies to check their reaction, and the result has been completely positive. In fact, it also produced some entries for next year's awards."

Mr Finney also has the full support of the awards scheme judging panel, and members have agreed to continue supporting the scheme in the absence of sponsorship. The judges are farmers and machinery specialists, and the awards scheme operating costs include travel expenses incurred when judges visit farms to interview equipment owners and operators.

These unique awards depend almost entirely on field assessment of the machines. Laboratory and research station results, when available, are taken into account, but are secondary to user experience. A group of seventeen farmers, contractors, journalists and researchers, selected for their separate and joint knowledge of farm machinery, visit users throughout the country to investigate and discuss all aspects of machine performance and costs. The information is pooled and examined at Stoneleigh and may lead to the award of an Award of Merit or a Silver Medal. Machines of outstanding importance, with particular relevance to current needs of the industry, and showing a high degree of innovation may be awarded a Gold Medal.

"The Society has agreed to continue the awards scheme on this basis for 2003, and we have been using Smithfield Show as an opportunity to invite machinery companies to submit entries. We all hope that the scheme will once more become a permanent part of the RASE's services to the farming industry," says Mr Finney.

"The Society has agreed to continue the awards scheme on this basis for 2003, and we have been using Smithfield Show as an opportunity to invite machinery companies to submit entries."

[Sources: RASE; Mike Williams, Farmer's Weekly]

ONE OF THE LEADING ITALIAN ENGINEERS

The Pioneering Technology Group held a technical meeting in conjunction with the West Midlands branch, it was held at SAME Deutz Fahr Ltd at Barby near Rugby. They are the UK concessionaires and importers of the SAME range of tractors.

Andrew Sinstadt, the brand manger for SAME, challenged us to compare Francesco Cassani with Harry Ferguson, who he assumed we knew a lot about, and then told us of the developments of the Cassani family in particular Francesco and left us to draw our own conclusions!

Francesco took over the running of his fathers blacksmith business at the age of 10 and in 1928 had launched the first true Diesel powered tractor. The year 1952 saw the launch of the first properly designed four wheel drive tractor. It had a three-point linkage incorporating hydraulic load sensing and did not infringe any Ferguson Patents. When there was a suspicion that one of the Patents might have been infringed he redesigned the control valve to remove this suspicion.

Four Wheels Ahead – a biography and the history of SAME tractors

However, it is suggested that the design of one of his tractors to look, at a distance, rather like a Massey Ferguson 65 was a deliberate taunting. Visit their office at Badby and see the six-cylinder air cooled model on display to make up your own mind!

Andrew Sinstadt donated to the Institution some copies of 'Four Wheels Ahead' the biography of Francesco Cassani and the history of SAME tractors. There are copies in the Institution libraries. **If you would like to borrow a copy please contact the Secretariat on 01525 861096.**

William Waddilove

INTERNATIONAL RECOGNITION

New opportunity for international recognition for UK engineers

The Engineering Council (UK) today announced the official opening of the UK section of the International Register of Professional Engineers.

The Register offers Chartered Engineers holding a recognised degree, and with at least 7 years' experience, the opportunity to join their peers from other signatory countries in gaining recognition in other jurisdictions. While not precluding recognition of other registered engineers, it takes advantage of the growing mutual confidence in registration systems in Washington Accord and allied countries, and responds to increasing demands from multinational companies for easier ways of recognising professionally qualified engineers

Welcoming the opening of the Register to UK engineers, EC(UK) International Advisory Panel Chairman, David Long said: "globalisation has provided new opportunities for UK engineers, and their employers. This important development will aid international trade in engineering services".

Whilst the Washington Accord is solely concerned with accredited undergraduate degrees conferred within signatory countries, the International Register focuses on the full formation of professional engineers. In the UK the International Register is open to Chartered Engineers who meet specified post-graduation registration criteria.

Engineering is an increasingly global industry, with UK engineers working throughout the world. It is hoped that the Register will remove many barriers that exist to mobility between signatory countries, particularly where issues of licensing to practice currently preclude movement. Although not providing, at this time, mutual recognition of professional title the signatories are committed to making easier the admittance to National Registers of incoming engineers who are on the International Register.

MORE INFORMATION

Enquiries about the International Register of Professional Engineers can be directed to Chris Simpson, Executive, International Recognition, EC(UK) , 10 Maltravers Street, London, WC2R 3ER. E-mail: csimpson@engc.org.uk

Details about International Register requirements alongwith application forms and guidance notes are available from the EC(UK) website, at www.engc.org.uk/international/irpe.asp

SPONSORED STUDENT MEMBERSHIP

Douglas Bomford Trust sponsored students from the following organisations, have been admitted to student membership.

Askham Bryan College.

D J Brocksopp
T S Cheesbrough
J W Coy
T M Gardman
C G Gill
R N Hinchliffe
R A Hepworth
B J Kingsbury
W C Lambert
C W Monkman
C Shaw
M P Taylor
M J Winder

Cranfield University

D M Reynolds
A A Abdawani
A Balafoutis
R T Borland
Miss C B E Huber
B Paque
H I Rogge
Ms J Wheeler
Miss S Dean
Miss S H M O'Keefe
Mrs I S C Merlin-Jones Ager
C P O Chapman
M Cracknell
E De Naurois
Ms H C Gardner
Miss R Hughes
Miss S Legg
J E McDevitt
Miss S E Cooper
Ms I Ferrer-Marti
Miss A E Rawlins

Wiltshire College Lackham

C J Arnold
S D Edwards
M Freeman
N J Grubb
P A Hill
D J Hutton
A J Luke
S Melrose
L B J O'Donnell
D Rapkins
J W Sheppard
M R Spicer
S J Vincent
N P West
J W Champ
T F Collett
S J Coxwell
M J Dixon
M Elderfield
W Farmer
J G Gerrard
A M J Hallett
S Read
D Roberts
G C Ryan
T R Shewell
B T Willis

Writtle College

S Aldridge
W Barrage
M J Barrett
M Bateman
A H Biney-Hayford
J Chillingworth
D Chisholm
B I Cradock
M Elliott
D French-Gildersleve
S Guzman-Enriquez
S Hanney
O M Hodnebrog
Ms S Jarmambula
Ms R Jeyaprakash
A King
J G Kireia
O J Nice
O Sharif
G Page
W L Rodwell
M C Roe
I Roussis
Ruhai Che
Z Slezacek
H Smallbone
K H Smith
I Spathis
G Suazo
I Cleaver
J J Ferrer Gonzalez
M I Payne

Membership Changes

IAgrE

Admissions

Fellow
M Broom (Cheshire)
R Purdy (South Yorkshire)
J Swift (West Midlands)

Member
J O Daudu (Nigeria)
T Lee (Essex)
J G Richards (Bedford)
A Williams (Shropshire)

Associate Member
M Dresser (Bedfordshire)

Associate
D R A M Lopes (Australia)
A W Mason (North Yorkshire)

Student
E M N Batchelor (Cranfield University)
S L Jones (Walford & North Shropshire College)

Transfers

Fellow
J Blackwell (Australia)
M StJ Carr-West (Essex)
P F Hemingway (Staffordshire)
R E Hughes (Essex)

Member
R J Goldsmith (Buckinghamshire)
A C Williamson (Cumbria)

Associate
T King (Ireland)

Death
J C Hawkins (Bedford)

Engineering Council

Registrations

EngTech
D J Booth (Dorset)

DOES ANYONE KNOW THE WHEREABOUTS?

Philip James Baumber
9 Main Street,
Scopwick, Lincoln LN4 3NR

Simon Peter Irwin
4 Spruce Drive,
Bicester, Oxfordshire OX26 3YN

DEFINING THE FUTURE OF ENGINEERING

A radical review of the standards for registration of Engineers and technicians has resulted in a draft specification: UK-SPEC (UK Standards for Professional Engineering Competence), issued for comment in March to a wide range of interested employers, institutions and educational establishments.

The specification consists of two documents – one concerned with the competences required by professional engineers, the other with those for engineering technicians. In 12 pages of A4, the documents attempt to summarise the principal characteristics that will be required for 21st century practice, and indicate the way in which these competencies will be acquired.

Care has been taken to ensure that the great number of those striving to meet the requirements of the EC(UK)'s current standard, SARTOR 3, are not disadvantaged. Considerable thought has also gone into ensuring the standard will be compatible with existing company schemes and education programmes – though some changes will be inevitable.

Steering Group Chairman, Professor Kel Fidler, Vice Chancellor of Northumbria University, said "We have already consulted widely and hope that UK-SPEC will be seen to reflect the widespread wish to widen access to registration without compromising standards. We have also taken into account the changing international scene and new developments in education and training – Modern Apprenticeships, Foundation Degrees and the successful widespread adoption of MEng Degrees".

Andrew Ramsay, EC(UK)'s Executive director, said: "It is important we get this revision right. Many of the good ideas that first appeared in the 1997 Standard (SARTOR 3) were overlooked simply because of its lack of clarity, and the opposition generated by the decision to use an entry standard based on A-level points. This time we are seeking a widespread consensus – particularly from industry – before we proceed to write the standard."

Alan Clark, CEO of ETB, said: "We welcome this first important step in the review of professional registration in the UK. The timing of this consultation means that the results of ETB research into industry views, and particularly research on Chartered Technologist and Professional Engineering Technician, will be available in good time to influence the final document.

MORE INFORMATION

UK-SPEC is available at www.engc.org.uk/registration/standards_review.asp

Academic Members

Askham Bryan College
Askham Bryan
York
YO23 3FR

Cranfield University Silsoe
Bedford
MK45 4DT

Duchy College
Rosewarne
Camborne
Cornwall
TR14 0AB

Harper Adams University College
Newport
Shropshire
TF10 8NB

Myerscough College
Myerscough Hall
Bilsborrow
Preston
Lancashire
PR3 0RY

Oatridge Agricultural College
Ecclesmachan
Broxburn
West Lothian
EH52 6NH

Pencoed College
Pencoed
Bridgend
CF35 5LG

Reaseheath College
Reaseheath
Nantwich
Cheshire
CW5 6DF

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

Sparsholt College
Sparsholt
Winchester
Hampshire
SO21 2NF

Wiltshire College – Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

Writtle Agricultural College
Chelmsford
Essex
CM1 3RR

Commercial Members

Autoguide Equipment Ltd
Stockley Road
Heddington
Calne
Wiltshire
SN11 0PS

Douglas Bomford Trust
16 The Oaks
Silsoe
Bedford
MK45 4EL

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

Rotomation Ltd
Summerwood Lane
Halsall
Ormskirk
Lancashire
L39 8RH

White Horse Contractors Ltd
Lodge Hill
Abingdon
Oxfordshire
OX14 2JD

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

INSTITUTION of AGRICULTURAL ENGINEERS, WEST END ROAD, SILSOE, BEDFORD, MK45 4DU, UNITED KINGDOM. Tel: 01525 861096 Fax: 01525 861660

Standen Vision potato harvester and light cable connections to the tractor bottom left

HARVESTING WITH CAN-bus

Morten Moller

Introduction

As agricultural machines have developed in complexity, customers have demanded more operator control. The latest version of the Standen Engineering Vision potato harvester features 55 individual switching signals, with which the operator can control 30 individual functions.

Standen Engineering has been manufacturing agricultural machinery in Ely, Cambridgeshire since the 1930s. During the 1970s, as hydraulic controls became more common on farm machinery, the company was one of the first to use solenoid operated valves, switched from the tractor cab to operate the services on the machines.

Cabling and control constraints

In 1999, Standen's engineering team realised that the practical limits of wiring had been reached, especially as the wiring from the tractor to the harvester is 15 m long and has to be able to be disconnected, often on a daily basis. A 26-page control protocol was circulated to various electronic and hydraulic supply companies to obtain a practical solution.

CAN-bus application

Standen's main hydraulic valve supplier Bucher Hydraulic proposed a CAN-bus system using the robust and already proven Sensor-Technik modules with software written by Bucher's electronic division. A prototype system was tested during the 2000 harvesting season, with four machines working during the 2001 season. The systems have worked with the minimum of fine tuning to the software, and have proved to be extremely reliable, giving Standen enough confidence for the 2002 production to build all machines with CAN-bus control system as standard.

The driver interface control unit has a membrane fascia, interfaced to the bus with a 56-channel input and an indicator output module with 32 light emitting diodes (LEDs). To allow the operator to view and set defaults for flow rates, delay and response times and to monitor pressures in circuits, a Wachendorff OPUS Light fourline operator display panel is inset in the fascia. Password protected second and third levels of access to the display allow override parameters to be set by service engineers and a step-through operator diagnostic menu to be used in conjunction with the control panel to display valve coil current and voltage.

The system drives between 18 and 24 valves, depending on the customer specification for the machine.

Harvesting system development

During the development of the system, several functions, which could only be manually preset on the harvester, were converted to in-cab adjustments allowing the operator far more control on the quality of the crop sample produced by the harvester. Optional automatic sensors for machine levelling, discharge elevator height, depth control and axle steering position can be plugged into the main job processor. Either a controller model type ESX-DIOS or ESX-DIOM slave module is used to achieve the required number of proportional or digital outputs.

Standen has been able to introduce the CAN-bus system and has achieved savings in production costs with a higher control specification. This is mainly due to the savings in commissioning times, when the machine is first run up and the ease of in-field setting when the customer starts to operate the machine. Owing to the simplicity of the wiring loom required, bringing the wiring in house has made additional cost savings. Specialist contractors produce only the distribution circuit board, which Standen has produced to interconnect the elements of the system and the fascia.

Development does not stand still and the ease of programming available allows for

ongoing software upgrades to be flashed onto the processor module from a laptop computer in the field, giving the customer the benefits of improvements. Sensor-Technik Wiedemann GmbH (STW) modules are single plug connection and in the unlikely event of a failure, a preprogrammed replacement can be fitted by a semiskilled person very quickly to keep the machine operating in operations where timeliness is vital.

Driver Interface control unit for the Standen Vision harvester

Main station for bus users

CAN-bus: what is it?

A controller area network (CAN) operates like a cricket team with all its players knowing what to do, but still able to talk to each other, and with an umpire to judge the game and register any unfair play by the participants. Basically, the bus is just a method of communication between two computers or several pieces of equipment, a pair of conductors along which serial data is transmitted to different locations like passengers transported to different points along the bus route. The CAN-bus is effectively an advanced version of the RS232/485 – the standard interface for computer and telecommunications systems.

Where does it come from?

The CAN-bus was originally developed by Bosch for use in the automotive industry and has now established itself as an International norm ISO 11898. Owing to its wide usage over the years, the component cost has become very reasonable and the protocol has spread into other industries.

Why CAN-bus?

The benefit is high transfer rate and high transmitter reliability with functions such as recognising data error, and it has the capability of being able to correct them with only very little loss of time. This, together with many other functions such as error flag, *etc.*, makes the bus ideal in an electrically noisy environment where earthing/grounding can be a problem.

Cabling hardware?

A pair of wires suffices as transmission medium (making wiring very easy). The length of cable at maximum transfer rate is 1 Mbit/s up to 40 metres. Networks without repeaters handle up to 1000 metres with rates of 80 kbit/s.

How many units can be used in systems?

The number is in theory unlimited, but it all depends on the integrated circuits (ICs) used in the equipment. CAN is a true Multimaster System with line topology and real time capability. Unique 'identifiers' contain information not directly related to the address of the participant but to the contents of the message. All participants check out the identifier being transmitted and decide if the type of message is related to themselves. This way all the messages can be received from many or all of the participants simultaneously. Each unit has its unique identifier which also includes the priority to ensure that the highest priority unit is guaranteed bus access, preventing conflicts of simultaneously transmission.

Two universal controllers with CAN-bus for hydraulics on vehicles

Initially developed for farm machinery applications, sensor manufacturer Sensor-Technik Wiedemann GmbH (STW) now also offers their universal electronic controller for other industries. Units are developed specially for direct sensor-actuator management in a compact and robust construction and forms the trend in bus-networking in various industries.

The integration of electronic controls in vehicles and machinery gives savings on design, construction and cabling, and together with the user friendly programming, offers outstanding operational possibilities. This sounds like 'an answered prayer' to machine manufacturers, which are under pressure to improve their products and keep cost low.

The standard unit gives equipment facilities on vehicles for agriculture and construction, as well as on textile and tooling machinery. This central controller can be used in applications such as steering by wire, anti-lock braking, anti-slip regulation, motor management, automatic gear shift, platform inclination, *etc.*

Networking in machinery and

vehicles offers a range of benefits:

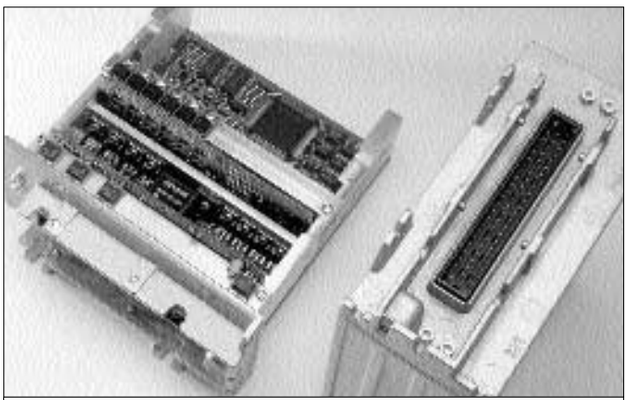
- every user on the network has data and system information available;
- every user has access to the bus at any time;
- all information is available in real-time;
- all data is digitally transferred, giving accurate and precise information;
- system diagnosis is available;
- number of controllers may work in tandem and/or be integrated into a network; and
- safety criteria can be customised.

The controllers are of robust construction and are ideal for harsh environments, with safety compliance to electromagnetic compatibility (EMC), and customised numbers and types of inputs and outputs. The controller itself consists of an electrical-erasable programmable read only memory (EEPROM) where all calibrated data and critical parameters can be stored. Using an editor, this data may be accessed on either the CAN-bus or the RS232 interface.

The function library with ready-to-use function components provides the possibility to quick and easy programming application software and may even be used without previous knowledge of any high level languages.

There are two versions of the controller model ESX with a single CAN-bus interface and the EST, which has two CAN-bus connections, both real-time systems work as individual units in a bigger process system.

The ESX can be customer specified with the expansion boards using two standard internal interfaces and various modules to provide up to 12 additional input or output ports.



Sensor-Technik CAN-bus controllers

Conclusion

The digital communication age has arrived and will develop much further over the next few years. The CAN-bus interface technology is currently one of the fastest growing areas with substantial investment and extensive development of controls, sensors, interface equipment, *etc*.

The digital communication age is here to stay!

MORE INFORMATION

Contact: Robin Gaborn at Standen Engineering. Tel: 01353 661111 Fax: 01353 666 202 Web: www.standen.co.uk

Contact: Morten Moller at Sensor-Technik UK Ltd (a wholly owned subsidiary of Sensor-Technik Wiedemann GmbH). Tel: 01234 782049 E-mail: morten@sensor-technik.co.uk Web: www.sensor-technik.co.uk

RECYCLING

From finished plate to fertiliser – when does recycling become environmental madness?

Did you know that DEFRA is currently considering proposals that will permit composted catering waste containing meat from restaurants and kitchens to be used as fertiliser on farmland? You could be out for a weekend walk, and stumble across the food you left on your plate the last time you went out for a meal – or your dog could run off with a tasty bone that could have started life anywhere in the world.

- It's inevitable that some of this material will include illegal meat imports.
- It can be uncooked, and up to 40 cm diameter in size the equivalent of two Sunday roasts laid end to end.
- Existing composting systems have not been proved to kill exotic viruses such as those responsible for Foot and Mouth. To be fully effective the material must be heated continuously for a specified period.
- Composting systems have no impact at all on the destruction of the BSE agent which we know can survive for long periods in the soil. A ticking bomb will be under the ground wherever this waste is spread.
- DEFRA is proposing that animals will not be allowed to graze on the land to which this waste has been applied for a period of two months. Why, if it is a safe practice, and who on earth is going to police it?
- Food spread across farmland will attract rats, foxes and other wild animals, adding to already growing populations.

The UKRA believes the Government is taking unwarranted risks by proposing these moves. It, and other sectors of the food and farming industries, have written to MPs with agricultural and food interests asking them to influence DEFRA and the Government. We believe changes must be made to this proposal before it becomes law.

While, in principle, we are in favour of extending composting, in part to meet the requirements of the Landfill Directive for biodegradable waste, we do not agree to these current proposals.

MORE INFORMATION

United Kingdom Renderers' Association, St Martha's lodge, One Tree Hill Road, Guildford GU4 9PJ. Tel: 01483 503701. Fax: 01483 502137. E-mail: alan@alaphc.demon.co.uk UKRA information line: 024 7641 8704. Web: www.ukra.co.uk E-mail: ukrainfo@pharoweb.co.uk

AMALGAMATION

A strong team

The world market for agricultural machinery will soon be witness to a new alliance. Renault Agriculture will become a new member of the Claas group. Shareholders and management of Claas and Renault have signed corresponding agreements.

Claas is initially going to take over 51% and in 2 – 3 years 80% of the shares of Renault Agriculture – given the approval of the anti trust authorities.

Rüdiger A. Günther, Executive President of Claas announced "The joining of these two agricultural machinery specialists is a logical step and does make a lot of sense from a strategic point of view. This agreement will allow us to build upon the core strengths of Claas and Renault Agriculture. The planned increased investment in technology and quality will provide a real opportunity for us to make a broadened portfolio of products available to our dealers and customers."

The success of the Claas company – in the last 10 years the average annual growth rate amounted to 11% – is based on outstanding products and on first class service, as well as on the strong performance of the local sales partner. "For us, it is important to guarantee a stable future to these sales partners, whether they are the sales partner of Claas or of Renault Agriculture. Therefore, the new alliance serves primarily to secure the distribution of France, which is Western Europe's biggest agricultural machinery market. But also in other Western European markets, we wish to offer our sales partners an attractive long-term alternative", emphasises Lothar Kriszun, Executive Vice President of Claas for Sales and Service.

Central and Eastern European markets also have a demand for powerful and cost-effective equipment. The extension of the distribution network will be supported by the enhanced product offer.

Kriszun said, "We want to strengthen the core businesses of Claas harvesting technology and Renault tractors in their present structure. It is the custom of both Claas and Renault to reach a common decision with our distribution partners on the market strategy. In the following months we are going to work on strategies with our distribution partners on a national level in order to find the best solution. After this process, a clear concept for each market will be communicated.

Guy Povie, President Directeur Général de Renault Agriculture confirms "This is a partnership, which was intended by Renault Agriculture to move from the isolated position of a tractor specialist to create a new agricultural competence in Europe together with Claas. This is a unique opportunity for the new team to benefit from the technology, the image and the awareness of the two brands. The characteristics of a partnership of two complementary companies is that each business can build on its strength, provide more added value for the customers and be attractive to a distribution network."

The new partnership will form a supporting pillar for profitable growth of the enlarged Claas group. Strong partners guarantee a successful future.

Claas is one of the leading global harvesting machinery specialists. In business year 2002, sales increased by more than 10% to 1.27 billion with profit before tax increasing by almost 55% to 55.8 million; Claas employed 6,114 individuals.

Renault Agriculture, with a market share of 18.4%, is one of the leading tractor manufacturers in France. The company generated turnover of 637 million in the last business year. The tractor manufacturer employs 2,074 people who produced and distributed approximately 9,500 tractors last year.

Clive Last, Chief Executive of Claas UK added: "The Claas/Renault deal protects the French distribution network where 70% of the Claas dealers also promote the Renault franchise and nearly half of which are Renault owned branches. France is the biggest European market for agricultural products and represents more than 20% of the Claas revenue.

"In Britain, Claas have no shared dealers with Renault and we are more than happy with the balance that Valtra and McCormick have brought to our dealers in recent years. We intend to continue as at present with Renault UK marketing their products separately to their independent dealer base. Claas still sees itself as a specialist producer and marketer of Harvesting Machinery. This remains our core competence and will continue to be the main focus of attention and future success."

MORE INFORMATION

Claas U.K. Limited, Saxham, Bury St Edmunds, Suffolk 1P28 6QZ. Tel: +44 (0)1284 763100 Fax: +44 (0)1284 769839 Website: www.claas.co.uk

HEALTH AND SAFETY

Specialist tree surgery harness

Tractel's range of 'Willans Arborists' harnesses is probably the most highly regarded height safety restraint in the specialist tree surgery business.

Unlike other harness wearers who use safety harnesses as protection from potential fails, the tree surgeon is often suspended in a harness for many hours a day. It is essential, therefore, that the harness they chose will be both comfortable over long periods and will also allow them the maximum freedom of movement to carry out their job.

Developed for this highly specialist area, the classic suspension harness has padded leg, waist and back straps, carefully positioned front D rings and attachments for work positioning. These harnesses conform to CE EN 361, EN 358 and EN 813.

The Willans Suspension Hamesses are now distributed by Tractel (UK) Ltd.

MORE INFORMATION

For more information contact: Tractel (UK) Ltd, Old Lane, Halfway, Sheffield, S20 3GA. Tel: +44 (0)1142 482266 Fax: +44 (0)1142 473350 E-mail: info@tractel.com Website: www.tractel.com

Timber walls and Scottish weather – can they live together?

More timber walls appearing on buildings in Scotland could be the result of a research project just launched by building and timber experts from Scotland, Norway, Iceland and the Faroe Islands. And the timber could be grown in Scotland, because one of the objectives of the three-year, European Union-funded project will be to explore the potential for using more Scottish timber on the outside walls of buildings. The project, entitled 'External Timber Cladding in Maritime Conditions', is part-funded by the EU's Northern Periphery Programme, and in Scotland it will look at whether Scotland's expanding production of Sitka spruce timber is suitable.

Announcing the EU funding, Scottish Forestry Minister Allan Wilson said, "Modern Scots tend to think of brick and stone as their traditional building materials, and that timber-clad buildings would be unsuitable in our climate. In fact, until about 300 years ago most buildings in Scotland were made of wood; only rich people had stone houses.

"Moreover, countries with similar maritime climates, such as Norway, the Faroes, Iceland and coastal Canada, continue to use durable, timber-clad buildings very successfully. I'm therefore delighted that through this project we will be able to draw on their experience to calculate the potential for using home-grown Sitka spruce for timber cladding, and for developing a new market for our growing timber production."

The project will be led by Highland Council, whose Sustainable Development Committee chairman, Cllr Ian Ross, said, "Buildings in the north and west of Scotland can be severely exposed to wind-driven rain, leading to a concern that moisture will penetrate timber-clad external walls and lead to building failure. Such perceptions have led Scottish builders to shy away from timber for external use. This is to be regretted, because timber is such a readily available and renewable resource that is widely used in many countries with climates similar to ours.

"This project will address these problems by investigating the widespread and satisfactory use of timber cladding in the partner countries of Norway, Iceland and the Faroes. It will promote best practice in design and detailing to safeguard against moisture problems. "By working together to solve these problems, the Council and its partners aim to demonstrate the effectiveness of timber for long-term external use and improved building performance. Through this we hope to stimulate the demand for locally grown timber, which will have positive spin-offs in terms of promoting sustainable development."

The chairman of the Council's Planning, Development, Europe and Tourism Committee, Cllr Sandy Park, also welcomed the Council's involvement in the project. "The Highlands have sustainable forests and we now need new products and processes to add value to this resource," he said. "This project will do just that, and could result in the expansion of local employment in the forestry and timber-processing sectors. This can only be good news for the Highlands."

Cllr Park said the project would support the Council's efforts, through planning policy guidance for sustainable development, to promote energy efficiency and the use of locally sourced materials such as timber. The establishment of rigorously tested design detailing should encourage a greater confidence in the use of external softwood timber cladding by the construction industry.

Scottish partners include Highland Council, the Forestry Commission, the Scottish Executive, Highlands & Islands Enterprise, Scottish Enterprise, the Scottish Forestry Trust and sawmillers James Jones & Sons Ltd and BSW Timber plc.

> "countries with similar maritime climates, such as Norway, the Faroes, Iceland and coastal Canada, continue to use durable, timber-clad buildings very successfully"

MORE INFORMATION

Bob Shannon, Highland Council. Tel: 01463 702270. E-mail: bob.shannon@highland.gov.uk or Derek Nelson, Forestry Commission. Tel: 0131 314 6159. E-mail: derek.nelson@forestry.gsi.gov.uk

ENVIRONMENT

Be money wise – get 'Waterwise

Framework proposals for agri-environment schemes announced today by the Department for the Environment, Food and Rural Affairs (Defra) are a huge step forward for the environment in England.

Helen Richardson, agricultural policy manager for the Environment Agency said: "We are pleased to see that protection of the natural resources of water, soil and air are to be a key objective of agri-environment schemes in the future. Good soil and nutrient management will deliver environmental benefits at low cost – helping to tackle pollution and providing a better environment for wildlife. A firm foundation of natural resource protection is critical for the rural economy."

The Agency said that the option of including flood management as part of the agri-environment framework should be pursued. Payments to farmers to manage land in ways that will minimise or mitigate against flooding impacts would be a practical element of wider catchment flood management planning, and also provide extra benefits for wildlife and biodiversity.

Work carried out by the Environment Agency has estimated that drainage to soil from farming costs in the region of £264 million a year, but that this cost could be reduced by 75% through simple changes to farm management practices.

Environmental damage to water costs around £203 million a year, but could be reduced by about two thirds, again by making simple changes to practice. The Agency believes examples that could be encouraged include soil and nutrient management planning, ditch management and, integrated crop management.

To promote greater water efficiency within agriculture, the Environment Agency has recently launched *Waterwise on the Farm*, something that will also help farmers save themselves money. The publication includes details on how to take a water audit and develop a Waterwise Action Plan on the farm. It is aimed to help farmers to:

- reduce water and energy use;
- reduce the quantity of dirty water requiring treatment and disposal;
- save money and increase profit;
- improve environmental performance.

Real-life examples of water efficiency on the farm are provided in the form of case studies and practical advice that has been tried and tested by LEAF and NFU members.

MORE INFORMATION

Free copies of the booklet are available. Tel: 01903 832073. E-mail: paula.wood@environment-agency.gov.uk Web: www.environment-agency.gov.uk/savewater (agriculture section)

For small and medium sized farms, a new Environment Agency initiative – NetRegs – has been designed to help farmers to comply with their environmental responsibilities without having to contact the regulator. The site – www.environment-agency.gov.uk/netregs offers easy to understand guidelines on environmental legislation affecting the industry, covering everything from agricultural waste and emissions to water, to disposal of animal carcasses and fuel storage.

HEALTH AND SAFETY

New HSE booklet highlights dangers of working at height in farming

A new 'black spot' report highlighting the dangers of falls from heights in the agricultural industry has been launched by the Health and Safety Executive (HSE). The report shows that in the past ten years, falls from height have claimed 80 lives and is the second largest cause of fatalities in the agricultural sector.

Launching the publication *Why fall for it? Preventing falls in agriculture*, Linda Williams, HSE's Chief Inspector of Agriculture, said: "HSE has analysed accident statistics and published the findings in this booklet. All too often falls have occurred because risks were not properly assessed and little, or no, safety equipment was used. Many of these accidents occurred during roof work and involved falls through roof sheets and roof lights.

"The fragile nature of many roofing materials is constantly ignored as farmers appear to take chances, risking serious injury and even death. The booklet highlights the importance of selecting and using the correct equipment for carrying out safely any work at height.

"Some fatal accidents and many serious injuries occur because the wrong equipment is used. For example, accidents happen when ladders are used for work which could be done more safely from alternative access equipment such as a scaffold tower or a work platform on a materials handler."

Mrs Williams added: "I hope this booklet will show people the importance of properly planning the means by which work at height is carried out, and how the use of appropriate equipment can reduce the risk of falling".

MORE INFORMATION

Copies of Why fall for it? Preventing falls in agriculture (INDG369), are available free from HSE Books, PO Box 1999, Sudbury, Suffolk, C010 2WA. Tel: 01787 881165. Fax: 01787 313995. Priced publications are also available from HSE Books and good booksellers.

HEALTH AND SAFETY

Guidance to help employers investigate accidents at work

The Health and Safety Executive (HSE) will issue new guidance later this year to help employers investigate incidents that cause injuries and ill health in the work place.

The decision to issue the guidance, rather than to recommend legislation to require employers to investigate incidents, was taken by the Health and Safety Commission (HSC) at its meeting last month after taking views in response to a wide-ranging consultation exercise.

HSE received 684 responses to the 1998 discussion document *A new duty to investigate accidents*, and 460 to the 2001 consultative document, *Proposals for a new duty to investigate accidents dangerous occurrences and diseases*. This set out proposals to introduce specific legal requirements on employers and others to investigate incidents reportable under the *Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995* (RIDDOR).

There was overwhelming support for the principle of using incident investigations to learn lessons and prevent workplace injury and ill health, and a range of views over how that could best be achieved. Research commissioned by HSE into current practice, published in *Accident investigation – The drivers, methods and outcomes* revealed widespread lack of confidence in carrying out such investigations, and many felt that guidance to address this knowledge gap would be more helpful than a legal duty.

HSC Chair Bill Callaghan said: "We want people to learn the lessons from work-related incidents with the potential to cause injury and ill health so that they can prevent similar occurrences in the future. We recognise that some employers need help to tackle this issue, so we are preparing a range of guidance material. We will monitor the effectiveness of this guidance closely – and if there is no improvement in incident investigation then we may consider the possibility of recommending new legislation."

In 2001/2, 249 people died and 27,477 more suffered major injury through work activity, while 40.2 million days off work were caused by work-related injury and illness. Lessons can be learned by investigating these incidents, and also 'near misses' – serious health and safety failures where no one is injured.

The guidance will come in a range of formats and the first of these will be published later this year. They will include paper and software investigation tools, and basic and more detailed information leaflets.

MORE INFORMATION

Copies of 'Accident investigation – The drivers, methods and outcomes', (CRR 344/2001, ISBN 0 7176 2022 0), price £25.00, are available from HSE Books, PO Box 1999, Sudbury, Suffolk, C010 2WA. Tel: 01787 881165. Fax: 01787 313995. Web: www.hse.gov.uk/research/crr_pdf/2001/crr01344.pdf

FOOD PROCESSING

SGS accredited for new food packaging standard

International certification organisation, SGS United Kingdom Ltd, has received accreditation from the United Kingdom Accreditation Service (UKAS) to audit against a new food packaging standard for the UK retail industry.

It allows SGS to audit and issue certificates against the new protocol which was developed jointly by the British Retail Consortium (BRC) and the UK's Institute of Packaging (IOP). The announcement comes after a 12 month pilot programme which SGS participated in.

The Standard, which is applicable to a wide range of primary and secondary food containers, packaging materials and labelling made from glass, paper, board, metals, plastics and wood, comes into force in June 2003. Compliance is expected to be mandatory for all food packaging suppliers to major UK retailers.

To achieve certification, manufacturers will need to demonstrate compliance to the requirements set out in the BRC/IOP Technical Standard and Protocol for Companies Supplying Food Packaging Materials for Retailer Branded Food Products. Audits will be conducted on-site and include assessment of procedures for contamination and pest control, personal hygiene, raw material handling, product flow, housekeeping, waste disposal as well as a review of the company's technical management system. Certificates will be subject to two 6-monthly surveillance visits and an annual follow-up audit thereafter.

Certification Manager, Chris Jepson believes SGS' worldwide experience of auditing makes it an obvious choice for packaging suppliers seeking certification: "SGS has been auditing against a plethora of product Standards and regulations for many years," he says, "Our overseas network of offices and affiliates will also enable us to audit the Standard on a global basis".

This latest UKAS accreditation extends SGS United Kingdom's scope for product certification activities which includes the following products: Toys (EN71 and 88/378/EEC), Medical Devices (93/42/EEC), Personal Protective Equipment (89/686/EEC), Electrical Products (73/23/EEC and 89/336/EEC), Gas Appliances (90/396/EEC), Machinery (Machinery Safety Regulations 1992), Manhole covers (EN124) and Pharmaceutical Packaging (PS 9000).

Through its Consumer Products Division, SGS United Kingdom Ltd provides a portfolio of modular technical support services developed specifically for the retail industry.

MORE INFORMATION

SGS United Kingdom Ltd, SGS House, 217/221 London Road, Camberley, Surrey, GU15 3EY. Tel: +44 (0) 1276 697 675. Fax: +44 (0) 1276 697 696. E-mail: chris_rowe@sgs.com

Book Reviews

Woodlands – A Practical Handbook

Elizabeth Agate

The UK's largest practical conservation charity, BTCV has published a new edition of Woodlands – A Practical Handbook. One of a series of handbooks on practical conservation, this book is an indispensable reference for anybody involved in practical woodland management.

This enlarged and newly illustrated edition includes important new sections on the following:

- management of woodland habitats;
- using coppiced material for green woodworking;
- charcoal burning;
- provision of access in woodlands;
- updated National Vegetation Classification tables;
- up to date contacts.

This revision of Woodlands is particularly significant in view of the current renewed interest in woodland management and ancient coppices.

MORE INFORMATION

Woodlands – A Practical Handbook, is now available priced £13.95 (plus £3 postage and packing). BTCV Enterprises Ltd, Balby Road, Doncaster DN4 0RH. Tel: 01302 572200. Fax: 01302 310167.

BTCV is the UK's largest practical conservation charity. It helps over 130,000 volunteers every year take hands-on action to improve both the rural and urban environment. Activities include regular conservation tasks, UK and International Conservation Holidays and Millennium Volunteer projects for 16-24 year olds. BTCV's community network provides groups with access to local support, newsletters, grants, specialist advice and publications. Tel: 01491 821600. E-mail: information@btcv.org.uk Web: www.btcv.org

Handbook of Postharvest Technology – Cereals, Fruits, Vegetables, Tea and Spices

Edited by: Amlendu Charkraverty, Arun S Mujumdar, G S Vijaya Raghavan and Hosahalli S Ramaswamy
Price: US$195
Publisher: Marcel Dekker Inc, New York
ISBN: 0-8247-0514-9

From processing, handling, drying and milling to storage, packaging and distribution, this reference text presents the latest methods in the manufacture and supply of grains, fruits, vegetables and spices – detailing the physiology, structure and composition and characteristics of agricultural products, as well as recent cooling and preservation techniques to maintain quality and decrease spoilage and withering during postharvest storage, processing and distribution.

With almost 900 pages of well-indexed information, it is a comprehensive text by some 50 expert contributors. The chapters are grouped into appropriate processing sections and edited by internationally respected reseachers whose names regularly appear as authors of peer reviewed articles in leading international research journals such as Biosystems Engineering (formerly, the Journal of Agricultural Engineering Research). Each chapter contains cited information sources and, in some case, the documentation is daunting with up to 400 references. Undoubtedly, there is easy access to a wealth of further data (both classical and current) from over 1700 publications for those seeking specific clarification and the tenacity to pursue it.

The *Handbook of Postharvest Technology* outlines useful programmes to design the best handling, aeration and storage equipment....sustain optimal atmospheric composition, temperature and humidity in storage facilities....select the most appropriate packaging and preservation procedures for extended shelf-life....reduce the occurrence of pests, insects, mould, disease and deterioration during food storage....prevent temperature variations, water loss, bruising and contamination during fruit and vegetable transportation....and grade, classify and evaluate fruits and vegetables. The text also includes the conversion of biomass resources into food, feed, chemicals, energy and other value-added products....the components and function of harvesting and drying machines and systems....and volatile monitoring for early disease detection.

The introductory information on physiology of the various agricultural

commodities is very relevant and places the subsequent storage criteria and processing procedures into context. The processing operations are treated in sequence to provide staple dry goods with a long shelf-life, as well as the handling requirements for perishables to minimise damage and maintain quality in the cool chain distribution network. Effective utilisation of the byproducts is also considered and is essential, not just to meet environmental pressures on recycling, but also to avoid being overwhelmed by the waste stream from any processing operation.

There is a large pool of data contained in some 200 tables and the text is extensively illustrated with over 350 images. It is disappointing, however, to find the graphics of such variable quality with pixellated photographs and fuzzy diagrams, although this is a presentational irritant rather than an obstruction to understanding. There is also inadequate attention to consistency of units of measurement, leaving the reader to complete the conversions and detracting from easy assimilation of valuable material collated in this hardback reference manual. Rather surprisingly, there is little evidence of recent advances in bioprocess engineering such as imaging technology and pulse electric field processing, but perhaps these techniques were considered to be at an early stage of commercial adoption and even comprehensive manuals must stop somewhere! Overall, the handbook will be a valuable reference resource on any library shelf.

BDW

HOTICULTURE

Peat substitute makes mushroom production more eco-friendly

The rapid depletion of the world's peat resources could be significantly reduced thanks to a new substitute product developed by scientists at Horticulture Research International (HRI).

The UK commercial horticulture industry is a major user of peat, sourced primarily from Ireland, Britain and Germany. Each year, about 250,000 m3 of peat are used for growing mushrooms. However, faced with increasing public and environmental pressure against the destruction of boglands for peat extraction, the Department for Environment, Food and Rural Affairs (Defra) and the mushroom industry, through the Horticultural Development Council (HDC), have provided £350,000 of funding to research alternatives.

The HRI study that started in 1997 has resulted in the discovery of two suitable products, composted bark fines and fine particle tailings (a by-product that creates a major, and costly, disposal problem for the coal industry). This clay-like material replaces the black peat fraction used in mushroom casing and also reduces the need to add lime to the mix. The use of fine particle tailings as a peat substitute has now been extensively trialled and patented by HRI.

To prove its effectiveness, an 18-month trial has been conducted in conjunction with the National Trust's Hanbury Hall in Worcestershire. These gardens contain the oldest mushroom house in the world remaining in production. Built in 1860, it still uses the original slate shelves for growing beds of mushrooms.

With the National Trust adopting a peat-free policy by the end of 2002, the production of plants in all its gardens had already been successfully transferred to peat-free growing media, the exception to date being mushroom production. The lack of a viable peat alternative in mushroom casing consequently threatened the continuing production of mushrooms at Hanbury Hall. With the co-operation of Neil Cook, the gardens' manager, trials commenced during the summer of 2002. As a result, HRI scientists established that a mix of 70% bark fines and 30% coal tailings produced mushrooms that, in terms of their yield and quality, were indistinguishable from those grown in peat-based casing on a small-scale. The success of HRI's work means that the world's oldest mushroom house is able to continue growing mushrooms under the National Trust's peat-free policy, at a cost slightly higher than using peat.

Work led by Ralph Noble at HRI is progressing to find peat reduced casing blends that are suitable for large-scale commercial mushroom production. English Casing Blenders Ltd is supplying a 'reduced peat' casing material to commercial mushroom growers. With 30% of the peat substituted with fine particle coal tailings, the product is producing good mushroom yields and quality, and benefits the environment.

MORE INFORMATION

Sarah Cook, Communications Manager, HRI Wellesbourne, Wellesbourne, Warwickshire, CV35 9EF. Tel: 01789 472027. Fax: 01789 472043. E-mail: sarah.cook@hri.ac.uk

HARVESTING

Silver Medal for CR stone detection system

New Holland's outstanding CR range of rotary combines has won a silver medal 'Palmares de l'Innovation SIMA 2003', for its highly innovative 'ASD: Advanced Stone Detection' system at the Paris International Agri-Business Show.

The innovative ASD overcomes the limitations of existing systems with a sophisticated solution that actively protects the machine and its inherent capability.

Capacity is the cornerstone of rotary combine performance, and is exemplified in the CR range. The CR combines are designed to cover many acres with ease, with efficient grain separation ensured by unimpeded feeding, which keeps the rotors supplied with plenty of crop.

This direct feed, is the key to performance in rotary combines but can also bring with it the danger of stones damaging the combine's internal mechanisms. That is why an efficient system is vital to ensure stones do not reach the heart of the machine. Manufacturers have carried out many studies to find a solution and have designed the different systems currently available in the market but these all have limitations. They are mechanical systems, requiring operator's intervention to empty the stone trap when servicing the machine. They also negatively affect productivity, as a beater is generally positioned in front of the threshing system, disrupting feeding.

New Holland's intelligent Advanced Stone Detection system, on the other hand, actively searches for stones. A closed drum at the entrance of the feeder directs the flow of crop along the bottom of the elevator. Using sophisticated electronics and acoustic sensors, the system analyses the sounds of crop flowing into the elevator for the concussion of stones. Upon detection, the New Holland ASD system automatically opens a trap door beneath the straw elevator and triggers a deflector plate to eject the stone. Once the foreign object has been ejected, the operator raises the header to reset the system and continues harvesting. The sensitivity of the system can be adjusted from the cab.

"Customers buy the CR combine for its unparalleled capacity, and this unique system ensures the combine achieves the highest levels of productivity with minimum operator intervention, while remaining fully protected. It has clear advantages over the competition," says Franck Adam, product marketing specialist for New Holland's Western Europe region.

At the heart of the CR's performance are two longitudinal mounted rotors that replace conventional threshing and separation elements. This purely rotary concept, results in a capacity increase of 20% more than New Holland's previous flagship model, the TF78.

The CR combine, with its progressive technology, is the result of collaboration between CNH's centre of excellence for harvesting equipment at Zedelgem in Belgium and the advanced research and development centre at New Holland, Pennsylvania. This rotary combine range comprises two models designed for large scale operations, the CR960 and CR980, with different rotor sizes ensuring that customers have the right combine to match the specific size of their operation.

"The Advanced Stone Detection system is a typical example of the ground-breaking products that we cultivate," says Mr Adam. "By listening to our customers we can develop more advanced machines with greater productivity and capacity."

The SIMA show is a biennial exhibition held by SYGMA, the French Association of Tractor and Agricultural Machinery Manufacturers and SECIMA, the French Association of International Machinery Business Concerns, at the Paris-Nord Villepinte Exhibition Centre from 23rd to 27th February 2003.

CONTACT

John Hewett, UK Communications Manager, CNH. Tel: +44 (0)1268 292183 E-mail: john.hewett@cnh.com Website: www.cnh.com

COMPUTERS

New upgraded mapsuite+ software

Sokkia Ltd are pleased to announce that their latest version of Mapsuite+ version 2.0 software is now available. Mapsuite+ is available in foundation, survey, earthworks and design and version 2.0 brings more improvements to serve the end users.

Some of the improvements made include divide lines into segments, more languages, improved plotting options, conversion of Autocad symbols to Mapsuite+ points including height, volume calculation from cross sections and improved communications.

CONTACT

For further information contact: Rachel Scallan, Marketing Supervisor, Sokkia Ltd, Datum House, Electra Way, Crewe Business Park, Crewe, Cheshire, CW1 6ZT. Tel: +44 (0)1270 250511 Fax: +44 (0)1270 250533 E-mail: sales@sokkia.co.uk Website: www.mapsuiteplus.co.uk

PRODUCT SELECTION

Bosch Motors and Controls goes online

Bosch Motors and Controls, the Company's division for non-automotive engineering products, has launched a website at www.boschmotorsandcontrols.co.uk, with three sections covering direct current (DC) electric motors, sensors and relays.

A broad selection of products, technical data, applications, diagrams and illustrations can be accessed on-screen, while Adobe Acrobat PDF catalogues can be printed or downloaded to a local drive.

The 'Electric Motors' section covers 12 and 24V DC motors up to 1.7kW, water pumps and radial and axial fans. There are also additional functions such as gearboxes, Hall generators, and potentiometers, plus technical specifications including types of duty and degrees of protection.

The 'Relays' section contains catalogues outlining the range of 12 and 24V relays, mini-relays and micro-relays, plus pushing and pulling electromagnets, socket housings, connectors and other accessories. Explanatory notes on parameters, operating modes and degrees of protection are included.

The 'Sensors' section covers angular-position, yaw-rate, rotational speed, acceleration, pressure, temperature and Lambda oxygen sensors, plus air-mass meters, knock sensors and steering sensors with CAN-Bus interface. Full technical details including drawings are included.

David Anderson, head of Bosch Motors and Controls said: "Each product in our Motors & Controls portfolio has been manufactured to Bosch's renowned high standards. There is a high degree of versatility in the range for machine builders and design engineers and this new web facility makes their research process quicker and easier."

Bosch motors, sensors and relays have been used in hospital equipment, automatic doors and blinds, agricultural equipment, water pumping, heating, ventilating and air conditioning (HVAC) systems and conveyor systems, plus industrial drives.

MORE INFORMATION

For more information contact: Robert Bosch Ltd, P.O. Box 98, Uxbridge, Middlesex, UB9 5HJ. Tel: +44 (0)1895 834466 Fax: +44 (0)1895 838548 E-mail: Info.de@uk.bosch.com Website: www.bosch.co.uk

TRACTORS

Purpose designed Lynx front linkage for challenger MT700 series

In line with its position as a key supplier of premium quality front linkages for most popular makes and model of tractor, Lynx Engineering has further expanded its comprehensive range with the introduction of a purpose designed system to fit Challenger MT700 tracked tractors.

The Challenger M1700 series front linkage has a 3.5 tonne capacity and was originally developed in co-operation with Caterpillar in America. A key feature of the unit is its short fitting time, the support brackets having been designed to closely match the chassis folds of the tractor. This reduces the need for spacers and additional brackets, and ensures the unit is particularly resilient to torsional loads.

The Challenger linkage incorporates the proven Zuidberg gas accumulator suspension system. This increases tractor stability when transporting a heavy front load, with the additional benefits of improved operator comfort and reduced shock loads passing through the tractor. The Challenger linkage also includes the Lynx multi-valve system. This enables the lift rams to be operated in either single or double acting mode, the latter enabling weight to be transferred to front mounted kit if necessary. A full float position is also included.

As an option, the MT700 linkage can be fitted with electronic position resume (EPR). This is connected to the tractor hydraulic system and does not require a spool valve. This enables the transport and working position of the linkage to be adjusted quickly and easily and also allows the linkage to be returned to pre-set positions in a similar way to electronic rear linkage control systems.

A future development planned for the linkage will be to enable it to integrate into the MT700 tractor's ISOBUS 11783 implement communication system. This will enable the linkage to be plugged directly into the tractor's electronics and do away with the need for a separate EPR system. The price for this will start from £3800.

Lynx Engineering is a rapidly growing specialist agricultural company working with farmers throughout the UK. It offers front linkages to fit all tractors front pto facilities. It also offers an extensive range of presses and tyre type packers for use in front or rear of tractors and in conjunction with other implements. Lynx is also an importer for the Stoll range of front loaders. Working from a new industrial unit near Rugby it supplies equipment through a UK distributor network.

MORE INFORMATION

For more information contact: Nick Ewbank, Lynx Engineering, Wharf Works, Long Buckby, Northampton, England, NN6 7PP. Tel: +44 (0)1327 843215 Fax: +44 (0)1327 844341 E-mail: info@lynx-engineering.co.uk Website: www.lynx-engineering.co.uk

ENVIRONMENTAL COMPLIANCE

Notcutts environmental policy enhanced by electric utility vehicles

Notcutts, the family owned firm of garden centres and nurseries based at Woodbridge near Ipswich, has taken delivery of 15 E-Z-GO Workhorse utility vehicles from Ransomes Jacobsen Ltd.

The primary function of the electric powered workhorses will be as tugs, pulling trailers loaded with plants, shrubs and trees around the nursery grounds, as well as being used for general maintenance duties. Ten workhorses have been put into use at the company's Pettistree nursery on the outskirts of Woodbridge, while the other 5 will be employed at their Waterers nursery at Bagshot in Surrey.

Production Director, Paul Masters commented, "We looked at numerous options when we decided to replace our ageing fleet of compact tractors that were being used as tugs at our various sites. The electric powered E-Z-GO Workhorse proved by far to be the best option and we purchased two initially, to assess their potential over a full 12 months. We were so impressed with their performance that we decided to phase out our tractors and replace them with E-Z-GO Workhorses.

"The reasoning behind the change is simple. In pure economic terms they are far more cost-effective than the tractors, but that was not the only consideration. From our staff's viewpoint they are quieter, easier to operate, highly manoeuvrable and provide a more comfortable ride, resulting in less fatigue at the end of a working day. Also they are providing 7 - 8 hours of productive work between recharging periods and have been working for over 10 hours during peak demand in late spring and early summer.

"We have an environmental policy here at Notcutts which ensures that all areas of the company proactively minimise their effect on the environment through best practice. This commitment has been followed through with the purchase of the Workhorses, which are extremely kind to the environment, creating no emissions, unlike the diesel fumes emitted by their predecessors."

Commenting at the recent handover of the vehicles, Nick Brown, Utility Vehicles Sales Manager at Ransomes Jacobsen said,

"To the best of my knowledge, Notcutts is the first large scale nursery operation in the UK to take the electric power route. They are seeing rewards that directly affect their bottom line and I'm sure that there would be similar benefits to many other producers, large or small, if they were to look at alternative power. At Ransomes Jacobsen we have a 'Workhorse' range utilising electric power or liquefied petroleum gas (LPG) that are ideal for use in horticultural applications."

Paul Master concluded, "At Notcutts we provide a customer-oriented service, be it direct to the public through our own outlets or to third parties as a supplier of quality shrubs and plants. Customer service and support that we have received from Bartram Mowers, Ransomes Jacobsen's local dealer, has been superb. They have provided excellent guidance and back up during the evaluation process and have carried that through during the delivery of the fleet."

MORE INFORMATION

Ransomes Jacobsen Ltd, Central Avenue, Ransomes Europark, Ipswich, Suffolk, IP3 9QG Tel: +44 (0)1473 270000 Website: www.ransomesjacobsen.com

CULTIVATORS

New cultivator development gives precise depth control

A specially designed front roller which provides very precise depth control for soil-working tools is the latest development on Knight Farm Machinery's Triple-Press cultivators.

The roller ensures that tines do not pull themselves into the soil as they move through the ground but maintain a consistent depth at all times, even over ridges. When a good weed seed chit is required, for example for blackgrass control in stale seedbeds, consistent shallow cultivations can be achieved across virtually any terrain.

Due to the lower power demand with the roller fitted, the machinery can be used with smaller tractors.

The roller, which is adjustable, is available in two versions. One incorporates a series of straight discs which cut trash in front of the tines, and the other has wavy discs which give an additional surface cultivation.

The rollers can be fitted to all Knight's Triple-Press machines, which are available from 2.8 to 8 m wide.

Knight's Farm Machinery's Triple-Press has new specially designed front roller providing precise depth control

CONTACT

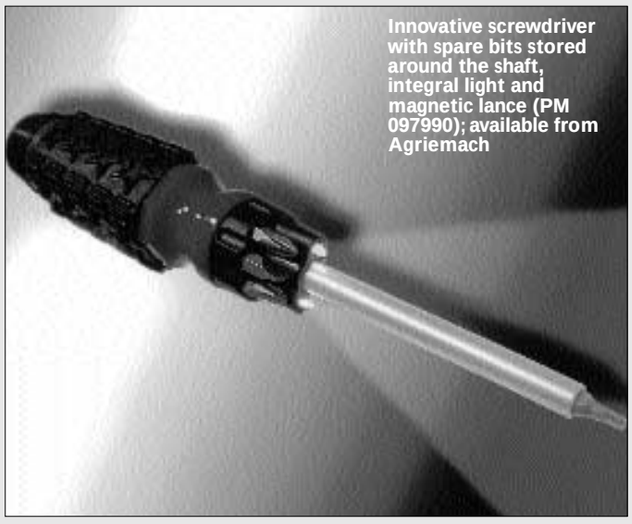
For more information contact: Knight Farm Machinery Ltd, Wireless Hill, South Luffenham, Oakham, Rutland, LE15 8NF. Tel: +44 (0)1780 722200 Fax: +44 (0)1780 722201 Website: www.knight-ltd.co.uk

INNOVATIVE TOOLS

Driving in the dark?

Have you ever been miles from mains lighting with the bonnet up juggling with a screwdriver, a torch and a loose component all at the same time? Had to find and tighten a fixing in a dark recess - like a drawer runner in a cabinet - then drop a screw just where you can't reach?

The Agriemach screwdriver set solves all those problems and more in just one tool!



Innovative screwdriver with spare bits stored around the shaft, integral light and magnetic lance (PM 097990); available from Agriemach

Equipped with two powerful LED lamps, 7 assorted bits (stored handily round the shaft), a magnetic probe that extends to 365 mm and a chunky non slip handle that gives excellent torque, it's the answer to your prayers. Powered by two M3 batteries, this screwdriver should be in the tool kit of every motorist, plumber, carpenter, agricultural engineer, electrician and DIY enthusiast.

Sold at £8.50 + vat (£9.99 inclusive) it is available direct from Agriemach or from selected stockists.

This is just one of the comprehensive Agriemach range of screwdrivers, specialised tools and equipment.

MORE INFORMATION

For more information on the Flashlight Screwdriver (product code PM097999) or any of Agriemach's extensive range of products contact: Agriemach Ltd, 'Wayfarers', Domewood, Copthorne, Crawley, West Sussex, RH10 3HD. Tel: +44 (0)1342 713743 Fax: +44 (0)1342 719181 E-mail: agriemach@hotmail.com Website: www.agriemach.com

LUBRICANTS

New BP range prolongs working life for farmers

BP has launched a new range of agricultural lubricants that will help farmers reduce costs by prolonging the working life of their machinery. New super tractor oil universal (STOU) products which have been specifically designed to disperse soot better than anything before lead the BP terrac line-up. Soot is a natural part of the combustion process in an engine and is made up of carbon particles and contaminants. These can build up into clumps which clog the engine causing severe problems if not tackled.

Tougher EU emissions legislation has also led manufacturers to redesign engines to operate at lower combustion temperatures in an effort to reduce the emissions of NOx gases. The lower temperatures at which the fuel burns leads to even more soot, most of which ends up in the oil. If this build up of soot is not handled properly, it increases wear on the engine, ultimately reducing the life of equipment and leading to problems of longer downtime and higher maintenance costs.

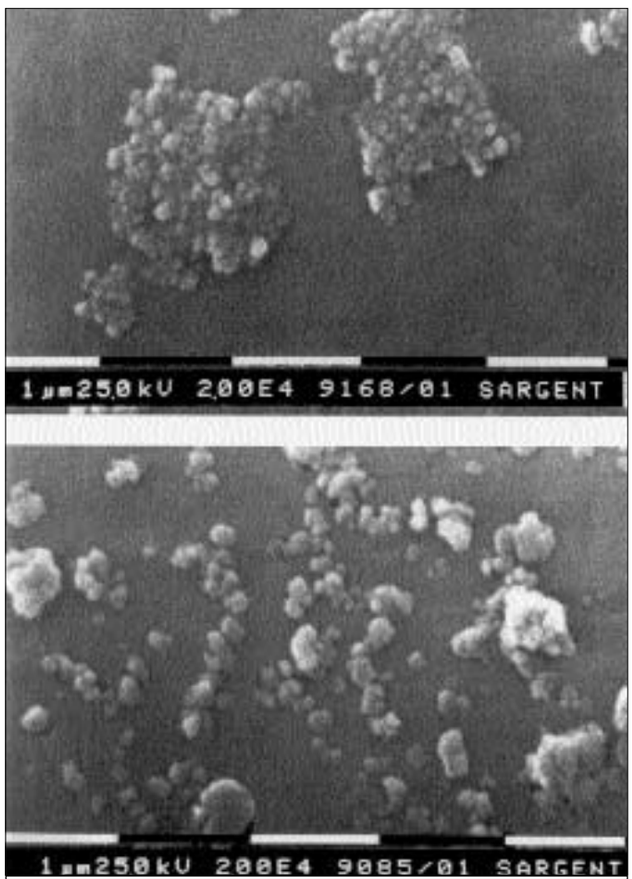
"With a one third reduction in engine wear this new product saves farmers both time and money by cutting the damage and reducing the downtime caused by soot build-up," explains Virginie Bahon, BP's UK Commercial Lubricants Marketing Advisor. "The new oil dramatically reduces the formation of soot into the huge clumps which can clog the engine quicker."

It is the unique formulation of BP terrac's STOU that stops soot particles forming clumps; this reduces the thickening of the oil and allows it to flow more freely and lubricate more effectively. In turn, this reduces the amount of wear in the engine, allowing it to work to maximum recommended oil drain intervals which saves the farmer money by prolonging the life of the equipment and helping to maximise the resale value.

The comprehensive range of BP terrac lubricants also includes engine, transmission and hydraulic oils. With products that are corrosion resistant, the line-up offers improved durability particularly in harsh conditions, and delivers easier start up in extreme weather. The packs in the terrac range have also been colour coded to represent each usage, allowing farmers to see at a glance which products are required for each application.

The European launch of the new range follows market research with the agricultural industry across Europe to establish what farmers look for and need from their lubricants. In addition to lower maintenance costs, extra protection and increased efficiency, the BP terrac range helps farmers protect the environment by better control of soot.

"Our new range delivers a simplified line up that will protect machines better, help them work harder and keep them running longer than anything else on the market," adds Bahon, "plus of course, you get the commitment and concern for minimising environmental impact that people have come to expect from BP."



With conventional oil, large soot particles increase engine wear, which can shorten the working life of your machinery (top); BP's unique formulation stops soot particles forming clumps to keep the oil flowing freely and the engine cleaner for longer (bottom)

The full line-up includes:

- **Super Tractor Universal Oils**
  - **terrac super universal 10W-30**
    An outstanding market leading product with exceptional soot control to give high performance 'all round' lubricant for engines, transmissions, wet brakes and front axles;
  - **terrac universal 15W-30**
    Specially designed to lubricate and protect a wide range of engines, transmissions, hydraulics and final drives, including oil immersed wet brakes.
- **Engine oils**
  - **terrac super motor 15W-30**
    An excellent quality 15W-40 lubricant designed for virtually all diesel and petrol engines
- **Transmission oils**
  - **terrac super transmission**
    Multifunctional tractor transmission and hydraulic fluid offering exceptional protection
  - **terrac super transmission S**
    A multifunctional transmission oil that prevents irritating and potentially damaging 'squawk'
- **Hydraulic oils**
  - **terrac super hydraulic**
    Premium multifunction hydraulic fluid using the most advanced technology.

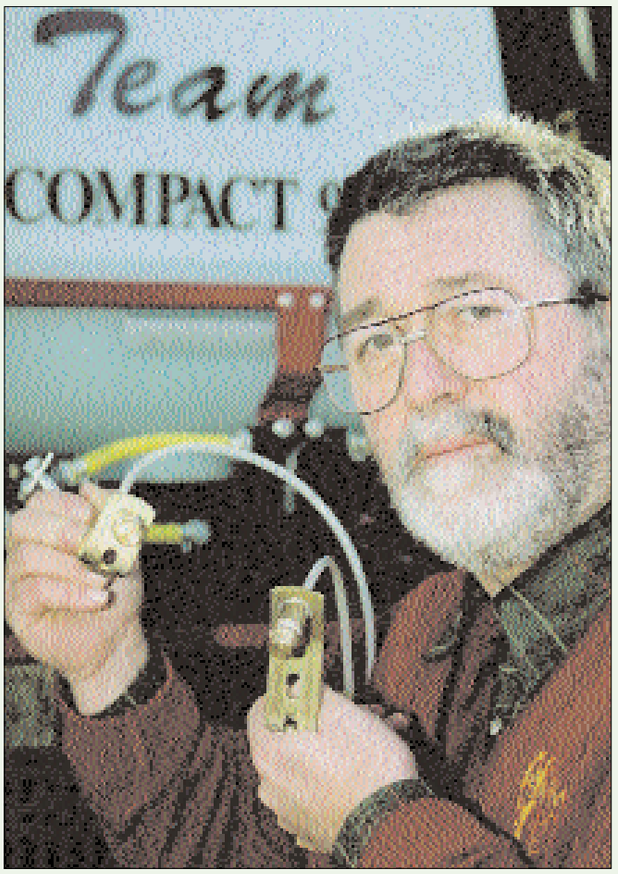
New team sprayer for in-furrow Amistar application

The UK's leading innovative specialist sprayer manufacturer, Team Sprayers, has developed the first purpose-built equipment to apply the fungicide Amistar in-furrow during potato planting. For the first time this year, potato growers will be able to use Amistar to control soil-borne 'Black Dot', with potential benefits for crop yield and quality.

Cambridge University Farms have obtained the specific off label approval (SOLA) on potatoes, for Amistar. It permits the application of six litres of the broadspectrum strobilurin fungicide, per hectare by conventional sprayer, across the soil surface. In addition it permits its incorporation into soil, or three litres per hectare applied directly into the furrow as the seed potato is planted.

Team Sprayers Technical Sales Manager, Mick Gathercole, reports on-farm trials last year, with an in-furrow sprayer mounted directly on the planter, demonstrated the precision in-furrow application worked equally as effectively as the far higher overall rate.

"Growers have the opportunity to make significant cost savings, use half the amount of fungicide on the crop, and still achieve the potential yield and quality benefits," he adds. Mr Gathercole calculates the cost of a two furrow applicator will be recouped after around 20 hectares of treatment through spray cost savings alone.



"Growers have the opportunity to make significant cost savings,

The innovative solution developed by Team Sprayers, to achieve even and thorough coverage of the soil surrounding the seed tuber, incorporates a twin-line application system. An initial nozzle is mounted on the furrow opener, to spray the soil as it is split, whilst a second nozzle sprays the soil as it is closed over the planted seed tuber. This combination, applying 50 litres of spray per hectare, is claimed to provide the optimum treated soil mix around the seed.

Specially engineered nozzles have been designed and manufactured to operate reliably and consistently at higher pressures. "Spraying direct into the furrow, with nozzles mounted close to the moving soil, is an incredibly hostile environment for any spray application," highlights Mr Gathercole. "The pressure has been increased to four bar (effectively minimising the risk of nozzle blocks) and four filtration units have been built in to the system. Furthermore, a warning light and buzzer are fitted in the cab, to alert operators to any blockage."

Units are supplied with a 90-litre tank to mount on the planter as standard, sufficient to plant two hectares. Two-row planter units cost £1585, with larger versions for three, four and six row planters available. Team Sprayers equipment is available from selected machinery distributors across the UK, which also provide the full back up and service for the equipment.

Amistar is the only fungicide available to growers for the control of soil-borne 'Black Dot' in potatoes. The disease was the major scourge of last year's crop, exacerbated by wet conditions and particularly in the more susceptible varieties. Monitoring over recent seasons has identified the disease in three-quarters of all crops, with infected tubers in over 40% of ware samples.

CONTACT

For more information or order of team sprayers contact: Mick Gathercole, Team Sprayers, Unwins Industrial Estate, Ely, Cambridgeshire, CB7 4QT. Tel: +44 (0)1353 661211 Fax: +44 (0)1353 666642 E-mail: sales@team-sprayers.com Website: www.team-sprayers.com

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

BENEFITS of MEMBERSHIP

Professional Registration

Recognition of professional status as Chartered Engineer (CEng), Incorporated Engineer (IEng) and Engineering Technician (EngTech); and shortly as Chartered Environmentalist (CEnv)

Professional Contacts

Networking opportunities with almost 2000 members worldwide by access to the Membership Directory

Publications

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

Career Planning

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

Specialist Fields

- Food Engineering and Technology
- Precision in Farming
- Vehicles and Machinery Management
- Forestry Engineering
- Horticultural Engineering
- Renewable Energy
- Soil and Water Management
- Amenity and Ecological Engineering
- Pioneering Technology
- Overseas/International Development
- Livestock Engineering

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

The Secretary
IAgrE
West End Rd
Silsoe
Bedford
MK45 4DU
United Kingdom

Tel: +44 (0)1525 861096
Fax: +44 (0)1525 861660
E-mail: secretary@iagre.org
www.iagre.org

IAgrE