



Agriculture • Horticulture • Forestry • Environment • Amenity

# LANDWARDS

Late Summer 2005

■ Cashew Nut  
Processing

■ Renewable  
Energy

## IRRIGATION

Pumps produce premium strawberries





## IAgrE Award for sustainability in design and use

IAgrE President Peter Redman and RASE President, the Rt Rev. Dr Anthony Russell, Bishop of Ely, presenting the award certificate and glass bowl to John Dale (centre) in front of the prize winning machine

### John Dale - Zero Till Drill

The Award for Sustainability in Design and Use, introduced for the first time in 2005, from the Institution of Agricultural Engineers is for a machine that has the potential to make a significant contribution to the achievement of sustainability in agriculture and land use. It may apply at any stage of development from early innovation to established use, and while it is considered on behalf of the IAgrE by the RASE Machinery Awards panel, it is independent of other RASE awards. The Institution of Agricultural Engineers is the professional body for all scientists, engineers and technicians working in the land based sector. Activities include professional registration of Chartered Engineers and Chartered Environmentalists, Incorporated Engineers and Engineering Technicians, technical publications, specialist technical groups and career planning.

The John Dale Zero Till Drill is available in 3, 4, and 6 metre widths, and is based on the Canadian 'Seed Hawk' tines and Accord seed metering. The tines are paired to place the seed in a band which can be adjusted to a maximum width of 100 mm between tines, with a gap between bands of 150 mm. The seed opening is closed by 100 mm wide packer wheels which control the depth and accurately follow ground contours. Penetration is provided by individual hydraulic rams attached to each pair of tines. The hydraulic pressure is adjustable to suit differing ground conditions. Hopper capacity is 2.5 tonnes on the 6 metre version.

Users consulted found the drill to be versatile, requiring very low power input compared with other drills of the same width, capable of handling large amounts of surface trash, and requiring few or no replacement parts over very large areas of drilling. Contour following was exceptional. The crops seen by the judges, which were zero-till, minimum till, through to full tillage, and included beans, cereals and rape, were excellent. Trash handling was good in all but the most severe crop and moisture conditions. Users were commonly covering more than 50 ha a day with the 6 metre version. The drill was considered to fulfil many of the present and future requirements for economy and flexibility.

#### MORE INFORMATION

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## Automatic guidance system for weed control wins Silsoe scientist national award

The Garford hoe which incorporates the technology for which the award was given to Dr Tillett.

A pioneering automatically guided hoe which is helping growers meet the stringent management constraints imposed by customers and organic standards by reducing the need for herbicides, has won its inventor a national award. Dr Nick Tillett of the Silsoe Research Institute received the Royal Agricultural Society of England's Technology Award for 2005, for the development of the automation technologies now being used in production of commercial guidance systems.

The Technology Award recognises those who, working in a commercial environment, have applied scientific advance into technology through the development of a product or process. These are likely to lead to cost effective improvements for farmers in any aspect of practical agriculture.

Dr Tillett's work caught the judges' eyes as an innovative idea that, after more than ten years of research and development, has produced a prized commercial product which will improve efficiency and effectiveness in crop management. Early work on this development was supported financially by a grant from the Douglas Bomford Trust

In developing the guidance system Dr Tillett overcame the practical challenge of maintaining precise alignment of cultivator blades between rows at speed and without crop damage. His work has resulted in greater accuracy and higher forward speeds than manual systems, with lower driver fatigue.

The technology, now being produced commercially by Robydome Electronics and Garford Farm Machinery, is already being adopted by farmers in the UK, New Zealand, USA, Spain, Hungary, Australia and Germany for cereals, sugarbeet and horticultural crops under conventional and organic production. The commercial system uses a digital colour video camera mounted above the ground viewing one to five rows of crops ahead of the hoe which is then centred automatically by a hydraulic sideshift.

Dr Tillett, who received his award from RASE President, the Rt. Rev. Dr Anthony Russell, Bishop of Ely, at the Royal Show Awards Dinner, said: "I am very pleased to accept this award on behalf of the team at Silsoe with whom I have worked on guidance related projects for many years. I would particularly like to mention Dr Tony Hague whose expertise has been critical to our achievements."

Nick Tillett and Tony Hague have recently formed a new company their research and development work on intelligent sensing and control for field machinery and will continue to support their vision guidance technology that has been commercialised by Garford Farm Machinery and Robydome Electronics on Robocrop inter-row hoes.

#### MORE INFORMATION

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# LANDWARDS

## CONTENTS

### Feature Articles

#### 2 POSTHARVEST TECHNOLOGY

Prospects for the cashew nut processing industry in Nigeria

*Babatunde Ogunsina and Peter Odugbenro*

#### 8 IRRIGATION

Pumps produce premium strawberries

#### 10 RENEWABLE ENERGY

Empowering the community

*Adam Spearey*

### Membership Matters centrefold

### News and Comment

IFC Innovation awards

6 News scan

16 Company and product information

22 RASE Machinery awards

**Front cover:** *Strawberries* (Photo: Land Technology Ltd © R L Witney)

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# PROSPECTS FOR THE CASHEW NUT PROCESSING INDUSTRY IN NIGERIA

Babatunde Ogunsina and Peter Odugbenro



## BIO NOTE

Mr Babatunde S. Ogunsina is a Lecturer in the Department of Agric Engineering, Obafemi Awolowo University, Ile-Ife, Nigeria. He was formerly the Production Manager, Cashew Nut Processing Industries plc, Ibadan. He has B.Sc and M.Sc degrees in Agricultural Engineering and he is currently a doctoral student of Agricultural Engineering, University of Ibadan, Nigeria. Dr Peter O. Odugbenro is a Lecturer in the Department of Food Science and Engineering of Ladoké Akintola University of Technology, Ogbomosho, Nigeria. He has B.Sc and M.Sc. degrees in Agricultural Engineering and a Ph.D in Food Engineering.

## Abstract

Nigeria has diverse ecological zones suitable for the cultivation of cashew – introduced in the 15<sup>th</sup> century. Although the production of raw cashew nut is increasing, much is exported to Asia where the processing capacity is large; to the detriment of the unemployment problem in the Country. A survey of major cashew nut processors in Nigeria showed that there are only 11 cashew nut processing factories with an estimated capacity of less than 7000 t, under 5% of the estimated 176,000 t present annual raw nut output.

In order to earn more foreign exchange through non-oil exports, there is an opportunity for local processing of the nuts, through the establishment of increased plant capacity.

## Introduction

### Background

Cashew, (*Anacardium occidentale*) is an evergreen tropical tree native to north-east Brazil in South America and was introduced to Africa and Asia during the 15<sup>th</sup> and 16<sup>th</sup> centuries by Portuguese explorers (Woodroof, 1967). When it was first introduced during this period to Nigeria, it was mainly used for afforestation schemes and erosion control in the old Eastern region (Agnoloni & Giuliani, 1977; Olunloyo, 1996). Among horti-

Table 1 Percentages of various components of cashew nuts

Cashew component	Proportion, %	
	From: Angloni and Giuliani (1977)	From: Ohler (1979)
Pericarp/shell	63 - 73	65.8 - 79.6
Integument/testa	2 - 5	1.3 - 3.6
Seed/kernel	20 - 25	19.1 - 31.6

Source: Andrighetti *et al.* (1994)

cultural crops, cashew has been found to provide very high economic returns, especially because of the foreign

exchange earning potential of the nut.

The cashew nut is unusual in comparison with other nuts

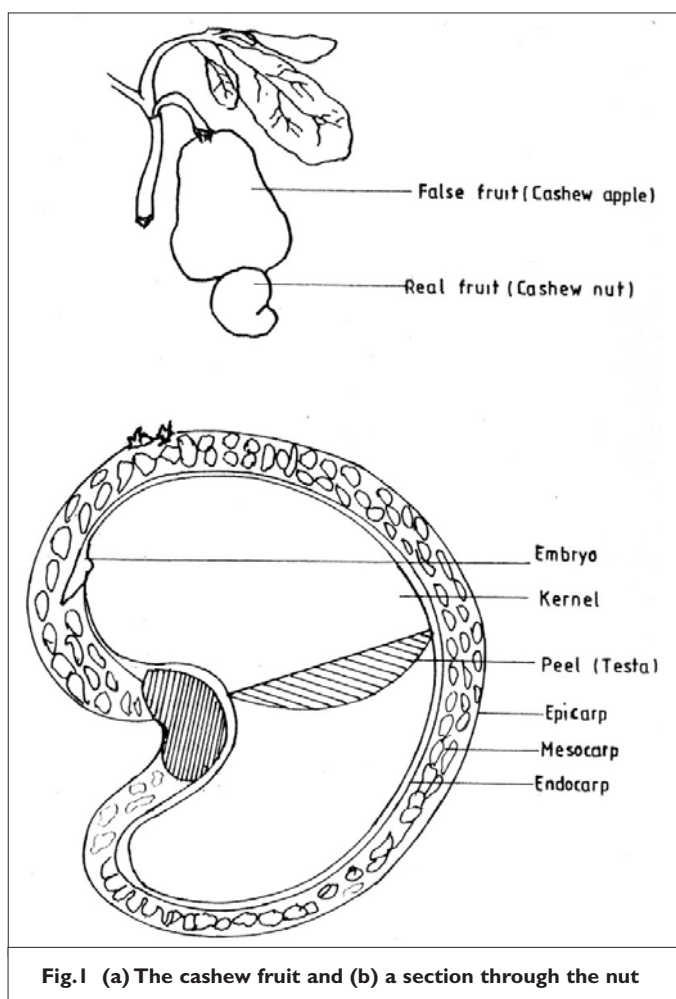


Fig.1 (a) The cashew fruit and (b) a section through the nut



because the nut is uncommonly outside the fruit. The nut is attached to the end of a fleshy, broadened and swollen receptacle forming the apple which is an edible false fruit. The nut has a pericarp commonly called shell which consists of three layers of protective tissues. The epicarp is the outer integument of the nut. The sponge-like interior which contains the cashew nut shell liquid is the mesocarp. The endocarp limits the internal cavity where the kernel develops. The thin, tannin-rich testa surrounds the kernel and keeps it separated from the shell inside the internal cavity of the shell. The kernel or seed is made up of two kidney-shaped cotyledons and the embryo. At maturity, cashew nut is usually ash-green or greyish-brown in colour, it is about 3-7 cm long and 4-16 g in weight (Agnoloni & Giuliani, 1977; Andrighetti *et al.*, 1994; ITDG, 2001). Figure 1 shows the entire cashew fruit and a section through the nut. Generally, the kernel accounts for about 22-24% of the whole nut at processing (Andrighetti *et al.*, 1994). Table 1 shows the percentages of various components of cashew nut.

The cashew tree has very high utility value from its leaves to the roots though the nuts are the major export commodity. As a result of its foreign exchange earning potential, cashew nut is fast becoming commercial crop of great importance in Nigeria. The most important cashew nut producing countries are Brazil, India, Mozambique, Tanzania and Kenya. Some of the other pro-

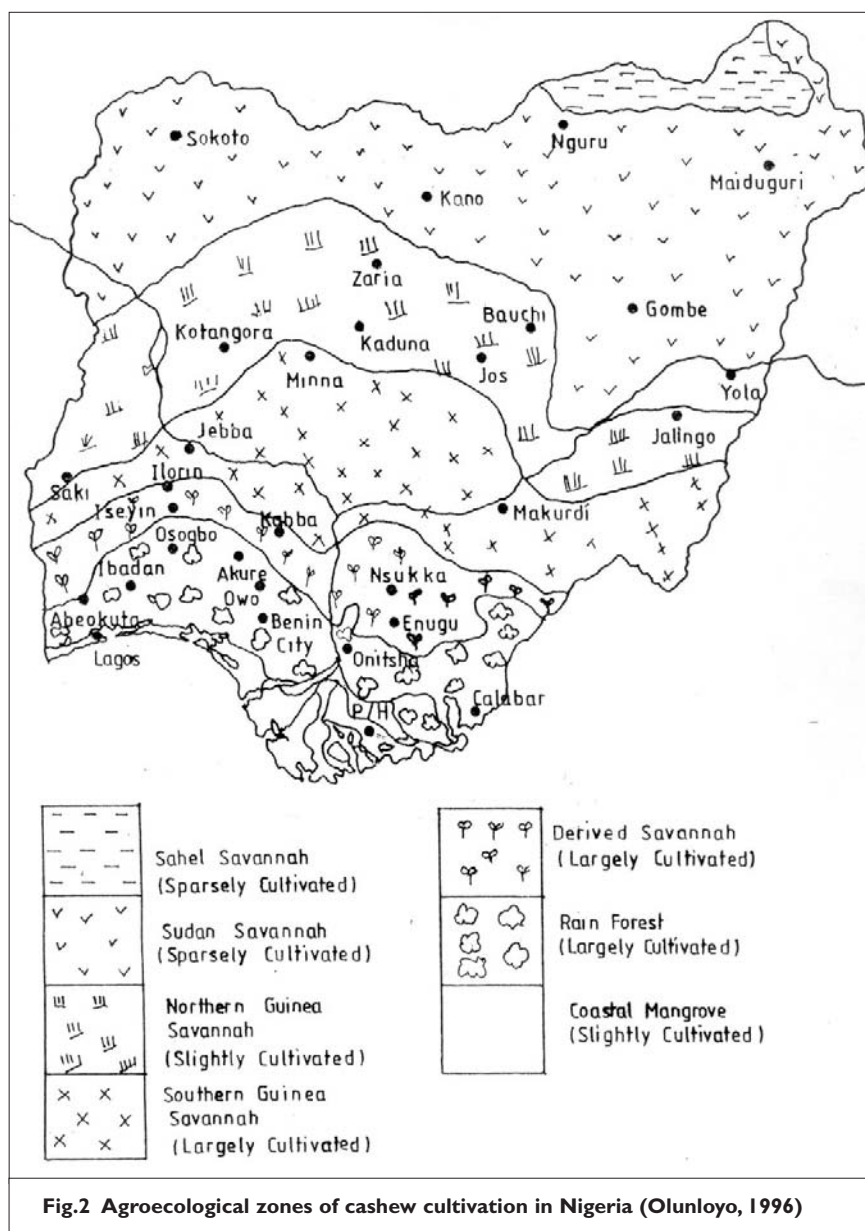


Fig.2 Agroecological zones of cashew cultivation in Nigeria (Olunloyo, 1996)

ducing countries are: Nigeria, Angola, Malaysia and Thailand (Oloso & Clarke, 1993).

#### Cashew production in Nigeria

The cultivation of cashew has been expanding in Nigeria since the 1950s, occupying over 60,000 ha presently, with a pro-

jection that an estimate of 100,000 ha could be in cultivation by the year 2010 (Olunloyo, 1996). The cashew tree thrives on a large variety of soils with minimum care and is highly resistant to adverse climatic conditions wherein several other commercial crops such as cocoa, kolanut and citrus will

not survive. It reaches full bearing age after three years and may continue yielding for over 40 years (Laurent & Russell, 1968).

The first cashew plantations in Nigeria dates back to 1954 with 800 ha at Oghe in Anambra state and at Mbaia in Imo state. Within that period, plantations were also established in Eruwa and Iseyin in the Upper Ogun area of Oyo state (624 ha) and Iwo in Osun state (200 ha), all being supported by state and private financing. The plantations which initially were not properly managed had low yield. However, as plantations were better tended, production increased in the 1970s. Apart from these large projects, the tree is still found in patches as ornamental or orchard trees in various part of the country (Olunloyo, 1996). Presently, cashew is cultivated in all the agro-ecological zones of Nigeria including the semi-arid regions as

shown in Fig. 2. The cultivation is concentrated in the southern Guinea and rain forest zones.

During two decades, the production of cashew nuts in Nigeria has increased seven-fold from 25,000 t in 1980 to 176,000 t in 2000. This is an increase from 15.4% to 40.7% of total production in Africa; and 5.4% to 14.5% of the total world production between 20 years (see Table 2). In the past, production was relatively low and there was no successive improvement because the awareness was low. The economic potential has now been recognised and Nigeria is making a concerted effort to improve production. However, there are very few processing

Table 2 The extent of cashew production in Nigeria as percentages of African and World annual production from 1980-2000.

Year	Annual production, kt			Nigerian proportion, %	
	World	Africa	Nigeria	Of World	Of Africa
1980	464	163	25	5.4	15.4
1985	521	115	25	4.8	21.8
1990	607	126	30	4.9	23.9
1995	944	275	95	10.1	34.5
1998	1071	405	152	14.2	37.5
2000	1217	433	176	14.5	40.7

Source: Azam-Alli and Judge (2001)

facilities in Nigeria with less than 5% of the harvest being processed and exported as kernels and the rest exported to India and other countries where the processing capacity is quite large.

### Economic importance of cashew nuts

The primary products of processed cashew nuts are: the kernel (which is the main product), the cashew nut shell liquid (CNSL), the testa and the shell (Table 1). Cashew kernel contains a high amount of organic calcium, iron, vitamin A and B, niacin, thiamin and riboflavin which are seldom found in daily diets (Table 3).

**Table 3 The mineral composition of cashew kernel**

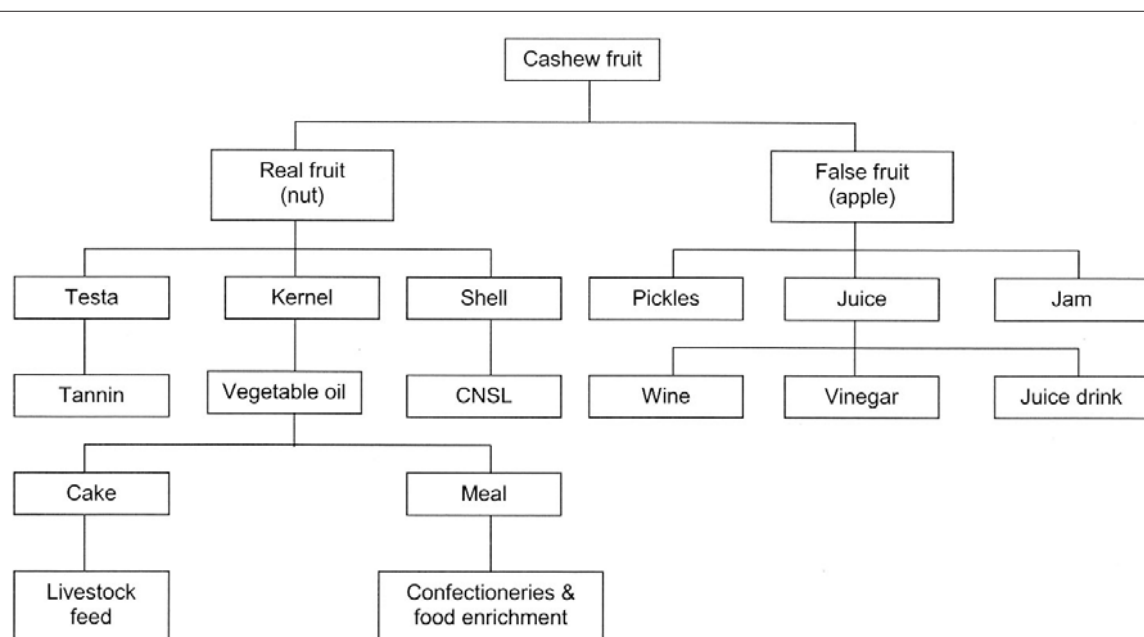
Vitamin	Composition, $\mu\text{g}/100\text{ g [kernel]}$
Carotene	6
Folate	68
Thiamine	400
Riboflavin	160
Niacin	1300
Pantothenate	1080
Biotin	13

Source: Holland *et al.* (1991)

The nutrient profile of cashew kernel as given by the Indian Cashew Export Promotion Council is shown in Table 4. Andrighetti *et al.* (1994) reported that cashew kernel contains nearly all the nine amino acids needed in human diets. Consequently, whether roasted or fried, salted or sugared, cashew kernel is widely consumed in the US and Europe; as snacks to accompany drinks at cocktails and as ingredients for food, such as minced meat nuts. Being a cholesterol free and energy giving food, it has also

been found to be a good additive in the confectionery industry (Oloso & Clarke, 1993). Apart from all these uses, the oil extracted from cashew kernel is rich and of similar quality with most highly priced oils such as olive, wheat germ and soya. It contains a high percentage of stearic acid and oleic acid and the nutritionally ideal ratio of saturated to unsaturated acid of 4:1 (Table 5). The cake obtained after oil extraction has been found to be a good ingredient for poultry concentrate and an additive to enrich some diets for infants and the elderly. Some of the potential uses of cashew kernel in Nigeria are shown in Fig. 3.

The cashew nut shell liquid (CNSL) which constitutes about 30-40% of the shell weight, is a viscous, dark brown and corrosive substance. It is obtainable from cashew nut shell by solvent extraction or as a by-product when cashew nut is processed, roasting the raw nuts in a bath of CNSL. When freshly extracted, the principal constituents of the



**Fig.3 Potential uses of cashews in Nigeria; CNSL, cashew nut shell liquid**

**Table 4 Nutrient profile of cashew kernel**

Nutritional profile	Contribution/ 100 g [kernel]
Energy, kJ	2512
Protein, g	21
Carbohydrates, g	22
Fats, g	47
Phosphorus, g	0.45
Calcium, g	0.05
Iron, mg	5
Vitamin A, IU	32
Vitamin B1, IU	111
Vitamin E, mg	46

Source: The Cashew Export Promotion Council (1992)

CNSL are cardol and anacardic acid. Due to its property of heat uptake, CNSL is useful in the manufacture of an anti-fade agent for clutch-discs and brake lining in the automotive industry. Industrial resin extracted from CNSL is used in the manufacture of dyes, printing inks, paints, plasticisers, insecticides and wood preservatives. The testa of cashew nut contains substantial amount of tannin, which is a chemical substance used for tanning leather by the leather manufacturing industry (Andrighetti *et al.*, 1994; Akinwale, 1996).

### Processing

Cashew nut processing involves

the removal of the kernel from the shell. The testa is removed after drying. The product is graded and packed with the addition of preservative. Cashew nut processing began in India in the 1920s with manual cracking of dry-roasted nuts with hammers, sun drying, manual peeling and packaging. This traditional method is still being used today. The industry is highly labour

intensive and processing techniques are completely manual in many places. A recent trend is the use of the mechanical pedal-operated shelling machines and low cost tray-dryers, which has been found to offer equally good product quality. These machines have been fabricated locally from available materials in Nigeria; they are independent of electricity and takes advantage of the labour availability in Nigeria, thereby making cashew nut processing a viable investment opportunity.

### Prospects

At present, the cashew industry in Nigeria is limited to the

**Table 5 The fat composition of cashew kernel oil**

Constituent	Fat composition, %	
	From: The Cashew Export Promotion Council (1992)	From: Eckey (1954)
Saturated acid	18.2	
Unsaturated acid	81.8	
Oleic acid	73.77	68.2 - 80.4
Linoleic acid	7.67	0 - 21.7
Palmitic acid	6.70	4.1 - 17.3
Stearic acid	11.44	1.5 - 11.2
Unsaponifiable matter	0.42	

exportation of raw nuts, very little quantity being processed for local sales and export. The marked awareness of cashew nut production recently can take Nigeria to a prominent position as one of the leading African cashew producers. In the past cashew nut has had little economic value when a tonne of raw nut sold for at most N300, today the price ranges between N60000-80000 or US\$400-600. Cashew kernels command better foreign exchange earnings than the raw nuts. Usually, the raw nuts are exported to third world countries in Asia where they are processed and exported as kernels to the US and Europe where the market is concentrated.

From Table 1, a tonne of raw nuts at an average recovery of 22% yields 220 kg of kernels, i.e. 1 t of raw nut provides 220 kg of kernels plus 30 kg of tannin rich testa and 210 kg of CNSL. Assuming white whole kernels sell for an average of US\$8/kg, the kernels yield alone will generate a revenue of US\$(8 × 220) i.e. US\$1,760, less the processing fee in Nigeria of N35,000/t (US\$ 250/t), gives a net income of US\$ 1510 which is 300% of the income obtainable from the raw nut. This is apart from the extra income obtainable from the testa and the CNSL.

As more investment interests in cashew are springing up, the sales of CNSL can also be harnessed for good economic gain. A factory processing 500 t annually will produce 110 t of

kernels and will earn US\$755,000 as compared to US\$300,000 that accrues if the nuts are exported raw.

Nigeria exports a large portion of the total harvest of raw nuts annually, whereas more foreign exchange could be earned if all is processed and exported as kernels. Besides, this will create several job opportunities for the unemployed. For instance a factory with an annual capacity of 500 t will employ at least 70 skilled and unskilled workers in a shift, using the Indian manual processing method. The multiplier effect of that will be great if Nigeria could process annually at least 70% of the harvest.

Apart from all these benefits, the foreign exchange earning potential of CNSL has not been exploited at all in Nigeria. Major importers of CNSL are USA, Japan, France and South Korea and some exporting countries such as Brazil and Mozambique and India have earned substantially from CNSL.

Due to the high processing capacity and inexpensive labour force (dominated by women), India buys more than 95% of the world raw cashew nut export (Andrighetti *et al.*, 1994), consequently cashew has been a major source of revenue for India and a leading company in the world cashew economy.

In Nigeria, eleven known processing factories have been identified and only six of these are functional. There are few others operating as cottage processors for local markets.

The installed capacity of these plants put together is still very far from being able to serve the yearly cashew nut output. The Eastern Nigerian Development Corporation in Enugu established the first cashew nut processing plant in the country in 1959. Laurent and Russell (1968) reported that the factory began operation in 1965 but was badly affected during the civil war (1967-1970) after which it was resuscitated. The present annual installed capacity of the plant is 1,500 t of raw nuts. The Western Nigerian Development Corporation in Ibadan established the second processing plant in 1962. The present annual installed capacity of the plant is 750 t of raw nut. Other processing plants in Ibadan, Owo, Oyo, Lagos and Ijebu are privately owned. Only two of these have an installed annual capacity of about 550 t each, others process less. As a result, the total installed capacity of all major processing factories is not enough to service the large tonnage of raw cashew nut produced in the country and the situation is being exploited by the Indian buyers on a yearly basis. They buy at cheap prices, process, export and get multiple foreign exchange earnings to boost their economy. Most cashew nut processors in Nigeria are operating below capacity due to machinery and management problems; while some are not even operating at all. Some are using mechanised systems and have consequently suffered from a lack of technical expertise and non-availability of spare parts to sustain the industry. This has had an adverse impact on the cashew nut industry.

With increasing awareness of the need to earn more foreign exchange through non-oil exports, emphasis should be placed on local processing of cashew nut. This calls for concentrated investment in the industry via resuscitating non-

functional factories, expansion of existing ones and establishment of new processing plants.

## Conclusion

In view of the sufficient market for cashew in the world, coupled with the fact that Nigeria has vast agricultural land and diverse ecological zones suitable for the production of cashew, the country has a great potential of becoming one of the African major producers of raw cashew nut. To complement this, efforts should also be directed towards the sustenance of the existing facilities for processing and establishing new ones in the country. This will provide a value added advantage for investors; that is, increasing the foreign exchange earnings obtainable from cashew and reducing the problem of unemployment considerably.

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## SUSTAINABLE TIMBER MARKETS

# Building project with a sustainable difference

*"An excellent skills training initiative, combined with the use of sustainable products for long term energy savings as well as for direct heating by wood pellet stoves", said Richard Witney who was invited to the launch of behalf of the Scottish Community & Householder Renewables Initiative*

Scottish Forestry Minister Lewis Macdonald went into the midst of an urban estate of brick-and-concrete houses recently to launch a very different building project. It uses grassed turf to insulate the roof, straw bales to insulate the walls, and Scottish timber almost everywhere in between.

Part of a local regeneration project led by Fife Council, the new building is serving as an exemplar of 'low-carbon' construction techniques that is also helping to train five young joinery apprentices in sustainable construction techniques. It is being built by the charity Community Self-Build Scotland (CSBS) and will house offices



for CSBS itself and local community organisations or small businesses. The charity CSBS has calculated that by maximising the use of 'carbon-neutral' materials such as wood and straw, the building will generate 25% less carbon-based greenhouse gas emissions than a similar-sized building made of traditional materials such as brick and concrete.

Speaking at the ceremony, Mr Macdonald said, "This building shows just what can be achieved when sustainability and local products and processes are at the heart of the design and construction process. In this building, we

can see and appreciate practical and attractive design that maximises the use of timber grown in Scotland and timber products made in Scotland. These have been grown and processed in ways that highlight their strength and aesthetic qualities, and whose use supports Scottish jobs in growing, harvesting and processing timber.

"And it goes a step further, because it also teaches young people essential joinery skills that are in great demand in the construction industry. "This scheme reflects our commitment to sustainability, innovation and skills and demon-

strates how we in Scotland can make a real contribution to sustainability, reducing greenhouse gas emissions and limiting the effects of climate change.

CSBS development manager Jess Christman added, "This innovative building demonstrates how a simple and affordable design can assist in reducing greenhouse gas emissions by 25% compared to a traditional design. The design is appropriate for affordable housing and CSBS looks forward to its use in the delivery of community self-build housing projects in Dunfermline and across Scotland."

Funding and support for the project has been provided by Fife Council, the European Regional Development Fund through the East of Scotland European Partnership, Communities Scotland through the Fife Special Housing Association, the Scottish Forest Industries Cluster, the Tudor Trust, the Energy Savings Trust, and Forestry Commission Scotland. The joinery trainees working on the project are students of Dunfermline's Lauder College.



# Bikers get active at Glentress

Cyclists of all ages and abilities are being given the chance to get more active by learning biking skills at a new skills loop opened at Glentress forest – the only one of its kind in Britain.

The skills area has been designed to help newcomers to mountain biking develop some basic skills and confidence before heading out on to the longer more challenging trails in the forest. The loop features small jumps, ramps, raised timber trails, rock gardens and twisty singletrack trails to help newcomers face some of the obstacles you might find on a bigger mountain bike route. All the features have interpretation signs to help riders better understand how to tackle them properly.

The launch of the skills area coincides with Forestry Commission Scotland's new 'active woods' campaign which is a new nationwide push aimed at tempting people off the sofa to explore the huge range of fun activities in the forest – and feel the benefits to both body and mind.

At the official opening ceremony, John McBay, Senior Sports Development Officer at Scottish Borders Council said: "It is great to see a skills loop being added to this world class facility, it will act as a great way of improving bike handling skills and confidence for the many riders. I am convinced that this new loop will be of enormous benefit to the instructors who are taking out



youth classes such as the Glentress Riders Kids Club, the Big Lottery Funded Fit Kids Mountain Bike Programme and the Council's own Summer and Easter Sports Schemes. This loop will for some be the starting place for many new mountain bikers who will hopefully go on to represent their school, club or country."

The skills area was built by Forestry Commission Scotland as part of the 7stanes mountain bike project which is creating seven centres right across the south of Scotland. The Peebles Cycle Club volunteered their time to help create many of the features under the watchful eye of trail designer Pete Laing from Selkirk.

Alex MacLennan is the Commission's recreation manager in the Borders: "As part of the continual success of

the 7stanes project, education is becoming a key factor in helping to bring newcomers to mountain biking. This is the first project of its kind in Scotland and will go a long way to building up riders' confidence and abilities. "We want more people to try out mountain biking as it is also a fun way to improve overall well-being. Getting out on the bike does wonders for your fitness and helps enormously with relieving the stresses and strains of everyday life. The beauty of the skills loop is that it doesn't commit you to riding long distance – you can do one loop or as many as you like."

The skills area is frequently used by the Kids Mountain Bike Club run by The Hub at Glentress. The club meets every Saturday says Emma Guy: "The skills loop is a great introduction to mountain biking. It can be as easy or as

challenging as you want – it's a real confidence builder."

Glentress is the flagship centre of the 7stanes project and attracts over 250,000 visitors each year. The trails at the venue are award winning and recently a poll by mountain bikers across Britain voted the centre the best place to go for great riding. Mountain bikers also voted The Hub as the best cafe in Britain.

## MORE INFORMATION

**To find out more about mountain biking in the Tweed Valley, or other 7stanes centres, log on to [www.7stanes.gov.uk](http://www.7stanes.gov.uk)**  
**For more details about the activewoods campaign log on to [www.forestry.gov.uk/active-woods](http://www.forestry.gov.uk/active-woods), or phone 0845 FORESTS (367 3787).**

# PUMPS PRODUCE PREMIUM STRAWBERRIES



Strawberries are big business in Queensland, on Australia's east coast

**O**n a new strawberry farm in Queensland, Australia, the grower was faced with multiple and varied demands on water requirements for crop irrigation and other tasks on the farm. Helping to cope with a wide variety of water needs is a set of all stainless steel Lowara pumps equipped with the Hydrovar variable speed control system.

Strawberries are big business in Queensland. Just north of Brisbane, on Australia's east coast, the area grows about 350 ha of strawberries each year, mainly along the coastal strip from Caboolture to Gympie.

The industry supplies fruit from about May to October

when the warmer winter and spring conditions of coastal Queensland enable strawberry plants to grow and produce the fruit. Growing strawberries is popular in this area because quick returns can be made from small areas of land with relatively little capital investment. Most of the premium strawberry crop is grown for the metropolitan wholesale markets in Brisbane, Sydney, Melbourne and Adelaide, south of the prime growing areas.

## New methods for new farm

One premium strawberry grower has recently established a new 90 ha farm for growing the berries in the semi-agricultural area known as Caboolture. Strawberries are a high-risk crop, with very little room for error. The berries need to be monitored closely for the duration of the growing season and any problems need to be dealt with quickly. These monitoring duties apply especially to the water supply.

Craig Priestley, the ITT Fluid Technology account manager for Queensland said that, "Through our dealer network, this farmer purchased five SHE50250-220 Lowara pumps. They are 22 kW units, equipped with Hydrovar control systems on a single base." Priestley also notes that with the control panels, the pump and the base, "We have a pump set size of about 4 m by 3 m – quite a substantial pump set."

The water supply for the

farm comes from a newly dug, dammed storage reservoir that is fed by a spring. Due to the digging and the fact that the farmland is under considerable construction, the water has mixed with acids within the soils, lowering the pH level of the water. Over time, the slightly acidic level of the water will eventually neutralise. However, for now, any water handling system must deal with varying levels of pH.

Priestley recalls that, "One of the major reasons we went with the Lowara product is because of the all 316 low-carbon stainless steel of the pumps. Since the pH level of the water will vary, if you use dissimilar metals in a pump, such as cast iron and galvanised pipe fittings, you can have a reaction to the water."

## Varied water demands

The water demands at the strawberry farm were very complex - not the least because of the strawberry's lifecycle. Immediately upon planting, the strawberries initially require a large sum of water. This lasts for the entire length of their three week first growth stage.

The strawberries receive rations of water through two forms of irrigation. The first type of irrigation is an overhead style with impact sprinklers. Additionally, there is an irrigation process known as 'fertigation' which uses a drip tape underneath the strawberries. The water supply for the irrigation system has to be extremely reliable. Priestley



says that "because of the excessive heat and erratic weather patterns in the growing area, if the farm gets a hot day, they'll need to be able to get water onto the actual leaves of the strawberry plant to take the heat stress away from the plant itself."

### **The 'Money Berry'**

In Australia, they call the strawberry the 'money berry'. The reason for this is that a fist-sized amount of strawberries - consisting of about 10 to 12 premium strawberries, can cost between 3 to 4 dollars Australian (approximately US\$1.50-2.00).

For premium strawberries - large unblemished berries - the grower can get a market value price of between 7 and 8 dollars Australian per kg. However, if the product is stressed, which, according to Priestley happens nine times out of ten because of the lack of water or poor irrigation, the berries become classified as a 'seconds' product. These 'seconds' get used in products such as strawberry jams and other products where the actual berry is not seen - with the per kg market price for the grower at about 80 cents.

With a risk/reward scenario, it is understandable that with 90 ha of strawberries under cultivation, a grower would want to have the most reliable pumping strategy that is right for the varied applications at the farm.

### **Beyond irrigation**

In addition to the irrigation, these pumps comprise the complete control plant for the whole 90 ha farm. The pumps will service the wash-down service for the packing sheds as the procedure of picking takes place. Water is also needed for cooling the packing machines as well as washing down tractors and other farm implements.

Since the varied water flows

required the use of variable frequency drives, the Hydrovar-controlled Lowara pumps were a perfect fit. Priestley notes that, "The customer specifically requested the technology of the Hydrovar because of its flexibility and it's reliability."

The Hydrovar-equipped pumps start on less than 1 amp and also vary the voltage. This will allow the pump set to provide large energy savings. Priestley explains that, "In an instance where the farm may not be irrigating, but instead, running a packing shed or wash down hoses for tractors, the pumps are only using the power required for that duty point." Priestley continues, noting that, "This is instead of using six-speed, end-suction motor pumps where you would be using 22 kW on a

single hose. With that approach, you may have all sorts of problems taking place, including water shock in the lines - where you have cracking or splitting of the poly vinyl chloride (PVC) lines. Since this pump has a soft start/stop/stall application, you have none of the of potential problems that you would encounter with a with a large booster set."

This pump set will also have the capability of hooking up an 200 mm diesel drive end suction on the discharge line in order to provide irrigation water in the case of a power supply failure.

With the farm now beginning cultivation, the initial installation will consist of three pumps, with two additional pumps coming on line as the planting proceeds through the

90 ha.

The owner of this new strawberry farm has plans for the farm beyond just selling berries to the major food distributors. He is planning a theme park, based around strawberries. With its working title of 'Strawberry World', the public will be invited to a centre where they can sample different types of strawberry products and take part in other fun activities.

From the irrigation requirements and the fluctuating acid levels of the water supply to the power and maintenance savings, the Hydrovar-equipped Lowara pumps will play a crucial part in producing the 'money berries' for this Australian grower.

[Courtesy: Minett Media]

## **SILSOE RESEARCH INSTITUTE**

### **LIBRARY COLLECTION**

Due to the closure of Silsoe Research Institute, the library collection is being dispersed to various academic and research organisations to complement their own libraries. Science and agricultural engineering books and some journals are being transferred to places such as Cranfield University (Silsoe campus), Harper Adams University College and Rothamsted Research.

It has been agreed in principle that the Museum of English Rural Life at Reading University will receive the archive material including photographs from the early work of the National Institute of Agricultural Engineering. We are also ensuring that the British Library has a complete set of our Divisional Notes.

Scientific and technical research journals are being offered to UK universities, but there are still many titles, especially foreign language titles, that have yet to find a home. Titles still available are listed on the website at <http://www.sri.bbsrc.ac.uk/general/library.htm>

We still have books on agriculture and agricultural engineering available for transfer to academic or not-for-profit research organisations. There is also a collection of ASAE papers (hard copy and microfiche) from 1971 -1994, ASAE standards yearbooks 1967 -1992 and SAE Handbooks 1950 -1988. For historians we have a collection of extension literature and reports published from mid 1960s to 1980s, largely from the farming organisations in the USA, Europe and the former USSR. Our patent collection on agricultural engineering equipment and processes goes back to the 1940s!

The stock will be freely available for transfer until the end of 2005, but we would appreciate the recipient to arrange collection from Silsoe.

**For further enquiries please contact Anne Jarvis Tel: 01525 860000 or e-mail: [anne.jarvis@bbsrc.ac.uk](mailto:anne.jarvis@bbsrc.ac.uk)**

# EMPOWERING THE COMMUNITY

Adam Spearey



Community group visiting a wind farm as part of a planning consultation with SgurrEnergy

## BIO NOTE

Adam Spearey is a Renewable Energy Consultant with SgurrEnergy, an independent consultancy specialising in the assessment, development, design and management of Renewable Energy Projects. SgurrEnergy, 69 Dixon Road, Glasgow G42 8AT Tel: 0141 433 9060 E-mail: adam.spearey@sgurrenergy.com Web: www.sgurrenergy.com

This paper was presented at the conference entitled 'Renewables, Here and Now' and organised under the convenership of Richard Witney, Renewables Adviser with the Lothians and Edinburgh Environmental partnership.

UK Government policy, in relation to community regeneration, has consistently referred to the need to build strong and sustainable communities. At the very heart of this drive lies also the desire for people to take pride in their community. Contemporary renewable energy technologies have the ability to merge these ideologies and create a range of opportunities for supporting communities and rural economies. This article aims to outline these opportunities and highlight the benefits associated with communities implementing and taking complete control of their own renewable energy scheme.

Currently in the UK, less

than 3% of all electricity produced comes from renewable sources. Of this figure the vast majority is generated from large scale commercial wind (0.4%), hydro (1.5%) and biomass developments (0.8%) (IEA, 2003). Encouraging further electricity generation from renewable sources is an integral part of both the UK and Scottish Climate Change Programmes. By 2010, the UK government aims to increase the amount of electricity generated from renewable sources to 10% of total production. In Scotland the figure is more challenging, with the 2010 target set at 18% rising to 40% in 2040. The drive to meet these

targets is, however, being held up as increasing numbers of wind farms and other large scale renewable energy developments are proposed in the vicinity of communities. This trend may lead to tensions between developers and the neighbouring population due to a feeling that the surrounding land is being exploited for the financial gain of companies who don't have an interest in the community.

## Community benefit

Commercial wind farm developers typically offer what is known as community benefit, a goodwill – usually financial – contribution voluntarily donated to communities 'affected' by a





**The wind-diesel scheme on the Isle of Muck**

proposed development. While there are unofficial guidelines on the size of this benefit there is no legal obligation on a developer to do this, meaning the amount offered is entirely at their discretion.

Increasingly, communities are realising that a more attractive community benefit can be obtained by establishing renewable energy schemes of their own. The benefits associated with community energy generation are widespread. Such projects have the ability to:

- provide direct and indirect employment opportunities during the construction and operational phases;
- generate revenue for the owners of the land on which they are built and the surrounding community;
- aid local economic and social development and encourage regeneration;
- provide an improved source of electricity in remote and island communities;
- raise the profile of a community; and
- act as an educational resource available to those within the community and further a field.

In a nutshell, community-led renewable projects have the potential to enhance and

strengthen a community whilst creating an income stream that will allow them to fulfil their local social and economic objectives.

The type of project chosen can be tailored to meet the specific requirements of a community, depending on their needs or aspirations. While some communities are simply looking for an innovative, sustainable way of generating an additional income, others turn to renewable energy more out of necessity. The Isle of Muck wind-diesel scheme demonstrates what can be achieved by a community seeking to reduce electricity costs and develop a more reliable supply. In 1992 due to the high cost of imported fuel and inefficient energy consumption, electricity on the Scottish west coast island cost 26p/kWh. To combat these prohibitive prices, the island's 38 residents took the decision to explore the opportunities provided by contemporary renewable energy technology. In 1998, following on from this initial work, Lottery, Local Enterprise Company (LEC) and Local Authority funding was made available and the Isle of Muck Wind-Diesel Scheme commenced. The project consists of two 25 kW wind turbines and a

24 kW diesel generator working in tandem. The wind regime on the island is such that the turbines are able to generate around 80% of the total power delivered. In times of insufficient wind speed, the diesel generators automatically ensure that the electricity supply is maintained. Recent figures show that as a result of the project, electricity costs fell by over 60%. Additional income from the scheme will cover repair and maintenance costs and will eventually fund the replacement of the turbines at the end of their useful life in about 20 years.

### **Available community-scale technologies**

Scotland is now home to increasingly diverse community renewable energy projects, covering a wide range of technologies. The type of technology selected for implementation will be dependent on a number of factors. These factors include availability of funding and the magnitude of the local natural resource.

Technologies currently utilised by communities in Scotland include the following.

- **Wind energy**  
Scotland's excellent wind regime makes wind turbines

an attractive option for communities all over Scotland. A Community wind project with an installed capacity of 7.9 MW could generate enough electricity for approximately 5500 homes, whilst saving around 13,500 tonnes of harmful greenhouse gas emissions in the process.

- **Small scale hydro-electric turbine**  
This has the potential to provide a steady income stream for a community through the generation and subsequent sale of electricity to the national grid.
- **Ground source heat pump**  
Heat pumps can be used to transfer the underlying heat from the ground into a building. At community level, this can be used for supplying space heating to a village hall, church or other communal building.
- **Solar energy**  
This can be used for water heating or to provide space heating to a community building or dwelling. On a smaller scale, solar energy can be harnessed though the use of photovoltaic panels to power other community assets such as fountains.
- **Biomass**  
Biomass energy is well suited to communities with a rich local woodland resource. Wood wastes such as tree trimmings and by-products from local businesses can be utilised to provide fuel for a combined heat and power (CHP) plant and in turn for the production of green energy.

### **Funding**

In terms of funding, there are various routes open to UK communities. In Scotland the Energy Saving Trust operate 'a one-stop shop offering grants, advice and project support' in the form of the Scottish Community and Householder Renewables Initiative (SCHRI) (<http://www.est.org.uk/schri>). Through SCHRI, communities

may apply for technical grants of up to £10,000 to support non-capital projects, such as initial scoping or feasibility studies. A further capital grant (to a maximum of £100,000) is also available to aid the actual capital costs of a project. To date, SCHRI has awarded funding to a total of 235 projects in Scotland, worth in excess of £3.3 million.

Communities based in

England, Wales or Northern Ireland can apply to the Department for Trade and Industry (DTI) funded Clear-Skies Initiative (<http://www.clear-skies.org>) for support of up to £100,000. In addition to these principal sources of funding grants can also be sought from Forward Scotland (<http://www.forward-scotland.org.uk/>) and The Big

Lottery Fund (<http://www.nof.org.uk/>), the latter of which is contributing £50 million to renewable energy projects, as part of its Transforming Communities Programme.

In the coming years, if government targets are to be met, renewable energy developments will become more commonplace on our

landscape. Forward thinking communities, now ever more than before, have the opportunity to embrace this revolution and take a first step on the road to sustainability.

## Reference

IEA (2003). Renewables Information 2003. International Energy Agency. ISBN 92-64-10754-1

## WASTE TREATMENT

# Enzymes from the former Soviet Union used for soil and groundwater remediation

On many development sites it is often necessary to dig up polluted soil and transport it to a suitable landfill site, a very costly practice!

This is generally the only option, but now using Enzyme Tech's combination of 'enzymes' and engineering practices it is possible to address the problem in situ. Recently there were around 250 sites that were licensed to accept hazardous waste, now there are only 5. The landfill directive of the 16<sup>th</sup> July 2004, states that hazardous waste can no longer be disposed of with domestic waste. This will inevitably increase dramatically the disposal costs of hazardous waste, especially with the Environment Agency calling for more stringent measures to protect society against pollution.

Hydrocarbon polluted ground (diesel, petrol, oil, grease, aviation fuel, etc.) is the most common form of pollution, one gallon of engine oil will pollute approximately one acre of land, by way of the saturated (or wet) zone migrating underground.

Enzyme Tech limited have a much cheaper solution using the very latest blend of enzymes

from the former Soviet Block.

Very simply explained, microbes exist in the soil and in anything organic, including oil, diesel, petrol and the like. By using these natural bacteria and fungi, it is possible to reduce to zero the Total Petroleum Hydrocarbon (TPH) levels in the soil. The microbes are stimulated by the enzymes to reproduce and, by careful timing, the enzyme food source is removed and the bacteria continue to consume their natural food source until their food source has gone and they die off. As the ground is polluted, the bacteria that like to live in hydrocarbons continue to multiply after the others have died, breaking the hydrocarbon chain into carbon dioxide (CO<sub>2</sub>), oxygen (O<sub>2</sub>), water (H<sub>2</sub>O) biomass (natural biproduct of the bacteria feeding process) and carbon.

What's left is completely none hazardous and natural. Wherever the pollution has gone the bacteria goes and breaks it down.

Most often, microbes exist in communities. Some of the microbes within these communities secrete a mucus-like substance that forms the framework (matrix) in which the

community is structured. These slime embedded communities are called biofilms.

Recent biofilm research shows that the distribution of different microbes and their respective capabilities within the biofilm make biofilm communities act like multicellular organisms. Some biofilm microbes keep the conditions inside the biofilm just right for other microbes that wouldn't survive very long outside the matrix. Others produce emulsifiers and surfactants that help make food molecules (for example petrol and diesel fuel) available to the cells. Within the soil biofilm system, some microbes eat fuel molecules. Others use the waste of the fuel-eaters as food. This means that as a community, biofilms can carry out many reactions that no community member can individually. This is a major reason why biofilms are the key to understanding hydrocarbon contaminated soil remediation.

Bacteria are remarkable organisms. When viewed under a microscope, they don't appear to have any internal structure. There are millions of different types of bacteria, only a few thousand of which have been



described in the scientific literature. Some bacteria can live in some very severe environments, by using our enzyme blend we can stimulate these bacteria into reproducing and consuming their favourite food.

So we let nature do its job, fast and cost effectively. Enzyme Tech can bioremediate large sites that would be prohibitively expensive for a developer to undertake, creating a clean site with a dramatically enhanced value.

Our enzyme blend is non-toxic, contains no added bacteria, only natural ingredients, complex sugars and amino acids for the building blocks of bacterial life.

## MORE INFORMATION

Vincent Harper, Managing Director Enzyme Tech Ltd, 2a Fountain Lane, Hockley, Essex SS5 4SU Tel: +44 (0)170 2203443 E-mail: [vinoil@hotmail.com](mailto:vinoil@hotmail.com)



## MEMBERSHIP

# MATTERS

THE NEWSLETTER OF THE INSTITUTION OF AGRICULTURAL ENGINEERS

## Engineering Technician Workshop

Engineering Technicians have a vital role in our industry but do we, as their professional institution, do enough for them? Do we understand their particular requirements? Do we provide them with the right kind of services?

How can we do better?

These were the questions addressed by a cross-section of members in a workshop held at John Deere, HQ Langar on 10 May 2005. The group included representatives from dealers, manufacturers, colleges and the press.

The issues and challenges are now well rehearsed. These include:

- the importance of recognition and valuing of skills, qualifications and experience;
- the benefits of a professional qualification, yet to be widely recognised;
- the working environment

for ag-technicians, seen by some as poor and leading to fall-out to similar sectors where conditions are better, i.e. automotive industry or emigration;

- the need to highlight the positive aspects of an Ag Eng career, the linkage with food production, the open air and variety of challenges;
- commitment from dealer principals to IAgRE initiatives essential; and
- regular communication from IAgRE of importance, both electronically or through publications, ideally in a new format which specifically addresses technician's interest.

So what were the answers?

- Look at the possibility of an 'on-line' resource centre.
- Consider how other professional bodies address this issue.
- Investigate the possibility of sponsorship through vouchers donated to

technicians.

- Review the membership matrix in relation to fitter/mechanic/technician/master technician grades.
- Consider the possibility of a form of pre-registration status.
- Plan for joint BAGMA/IAgRE meetings, thus promoting more dealer involvement and better communication with the technical community.
- Continue the liaison between the Presidents of AEA, BAGMA and IAgRE.
- 'Market' the excitement and opportunities of working for the land industries through 'good stories'.

The Secretariat will be picking up some of these initiatives, but we invite you all to build the 'technician community' into the thinking when planning future events and activities.

If you have any better ideas let us know.

*Christopher Whetnall*  
Chief Executive

## Godwin goes for gold

Professor Richard J Godwin attended, by invitation, the 2005 Annual International Meeting of the American Society of Agricultural Engineers (ASAE) in Florida to receive the John Deere Gold Medal Award.

**This award is given for distinguished achievement in the application of science and art to the soil and was presented at an ASAE reception luncheon on 20th July.** Dick was selected for the award in recognition of outstanding contributions as a researcher, educator and extender of agricultural engineering knowledge.

Dick Godwin is Professor and Head of Engineering at the National Soil Resources Institute, Cranfield University and a Past President of the IAgRE. We congratulate him on this signal honour.

## News of Members

**Harry Henderson** has left RAGT Seeds Ltd and is now working for John Deere UK Ltd as a Crop Systems Specialist. His work involves assisting dealers in technical knowledge of combine harvesters, sprayers and satellite guided systems.

The Arable Group (TAG) will soon be setting up a pesticide

application research facility at Silsoe, with Professor **Paul Miller** joining TAG in August to oversee the unit. Paul Miller is regarded as one of the leading scientists within his field, in the world and is IAgRE President Elect.

With the imminent closure of the Silsoe Research Institute, TAG has acquired access to the pesticide application research

facilities there. Professor Paul Miller who has run the unit for many years, will continue to test and develop application technology at the facility as an employee of TAG which is the UK's largest independent agronomy organisation providing information and advice to progressive arable farmers.

Professor **Christopher Wathes** is transferring shortly to the Royal Veterinary College, University of London to estab-

lish an Animal Welfare Group. He is also currently Chairman of the Farm Animal Welfare Council (FAWC), an independent advisory body established by Government in 1979. The FAWC has just announced the publication of a report entitled: 'Welfare Implications of Farm Assurance Schemes'.

*Tony Chestney*

*Write to Tony with your news!  
His address is: 32 Beverley  
Crescent, Bedford MK40 4BY*

## UK's first food safety degree course gets expert sponsorship

Ambitious plans to help Scotland's rural communities and economy, by boosting the growth, efficiency and creation of landbased businesses, have been unveiled today at Oatridge College in West Lothian. The multi-disciplinary expertise of the College is to be harnessed through the unique Landbased Industries Support Service (LISS), which aims to become a one-stop-shop for consultancy and training. Manager Chris Wond says: "LISS will be the first dedicated, truly coherent agency in Scotland for a whole range of sectors. Our emphasis will be on business support, business development, encouraging business start-ups and diversification activities."

The Support Service is the latest step in a drive by Oatridge to forge closer links with business, while developing as a 'Centre of Excellence' for landbased education. The College already has an outstanding reputation for the quality of its teaching and training in horticulture, landscaping, sports turf management, landbased engineering, equestrianism, farriery, environmental management, conservation and animal care.

"Our aim is to give small and medium-sized enterprises (SMEs) in all of these fields improved access to support," says Wond. "We will encourage growth, competitiveness and sustainability through training – in conjunction with the College – advice, networking and business guidance. We want to see job creation and the safeguarding of jobs." The project is part-funded by the EU European Regional Development Fund.

Wond arrives at Oatridge with ten years experience in the field, primarily as a horticultural adviser with the Scottish Agricultural

College. Latterly he was project co-ordinator on "Forth Valley Food Links", an initiative designed to reconnect local food producers with their local markets.

The Oatridge initiative comes at a time when there is clear evidence of growth potential for landbased industries, "But," says Chris Wond, "we need to do as much as possible to ensure that businesses survive and thrive. That means they have to be better-informed, better skilled and more competitive."

Of the challenge at Oatridge, he says: "In part this project has involved re-focusing the range of assistance offered to business by the College, under one cohesive service, but it will also mean proactively approaching sec-

tors and clients who have been under-represented in the past, and expanding the provision of advice and consultancy. I am looking forward to getting out to meet people throughout the sector, to hear their needs and their views on how we can best support SMEs. "There will also be a strong signposting role, establishing links and partnerships with other organisation, so if we cannot help directly, we will be able to guide businesses to someone who can."

### MORE INFORMATION

**Chris Wond, Project Manager,  
Landbased Industries Support Service.  
Tel: +44 (0)1506 86400. E-mail:  
cwond@oatridge.ac.uk**

## LONG SERVICE CERTIFICATES

Name	Grade	Date of Anniversary
<b>50 years</b>		
Robert Taunton <b>Lewis</b>	MIAGR	1 Jul 2005
<b>35 years</b>		
Guy Edward Rothney <b>Blakely</b>	IEng MIAGR	23 Jul 2005
Robin <b>Blackford</b>	IEng MIAGR	23 Jul 2005
David Geoffrey <b>Bedingfeld</b>	CEng MIAGR	23 Jul 2005
Eugen <b>Kramer</b>	AIAGR	23 Jul 2005
Christopher Rees <b>Whetnall</b>	CEnv IEng FIAGR	23 Jul 2005
Alan John <b>Brewer</b>	IEng MIAGR	27 Jul 2005
<b>25 years</b>		
Andreas P <b>Savva</b>	CEng FIAGR	10 Jul 2005
Jonathan Richard <b>Appleton</b>	AMIAGR	14 Jul 2005
Timothy John <b>Wilson</b>	IEng MIAGR	18 Jul 2005
Robin William <b>Sadler</b>	IEng MIAGR	18 Jul 2005
Timothy Genn <b>Elmhirst</b>	AMIAGR	25 Jul 2005
Martin Ian Howard <b>Bennett</b>	MIAGR	31 Jul 2005
Carnegie Drummond <b>Fullerton</b>	IEng MIAGR	21 Aug 2005
Nimal Ranjan <b>Perera</b>	CEng MIAGR	21 Aug 2005



# MEMBERSHIP CHANGES

## Admissions

### Member

B Lamarche (Canada)  
G B Preece (Lincolnshire)

### Associate

M Manning (Kent)  
I C Miller (Nottinghamshire)  
J Morley (Nottinghamshire)  
A C Roston (Lancashire)  
M R Tomkinson (Staffordshire)  
T J Way (Devon)

### Student

*Cranfield University:*  
B Boubrit

*Myerscough College:*

R J Ball  
R Bamber  
M Burland  
J Clarke  
T Cotterill  
C J Davidson  
C J Fawcett  
S D Hesketh  
R W Heywood  
K A Livesey

J T Rigby  
A Sanderson  
D Schofield  
R G Snape  
R Stott  
K F Sweeting  
M E Watkin  
J Worthington  
S Wright

*Salesian Agricultural College,  
Ireland:*

P Burke  
W J P Byrne  
T Carthy  
J J Casey  
P J Coleman  
G Conway  
J E Dolan  
T Drinan  
M Griffin  
J Hannon  
J E Harrington  
D T Murphy  
N Reeves  
J Scannell  
M Stamp  
B Stokes

F Tuffy  
C Young

*Walford North Shropshire College:*

M J Arnold  
L N Counsell  
J I Cumine  
B Dwyer  
T J Emberton  
T G Evans  
A Kenworthy  
C J Price  
C W Roberts

## Readmission

J L Douglas (Stranraer)

## Transfers

### Member

D Bentley (Durham)  
A J H Tulloch (Suffolk)

### Associate Member

S R Bazeley (Canada)

## Engineering Council

## Registrations

### CEng

G P Connolly (Co Londonderry)  
A C Newbold (Lancashire)  
N R Perera (Essex)

### IEng

S E Cooper (Shropshire)  
R H Trevarthen (Leicestershire)

### EngTech

D C Preece (Nottingham)

## Builders join Environmentalists

The Chartered Institution of Building (CIOB) has become the latest Institution to be accepted into membership of the Society for the Environment (SocEnv). It will join the other twelve Constituent Bodies (CBs) and be represented on the Board of the Society, playing a full role in

its governance. The CIOB has 40,000 members and it is anticipated that it will apply to the Society's Registration Authority for a Licence to award the Chartered Environmentalist (CEng) qualification to those of its members who meet the qualifying criteria.

### Constituent Bodies of the Society for the Environment:

1. Chartered Institute of Building (CIOB)
2. Chartered Institution of Wastes Management (CIWM)
3. Chartered Institution of Water and Environmental Management (CIWEM)
4. Institute of Ecology and Environmental Management (IEEM)
5. Institute of Environmental Management and Assessment (IEMA)
6. Institute of Fisheries Management (IFM)
7. Institute of Professional Soil Scientists (IPSS) (associate member)
8. Institution of Agricultural Engineers (IAGrE)
9. Institution of Chemical Engineers (ICHEME)
10. Institution of Civil Engineers (ICE)
11. Institution of Environmental Sciences (IES)
12. Institution of Water Officers (IWO)
13. Royal Meteorological Society (RMetS)

Chair of the Society Will Pope said: "I am delighted to welcome the Chartered Institute of Building to the Society. The construction sector is playing a vital role in the war on climate change as building professionals take a lead in developing and implementing the technologies society will need for buildings that are energy efficient and sustainable. My

Board colleagues and I look forward to the CIOB playing a full and robust role in the development of the Society, and the continued extension of the sustainability agenda in the role of the profession in building construction".

Michael Brown, Deputy Chief Executive of the CIOB, said: "The Chartered Institute of

Building is proud to have been accepted into membership of the Society and to have the opportunity to work more closely with other Constituent Bodies who share our aspirations for the environment and for the raising of standards of professional practice for the public benefit".

The Society for the Environment is celebrating 2,000 Chartered Environmentalists on its Register less than 12 months after receiving its Royal Charter. Working in many different aspects of the environment: regulation, industry, consulting, government, research, academia these Chartered Environmentalists hold the highest level professional qualification available to environmental practitioners. It demonstrates high standards of professional practice and knowledge.

# New appointments at SocEnv

Professor Peter Matthews has been elected to Chair the Society for the Environment (SocEnv) and succeeds the current Chair, Will Pope, at the end of June 2005. Peter Matthews is one of the founder-Directors of the Society, a Board Member of the Environment Agency, a Past President of the Chartered Institution of Water and Environmental Management (CIWEM) and a Board Governor for Anglia Polytechnic University.

Peter Matthews said: "For me, there is no average day in the service of the

environment. I look forward to spreading the word about the key role of Chartered Environmentalists and a sustainable future through my ongoing programme of work, public meetings and other activities. In addition, I shall be doing my best to develop strategic partnerships and networks on behalf of the Society for the Environment, building on the excellent work of my predecessor, Will Pope, and of my Board colleagues.

I also look forward to working alongside my Board colleague, Dr John Brady, the Society's new Vice-Chair. John

has a distinguished record of service to the Society and I welcome his support".

Also at the end of June, Dr John Brady – who represents the Institute of Environmental Management and Assessment (IEMA) on the Board of SocEnv – became Vice-Chair. Dr Brady is Chair of the Society's Management Committee.

Dr David Hickie has been appointed Chief Executive of the Society for the Environment and will take up his post on 1 September. He succeeds Dr Tim Bines. David joins the Society with a wide

range of experience in different aspects of the environment and in management roles in organisations and companies that champion a sustainable environment, including the Environment Agency, English Heritage and Severn Trent Water.

The recently chartered Society for the Environment was originally established in 2000, and is the leading co-ordinating and regulatory umbrella body in environmental matters and a pre-eminent champion of a sustainable environment.

## etb appoints new Chief Executive

Dr John Morton has been appointed as the new Chief Executive of the etb with effect from 1<sup>st</sup> July 2005. John comes to the etb from QinetiQ plc where he was Strategy Director of the Future Systems Technology Division.

Following his first degree in Engineering at the University of Cambridge and DPhil in Metallurgy and the Science of Materials from the University of Oxford, John held research and teaching appointments at Oxford, Imperial College, NASA and Virginia Tech. From there, he joined the Defence Research Agency (DRA) as the Director of the Structural Materials Centre and as DRA grew to become the Defence Evaluation and Research Agency, his responsibilities broadened with his appointment as the Director of the Mechanical Sciences Business Sector. With the formation of QinetiQ he became Chief Operating Officer of the Future Systems Technology Division. A Chartered Engineer, a Fellow and co-opted Council Member of

the Institute of Materials, Minerals and Mining and a Fellow of the Royal Aeronautical Society, John is also a Visiting Professor in the Aeronautics Department at the Imperial College of Science, Technology and Medicine.

John has been internationally recognised for his pioneering research on composite materials and is also the recipient of the Donald Julius Groen and the William Sweet Smith Prizes of the Institution of Mechanical Engineers.

Sir Peter Williams, Chairman said on announcing his appointment: "The etb Board and the organisation are delighted at his appointment. I know that John is looking forward to meeting with all our Institution partners and growing the etb's relationships across the science, engineering and technology community. In welcoming John, I would also like to add my personal thanks to Alan Clark for all that he has done to ensure the successful establishment of the etb."

## Wrekin Branch Summer Visit to Cosford Aerospace Museum

Members of the Wrekin Branch of the Institution of Agricultural Engineers and their friends and families visited Cosford Royal Air



force Museum on 2 July 2005 whilst most of the rest of the world were watching the ladies tennis final or the Live 8 concert.

With Terry Lavender as their guide they gained a fascinating insight into the history of aviation and the RAF. It was the considered opinion of the group that an unguided World War II, ten metre pencil thin rocket fitted with a small shell at its tip was unlikely to do much damage to a moving tank at 100 miles range and the British government's decision that manned aircraft were history back in the mid 1960s was as inaccurate as the rockets but did far more damage.

The future developments at the museum of a new display hall were dominating the site. The design of this building was impressive and will add to the facilities in a significant way. A return visit in two years time is highly recommended.

This proved to be an enjoyable day out with the chance to meet and chat in more relaxed surroundings than formal technical meetings.

## Academic Members

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Barony College  
Parkgate  
Dumfries  
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Bicton College  
Budleigh  
Budleigh Salterton  
Devon  
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Coleg Sir Gar  
Pibwrlwyd Campus  
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Carmarthen  
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Cranfield University Silsoe  
Bedford  
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Harper Adams University  
College  
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Shropshire  
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Institute of Technology, Tralee  
Clash  
Tralee  
Co Kerry  
Ireland

Myerscough College  
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Oatridge Agricultural College  
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Broxburn  
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Pencoed College  
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Bridgend  
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Lewes  
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Reaseheath College  
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Cheshire  
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Royal Agricultural College  
Cirencester  
Gloucester  
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Scottish Agricultural College  
SAC Ayr Campus  
Auchincruive Estate  
Ayr  
KA6 5HW

Sparsholt College  
Sparsholt  
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Willowdene Training Ltd  
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Wiltshire College - Lackham  
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Wiltshire  
SN15 2NY

Writtle College  
Chelmsford  
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## COMMERCIAL MEMBERS

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Pershore  
Worcestershire  
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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  
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Suttieside  
Forfar  
Angus  
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Shelbourne Reynolds  
Shepherds Grove Industrial Estate  
Stanton  
Bury St Edmunds  
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White Horse Contractors Ltd  
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# Cranfield University responds to the growing need for soil managers

Soil: a key natural resource and one which requires better management to support sustainable development and climate change adaptation. Productive soils are degrading; indeed research by the EU's Joint Research Centre shows 16% of EU land is affected by soil degradation. This is why Governments are putting soil towards the top of their policy agendas.

With this in mind and in response to the England Soil Action Plan and the EU Soil Thematic Strategy, Cranfield University has launched a new Masters programme in Soil Management. Professor Mark Kibblewhite, Director of the National Soil Resources Institute at Cranfield University, said:

"There is an urgent need across Europe for well-trained soil professionals with a sound scientific understanding of soil systems; people who can also develop policy and provide practical advice and guidance on how to manage soil to assure its long-term sustainability.

"New environmental legislation, Common Agricultural Policy (CAP) reform and the anticipated Soil Directive means demand for these professionals is growing rapidly."

The MSc course, aimed primarily at the agri-business sector, is the only course of its kind in the UK and combines advanced education in soil science and engineering with policy and management

skills development. It is offered as a full or part-time MSc degree with a Postgraduate Diploma or Certificate as further options for those with more limited time and resources.

Professor Kibblewhite continued: "This unique post-graduate course, led by world-leading soil experts, has been welcomed enthusiastically by government, industry and Non Governmental Organisations (NGO's), whose contributions are ensuring its relevance."

Sir Donald Curry KB CBE, Chairman of the Food and Farming Commission, said: "The course proposal is a very good one and extremely relevant to what

has now become an environmental and economic priority."

Including both taught and project elements as well as a major personal project, this MSc course will provide experts in the management of soil in agricultural and rural land systems. Its graduates will be at the leading edge in their sector, able to develop, evaluate and implement soil management solutions which optimise economic productivity, while, at the same time, protecting the environment and conserving biodiversity.

## MORE INFORMATION

Visit: [www.silsoe.cranfield.ac.uk/courses/msc\\_sml/](http://www.silsoe.cranfield.ac.uk/courses/msc_sml/)

# Foresters stay independent

At the Annual General Meeting of the Institute of Chartered Foresters (ICF) on 23 June 2005, ICF members voted on the issue of winding-up ICF in favour of transferring its entire membership to the Royal Institution of Chartered Surveyors (RICS).

While a clear majority (64%) of voting ICF members supported the move, the result falls short of the 75% required by the ICF constitution to effect change. The merger, planned to take effect on 1 January 2006, will

therefore not now go ahead.

The vote follows some eighteen months of discussions between RICS and ICF, during which the leadership of both chartered bodies supported the proposed change.

RICS president Barry Gilbertson, said: "While we believed there is an excellent fit between RICS and ICF, professional people have the right to choose their own future.

"I should like to pay tribute to the leadership shown by Wilma Harper the

ICF President and her Council, and record my thanks for the robust but courteous way in which these negotiations have been conducted. I hope our two bodies can continue to collaborate on matters of common interest for the benefit of our members and the public at large."

ICF President, Wilma Harper said: "Naturally both I and the Council are disappointed that, although the proposal to transfer to RICS was supported by a clear majority, this was insufficient

to trigger change under our constitutional arrangements. I would like to thank my ICF colleagues and the RICS office bearers and staff for their hard work to develop the transfer proposal with us and I very much hope that we can build on this excellent relationship by working together on common issues in the future. For ICF, the main priority now is to build on our past achievements and strive to develop a strong and dynamic Institute to serve the needs of professional foresters and arboriculturists."

## NOVEL TECHNOLOGY

# Winners of the Carbon Trust Innovation Awards

CMR Fuel Cells were selected as the overall winner of the Carbon Trust Innovation Awards 2005. The awards recognise the work of organisations that are developing and deploying innovative technologies or energy efficiency measures that help reduce the UK's carbon emissions.

CMR Fuel Cells, which also won the individual and small business category award, has developed technology which has the potential to make fuel cells commercially viable for the first time. As fuel cells are an energy efficient and zero carbon emission replacement for engines and batteries, their widespread uptake will save millions of tonnes of carbon emissions.

The winners in the five categories are:

- Individual and small businesses award - CMR Fuel Cells for its innovative fuel cell technology
- Larger companies and public sector organisations award – SMD Hydrovision for its innovative tidal turbine system
- Innovation in energy efficiency - Marks and Spencer for its development of a remote integrated energy management system
- Academic institutions - Oxford University for its development of technology that will help to exploit the commercial potential of methane
- Overall innovator of the

year - CMR Fuel Cells

The winners were chosen by a distinguished judging panel that included Sir David King, Ian McAllister and Tom Delay from the Carbon Trust, and Grant Ringshaw from the Sunday Telegraph.

Tom Delay, chief executive at the Carbon Trust, said: "The Carbon Trust Innovation awards are a key step on the path towards creating a low carbon economy in the UK. It takes smarter thinking to tackle climate change and all the winners of this year's awards have recognised not only the challenge that climate change poses, but also the business opportunities it presents. We are delighted to announce the winners of the 2005 Innovation awards and believe the calibre and variety of this year's entries demonstrates the real progress that is being made towards the building of a low carbon world."

CMR is set to make mass-market fuel cells commercially viable for the first time. The company has developed unique, patented fuel cell technology which delivers the low-cost, long run-time power solutions that portable electronic products demand. For many years, fuel cells have been hailed as the solution to providing electricity cleanly and efficiently, taking over from existing solutions like batteries and engines. However, major issues with today's fuel cells - cost, size, complexity and fuel availability

have ensured that fuel cells remain an unfulfilled promise. CMR technology changes this - it reduces the cost of a fuel cell stack by up to 80%, the size by up to 90% and CMR's products can be built using printing or roll-to-roll techniques, improving reliability and further reducing costs.

## CONTACT

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at  
[ainslie.macleod@nelsonbosstock.com](mailto:ainslie.macleod@nelsonbosstock.com)

SMD Hydrovision has been developing the TidEl concept – an innovative moored free stream tidal turbine system - since 2002. The system minimises initial capital cost while reducing subsea complexity as well as providing high quality power to the grid. In the UK alone there is the potential to install 7000 MW of plant that by the nature of tides can produce predictable carbon free power with load factors approaching 50 per cent in some locations.

## CONTACT

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There are many sources of methane around us including methane from waste materials. It is difficult to fully exploit the methane due to its gaseous nature. The University of Oxford has developed catalysts that work particularly well in low-

pressure conditions that are suitable for widespread distributed use. The catalysts can be used to transform the methane into hydrogen for use with fuel cells or into pure liquid fuels that can be used for engines or heating and are easy to transport. The technology contributes not only to a reduction in carbon dioxide emissions but also to a reduction in waste methane an even more powerful greenhouse gas.

## CONTACT

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Over the last three years, Marks and Spencer Group has developed a cohesive system, which integrates the remote management of refrigeration, HVAC and electricity exception reporting. This has involved assessment not only of the technical potential but also the significant commercial opportunities for reducing costs and improving carbon efficiency. The systems are in their final stages of development but indications show that Marks and Spencer Group is achieving major benefits in energy efficiency as well as improvements to plant performance and physical maintenance.

## CONTACT

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## FUTURE PERFECT

# ADAS predicts how the world looks in 2040

## Insight into future

ADAS, the UK's largest provider of rural and environmental solutions and policy advice, is providing a tantalising glimpse into how the world might look in the year 2040 - 35 years on - with the launch of its Blue Sky 35 campaign.

The campaign has been developed to celebrate the company's 35<sup>th</sup> anniversary and to mark the beginning of a major new chapter in ADAS' life. It coincides with the repositioning and rebranding of ADAS to reflect the more dynamic and forward-looking business it has become since being privatised in 1997.

As part of the Blue Sky 35 campaign, ADAS specialists - many of whom are internationally recognised and published experts in their field - have developed a series of fascinating predictions for the next 35 years. Based on fact, knowledge and extensive experience, the result is 35, challenging but feasible predictions for between now and the year 2040.

Steve Collier, ADAS' chief executive explains: "The company has been in existence as ADAS since the 1970s and our staff are amongst the foremost scientists and experts in the UK, if not the world. We have an impressive track record and have led the way in scientific research and rural and environmental policy advice and implementation. This makes us ideally positioned to provide this intriguing insight into the next 35 years.

"Our remit covers a broad range of agricultural, environmental and scientific disciplines and, as a result, the predictions touch on issues which are important for the future of the entire rural infrastructure. Futuristic scenarios for major themes such as climate change, food production, energy, technol-

ogy and animal health are all featured, amongst others.

"We have had enormous fun with these predictions - some of which push current thinking and knowledge to the limits. But the results are hard-hitting in that they not only allow us to visualise how the world might look in 2040, they also enable us to start preparing for scenarios which will impact our clients on a national and international scale."

The launch of the Blue Sky 35 campaign coincides with a new beginning for ADAS with

## Blue Sky 35 predictions

Experts from ADAS, the UK's largest provider of rural and environmental solutions and policy advice predict that by 2040 we can expect to see:

1. Agriculture resulting in little or no nutrient pollution
2. The Water Framework Directive reaching its final conclusion
3. Water quality standards based on the understanding of impacts on ecological systems
4. Wildlife vs water: water resource planning issues to clash with environmental legislation
5. All biodegradable waste banned from landfill and waste incineration increased
6. Old landfill sites opened up and materials mined
7. More waste used as fuel
8. A new climate for farming and the green environment
9. East Anglia strengthening its flood defences
10. Green tax introduced to fund climate change mitigation packages
11. Colorado beetle endemic in the UK
12. Farming water under climate change!
13. Energy crops accounting for 20 per cent of agricultural land area and challenging food crops for space
14. Biomass based fuels purchased for home use much as coal is now
15. On-farm anaerobic digesters providing sustainable heat and electricity
16. Micro hydro-power becomes more common as farmers take advantage of increased winter rainfall and river flows
17. Genomics: farmers identifying desirable characteristics in animals
18. Animal welfare live TV available at point of sale
19. BSE: a disease of the past
20. Techno vets: animal well-being tracked remotely by vets
21. Environmental biodiversity built into all new developments
22. Roadside nature reserves helping species and habitats respond to climate change
23. Farmers divided into producers or conservationists
24. China dominating global meat market
25. Consumers forcing reduction in food miles by demanding an increase in local food
26. Animals fed to produce designer milk or meat; crops bred and managed to produce designer food
27. New integrated pollution monitoring tools to demonstrate where action needs to be taken
28. Most UK farm transactions conducted online
29. Remote sensing of crops and use of IT to drive decisions becoming commonplace
30. Pesticide management by technology
31. Molecular diagnostics: from farm to fork
32. Super crops sucking our rivers dry
33. Pest and disease risk easier to manage
34. Pesticide resistance widespread in the UK
35. Fewer farm businesses in a diverse countryside

the unveiling of the company's new brand image, which has been developed in response to the views of staff, clients and partners.

Steve Collier explains: "We wanted to find out what our stakeholders thought of the organisation so we conducted extensive research amongst our clients, potential clients and staff. It revealed that whilst there is a tremendous amount of warmth and goodwill towards ADAS, with our history conferring significant benefits, there is also some confusion about who we

are and what we do. For example, although we were privatised in 1997, some of our own clients and the media still think of us as a government advisory service!

"The market research made it clear that whilst we have immense brand loyalty we need to be much more client-focused in our communications."

Armed with this knowledge, the company has reviewed its brand and customer relationship management strategies. As a result, the ADAS brand image has been refreshed, with a new look and feel reflected in a vari-



ety of new marketing materials.”

But as Steve Collier says, the change goes far deeper than merely the visual image of the company: “This isn’t just about bringing in a new logo - this is about introducing an entirely new direction for ADAS. We are looking forward with renewed energy and focus.

“All our staff have welcomed the change in approach. There is a real buzz about the company, and the launch of the Blue Sky 35 campaign has really captured the imagination of us all.

“As we unveil the campaign and new identity we are saying that ADAS has listened to the views of its stakeholders and is

responding to meet their needs. We are looking forward to a very exciting future,” he adds.

### ADAS

Established for 35 years, ADAS provides independent scientific research, consultancy and contracting services to Governments, land and rural based industries in the UK and abroad. With core disciplines encompassing the living, growing environment, rural development and agricultural services, ADAS has over 725 staff covering more than 60 specialisms. It operates from a network of offices and research sites in England, Scotland and Wales and works

on projects covering technical, economic and policy issues. ADAS’ clients number in excess of 20,000, including Government departments and agencies, major corporations and small rural enterprises.

### ADAS Expert Group

Set up to meet the needs of existing and potential clients who require highly strategic input, guidance and support, the ADAS Expert Group is made up of its most highly qualified and experienced individuals who are widely recognised as experts in their field.

To be eligible to join the Group, staff must meet a set of

established criteria. All members must be recognised in their industry as a national and/or international authority in their specialist area and have a representational role with a leading industry or scientific body. Furthermore, each member must have a comprehensive knowledge of UK, EU and international issues and legislation and be able to integrate their knowledge into a range of practical applications.

#### MORE INFORMATION

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## INNOVATION

# Intellectual property

From time to time, a story emerges which involves one or more aspects of the world of ‘Intellectual Property’ – a term which is usually used to embrace Patents, Trade Marks, Designs and Copyright. The recent demise of Rover is a good example of such a story.

The Patent Office has responsibility in the UK for not only patents but also trade marks, designs and copyright. Similarly, members of the Chartered Institute of Patent Agents (CIPA) are fully qualified in all aspects of intellectual property law and practice, not just patents.

The Institute realises that Intellectual Property can be a complicated business and it is not widely understood. Its importance is, however, growing and we feel it may be useful to publications such as yours if we provided some basic background information that you might find useful in the future.

### Intellectual Property

#### Patents

Patents protect inventions by giving the owner of the patent

the right to stop anyone from making or using the invention. This right to stop others is limited in time, usually, for up to 20 years. In other words, a patent is a right to stop competition for the invention for a limited period.

Key Patent points to remember:

- Don’t make the details of your invention public before you file a patent application.
- To get a patent, your invention must not have been disclosed publicly anywhere in the world before you apply – even by yourself.
- Patents are not kept secret – they are published, usually 18 months after application.
- Ignorance that you are infringing someone else’s patent is no defence.

#### Trade marks

These are signs, which are used to distinguish the goods or services of one trader from those of another. In this context, the word ‘sign’ is used very broadly. Although most trade marks are words or logos or combinations of the

two, other forms such as three dimensional shapes, combinations of colours and even sounds can be, and indeed are, used as trade marks.

Trade marks are a most important means of protecting the reputation and goodwill that a trader has built up. Trade Mark registration gives you the best protection from unfair competition.

Generally speaking, the protection afforded to *industrial designs* under European law is for the ‘new’ features of shape, configuration, form, patterns or ornament of an industrial product, which convey an aesthetic effect. In other words there must be some appeal to the eye in the design for which protection sought.

#### Copyright

Copyright is a right associated with a particular ‘copyright work’ such as books, films, music, and computer programmes, etc. It is easiest thought of as a right to stop people copying the work, either in the same form, or in some other form without per-

mission.

The Chartered Institute of Patent Agents (CIPA) is a professional body representing Patent Attorneys in the UK.

CIPA was founded in 1882 and incorporated by Royal Charter in 1891. CIPA is therefore a recognised and established part of the legal profession in the UK.

The primary function of patent agents (also known as patent attorneys) has been, and still is, securing and obtaining of intellectual property (IP) rights for their clients before granting authorities, whether the United Kingdom Patent Office or the European Patent Office, or before the Office for Harmonisation within the Internal Market (OHIM).

#### MORE INFORMATION

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## SPRAYER

# Flexible sprayer for weed control in forestry

Micron Sprayers the innovative designer and manufacturer of spray application equipment has produced a highly flexible sprayer for total weed control in young forest plantations.

The original Flexidome sprayer was developed jointly by R and D Engineer, Alf Ganderton and Sales Director, Haydn Beddows for control of weeds in tunnelled strawberries and has since played a key role in the UK strawberry industry when used for weed control along strawberry beds in polythene 'Spanish Tunnels'.

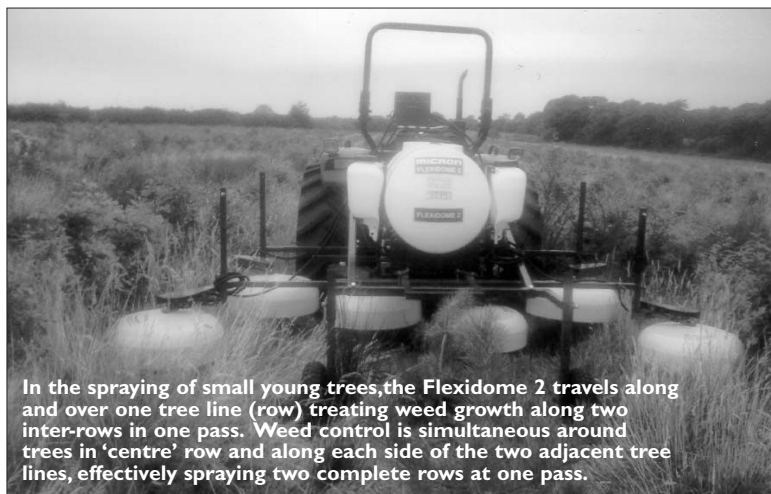
Now re-designed as the 'Flexidome 2', the covered (shrouded) sprayer is set to play another key role in the precise and measured application of herbicide but this time in forestry and 'forestry on the farm'. Initially the 'Flexidome 2' is being used in the Republic of Ireland for weed control in large areas of newly established farm forestry, that are supported with grants and premiums under the Common Agricultural Policy (CAP) Afforestation Programme of the European Union (EU).

The vehicle-drawn Flexidome 2 sprayer, with its completely covered atomiser heads, sprays at low volumes with minimal drift to offer safe, lightweight operation and high productivity. The rotary atomiser spray heads are mounted under spring loaded circular shrouds able to rotate freely and flexibly around the stems of young trees, right along the rows being sprayed. This effectively kills all the weeds particularly those directly under the trees.

The rotary atomiser sprayheads are mounted underneath soft plastic domes that form a complete cover, so virtually all spray droplets are contained under and within the shroud. Use of covered sprayheads opens a much wider window of spray application opportunity, by maximising the number of days on which spraying can be carried out accurately, safely and efficiently.

A combination of low volume application spray heads and the high capacity (200 l) spray tank fitted as standard offers high work rates, allowing operators to cover up to three times the area currently achieved with standard spray rigs. System wash and hand wash tanks are fitted as standard.

The Flexidome 2 is already being used by



In the spraying of small young trees, the Flexidome 2 travels along and over one tree line (row) treating weed growth along two inter-rows in one pass. Weed control is simultaneous around trees in 'centre' row and along each side of the two adjacent tree lines, effectively spraying two complete rows at one pass.

Nicky Cotter owner of Mid Western Forestry Services Ltd based in County Limerick, one of many companies in Ireland contracted to maintain newly planted areas right through tree establishment and development. Contracts run for an initial four period, during which time weed management and control is clearly a key and essential task. Follow-up contracts then cover the well-established young trees for another period, to give a total maintenance time scale of some twenty years.

Mid-western forestry services ranks in the top four or five contractors by size and currently maintains 1000 ha mostly in the Counties of Limerick, Kerry, Cork and Clare. Weed control is provided using a tractor-drawn Flexidome 2 sprayer [re-mounted on an all-terrain vehicle (ATV) Quad bike for difficult terrain] fitted with three spraydomes on each side of the rig. This allows the operator a high degree of flexibility in spray run mode depending on the age and size of trees and width of the inter-row.

For instance Nicky Cotter, now spraying small young trees, travels along and over one tree line (row) treating weed growth along two inter-rows in one pass. Weed control is simultaneously achieved around the trees in this 'centre' row and along each side of the two adjacent tree lines, effectively spraying two complete rows at one pass.

An alternative option most likely to be adopted in the United Kingdom is to spray along the tree line as described, but with the centrally positioned spray head in each trio of spraydomes switched off. Thus herbicide will be sprayed around the trees but not across the inter-rows.

Nicky Cotter also uses Micron's Enviromist 'Spraymiser' a light compact

machine with universal fittings available for attachment to all ATV's and tractor tool bar or three-point linkage. The 'Spraymiser' provides inter-row weed control at low volumes using a vertically mounted, controlled droplet application (CDA) spray head that incorporates a re-circulation system.

The 'Spraymiser' is equipped to cope with the lay out and design of for-

est plantations. For instance, using a pivot located behind the driver the 'Spraymiser' can be raised up through 180 degrees behind his head. This adjustment ensures ample and safe clearance at the end of tree lines where there is typically no 'headland', unlike in arable farming, for easy manoeuvrability. In addition, the pivot operated lifting facility allows the operator to traverse ditches and drains without 'dumping' the sprayer.

A wide variety of trees are being planted on these 'farm forest' developments in the Republic of Ireland, including common beech, native white oaks and conifers like Scots Pine - usually in alternating rows of broad-leaved deciduous and coniferous species.

Over Europe as a whole The Republic of Ireland has the lowest percentage of forested land, with the United Kingdom not far behind. Current initiatives aimed at redressing the imbalance offer incentives for planting trees on ex-agricultural land, both arable and pasture.

However, such plantings typically run into severe weed problems. Trees generally respond well to the fertile and friable agricultural soils but so do the weeds and they are generally ready and waiting in abundance as large weed seed banks, built up in the soil - often over many years - when the land was in agricultural production.

## CONTACT

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# Europe's largest solar panel array constructed

Manchester is to get Europe's largest vertical array of solar panels, designed to convert daylight into electricity.

It has been confirmed that three sides of the landmark CIS service tower, the city's tallest building, will be clad with photovoltaic panels which will create 180,000 units of renewable electricity each year - enough energy to make nine million cups of tea.

The ambitious £5.5m solar project, the largest ever in the UK, is being supported by a £885,000 grant from the Northwest Regional Development Agency (NWDA) and a £175,000 grant from the Department of Trade & Industry.

It is expected that the 122 m high array of dark blue solar panels which will work regardless of the weather, will stand out on the Manchester skyline and may even become a tourist attraction. Work will commence shortly and it is expected to be complete by the end of 2005.

Mervyn Pedelty, Chief Executive of Co-operative Financial Services (CFS) which was formed to bring the CIS and The Co-operative Bank together, said: "This is a landmark development, in every sense of the phrase. For Manchester, the UK and for the whole of Europe it demonstrates that solar panels are viable almost anywhere.

"The Grade II listed CIS building is

already a landmark, being the tallest office building outside London, but it is now more than 40 years old and the small mosaic tiles that clad the service tower of the building need replacing. These solar panels are the ideal solution. They will protect the tower from the elements, enhance its appearance and generate significant amounts of renewable energy.

"CFS has never shied away from the greatest environmental problem facing mankind today - climate change. All our mortgages are climate-friendly and for some time we have been one of the largest purchasers of green electricity in Europe. Now we are embarking on renewables generation."

Bryan Gray, Chair of the NWDA said: "We are delighted to be supporting this high profile project which typifies how innovative and forward looking this region is.

"Forty per cent of Europe's energy use is associated with buildings but old building stock is renewed at only two per cent per annum. Therefore, renewable energy and energy efficient solutions for existing buildings will be key to delivering national and regional targets in this area.

"As climate change moves up the political agenda, the North West is yet again shining a beacon and leading the way for the rest

of the UK."

UK Energy Minister, Mike O'Brien said: "This solar installation on Manchester's tallest building will demonstrate in the most visible way just how important renewable energy is becoming in our every day lives. It is proof of its growing appeal throughout the country. The growth and development of the solar power industry will help take us a step closer to achieving our renewable energy target of 10% of electricity by 2010, and to tackling the threat posed by climate change.

"The ultimate potential that solar offers, even in our climate, is substantial. It is therefore important to maintain a position whereby the UK can take advantage of the technology as the market develops. To that end, the Government has committed over £40 million to supporting solar projects such as this one and many others throughout the UK."

## CONTACT

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## WATER

# Reuse of water aids cash strapped farmers

Cash strapped farmers could slash their water bills thanks to a new system that will help them store and reuse rainwater.

The system simply diverts rain from guttering and downpipes to a specially created lagoon, where it is stored until needed.

Ken Bray from Cambridge-based DRC Polymers, which

manufactures the high-tech material used in the lagoons, believes the system will save farmers a lot of money:

"Barns and out buildings mean that most farms have a massive surface area of roofs. Rain that falls on these roofs normally just goes to ground and is wasted.

"By diverting and storing this

rain, farmers can make huge savings. Lagoons can be any size the farmer wants, from a few square metres to half a football pitch.

"The product pays for itself very quickly and we're confident that it will be a feature of most farms in the future."

## CONTACT

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## COMBINE HARVESTERS

# Presence expanding in the European combine harvester market

Massey Ferguson's combine harvester line-up gains two extra ranges with the launch of the MF 7200 Activa and MF 7200 Beta.

Anybody who thought that Massey Ferguson's relentless relaunch of its entire product range was limited to MF tractors only should think again. Massey Ferguson has just launched two new ranges of combine harvesters to add to its CEREAL range. Recently AGCO announced the creation of two new Global Centres of Engineering Excellence for Harvesting, one for conventional and one for rotary combine harvesters. Declan Hayden, Massey Ferguson's Vice President of Marketing for Europe, Africa and Middle East said, "Massey Ferguson produces over 3,500 combine harvesters per annum globally and is a major player in the harvesting business around the world. Within Europe we are planning to use that experience, particularly of tough and marginal harvesting conditions, to continue to develop our combine harvester range and gain an increasing share of the market". By launching the entry level MF 7200 Activa and mid range MF 7200 Beta machines, Massey Ferguson has provided perfect partners for the high capacity CEREAL combine harvester range. In doing so these new models, designed specifically to



MF 7200 Activa, one of two new combine harvesters added to Massey Ferguson's CEREAL range

operate in European conditions, ensure that Massey Ferguson's combine harvester range encompasses machines to cater for the demands of all growers - whatever the acreage or crop they are harvesting.

## MF Activa and MF Beta Power

The MF Activa combine harvester range comprises three models. All are powered by the latest generation 5.8 l Iveco engines with the MF 7244 rated at 165 kW, the MF 7245 at 191 kW and the MF 7246 at 191 kW.

The MF Beta range of combine harvesters has two models - the MF 7260 and the MF 7270. Both are powered by electronically managed Sisu engines with the MF 7260 having a 7.4 l 206 kW engine and the MF 7270 an 8.4 l rated at 229 kW.

## Smooth cutting, positive feed

The combine harvesters are provided with a cutting table designed to handle a wide range of crops ensuring that the flow of crop to the threshing system is smooth and constant. The table is constructed on a strong welded frame to give a rigid backbone. The crop is cut by a high performance, self-

cleaning Schumacher knife and gearbox with the cut crop feeding to a large diameter table auger having feathering fingers along its entire length. This important feature ensures the crop feeds positively and evenly into the main crop elevator. All major table functions are controlled from the main hydro lever in the cab. To further optimise performance an automatic table cutting height control system is standard on all models.

For farmers working on sloping ground an Autolevel system which allows the table to follow changes in contour of up to 8% provides a real boost to harvesting efficiency. Autolevel tables are optional for MF Activa and standard for MF Beta combine harvesters.

## Powerfeed Roller

At the base of the elevator, exclusive to MF Beta combines, is the Powerfeed Roller which provides a constant crop flow between the table and the main crop elevator. This smoother, full width feed results in a more even crop flow into the threshing system with the result that less power is required and threshing is improved overall.

## Heavy duty threshing

With the crop on board, the heavy duty, Hi-Inertia cylinder and concave is designed to thresh a wide variety of crops. To optimise the balance between threshing ability and grain flow, the concave is constructed with differential wire spacing - the rear section has half the number of wires of the front. A neat feature of the concave is the ability to adjust the front and rear concave clearance independently - not just a front clearance adjustment.

This feature enables the operator to adjust the front and rear concave clearances individually to obtain maximum threshing capability in all conditions, for example dry conditions in the middle of the day.

## Extra concave wrap

Positioned at the rear of the main concave on MF Activa is the Active Beater Concave which provides an extra 14% of concave wrap and improves threshing efficiency as a result. The Active Beater Concave also has another key role - it controls the straw flow onto the walkers and can be adjusted to improve the separation on the straw walkers should the straw be long or short, damp or dry.

### Rotary separator

MF Beta combine harvesters also benefit from a rotary separator with an adjustable concave, the speed of which is reduced simply by changing a belt and pulley.

A unique feature is an ability to rotate the rotary separator concave up over the top of the rotary separator when it is not required. The rotary separator's drum, void of the concave, now becomes an additional rear beater.

With this facility, the operator has even greater flexibility to optimise combine harvester performance in dry conditions

### Straw walkers with 'active walls'

The two smaller MF Activa models have five straw walkers and the range topping MF Activa 7246 has six. MF Beta 7260 and MF Beta 7270 combine harvesters have five and six straw walkers respectively.

Each walker has four steps with the vertical sections - the walls - are constructed from punched grids, like the horizontal grids. This design means that the walker walls also provide a separation area - hence the term 'active walls', and an extra separation area as a result.

The front steps of the walkers

are made from thicker metal to deal with the initial weight of the straw flowing from the concave, and all walkers have a closed bottom design.

Clearly a well thought out design, the straw walkers also benefit from being 'hot dip' galvanised to provide added durability.

A further example of clever design is the construction of the grain pan which has high divisions running from front to back. These minimise grain movement across the pan when harvesting sloping fields.

The cleaning air for the combine harvesters' high performance sieves is supplied by a full-width fan which can be adjusted electrically for different crop types. Returns are fed back to the main threshing drum.

### High capacity grain tanks

Grain tank capacity for the MF Activa and MF Beta combine harvesters extend from 7000 l to 9000 l depending on model and unloading rates of up to 105 l/s, very little time is taken out from harvesting.

The tanks have a turret-type unloading auger which provides the height and reach to fill all trailers and a two stage grain level alarm ensures that grain tanks are not allowed to over-

flow.

And to help ensure working life is maximised with the minimum of down time, all augers and the caps of the main grain elevator have 'Hardox' hardening.

### Serrated knives chop the straw

All knives in the straw chopper are serrated to provide a clean efficient chop of crop residues as they leave the combine harvester.

Chopping is enhanced even further by use of a fully adjustable shearbar, stationary knives and straw chopper hood. This allows complete control over the chopping process, ensuring that both the chop and spread of the straw is of a constantly high standard.

A chaff spreader is available as an option for all models on both ranges.

### Operator comfort

Both the MF Activa and MF Beta range are fitted with a cab offering levels of comfort that should ensure a stress free working day. Included in the Activa XL cab's specification is air conditioning, electrically adjusted heated mirrors, deluxe suspended seat, heating and fully adjustable steering column.

MF Beta operators, in their XLR

cab also enjoy an excellent working environment but have the added bonus of an on board fridge, air suspended seat, and all controls mounted on the arm-rest.

Operating controls are positioned conveniently to the right hand side and arranged in a neat user friendly format that sees the most used controls coming easily to hand.

For the MF Activa, the Agritronic monitor and right hand console monitor provide all the information required during the day's work - drum speed, concave clearance, engine management details, to name but a few.

The MF Beta combine harvesters have Agritronicplus to provide the entire combine harvester's monitoring and performance information. All located in an easy to read console mounted on the cab ceiling.

### CONTACT

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### HEDGE TRIMMERS

## New Ferri hedge-cutter gets up close

A new Ferri hedge-cutter shown by Rustons Engineering at LAMMA, includes a number of completely new design features for sages and more efficient operation.

The TM46 model has a rear cranked second arm which gives a number of benefits. When cutting the sides of hedges, for example, the tractor can operate right against the hedge without the need for orbiter brackets on narrow lanes.

The special geometry also

allows verge mowing behind the nearside tractor wheel, giving safer operation and folds close to the rear of the tractor for transport, eliminating the risk of fouling the rear tyres or the cab.

The machine incorporates all the latest Ferri design features including drop-forged hinge points between arms, drop-forged ram mounts and drop-forged head mounting elements - all giving greater strength with less weight.

The TM46 is fitted with a

1.2 m flail head and a 34 kW high performance hydraulic motor.



### CONTACT

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## RECYCLING

## Recycled plastic products advantageous for Fusion Marine

Environmentally friendly, versatile and suitable for a wide variety of uses, Fusion Marine has diversified its manufacturing capability to provide a range of recycled plastic products for a variety of outdoor and indoor applications.

Fusion Marine is now a specialist in a wide range of bespoke recycled plastic materials. These can be used to manufacture walkways, fences, bridges, way marking posts and other traditionally wooden structures that can be used by the agricultural industry, parks, nature reserves and other recreational users.

The range offered by Fusion Marine, a well-established and leading manufacturer of plastic equipment, can also be used in the marine environment, including mooring

**Pontoon made from recycled plastic; just one of a range of recycled plastic products now offered by Fusion Marine**



pontoons, jetties and other features.

"The sheer durability and long-life of these recycled plastic products makes them much more cost-effective in the long term, than wooden alternatives," states Alan Macleod, Fusion Marine's technical director.

"Not only are recycled plastic products tougher and better value but they are also

helping the environment too," he says.

Available in a range of colours, all products can be manufactured and supplied to meet customer requirements. Fusion Marine use Holloplas recycled plastic supplied by Centrforce, the UK's leading recycled plastic extruders.

Advantages of using recycled plastic include its lightness, durability, resistance to chemicals and ease of cleaning. Recycled plastic is low-maintenance, rot proof and can come in a variety of surface textures.

## CONTACT

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## CROP SPRAYERS

## High quality spray balls now in UK

A leading range of high performance spray balls is now available, for the first time in the UK, from BETE Ltd. Established in 1950, BETE has been acknowledged as a pioneer and market-leading developer of specialised spray nozzles for a wide range of sectors, particularly industrial, pollution control and fire protection applications. The devices offer a cost-effective and efficient solution for Clean In Place (CIP) applications and are perfectly suited to a wide variety of sectors including the wine, brewing, distilling, chemical, pharmaceutical, biotech, cosmetic, food, beverage and dairy industries.



**A range of high performance spray balls are now available in the UK, direct from Bete Ltd.**

Designed to meet the strictest hygiene standards,

BETE's spray balls are constructed in 316 stainless steel and contain no moving parts. Delivering a constant and consistent rinsing action, the high quality range features precision drilled spray holes from 1.3 to 2.5 mm in diameter - in a number of configurations - for either upward, downward, or 360° spray coverage.

The hard-wearing sprayers are resistant to a wide range of chemicals and cleaning fluids, either hot or cold, and operate effectively up to a maximum temperature of 430°C. Device widths range from 28 to 120 mm, with clip-on inlet connections available from 22 to 60.3 mm and threaded connections

in standard imperial sizes of 1/4" to 1 1/4" BSP. With flow rates from 1.2 to 29.8 m<sup>3</sup>/h and an operating pressure range of 1 to 3 bar, BETE spray balls weigh between 20 and 540 grams, can be installed at any angle and deliver a throw radius of 1 to 6.4 m at a pressure of 1 bar.

## CONTACT

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# Expanding population accelerates gen-set markets growth in Middle East and Africa

Sluggish gen-set sales in Europe are motivating companies to focus their attention on the Middle East and Africa markets. The gen-set market in this region is demonstrating substantial growth as it evolves from a developmental stage to one of relative maturity.

Resurgent economies in the Middle East and Africa are set to create opportunities for gen-sets in stand-by applications. In addition, electricity demand is also set to rise, creating opportunities for units in the peaking and base load segments.

"At the same time, rapidly expanding populations, particularly in major countries such as the United Arab Emirates, Saudi Arabia, and Nigeria, combined with an anticipated increased energy need per head of population are poised to increase demand for sets in all the applications; base load, peak, and standby," says Frost & Sullivan ([www.energyfrost.com](http://www.energyfrost.com)) Industry Analyst, Colin O'Hanlon.

The burgeoning global demand for oil and minerals is prompting increased investment in mining and in oil and gas extraction facilities in the Middle East and Africa. While this development is set to positively impact on the uptake of gen-sets, the general price volatility of commodity markets is likely to leave gen-set manufacturers vulnerable to any downturns in product prices.

Supported by these trends, the gen-set market in the Middle East and Africa which

was estimated to be at \$851.8 million in 2003, is forecast to amass an impressive \$1,120.2 million in 2010.

Fuelled by hectic reconstruction activity, Iraq emerged as the largest market in the region during 2003, with Iraq, Iran, Kuwait and the United Arab Emirates also exhibiting significant demand. Recovering from its recent financial crisis, Turkey, helped by strong infrastructure investment, is set to emerge as the second largest market at the end of the decade.

With just 10 per cent of the regions population having access to electricity and containing several countries that control immense and as yet under-exploited domestic reserves of minerals, oil and gas, Africa offers exciting prospects for gen-set manufacturers. So far, however, market development has been subdued. Overall, Nigeria, driven by its significant oil and gas sector, is expected to account for the largest share of revenues in the overall market in 2010.

Increasing investment in mobile telecom infrastructure, particularly in Saudi Arabia, Iran and various African countries, is likely to open several opportunities for small base load sets, in the 10 to 100 kVA power range used in base stations. While growth in the mining sector is expected to create opportunities in the 100 to 500 kVA size range - particularly in the short-term - the construction sector is expected to provide significant opportunities for sales of sets

up to around 800 kVA.

Demand from Iraq boosted the 1000 to 2500 kVA segment in 2003.

Rapid service sector development in the Middle East has underpinned sales of sets to the commercial segment. Similarly, expansion of the industrial segment in Africa has boosted opportunities for sales of units to industrial end users. Demand from the public and infrastructure segment has been supported by military and utility users as well as by sales of units installed in public buildings and hospitals.

"While the base load market is expected to receive a short-term boost due to demand from Iraq, over the long term, the base load/ prime power market is likely to be under mounting pressure from a more stringent emissions legislation, the development of the gas engine market and improving reliability of the electricity grid," remarks Colin O'Hanlon says. "In the meantime, the development of the service sector in the region is projected to increase the opportunities for sales of stand-by gen-sets to hotels, offices and conference venues."

While FG Wilson is the leading supplier in Africa and Caterpillar dominates the Middle East, they both have significant shares in each other's main markets. In addition, both companies have benefited from the upsurge in orders from Iraq and are supplying a high volume of sets there. Sakr, which put in an outstanding performance in 2003, was positioned as the

third largest supplier of gen-sets in the region in terms of revenue.

Apart from major western companies, there are also several key domestic manufacturers as well as a number of other Europe-based participants looking to increase their presence in the region.

Emphasising the value of nurturing robust local distribution and supply networks, Colin O'Hanlon says, "Strong local links where distributors or partners sell, install and service units incorporating local knowledge and have a sound reputation represents the ideal situation which is vital for repeat business. Local component supply is also essential to maintain competitive margins."

If you are interested in a summary of this research service providing an introduction to the Middle East and Africa gen-set Markets, please send an email to Magdalena Oberland, Corporate Communications at [magdalena.oberland@frost.com](mailto:magdalena.oberland@frost.com).

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# RASE MACHINERY AWARDS

## 2005

### Overview

Outstanding reliability in an ingenious two-in-one baler and wrapper combination has earned McHale Engineering the top machinery award at this year's Royal Show (see *Inside Back Cover*). The prestigious Royal Agricultural Society of England's (RASE) Gold Medal took pride of place for the Irish manufacturer in the machinery area at the show which took place in early July at Stoneleigh Park, Warwickshire.

The RASE Machinery Awards are unique in that they are based on a rigorous examination of the performance of the machines in the hands of commercial users. These judges, primarily farmers and contractors, had chosen the McHale for the economy of the combined operation, the compact dimensions of the machine, its ability to work well on sloping land, high output, and the reputation of the Company.

"The reliability of the machine was outstanding, lubrication time minimal, and the service and attention from McHale was of the highest order," is the verdict from the judging panel.

Nine manufacturers were awarded Silver Medals for innovations that have outstanding advantages for the user. These ranged from a high-output rear-discharge manure spreader to a knife on a cylinder mower for the amenity sector that takes minutes to replace.

The Burke Trophy, for sustained and substantial contribution in a particular sector of the machinery industry was awarded to McConnell (see *Inside Back Cover*). The Shropshire-based manufacturer received the senior machinery award at a special dinner on the Monday evening at the Royal showground. The judges considered that McConnell show consistent engineering excellence, innovation, and close attention to the needs of their customers across the agricultural and allied industries which made them outstanding winners of the 2005 award.

"Visitors to the show saw a truly prestigious line-up of the very best of agricultural machinery," comments Royal Show event presenter Jimmy Birchmore. "The awards stand has become a central attraction in the machinery area and the stand is staffed by well-qualified

engineers, throughout the Show period.

"An RASE Gold or Silver Medal brings a manufacturer well-earned esteem throughout the industry, since it is the only set of awards based on the experiences of those that use the machines.

### Awards Scheme

Collectively the Machinery Awards Scheme, the New Equipment Awards and the Sir Roland Burke Perpetual Challenge Machinery Trophy demonstrate the Society's support for innovation, technical excellence, proven reliability and its long-standing commitment to the machinery and equipment sector.

Innovative and reliable machinery is essential to farm profitability. The Machinery Award Scheme is unique, being based on a rigorous examination of the performance of machines in the hands of commercial users.

Machine users across the country are visited and interviewed to assess the performance of the equipment in a variety of working situations. While efficiency and effectiveness are of paramount impor-

tance, judges also report on the economic value of the equipment, durability, availability and cost of spares, the support provided by the supplier, and safety aspects.

Award of Merit - signifies that a machine or item of equipment has been found to be effective and reliable by users in terms of its performance and function, and that it should be included by a potential buyer in a list of possible purchases.

Silver Medal - implies similar assurances but additionally that the product has important new features, outstanding advantages for the user and is a major item of equipment.

Gold Medal - may be awarded at the discretion of the Society to replace a Silver award for an item that is clearly outstanding in terms of innovation, technical achievement and potential service to the industry.

Entries meeting the criteria for a Silver Medal may also be awarded the Grower Award for a machine of particular significance for the horticultural industry.

## SILVER MEDAL

### Restrain Co Ltd - Restrain ethylene generator

The use of ethylene for sprout control in stored potatoes has been documented since 1934. Ethylene is produced naturally by all plant tissue, and at the 10 ppm concentration required for sprout control in potatoes it is entirely non-toxic and there is no risk of fire or explosion. On removal of the crop, there are no residues left in the crop, boxes or store and the gas has no adverse effect on the store fabric or structure.

The Restrain Generator, based on a heated catalyst, produces ethylene by converting liquid Restrain Fuel into ethylene and water vapour. The integral fuel tank holds enough for typically 2-3 weeks operation. The Restrain sensor measures concentration in the store, and the signal is used to control generator output. The system is fully automatic and will run for many months without the need for maintenance other than the provision of fuel. Ethylene concentration, storage room temperature,

and all operational data and alarm incidents are automatically recorded for laptop or network display.

The machine is leased to the user, with an additional charge per tonne of product treated. Cost of operation is related to the integrity and gas-tightness of the store structure, with any leakage adding to the fuel bill.

Users consulted found the system simple, safe, automatic and highly reliable. Sprout control is excellent, there are no residues, the problem of contaminated washings from traditional chemical treatments is avoided, and the sample is brighter than after alternative treatments. Cost of treatment was said to be the same. The only failures recorded were of a few sensors which were immediately replaced by Restrain. Technical support was in all cases excellent. All the users contacted were selling to the major supermarkets.

#### MORE INFORMATION

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## SILVER MEDAL

### Harry West (Prees) - limited rear discharge spreader

The Rear Discharge Spreader is a very substantial, nominal 10 tonne (8.70 m<sup>3</sup> level capacity) manure spreader with twin rear vertical beaters. The hydraulically driven twin bed chains are individually adjustable with speed and reversing facility controlled from the tractor cab. The 400 rpm beaters

have reversible and replaceable blades, and counter-rotate towards the spring loaded sides of the spreader to allow foreign objects to be safely discharged. The spreader has large diameter wheels for low ground pressure and is equipped as standard for road use with hydraulic brakes, hand

brake and lighting.

Users, mainly contractors, were discharging full loads in about 3 minutes and moving up to 300 tonnes of manure in an 8 hour day. They were handling mainly straw manure, but also sewage sludge, beet factory lime, and compost. The evenness of spread over the 12 m width was described as 'fantastic', making it an important spreader for grassland applications, and the outward rotation of the beaters to discharge bricks and other undesirable objects without damage to the machine was a winning feature. Harry West staff were widely praised for their personal service and friendly approach.

#### MORE INFORMATION

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## SILVER MEDAL

## Simba International Ltd - Simba-Horsch CO drill

The CO drill is a high output, comparatively light, compact system drill which requires relatively low power per metre of width, mainly by virtue of its reduced number of ground-contacting parts. The key feature of the drill is the 'Duett' coulter. These are set at 250 mm spacing and effectively replace two conventional drill coulters. The seed is spread in a broad band to cover up to 80% of the seedbed. This has significant benefits because the seeds are more evenly spaced and bunching is reduced. Each plant has more room to develop and



tiller, makes better use of light, nutrients and moisture, and the crop is able to shade out weed competition more effectively. The wide spacing between coulters reduces blockages and improves drilling performance in the presence of trash. The drill is available in 3 m to 12 m widths, with seed hopper capacity up to 7000 litres.

Control from the cab is by 'DrillManager' which deals with all settings such as seed rate, speed, and tramline sequences.

Users consulted had drilled thousands of hectares with the CO drill, using 4 m, 6 m, and 8 m versions. The drill had been used widely on minimum tillage, but also after conventional tillage and as a direct drill, and had sown most combinable crops including cereals, rape and beans. Seed placement and the band sowing was widely praised for the crop produced and for the opportunity to reduce sowing rates.

'DrillManager' was an outstanding success, as was the trash-handling of the 'Duett' coulters. Construction and finish of the drill and support from Simba were highly rated. Tractor requirement confirmed the manufacturer's estimate of 26 kW for each metre of drill width, and daily output for the 8 m size was up to 60 hectares.

## CONTACT

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## SILVER MEDAL

## ACNH UK - New Holland TS-A tractors:TSI100A,TSI110A,TSI115A,TSI25A,TSI35A

The TS-A tractor range is made up of 5 models covering the 75-100 kW sector. This power range has to cater for every kind of farm – stock, mixed and arable, which the TS-A does by offering a wide choice of specifications and prices. The TSI100A and TSI115A use conventionally fuelled engines, while the TSI110A, 125A and 135A use 4 valve and common rail technology.

The three models with electronically controlled engines deliver exceptional levels of extra 'managed power' for PTO and road work (up to 20 kW). Advances in transmission control come with Intellishift, a reactive system that monitors the speeds of each half of the clutch packs to ensure the smoothest shift under high load or low load. Active Electro Command takes the four speed powershift concept forwards by



automating range shifts, removing the need for manual lever changes. The Horizon cab delivers extreme comfort and visibility, with the pillars obscuring just 26 degrees of

vision. Then there is the ultimate in convenience with the 'Ultra' specification with 4 electro remote valves and a Headland Turn Sequencer.

Clearly the users that the

judges were able to visit could not cover all versions and variations of this tractor. The comments included superb visibility, very easy access for servicing, and an outstandingly logical cab layout. Managed power was a feature greatly valued. The overall view of some very experienced and knowledgeable users was that this tractor represents a real step forward in tractor performance, driver comfort and in-cab support, versatility, and range of options available to the customer.

## CONTACT

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## William Taylor Agricultural Equipment - Livestock Controller

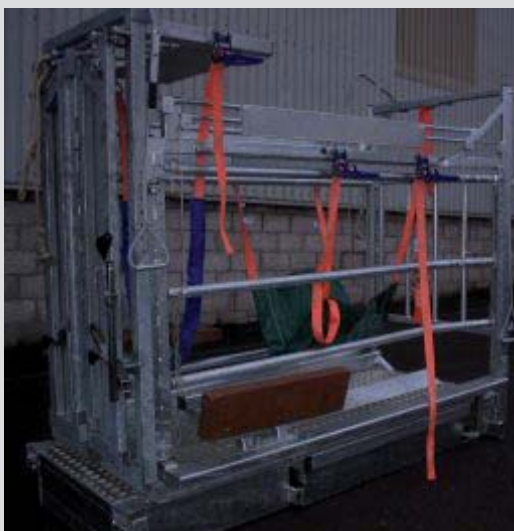
The CO drill is a high output, comparatively light, compact system drill which requires relatively low power per metre of width, mainly by virtue of its reduced number of ground-

contacting parts. The key feature of the drill is the 'Duett' coulter. These are set at 250 mm spacing and effectively replace two conventional drill coulters. The seed is spread in a broad band to cover up to 80% of the

seedbed. This has significant benefits because the seeds are more evenly spaced and bunching is reduced. Each plant has more room to develop and tiller, makes better use of light, nutrients and moisture, and the crop is able to shade out weed competition more effectively. The wide spacing between coulters reduces blockages and improves drilling performance in the presence of trash. The drill is available in 3 m to 12 m widths, with seed hopper capacity up to 7000 litres. Control from the cab is by 'DrillManager' which deals with all settings such as seed rate, speed, and tramline sequences.

Users consulted had drilled thousands of hectares with the CO drill, using 4 m, 6 m, and 8 m versions. The drill had been used widely on

minimum tillage, but also after conventional tillage and as a direct drill, and had sown most combinable crops including cereals, rape and beans. Seed placement and the band



sowing was widely praised for the crop produced and for the opportunity to reduce sowing rates. 'DrillManager' was an outstanding success, as was the trash-handling of the 'Duett' coulters. Construction and finish of the drill and support from Simba were highly rated. Tractor requirement confirmed the manufacturer's estimate of 26 kW for each metre of drill width, and daily output for the 8 m size was up to 60 hectares.

### CONTACT

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## Bomford Turner Ltd – Buzzard hedge and verge cutter



The Buzzard is a substantial hedge and verge cutter designed for the contractor market. The construction is rugged, but the basic weight is only 1850 kg, which widens the range of suitable operating tractor sizes. It is offered in 6.5 m, 7.25 m and 8 m reach options, and features a telescopic arm with externally adjustable wear pads for smooth operation and longevity. Both 1.2 m and 1.5 m cutting heads are available with a choice of 6 flail types. A gear-driven pump providing 48 kW is standard, with an optional piston pump with a load sensor offering an additional 25% power. The standard oil cooler is fitted with an advanced load sensing valve to ensure optimum operating temperatures under the most severe conditions.

The Buzzard has an advanced 'Intelligent Control System' (ICS) fitted as standard to give the operator fully proportional control of the first and second arm movement, head float, arm float, telescopic arm and the forward reach arm where that

is fitted as an option.

The users we interviewed were contractors giving the machine very heavy usage. For example, one Norfolk contractor had used it for 2500 hours in just over a year. Much of the work was on several thousand kilometres of road verges at speeds of up to 12 km/h. Profitability depended largely on speed of operation and freedom from breakdowns, and the Buzzard scored very highly on both counts. The Intelligent Control System was in every case said to be a pleasure to use, and contractors found that they could work very long hours without undue stress. Technical support, where it was needed, was excellent from Bomford and the dealers.

### CONTACT

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## SILVER MEDAL



## Amazone Ltd – ZA-M Ultra Profis spreader

The ZA-M Ultra Profis is a high performance twin-disc spreader with a spread width up to 48 m with granular fertiliser and 36 m with urea. Maximum hopper capacity is 3600 litres or about 4000 kg. The new OM 24-48 discs are at the heart of this machine. A combination of slow disc speed and long blade length protects the fertiliser from shattering yet it gives huge overlap zones to ensure an accurate spread pattern. In cab, the Amatron+ on-board computer controls the application rate to the forward speed, with the weigh cell technology designed to alter the calibration settings 'on the move' as the fertiliser flow characteristics change. Global positioning system (GPS) compatibility is provided for site-specific fertiliser application.

Users were covering more than 1200 hectares a season with each ZA-M seen. All were highly satisfied with the

accuracy of spread, and particularly with the 'ECO' and side-spreading hydraulic engagement from the tractor seat. All those seen had the large 3600 litre hopper and the weigh-cell addition. Daily coverage was up to 150 ha. The construction of the machine, with the extensive use of stainless steel, was thought to be excellent. Support from Amazone, particularly on calibrations for particular fertilisers, was outstandingly good.

### CONTACT

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## SILVER MEDAL



## Ransomes Jacobsen Ltd – MagKnife

MagKnife is a magnetic bottom blade attachment for commercial mowers. Ever since the invention of the lawnmower the bottom blade has been held in place by screws. MagKnife uses powerful magnets together with dowels to accurately and securely position the bottom blade. Without screws to remove and insert the time required to replace a set of worn or damaged blades is reduced from hours to minutes. The unique feature of the system is the strength of the magnets which exert a force of 180 N across the bottom blade, yet only minimal force is required to break the hold using a special removal tool. Benefits in addition to the time saving include the possible use of thinner bottom blades for closer cutting, no bottom blade truing is required, and the magnetic attachment allows sufficient 'give' for foreign bodies to pass between the cylinder and the

bottom blade without damage.

Users consulted confirmed the time saving on blade changes (down from 2 hours to 30 minutes for 3 blades) and the advantage of the reduced down-time at busy periods. Actual removal of a blade was taking around 5 seconds. They also took advantage of the quick-change to fit older blades for rough jobs such as mowing after fertiliser top-dressing. Users said that they would have the MagKnife on all new mowers.

### CONTACT

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## CHALLENGE TROPHY

### Sir Roland Burke Perpetual Challenge Machinery Trophy 2005 McConnell Ltd for vegetation control equipment

The Burke Trophy, the senior machinery award of the Royal Agricultural Society, is for a sustained and substantial contribution in a particular sector of the machinery industry. The judges considered that the long-term record of McConnell in vegetation control machinery, showing consistent engineering excellence, innovation and close attention to the needs of their customers across the agricultural and allied industries, made them outstanding winners of the 2005 award.



McConnell Ltd were founded in 1935. Major products include hedge and verge trimmers which have won

RASE Silver Medals as well as awards at the Royal Welsh Show and SIMA - Paris' agricultural machinery show - in recent

years. They also produce flex-wing mowers and have in the past pioneered cultivation equipment such as the widely used Shakeaerator.

They serve, as well as the agricultural industry, local authorities and the turf-care, environment and horse racing industries.

They employ 120 people and are part of the ALAMO Group.

#### CONTACT

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## GOLD MEDAL

### McHale Engineering - combined baler and wrapper

The Fusion is a compact, high output, combined baler and wrapper. A key feature is the horizontally split bale chamber, with the baler rollers effecting the transfer to the wrapper and eliminating the need for a separate transfer mechanism. The result is a

shorter and compact unit, very quick transfer, and a high output system. Fully automatic operation and baling can continue during the wrapping cycle. The twin wrap dispensers rotate about the bale in a vertical plane which allows the wrapping rollers to be sited

very close to the baler with a reduction in wrap usage. The single-axle machine has wide low ground pressure tyres to minimise soil damage, and produces a high output of wrapped bales with one tractor and driver.

Users consulted had chosen the McHale for the economy of the combined operation, the compact dimensions of the machine, its ability to work well on sloping land, high output, and the reputation of the Company. Increases in output were put at 20%-50% over previous equipment, with outputs up to 60 bales an hour. Material baled was mostly grass, but included straw and even lupins, triticale and whole-crop peas. The reliability of the machine was outstanding, lubrication time minimal, and the service and attention from McHale was of the highest order.



The RASE Gold Medal was presented to Managing Director Padraic McHale by RASE President, the Rt Rev. Dr Anthony Russell, Bishop of Ely. Mr McHale was accompanied by his wife Martina and the McHale R&D team.

#### CONTACT

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