Agriculture • Horticulture • Forestry • Environment • Amenity

LANDWARDS

Late Spring 2004

- Tractor Design
- Wheel Hoes

Sugarcane Cutter-planter

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Making progress 2002-04

When I gave my Presidential Address in 2002, I stressed that all I could offer was Experience, Energy and a wide range of Professional Contacts.

Current strategy

My simple strategy to help move this Institution forwards had three elements:
1. student membership
2. eminent membership
3. raising the profile of the Institution.

So near the end of my term of office, I feel it is important to report back on the deliverables.

1. *Student membership*

For several years, I had been concerned about our lack of involvement with agricultural engineering students as an Institution at all levels and also how few of the College engineering lecturers were members of this Institution. We seemed to have only about 15 student members and, without young members, no Institution has a future.

Thanks to the support of The Douglas Bomford Trust and the staff at 14 Colleges, we now have about 500 student members. I am particularly pleased that each of the colleges has asked me to repeat my recruitment drive next year and that the staff at two of these colleges have taken ownership of the scheme for recruiting their own students. At the simplest level, this is possibly 500 young engineers who might not have known that we exist if this action had not been taken. From these College visits, four engineering lecturers have been recruited as members and five current members at these colleges have been mentored through to IEng and CEng.

In support of the student and young engineer membership, we now have a Mentoring Service launched in Landwards last year and listed on the Institution website. I have been delighted with the support of Council and Executive members prepared to give their time to help this action. It is vital that we retain a high percentage of these students who represent our future. The main demand from them has been for specific mentoring on a one-to-one basis and news via e-mail. For instance, the graduates working for large companies are very keen to obtain Chartered Engineer status. Students will certainly remain members if we offer mentoring and prove that membership is of value to them.

2. *Eminent membership*

I was keen to gain eminent members to help widen our contacts in Agricultural Engineering and raise our profile within organisations.

We now have a group of about 40 eminent members and their involvement has helped to raise our profile and recruit more members. I have used my own contacts to recruit six members of this group.

3. *Raising the profile of the institution*

I have introduced recruitment cards and posters which can be used widely. It is good to see posters up in the Colleges visited.

I have also encouraged the build up of a wide-ranging press database from my PR contacts so that press releases go far and wide. We also invite key press members to our events and this has resulted in more press coverage in the last two years. We have prominent lead speakers at our annual conferences *e.g.* Mary Archer in 2003 and Baroness Young in 2004.

At the start of my Presidency, I had a meeting with Jake Vowles the DG of AEA and one of our members. I received his weekly e-mail notes as a member of staff at Harper Adams University College and found them very useful. He agreed to my request that they could also go via e-mail to our membership. Our members have regularly told us how useful they are. Thank you Jake.

My long term vision is that IAgrE, AEA, Bagma, RDBA and NAAC work much closer together for the benefit of Agricultural Engineering and some progress has been made. For instance, RDBA has agreed to an IAgrE presence on there stand at this year's Royal Show and Royal Welsh Show stands.

Perspectives and outlook

Looking ahead, it is vital that we are more open and willing to recruit more members. It has regularly surprised me when an agricultural engineer has told me that he has never even heard of IAgrE!

I have been asked what have been the worst moments as your President. They have been very few but three are important. On fortunately few occasions, I have been told that membership is of high value to an individual so why should he give away his advantage by recruiting a colleague? How negative can you get?! Part of professionalism is helping other engineers to progress and it is our duty to give help. Just think how many people have helped you to progress in life. Secondly, I totally oppose the attitude that says we will only help you if you first join us. How can an individual see the benefits if this approach is taken? I offer no apology for bluntly opposing these attitudes and encouraging a more positive approach.

In support of my strategy, I have also been concerned about defaulters, members who drift away from us. Last year, I telephoned eight and, out of this group, seven continued their membership with us. Is it possible that we lose members simply because we are not in contact with them? Most of these defaulters had no idea of the full benefits of membership today and, in several cases, even that we have a website. Two were not aware that IAgrE fees are a legitimate tax deductible professional fee and one moving to New Zealand that we have members over there prepared to help his move. I have introduced a clear approach to defaulters and ask all involved to take this aspect seriously. It can only benefit our future.

Each President aims to bring in a supportive strategy to help the Institution long term, and I have agreed to lead the student and mentoring strategy for the next two years.

It has been a very enjoyable time as your President and I have been pleased to watch the total membership go up above two thousand and the average age decline at the same time! As the IAgrE has been of considerable value to me in my career regarding both my health and wealth, it has been a privilege to put something back.

The staff sees a new President every two years and I say a simple thank you for all their patience and assistance. it takes a while for them to bed in a new candidate but they do so with great patience! I would also like to thank Brian Finney and Dick Godwin who as past Presidents have been both supportive and extremely helpful at the planning stage and during my Presidency.

In the past few months I have briefed Peter Redman our incoming President in May 2004 from my experience and now wish him both an enjoyable and a profitable two years.

Dan Mitchell

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Front cover: *Sprayer nozzles (courtesy: Hypro EU Ltd)*

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World-class research to be axed at Silsoe

Silsoe Research Institute (SRI) is under threat following a decision by the Biotechnology and Biological Science Research Council (BBSRC) to withdraw its £4 million strategic grant – a third of the Institute's total annual funding – as from March 2006.

Silsoe, the place, has become synonymous with agricultural engineering innovation and has attracted international respect for its achievements in mechanised food production, not just in research and technology transfer but also in the export of education, training and expertise. That respect comes from those within the land-based industries benefiting from the support provided by the Institute and formerly from the nearby College. In the wider public arena, however, the geographical location of SRI and its acronym provides no clue to its *raison d'être* in agricultural and environmental engineering research. Consequently, its passing will cause scarcely a ripple overtaken by the prospective 40 000 civil service job losses elsewhere.

Perhaps the latest move is the culmination of earlier strategic planning by a previous Chief Scientist to eradicate its engineering identity, and offering future flexibility for the redirection of funds to underpin more sensitive issues of genetically modifying food crops (whether the electorate wants them or not) or an opportunity to recoup outlay on outmoded livestock disease control strategies.

Perhaps we, the agricultural engineers and biosystems engineers, are victims of our own success, for engineers solve problems and transfer the technological solutions to the commercial sector. Our industry has had an enviable track record of trade surpluses until recently. As tractor and machine production moves inexorably eastwards across Continental Europe, to Asia and to the Far East, the balance of trade figures have declined and the intellectual, 'high tech', part of the employment profile is being discarded. For inward investment, much is made of the 'multiplier effect' of increased employment and the income stream cascading through the national economy. Yet, the 'divisor effect' from threatened closure is never mentioned. With creative accounting, it can be presented as governmental savings ready to be reallocated with political agility. It must be purely coincidental that Lord Whitty, Minister at the Department for the Environment, Food and Rural Affairs (Defra), has just announced a £50 million investment "to provide a secure platform for research and development to benefit the UK horticultural industry", following a restructuring of Horticultural Research International (HRI).

Over the past two decades, the clear signal has been given to research organisations to attract a greater proportion of annual funding from external research contracts. Those who failed have already fallen by the wayside. In the late 1980s, the Scottish Institute of Agricultural Engineering (SIAE) was a casualty of the campaign to reduce public expenditure. It was restructured to become the Scottish Centre of Agricultural Engineering (SCAE), a smaller, leaner division within the Scottish Agricultural College, until asset stripping was accomplished, with remaining staff groups and research contracts disguised under an environmental umbrella and buildings redeployed to animal scientists. 'Out, out, brief candle! Life's but a walking shadow, a poor player, that struts and frets its hour upon the stage, and then is heard no more;....'

The researchers at Wrest Park met the challenge of attracting external contracts and commissions. Whilst the location remained the same, the institute identity metamorphosed from the National Institute of Agricultural Engineering (NIAE) through the Institute for Engineering Research (IER) to its present form of address. We recall the development and technology transfer of the stripper header combine harvester and of robotic milking equipment. The resultant revenue streams are not ignored. In the *Statement on the future of research at SRI*, Professor Julia Goodfellow, BBSRC Chief Executive, gave credit for this enterprise but with the ultimate sting in the tail: "The key issue throughout has been that SRI's commendable efforts to survive in a difficult operating environment have led to a spread of activities that is incompatible with maintaining the critical mass in core scientific areas required in a Research Council institute. The result is an unsustainably high overhead cost for those areas of research."

Among the BBSRC proposals is a plan to transfer ('cherry pick' is the apposite agricultural metaphor) aspects of SRI's environmental engineering and mechatronics research to institutes and universities with complementary research: soil physics and aerobiology to Rothamsted Research; animal welfare elsewhere (unspecified); and universities (unmentioned) where, of course, the choice is rather limited following the demise of the specialist agricultural engineering departments, such as at Newcastle University. Such an approach is to the further detriment of the critical mass and synergies already in place with the current staff complement. 'The BBSRC is minded' as biologists to divest the engineering interface which they do not understand and do not value, and estimate saving the princely sum of £600k per year. Does this bear comparison with the 10-fold annual investment just approved for horticulture, given SRI's research contribution to nursery robotics and environmental control strategies for protected cropping?

And the prime location – Wrest Park will continue to be conserved for the Nation, landscaped and well-maintained grounds, uninterrupted views, within easy commuting distance from London. Is there a second agenda with another quasi-autonomous non-governmental organisation aspiring to the grandeur of the accommodation and acquisitive interest already registered?

The current successes of SRI in exploiting its intellectual assets are broad-based and well-documented: Well Cow™ technology to measure fertility status of dairy cows; vision-guided hoe for crop weeding without chemical treatment; PatchSpray variable rate controller for site-specific crop protection target; Integrated Management Systems for precision livestock production; and automated handling systems for the singulation and manipulation of biologically delicate products. Some of these have been partially funded by the Douglas Bomford Trust, a charity which is proud of fostering innovation and technology transfer as envisaged by its commercial benefactor. Technical articles have been featured on some of the innovations in *Landwards*, whilst the peer-reviewed research reviews and articles have appeared in leading international journals such as *Biosystems Engineering*.

Worldwide, there is a huge activity in the broad remit encompassed by Agricultural Engineering and there remains immense scope for application of the associated technology. The imminent closure and/or dispersal palliatives are not only a rejection of personal commitment of staff undertaking internationally acclaimed research, but also a termination of our National capability to influence future developments in Biosystems Engineering. Government policies which have led to the loss of our manufacturing base in many sectors including agricultural equipment, inevitably reduce opportunities for technology transfer and our justification for research. This negative spiral is not assisting our future wealth creation or employment opportunities.

Agriculture in the UK is highly mechanised, with a level of productivity to which many countries aspire. Let us not relinquish yet another skills base and sector sustaining our national economy. For now, we can import everything from elsewhere; but, in the longer term, will we have the wealth to pay for it?

BDW

DEVELOPMENT OF A ZERO-TILL SUGARCANE CUTTER-PLANTER

A.C. Srivastava

Ground wheel driven cutter-planter, in action, planting in a mustard field

Abstract

Sugarcane planting is an arduous and labour-intensive operation. Equipment has been developed in countries, such as Australia, India, Pakistan, to reduce the manual effort with varying degree of success. In 1992, a two row sugarcane cutter-planter was designed and developed at the Indian Institute of Sugarcane Research (IISR), Lucknow. The sett cutting unit of the implement was powered through tractor power take-off (pto) which remained constant at a given engine speed. The number of setts per unit row length varied with the change in forward speed of the tractor. The sett planting rate and overlapping between setts was not homogenous. It was difficult to manoeuvre a 27 kW tractor with this rear mounted relatively heavy equipment, especially so with the additional weight of about 200 kg which was required in front of the tractor for smooth operation. A simple, lightweight and energy efficient mechanism was, therefore, required and developed, which enabled planting at a constant seed rate and also overlapping between setts.

The rear-mounted, two row sugarcane cutter-planter developed, was equipped with disc-type furrow openers, furrow guides and a ground wheel. The two discs were configured with 20° tilt angle and a 25° disc angle, to open a furrow 30 to 35 cm wide and 20 cm deep. Provision of the furrow guide, behind the furrow opener, helped placement and alignment of the cane setts in the furrow by preventing the crest of soil falling back into it . Sett cutting and fertiliser metering units were powered through the ground wheel which assisted in maintaining a constant seed rate per unit row length. Unlike its predecessor (an earlier model of the IISR cutter-planter) this equipment contained minimal fast moving parts. It worked satisfactorily in dry, untilled fields (zero-till) as well as in tilled fields with adequate soil moisture. Chemicals for seed and soil treatments were applied through gravity. Used as a zero-till planter, without adversely affecting crop yield, a saving of about 32% in total cost/energy, required to raise the sugarcane crop otherwise, was achieved. The feasibility of using this equipment in dry field conditions (immediately after harvesting a wheat crop) helps to avoid late planting of the sugarcane crop.

BIO NOTE

A C. Srivastava is the Head of the Division of Agricultural Engineering at the Indian Institute of Sugarcane Research, Lucknow, India.

Introduction

Sugarcane is a vegetatively propagated crop. Stalks are cut in 35 to 37 cm long pieces, called setts. These setts are then placed or planted in an orderly manner in soil furrows. Chemicals are dispensed in these furrows and the loose soil is then pressed lightly to conserve soil moisture. These operations are tedious and labour intensive. Efforts have been made with varying degree of success in countries, such as Australia, India and Pakistan, to develop suitable equipment for planting sugarcane (Menon, 1961; Srivastava *et al.*, 1989; Srivastava, 1990; Farooq *et al.*, 1992; Khalid, 1987; Sharma *et al.*, 1995). These machines were equipped with furrow openers primarily for cultivated land with workable soil moisture, not dry, untilled soil.

In an intensive cropping system, sugarcane is being grown on a large scale after harvesting mustard, wheat or paddy. As a consequence, time becomes a major constraint to complete field operations and planting is often delayed and prolonged (Tiwari & Bali, 1982). Delays reduce the initial plant population and restrict tillering span (Verma *et al.*, 1986). Reports indicate that, in a sugarcane cropping system prevalent in the subtropical region of India, tillage before planting could be eliminated without affecting yield of the sugarcane crop adversely (Singh *et al.*, 1995).

Planting sugarcane in fields with no tillage requires effective

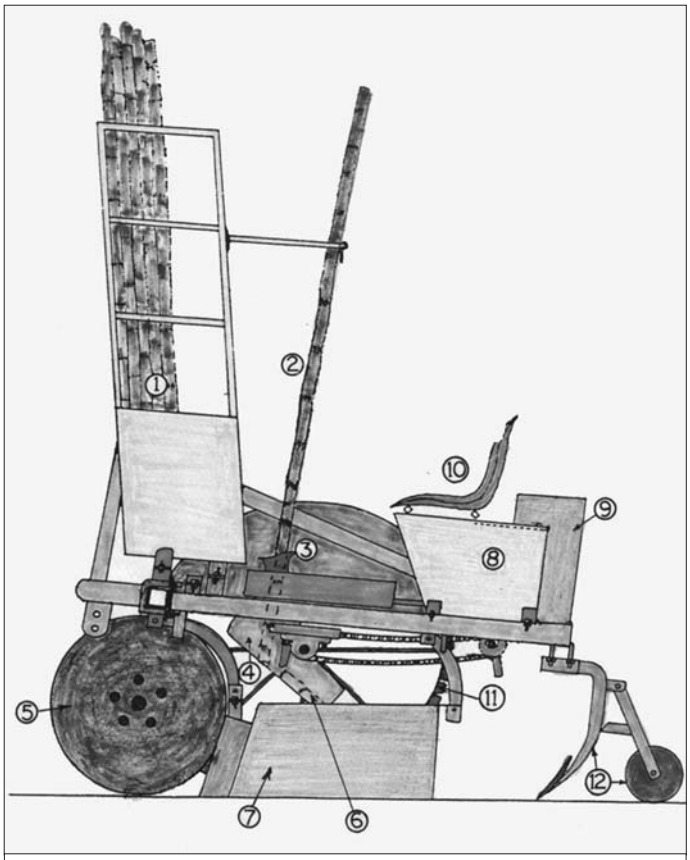

Fig. 1 Zero-till sugarcane cutter-planter: (1) whole sugarcane stalk box; (2) whole cane fed manually; (3) hole to feed sugarcane; (4) chute; (5) disc type furrow opener; (6) sett dropping from chute (16T); (7) furrow guides; (8) fertiliser box; (9) container for Gamma BHC solution; (10) seat; (11) ground wheel; (12) tines and tamping roller

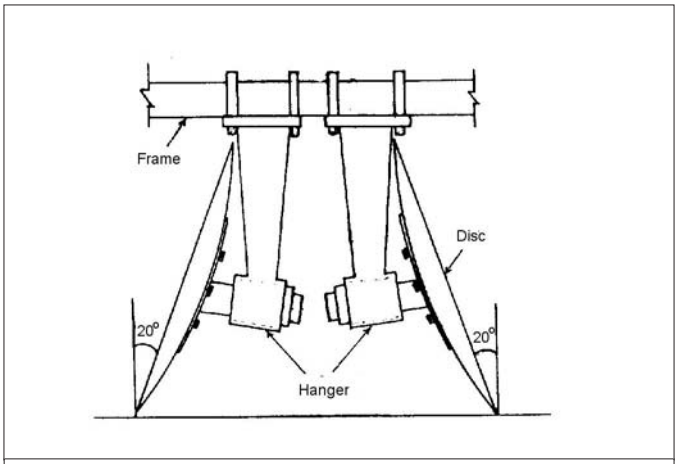

Fig. 2 Disc hanger with frame

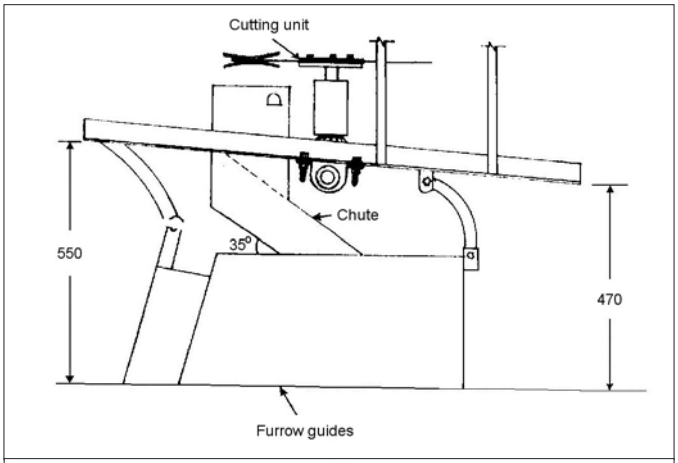

Fig 3. Furrow opener with sett cutting unit

tractor drawn equipment. The IISR sugarcane cutter-planter with four tillage discs provided some relief by opening furrows in almost any type of soil and by performing all other requisite operations involved in planting simultaneously (Srivastava, 1995). The sett cutting unit of this equipment was powered through the tractor pto. Since the rotational speed of the tractor pto does not vary at a constant engine speed, planting rate was dependent on the forward speed of the tractor. Consequently cane setts per unit furrow length and overlapping between setts varied. The equipment was designed to be operated by a 27 kW tractor. The heavy equipment (approx. 400 kg) caused manoeuvring problems during operation. An additional weight (150 to 200 kg) in front of the tractor was required to counterbalance the machine for smooth functioning. It was thus decided to develop a simple, comparatively lightweight machine with better manoeuvrability for planting at a uniform sett rate. A prototype of such unit was designed and developed at IISR, Lucknow, India. The objective of this research article is to document (i) design details of this equipment and (ii) results obtained during its field evaluation trials.

Development of the equipment

The rear-mounted, two-row machine was designed for a 27 kW tractor (Fig. 1).

Each furrow was opened by a single disc, mounted on a frame at a tilt angle of 20° and with a disc angle of 25° (Fig. 2). Each disc was designed to bear a workload of 150 to 180 kg during operation. The spacing between the two discs was adjustable from 0.65 m to 1 m. Furrow guides of two parallel mild steel plates, fastened at an angle of 45° at the front, followed closely behind the discs. This attachment retained the soil crest until the cane setts were placed and aligned in it (Fig. 3).

The sett cutting and fertiliser application units on the sugarcane cutter-planter, were ground-driven using an 80 cm diameter by 10 cm wide wheel which had 5 cm high lugs attached on its rim.

The sett cutting unit contained two pairs of horizontally mounted replaceable blades encircled over the mouth of a cane-dropping chute. These blades were angled to cut canes smoothly through shearing. The unit accepted canes with varying diameter. A stop mechanism was provided to regulate the dropping of the whole cane through gravity so that it was cut into relatively fixed lengths of between 35 cm and 37 cm. The variation was mainly due to sett changes in the feed angle and the curvature of the cane. Straight canes, fed at right angles to the blade, yielded a uniform sett length. The chute was mounted at an angle so that the setts slid downwards through gravity into the furrow to lie horizontally one after another with a 5 to 7 cm overlap, rather than standing vertically.

The fertiliser rate was metered by a plate and star wheel mechanism in the base of the hopper. Fertiliser was placed in a band about 5 cm from the setts in the soil furrow. The unit could meter urea and a mixture of urea and di-ammonium phosphate. Hygroscopic fertilisers were required to be mixed with sand, ash, *etc.,* for smooth flow.

Chemical, in liquid form, was applied before providing soil cover over the setts. The solution was kept in a 30 litre plastic container and metered through a valve to a horizontal pipe (10 cm long) with small holes to let liquid drip in to the furrow through gravity.

The sett covering unit consisted of a pair of shovel tines and a free-floating tamping roller to push loose soil back into the furrow and press the surface lightly to conserve soil moisture.

All the units were mounted on a rugged frame. The cutter-planter was also equipped with plastic moulded adjustable seats, a power drive system (bevel gears, chain and sprockets) and containers for storing whole cane, fertiliser and chemicals. The cane containers were designed to store enough whole canes for planting two rows of 170 m to 200 m in length, where both rows are completed without the need to refill the containers. This length is considered the optimum length of field suitable for using a general purpose tractor and equipment in India. The capacity of the containers to store cane, fertiliser and chemicals was constrained by the load bearing limit of the three point linkage of the tractor.

Design of field trial

Field trials for evaluating the performance of this equipment were conducted successively in 1996, 1997 and 1998. This was completed at both the Indian Institute of Sugarcane Research (IISR) Lucknow, India (26.5° N, 80.5° E and 120 m altitude), in a fine loamy non-calcareous mixed hypothermic Udic Ustochrepts soil, with pH of 7.5 and also at farmers' fields in 1999. Experimental fields were divided in two halves, each of 0.5 ha in area. While one plot was provided with conventional tillage before planting, the other half was planted at a workable soil moisture content, directly after the harvest of preceding crop (mustard). Both were planted by using the IISR zero-till sugarcane cutter-planter (Title photo). Trials were also conducted to compare the performance of this implement with that of a conventional planter (Table 1 contains general technical details of the zero-till cutter-planter and the ridger-type cutter-planter). Soil samples were collected to determine moisture contents and bulk densities. Observations recorded, related to furrow dimensions, placement and overlap of setts and depth of soil cover over the setts, sugarcane growth, cane yield, factors related to field efficiency of the equipment and energy consumed in doing various farm operations.

Table 1 General technical information of the zero-till cutter-planter

Particulars	*Ridger type cutter-planter*	*Zero-till cutter-planter with disc and ground wheel*
Power requirement, kW	28	19/28
No. of operators	4	4
Type of furrow openers	Ridger	Disc with furrow guides
No. of furrow openers	2	2
Row to row distance, cm	75 or 90	75 or 90
Equipment drive system	Tractor pto	Ground wheel
Field capacity, ha/h	0.25	0.25
Field efficiency, %	60	65
Saving over conventional planting system, %	40	40
Price, Rs	35000	35000
Length × Width × Height, cm	295 × 180 × 200	170 × 155 × 215
Weight, kg	425	320

Discussion of results

Furrow opening

The quality of a furrow can be characterised by variations in its depth and width. It ranged from 18 to 20 cm and from 32 to 34 cm, respectively, at 15.4% soil moisture. This was mainly due to clean shearing of the soil mass by the disc. While ridgers were effective enough in tilled soil, the disc could scour well in tilled/untilled and dry/moist soil. The soil bulk density ranged from 1310 to 1280 kg/m^3 in tilled and untilled field strips.

The furrow guides were very effective in preventing loose soil from falling into the furrow, until the cane setts were laid in it, and assisted with the correct alignment of the cane setts in the furrow bottom.

Sett cutting, placement and covering

The sett cutting mechanism was provided with replaceable, sharp and straight edged blades. These were mounted at an angle of 25° to cut canes with a shearing action, rather than with

Table 2 Field performance data for three planting systems all using the same cane variety CoS 91269 planted on 20th February 1997

Particulars	*Ridger type cutter-planter*	*Zero-till cutter-planter*	*Conventional planting*
Moisture content of soil, % d.b.	15.1	8, 15.4	15.1
Pre-requisite material	Whole cane	Whole cane	Pre-cut setts
Depth of planting, cm	14	16	14
No. of setts/metre furrow length	3.1	3.4	3.5
Gap, %	3	3	5.4
Depth of soil cover, cm	8	8, 7†	8
Setts not properly covered, %	5	2*, 5**	4
Row to row spacing, cm	75	75	75
Forward speed, km/h	1.9	1.9, 1.7	1.9
Time loss in each headland turning, min	0.78	0.8	0.7
Total time loss in headland turning/ha, min	38.4	36	35
Time loss in each refilling of setts, min	2.5	2.5	3.5
No. of refillings per ha	45	45	65
Length covered in one filling of cane box, m	185	185	190
Total time loss in refilling, min	129	130	230
Total time consumed, h/ha	4.3	4.3	5.7
Germination after 45 days, %	38.7	40.8	34.3

† well covered after immediate irrigation * moist soil ** dry soil (8% moisture content)

an impact. This helped to reduce the frequency of blade breakages and the shearing action improved the performance.

The average length of the setts was 35.8 cm. These setts were guided to lie along at the furrow bottom with an overlap of 6 cm (Table 2). Setts were cut blindly at a relatively fixed length. A large number of setts (82 to 87%) contained three buds or more. Visual damage to the buds due to blind cutting ranged from 2 to 3.3%, which is less than the damage (5 to 7%) caused in cutting setts manually at a large scale. Conventionally sugarcane planting was accomplished by using two independent machines, namely a sett cutting machine and a planter. The setts were cut from whole cane using the sett cutting machine. These were piled at convenient locations and were loaded manually in the drop type semi-automatic planter by using baskets. Two independent man-machine interactive operations enhanced bud damage. The sugarcane cutter-planter was an integrated unit. It performed sett cutting and planting operations simultaneously. The unit accepted whole cane. Setts were cut and placed in furrows synchronously. Bud damage was minimal due to less handling of the cane-buds.

A gap is normally defined as two or three successively missing setts (70 to 100 cm void) in the furrows. There were considerably fewer gaps by using this equipment, as compared to the conventional planting (Table 2) mainly because it was easier to maintain continuity in feeding whole cane than setts. Cutting setts from whole cane, placing them in furrows and providing soil cover with the same equipment, prevented loss of moisture from soil and setts. This benefit is more pronounced in late planting say in April/May when setts, cut in advance, start dehydrating which affects germination adversely. Use of this equipment helped advance and in most cases improve germination of the buds (Table 2).

Table 3 Field performance of cutter-planter with disc and ground wheel, with and without pre-planting for the sugarcane variety Colk 8102 planted after a Mustard crop

Particulars	*Treatments*	
	No pre-planting tillage	*Pre-planting tillage*
Date of planting	03.04.98	05.04.98*
Moisture content during planting	14	12
Germination after 15 days, %	43	40
Field capacity, ha/h	0.20	0.20
Yield, t/ha	58.8	59.1
Energy consumed in pre-plant tillage, %**	Nil	32
Cost involved in pre-plant tillage, %**	Nil	30

* time taken for seedbed preparation
** of the total energy/cost involved to grow cane

While using the zero-till cutter-planter in dry soil condition (8% moisture content), special attention was required to align and cover the cane setts. The soil mass displaced by the disc did not yield pulverised/loose soil. Provision of a furrow guide helped aligning setts placed or dropped into clean furrows, but the resultant soil cover was neither uniform nor satisfactory due to irregular soil masses. These were later broken down, to some extent, by subsequent irrigation. As a general practice, dry fields are irrigated immediately after planting. It may be emphasised that with the conventional method of planting, loose soil from the ridge had a tendency to slide down into the furrow before the setts were planted in it, hindering the proper placement of the setts. A few setts (5 to 7%) were found inclined horizontally and vertically (7 to 10%) without proper soil cover. Provision of a furrow guide helped to alleviate these problems.

Quality and uniformity of soil cover over the setts in furrows opened in tilled soil were also affected by the intensity of weed infestation. Under normal field conditions with less than 10 g/m^2 weed infestation the equipment provided smooth and homogeneous soil cover. When planting by conventional methods, however, 3 to 5% setts remained covered unsatisfactorily. The metering unit for dispensing the regulated amount of fertiliser in furrows was required to be calibrated before using it in the field. The system performed well using fertiliser, such as urea and di-ammonium phosphate, both having different flow characteristics. Chemical solution was applied through small holes designed to suffice the requirement.

Zero-till planter performance

The cutter-planter, with disc type furrow opener, worked satisfactorily in fields with or without tillage operations before planting. Soil (dry or moist) clods were sliced, turned upside down and thrown aside by the discs. The furrow guides helped to align the setts properly at the bottom of the furrow. In the case of zero-till planting, the soil strip in between two rows was left undisturbed. The field was irrigated immediately after finishing the planting operation. It helped to advance late planting (especially after wheat harvest in the month of April/May) by 7 to 10 days, which is considered to be crucial parameter to enhance crop productivity. Weeds were managed by mechanical and chemical methods. Crop yield in the zero-till planted fields were comparable and in some cases more than the yield of the plots having conventional tillage operations. With zero-till planting, however, a saving of about 30% of the total cost/energy required to raise crop conventionally could be accrued, by eliminating tillage before planting. It was more pronounced in the example of the wheat sugarcane cropping sequence (Table 3). Use of this equipment as a zero-till planter yielded (i) savings due to no tillage operation before planting and (ii) increase in yield due to advancement in planting sugarcane after harvesting the wheat crop. It may be pointed out that delay in planting during April/May in the sub-tropical belt in India causes an adverse effect on germination, tillering and crop yield. The implement was very simple to operate and maintain. Based on farmers' interaction, it commanded better acceptability and adaptability by farmers compared to its predecessors.

Conclusions

(1) A tractor rear-mounted, two-row sugarcane cutter-planter with disc type furrow openers and ground wheel driven sett cutting and fertiliser application units was designed and developed at IISR Lucknow, India. It worked satisfactorily in dry or moist, tilled or untilled fields.
(2) As a zero-till machine, it yielded 30% saving in the total cost of growing the sugarcane crop.
(3) Setts from whole cane were cut smoothly due to shearing action. The angled configuration of the blade reduced breakages.
(4) Furrow guides assisted in laying and aligning setts properly in the furrows.

Acknowledgement

The author acknowledges the technical help rendered by Er. Ashish Kumar and Sh. Piush Kumar Singh.

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AIR QUALITY RESEARCH

The social injustice of pollution

A leading expert from Staffordshire University – who led a study which revealed that people living in the most deprived areas of England are more likely to suffer the effects of pollution – says social injustice has to be tackled through environmental as well as economic policies.

Professor Gordon Walker from Staffordshire University made his comments after the publication of the results from the biggest research project of its kind ever conducted in the UK. Professor Walker, Director of the Institute for Environment and Sustainability Research at Staffordshire University, led the project in partnership with colleagues from the University of Leeds. The research was commissioned by the Environment Agency.

According to the study people living in England's most deprived neighbourhoods bear the burden of air pollution, factory emissions and flooding risk. "Clearly there is an environmental dimension to social injustice. Therefore regeneration cannot just be about creating more jobs or wanting to boost the local economy – it must also have an environmental element," said Professor Walker. Findings from the research include the following.

- **In some parts of the country, deprived communities bear the greatest burden of poor air quality**.
  In England, the most deprived wards experience the highest concentrations of nitrogen dioxide (NO_2), fine particulates (PM10), sulphur dioxide (SO_2), carbon monoxide (CO), and benzene. People in deprived wards are exposed to 41 per cent higher concentrations of NO_2, than people living in wards of average deprivation. There are also clusters of wards that have poor aggregate air quality and high deprivation in London, Manchester, Sheffield, Nottingham and Liverpool. However, in Wales, although air quality is generally better, air pollution concentrations are highest in the least deprived wards.
- **Industrial sites where emissions into the environment have to be carefully controlled – known as Integrated Pollution Control (IPC) sites – are located disproportionately in deprived areas in England.**
  There are five times more sites and authorisations, and seven times more emission sources, in wards containing the most deprived 10 per cent of the population, than in wards with the least deprived 10 per cent. In deprived areas, IPC sites are: more clustered together; on average produce greater numbers of emissions; present a greater pollution hazard; produce more 'offensive' pollutants; produce higher emissions of PM10 and carcinogens. In Wales, patterns are very different – there is only some bias towards deprived areas found when looking at multiple sites, while emission levels showed some bias towards affluent areas.
- **Tidal floodplain populations in England are strongly biased towards deprived communities.**
  There are eight times more people from the most deprived 10 per cent of the population living in tidal floodplains, than from the least deprived 10 per cent. However, river floodplain populations are weakly biased towards more affluent communities in England. The relationship between flooding and deprivation is less distinct in Wales.

These findings were produced through the use of digital mapping at Staffordshire University's state-of-the-art Geographical Information Systems (GIS) lab. Researchers were able to match environmental information from the Environment Agency with socio-economic data. Professor Walker said it was the biggest study of its kind ever conducted in the UK and it had huge ramifications for policy-makers.

This analysis builds on previous Environment Agency research published in 'Our Urban Future' (September 2002).

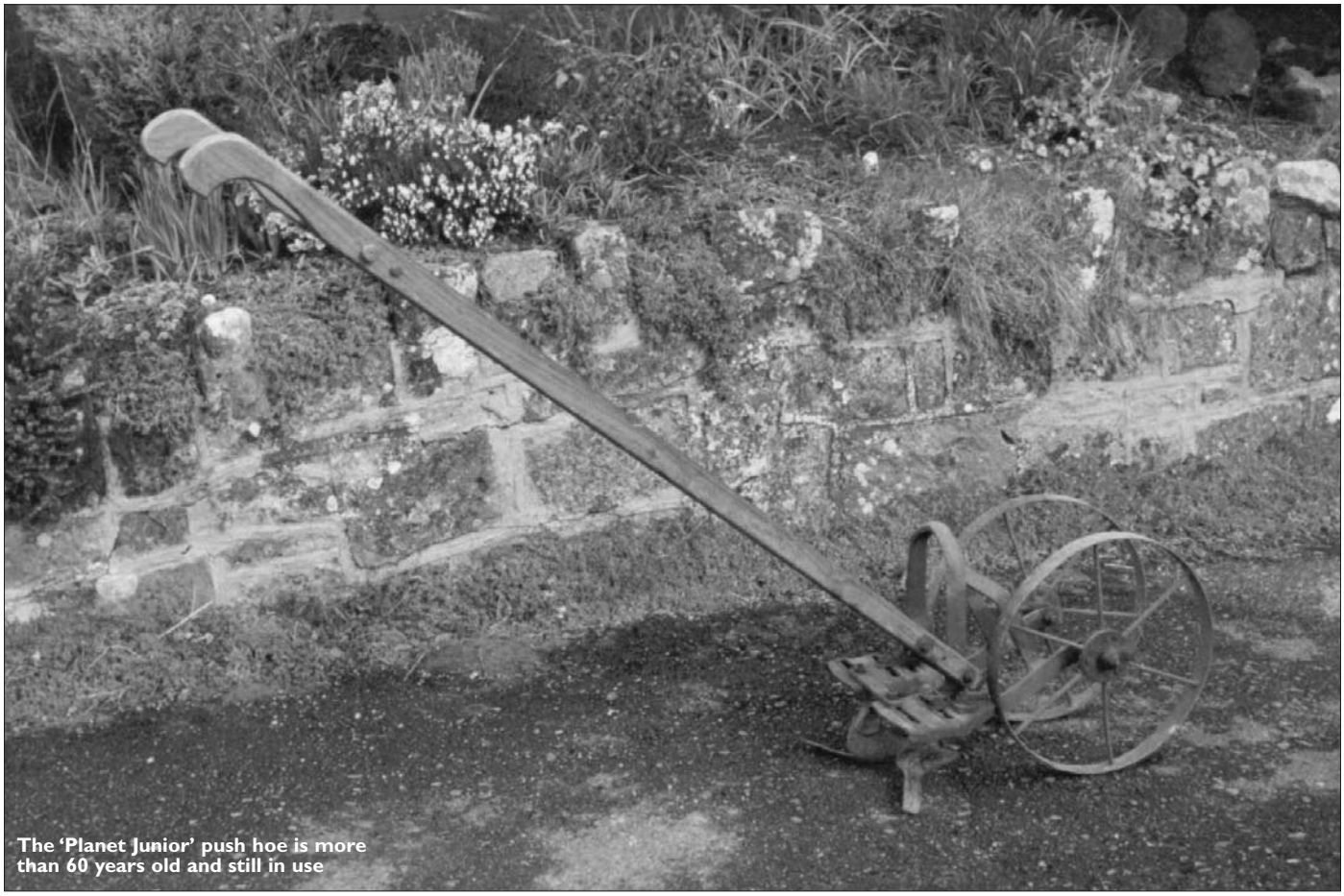
MORE INFORMATION

For more information see the Institute for Environment and Sustainability Research website www.staffs.ac.uk/iesr The project team included Jon Fairburn and Graham Smith at Staffordshire University, and Dr Gordon Mitchell at University of Leeds.

WHO KNOWS WHEEL HOES?

(or *multum in parvo**)

Geoffrey Lawson



The 'Planet Junior' push hoe is more than 60 years old and still in use

BIO NOTE

Geoffrey Lawson MIAgrE, following a career as a Horticultural Journalist, has continued to exercise his skills through active involvement in the Horticultural Engineering Specialist Group

There are some items of agricultural equipment which have a long span in manufacture. Some models of Ransome's ploughs and the Fordson Standard tractor are classic examples. But not every thing has to be big or complicated to be worthy of note, and longevity is not confined to models of well known items.

For example, take the 'Push Hoe', more properly called in American terms where it originated, the 'Wheel Hoe'. It is a simple machine which can speed up a hoeing process considerably and without having to bend one's back. It may not be well known outside vegetable and salad growing circles so a description may be in order.

It comes in many forms but the simplest version is a lateral frame fitted with two wheels which will straddle a row of the crop, though a single wheel version would work in the alley. The frame is fitted with two 'L' shaped hoes, or alternatively cultivating tines, *etc.*, and by means of long handles is pushed along the row. The technique for the worker is to take a pace forward, allowing the arms to come back, stop moving, and then push the hoe forward with just using the

arms. This allows for more accurate work and closer work and is less tiring than pushing continuously whilst walking. A range of accessories used to be available for these simple machines, ridging bodies, ploughs, different form of hoes and tines, and also seed drills. Though in practice the latter were usually built as a complete unit but using the same 'push' principle.

The best known hoe was the 'Planet Junior' and which originated in the USA. I first encountered them when I started work on a large scale fruit and vegetable farming enterprise in 1942. That same farm still has three of these, and I borrowed one to make the 1/5th scale model which is illustrated here. Now more than 60 years old and notwithstanding a high degree of mechanisation, they are still in occasional use.

I was under the impression that these hoes originated in the 1920's or 30's. Quite wrong.

Following some research in the USA, and considerably helped by an article entitled 'The Wheel Hoe' written by Arthur Bolduc in an issue (Vol. 22, No. 2) of *Small Farmers Journal* published in Oregon, I was in for a surprise. Mr Bolduc traces the origins of the wheel hoe back to the 1860's when, following the Civil War, manufacturers started to make and use replaceable spare parts. It was about this time that the wheel hoe emerged made by

a number of different manufacturers. In time, one predominated, S L Allen of Philadelphia, and they used the now familiar trade name of 'Planet Junior' for their hoe and other products which included seed drills, field and inter-row cultivators, steerage and horse hoes, *etc*.

A catalogue, which probably dates from the 1920's illustrates no less than 12 models of wheel hoe. The one illustrated with this article, and for the record, is probably a No.11.

The Allen Co. no longer exists so it is not possible now to discover how many hoes were made until production was ceased after the Second World War ended. This was largely due to the advent of small petrol engines fitted to cultivators to ease the physical load.

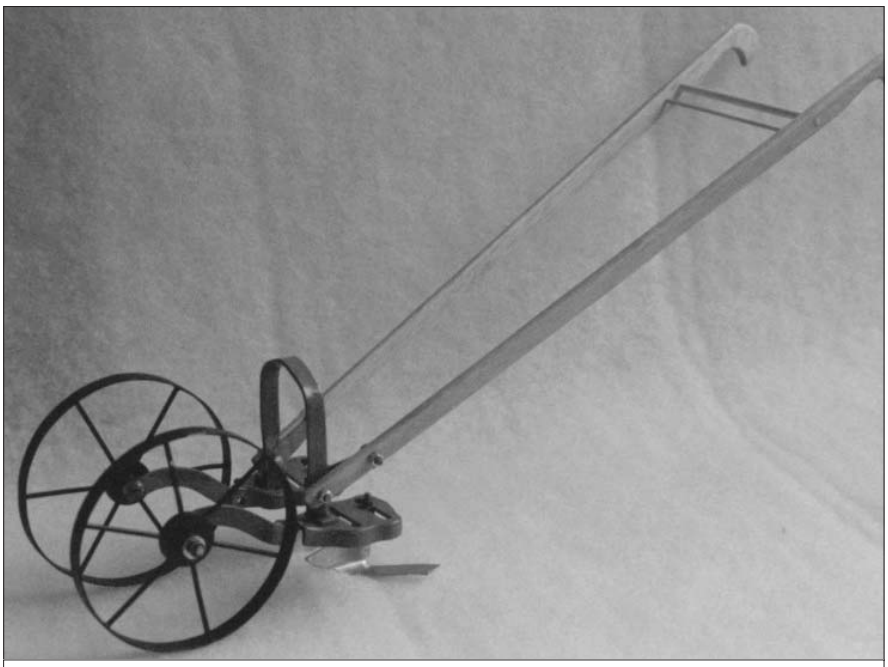
However, Planet Junior hoes are still used by the Amish folk in Philadelphia, who spurn power operated machinery, and who will pay high prices for them.

All is not lost as Denman & Co. of Orange California, are currently selling a wheel hoe called the 'Red Pig No.1' and this appears to be almost identical to a 'Planet Jnr' design and fulfils similar functions. Until recently the 'Jalo Gardener', based on a push hoe and at one time I owned three of these, was made in the UK.

I suppose, and rather like the famous whisky, one could say of push hoes: 'Born 1860 still going Strong'. Well, maybe not exactly 'strong' now, but still around.

I find it quite remarkable that such a simple machine as the 'Planet Junior' wheel hoe should have persisted for 60 years, and that production of other later makes continues to this day some 140 years from the origin.

I expect many push hoes can still be found at the back of barns or hung up on the wall of potting sheds, and may now regarded and sold as 'antiques'.



A fifth scale model of a No.11 Planet Junior hoe made by the author

Very similar to a 'Planter Junior' wheel hoe, this one called the 'Red Pig', is currently made by Denman & Co. in California

* '*Much in a small space*'

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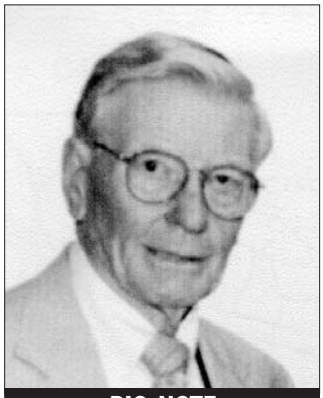
MEASURING TRACTOR EFFICIENCY

The next major advance in the farm tractor evolution

W. John Foxwell



BIO NOTE

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Introduction

No tractors that are produced today provide the farmer with sufficient indication of the level of performance at which his machine is operating. Only the larger ones provide, in addition to the engine speed, true radar sensed ground speed, percentage wheelslip and rarely the draught of the implement. Even these are insufficient for the farmers' needs.

Not only is the farmer handicapped but so are the technicians in the manufacturers' test departments. While there are many engine, driveline, electronic, cab, hydraulic and implement specialists, performance specialists are a rare breed. Not many of the above specialists have the slightest understanding of tractor performance in the field. Few, other than tyre engineers, can make use of the Organisation for Economic Cooperation and Development (OECD) drawbar tests and how to relate them to the soil conditions in the field with different implements. This state of affairs would significantly improve if instrumentation providing digital readouts of instantaneous tractive efficiency in the field was made available, not only to the farmer, the end user, but also to the manufacturers' engineers, salesmen and dealers. In time, as experience is gained, the savings in fuel used would be enormous and would probably do more to reduce engine pollution than all the pending legislation.

Definitions

Tractive efficiency is the ratio that the drawbar power in kW to the axle power in kW of the tractor. The difference between them is the power lost by the tyres or tracks. Maximum figures for tractive efficiency varies from 80% for hard ground (grassland) to as low as 50% for softer sandy soils and can be considerably less if the tractor is not configured properly.

Axle power results when the losses in the driveline are subtracted from the output power, or brake power in kW of the engine,

Engine brake power is proportional to the engine output torque in Nm and the engine speed in rev/min.
Drawbar power in kW is proportional to the drawbar pull in kN and the true ground speed in km/h when it is detected with a radar sensor.

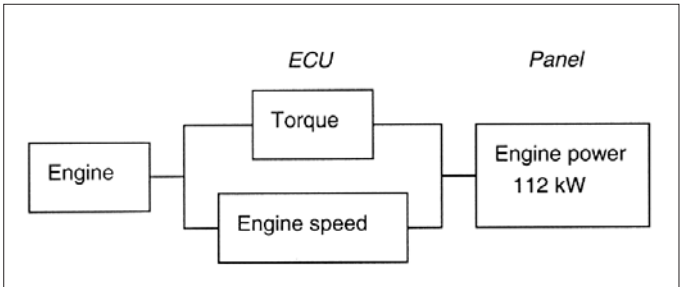

Fig.1 Engine power output; ECU, electronic control unit

Steps required to provide tractive efficiency instrumentation

1. Engine output power

This can be measured when a torque sensor, mounted either in the flywheel or the input shaft to the transmission, sends torque signals to the on-board computer or electronic control unit (ECU) and intermixes them with the engine speed (Fig.1).

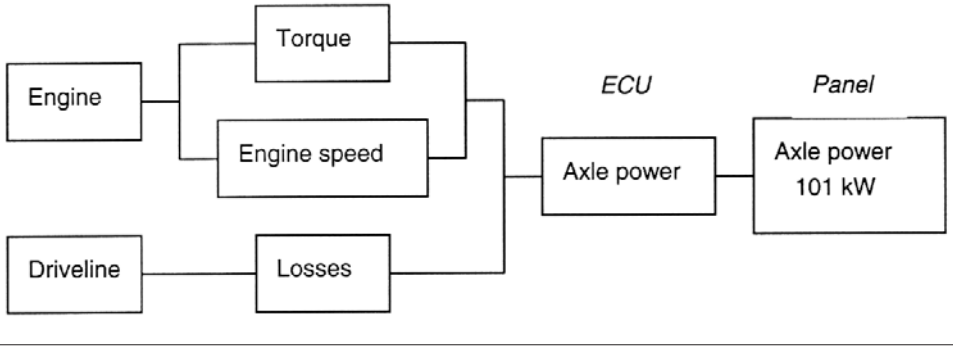

Fig.2 Axle power; ECU, electronic control unit

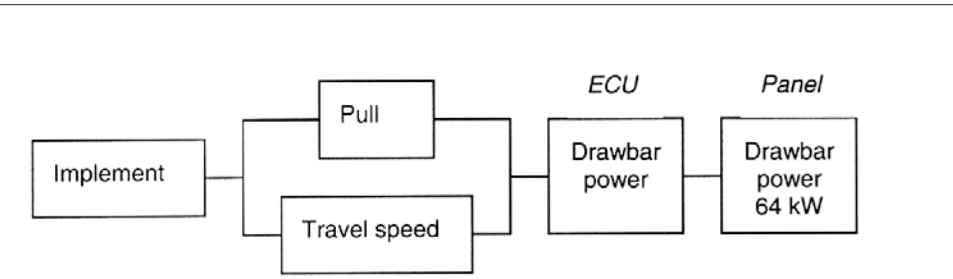

Fig. 3 Drawbar power; ECU, electronic control unit

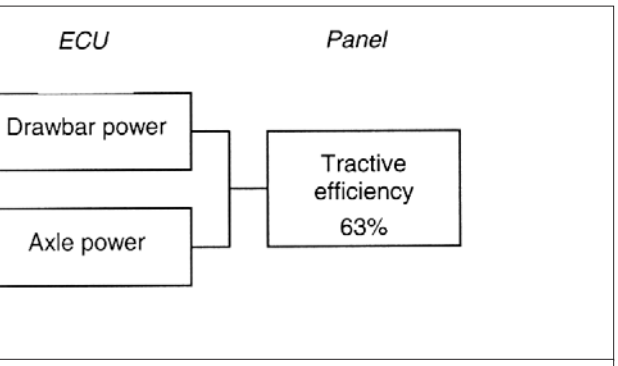

Fig. 4 Tractive efficiency; ECU, electronic control unit

2. Axle power
Each manufacturer would be responsible for determining the power lost in the drivelines for all new models, one time only, by measuring the power at each axle and subtracting it from the engine output power as determined in the previous subsection above. These losses would be factored into the ECU to provide axle power readings on production tractors equipped with engine torque sensors (Fig. 2).

3. Drawbar power with mounted implements
The Bosch sensor pins in the front pivots of the two lower links of the three-point hitch can be calibrated to measure the draught of the implement (drawbar pull) in kN and when intermixed in the CU with the radar detected ground speed will give drawbar power in kW (Fig. 3).

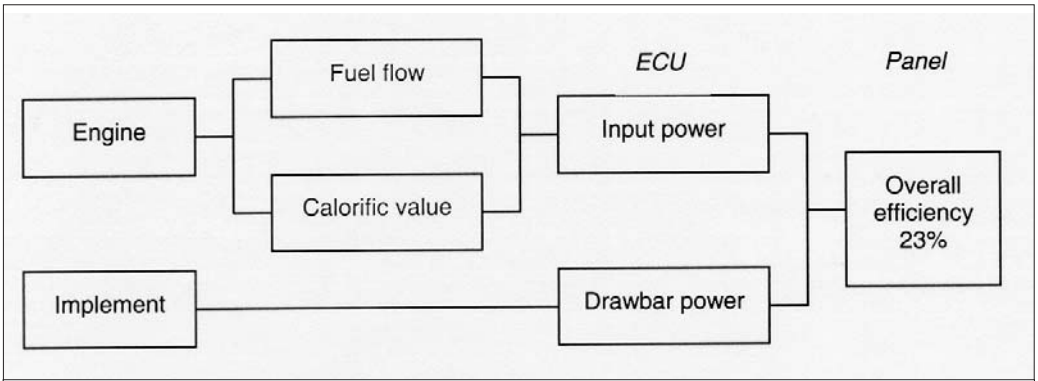

Fig. 5 Overall efficiency; ECU, electronic control unit

4. Tractive efficiency (mounted implements)
The axle power and drawbar power can be intermixed in the ECU to obtain the tractive efficiency for readout on the instrument panel.

5. Tractive efficiency (trailed implements)
The logic in subsections 3 and 4 above can be applied to trailed implements if they are connected to the three-point hitch by a crossmember between the lower links housing a large ball joint, and using the Bosch pins to sense the draught (Fig. 4). The crossmember could be permanently attached to the implement drawbar and would be picked up by a quick hitch similar to a mounted implement.

On tractors which do not use Bosch pins in the three-point hitch, the implement could still be connected to the crossmember between the lower links and a Bosch pin could be adapted to the drawbar pin, or the implement could be attached to the tractor drawbar and a Bosch pin could be used at its front pivot.

6. Overall efficiency
A further interesting step which might be made possible in the future, as electronically controlled fuel injection pumps become available, would be to determine the input power or the engine by measuring the fuel flow and intermix it with the calorific value of the diesel fuel.

The input power would then be compared in the ECU with the drawbar power to provide a readout of the overall efficiency (Fig. 5).

7. Tractor test modifications
The OECD tractor tests need to be updated to specify the

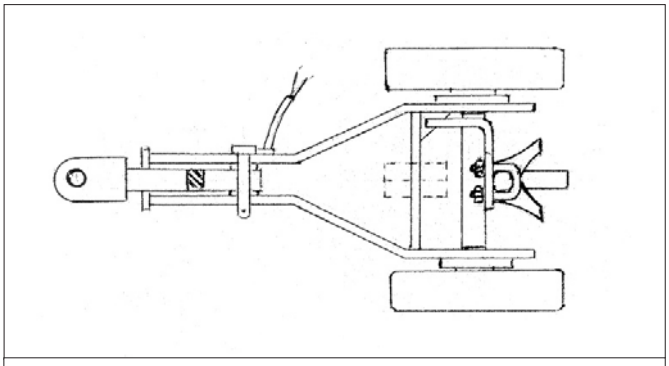

Fig. 6 Tractive efficiency transducer

axle power by measuring the power at each axle and eliminating the drawbar power tests on the concrete track. The axle power would then be compared to the engine power measured by the inbuilt torque sensor to determine the driveline efficiency and report it. Some multi-speed powershift transmissions are very low in efficiency compared to simpler ones. It would also benefit the farmer if the OECD reports would project the tractive efficiency for different soils in order to give targets at which to aim.

8. Tractive efficiency transducer

To accomplish these projections there needs to be a better way to quantify the resistance of the various soils than that obtained by the soil cone penetrometer which does not easily relate to tillage requirements. A simple machine acting like a small tillage implement would probably suffice (Fig. 6). It would have a two-member frame supporting an axle shaft which carries the two implement wheels and a standard implement chisel tool. The front end of the frame houses a Bosch pin or other available load sensing device to measure the draught. Detachable weights are easily mounted on the frame in front of the axle. Before each test, a hole would be dug in the soil to allow the chisel point to reach its depth of say 20 cm in the soil. The chisel would pivot on the axle so that it could be clear of the ground when the machine is being moved to another test site in the field.

The Bosch pin would be connected to a portable computer for each test run over a distance of say 33 m at speeds between 5 km/h and 7.5 km/h, corresponding to times of between 22 and 16 s. A chart or tabulation in the computer between the time and the draught would be calibrated to give a reading of 63% for average soil and 80-50% for the extremes on hard to soft soils. These figures, of course, would be modified in the computer as experience is gained with its use by the OECD test stations and those of the manufacturers and would be different for two-wheel drive (2WD), front wheel assist (FWA) and four-wheel drive (4WD), both rigid and articulated, multiple tires as well as for tracklaying vehicles.

If these machines were in general use they would benefit everyone from manufacturers of tractors and implements to the farmer. For the first time, the implement supplier would be able to advise the best operating speed and the corresponding draught and the weight transfer for their equipment. The test machine would then become an OECD standard.

9. Other benefits from torque sensing.

Independent of the above steps for measuring tractive efficiency, torque sensors can provide other benefits to improve tractor operations.

First, it can be programmed to automatically change gears in a powershift transmission. It also senses the torque in the power take-off (PTO) shaft and, where the tractor is used with forage harvesters, it can change gears and slow the tractor forward motion when the density of the crop increases and prevent the cutter mechanism from jamming. More importantly, when integrated into the hydraulic power lifts, it can be made to control more precisely the working depth in the ground of fully mounted, semi-mounted and trailed implements than present linkage control systems when operating on marginal and undulating fields.

Finally, it can be used as a diagnostic medium to detect sick engine problems such as blocked injectors, sticking rings, piston scuffing, stuck valves and many others not possible by other measures.

Summary

The technology is available today to carry out all the steps required to obtain the tractive efficiency. Owing to the dearth of performance engineers, no-one to date has combined these steps to determine the optimum efficiency of tractors in the field. These steps would benefit test engineers, salesmen, dealers and implement designers as well as farmers. The OECD tests would be simpler to understand as well. More people would become performance oriented because the values would be in full view to them and the recommendations made in the published papers on tractor and implement performance would be put to practical use.

The costs to accomplish this integration would be recovered many times over from the savings of fuel and pollution. The industry would receive recognition from governmental and environmental groups if the extent of these savings were published.

Footnote

The readout numbers in the steps 1 to 8 are are those that might be expected for a 2WD tractor with an engine delivering 112 kW. Other measured figures are: engine output torque of 532 Nm at 2,000 rev/min; driveline efficiency (assumed) of 10%; drawbar pull of 34.4 kN; ground speed of 6.6 km/h; and wheelslip (assumed) of 14.5%.

Useful formulae:

Engine power (kW) = Torque (Nm) x Engine speed (rev/min) / 9493

Drawbar power (kW) = Pull (kN) x Travel speed (km/h) / 3.57

Further reading

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CONSERVATION AWARD

Living Wetland Award

Aston Hall Farm, at Stone in Staffordshire, was named the winner of the RSPB/CIWEM Living Wetlands Award 2004, at a conference which brings together key players in the wetlands debate to discuss how to take forward protection, promotion and creation of these important sites.

The project represents a unique collaboration of farmers, a water company, conservation groups, and a local community.

Over four years, the 120 ha site has been transformed into a floodplain grazing marsh, prompting a huge increase in bird numbers and diversity of bird species. Parts of the River Trent margins have been restored, voles and bats are thriving in the new environment, and a model scheme used as an example by the government brings together farmers and conservation groups to look at sustainable farming methods.

The judges of the annual Award were particularly impressed by the project's ability to create valuable wildlife habitats within a landscape that benefits the local community and is at the same time a working farm. Ruth Davis, Head of Water Policy at the Royal Society for the Protection of Birds (RSPB), said: "This scheme has produced really valuable habitat for threatened birds such as lapwing, snipe and reed-bunting. It has also given local people somewhere exciting to visit, helped protect the River Trent from pollution, and reduced the risk of nearby properties flooding. This is exactly the kind of innovative project our Award was designed to celebrate. Let's hope we see many more of them in the years to come."

Richard Clinton, Regional Manager for Severn Trent Water, which manages the Aston Hall site, said: "I am delighted that this project has confirmed my belief that objectives which are often considered to be conflicting can actually be realised. Through careful planning and implementation the diversity of both habitat and species have been improved, the primary use to which the land is put has been preserved and access for people enhanced."

Justin Taberham, Director of Policy at the Chartered Institution of Water and Environmental Management (CIWEM) and one of the judges, said: "It is impressive to see a water company working on its own land to create a project with benefits to so many different groups. The strong promotion of farming involvement, increased access for the public, and concentration on increasing habitats and biodiversity made the Aston Hall Farm project the winner in a strong field."

A project to create habitat and recreational improvements at the Wigan Flashes in Greater Manchester was also commended for the Award, recognising the multiple benefits the project has brought to a site that was previously very degraded. In addition, there was very active community involvement and significant recreation benefits to local people.

MORE INFORMATION

To make a submission for next year's Living Wetlands Award, and for information about other CIWEM Awards, contact Helen Wilson. Tel: +44 (0)20 7831 3110. E-mail: helen@ciwem.com

EDUCATION

Not just pulp fiction

A new video aimed at helping teachers educate children about the 'green' life-cycle of Scotland's timber is now available. Entitled 'Visit to Riding Sawmill', the video has been produced by Forestry Commission Scotland and the Forest Education Initiative.

The video takes viewers on a virtual tour of a working sawmill, following the path of a piece of wood from saw-log to tabletop. It helps get the message across to children how Scotland's trees are planted, grown, harvested, milled and used for everyday use. Importantly the video educates children how new trees are planted to replace the harvested ones so that the whole life-cycle can carry on in an environmentally friendly way.

Launching the video at the Commodore Hotel in Helensburgh with teachers from the area, David Robertson of Forestry Commission Scotland said: "The video is the next best thing to an actual visit, and helps to prepare children so that they get the most out of their trip. It can also be used in conjunction with the Teachers Resource Pack that was launched before Christmas."

Funding to produce the pack and the video was obtained from The Lower Clyde Greenspace project, the Scottish Forest Industries Cluster, Argyll and Bute Council and the and Forestry Commission Scotland.

"I'm pleased that children through this video are being made aware where the wood around them comes from, and that we were able to help produce the video through the Forest Education Initiative," said Frank Riding, Managing Director of Riding Sawmill in Cardross where the video was shot. The sawmill is one of the largest employers in the area, and the video is also being used to help local people understand what takes place in the mill.

MORE INFORMATION

For more details on the 'Visit to Riding Sawmill' video and the Teachers Pack contact Sven Rasmussen of the Forestry Commission Scotland's Strathclyde Conservancy. Tel: +44 (0)141 941 2611.

PESTICIDE CONTROLS

Illegal residues on winter lettuce

An enforcement programme to crack down on illegal pesticide residues in winter lettuce over 2003/2004, has been announced by the Department for the Environment, Food and Rural Affairs (Defra) minister Alun Michael. The Annual Report of the Pesticide Residues Committee (PRC) for 2002 revealed that of over 4,000 food samples analysed, only one per cent contained illegal residues, and none were judged to present a safety risk to the consumer.

Nevertheless, the Department continues to be concerned about residues found in particular on winter lettuce, despite previous action taken to address the problem.

Alun Michael said: "I recognise consumers need to be reassured that produce does not contain undesirable or unnecessary residues and that good agricultural practice is followed. The evidence shows that the majority of farmers and growers operate well within the bounds of good agricultural practice.

"But although there has been some improvement, the number of undesirable residues found in winter lettuce is still high so we intend to conduct a further monitoring survey of winter lettuce this year, and we will continue to take firm action against growers or retailers where it is necessary to eradicate the problem. Where it is appropriate, legal action will be considered."

The programme will involve sampling winter lettuce at all points in the supply chain, from grower to retailer. Advisers from the Rural Development Service, who are authorised enforcement officers under the Food and Environment Protection Act 1985, will take samples and make follow up enquiries where necessary.

Winter lettuce grown in the UK under glass is particularly prone to fungal attack during the cool damp winter months and there are only a limited number of products approved for disease control. To advise growers of good practice, the advisory leaflet published for the first time last year and amended in the light of last year's results will be revised.

MORE INFORMATION

Defra, Nobel House, 17 Smith Square, London SW1P 3JR. Tel: +44 (0)8459 335577. Fax +44 (0)20 7238 5529. Web: www.defra.gov.uk Results of the winter lettuce monitoring programme for 2002/2003 are available on the PSD website at: www.pesticides.gov.uk/citizen/residues/enforcement/enforcement_residues_monitoring.htm

AMENITY

From farmland to fairway

Shropshire farmer Ralph Tomley, has transformed 52 ha of his 144 ha Daywell farm into a successful golf course, thanks to a Rural Enterprise Scheme (RES) grant from Department for the Environment, Food and Rural Affairs (Defra). Last week, Mr Tomley received a prestigious award from the Oswestry and District Civic Society for making a significant contribution to the environment of the Oswestry Borough.

The 18 hole par-72 golf course is situated in the grounds of Henlle Hall, and part of the project has involved encouraging wildlife back to the Georgian parkland. The RES funding has provided installation of a full irrigation system and planting of 350 hardwood trees, as well as the clean-up of existing lakes and excavation of new ornamental pools. As a result the land is now expected to provide a home for many species of wildlife and birds, including the great crested newt. In conjunction with English Nature, Mr Tomley has drawn up a management scheme to encourage the flora and fauna to flourish.

Mr Tomley said: "The golf course was actually designed by an architect 12 years ago, but we did not have sufficient funds to go ahead with the project until we were given the grant by Defra.

"We are very proud of the contribution that we have made to the environment with this project. The Golf Club has also increased local job opportunities as we employ 5 people full-time now, whereas we only required one part-time worker on that land before; and from a tourism point of view, the golfing itself will bring visitors to this region."

With its extensive views of the Welsh hills, the new course is already attracting plenty of golfers. Since opening in July, membership has more than doubled to 125 members and Mr Tomley regularly receives positive comments from newcomers.

Peter Loat, a project officer at Defra's Rural Development Service said: "This project involves all the elements which we look for in a grant proposal: it will benefit local employment and tourism, and it contributes towards a sustainable environment. The parkland incorporates hundreds of oak trees which are complementary both to the scenery and to wildlife, whereas previously the trees made it difficult to farm the land. Its conversion to a golf course means the oaks are now appreciated and maintained as they should be."

Lawrence Burton MBE, chairman of Oswestry and District Civic society, said:

"We are delighted to have awarded the Millicent Kaye Trophy to Ralph Tomley; he deserves to be highly commended on the tremendous improvement he has made to Henlle Hall's old park. Local reaction to the golf course has been incredible and the fact that it is accessed by a public footpath means that we can all enjoy it, whether we play golf or not."

Bimonthly LATE SPRING 2004

MEMBERSHIP MATTERS

THE NEWSLETTER OF THE INSTITUTION OF AGRICULTURAL ENGINEERS

A NEW APPROACH TO SPECIALIST GROUPS

Council has agreed a revised structure for the Specialist Groups. They will be fewer but stronger. This will concentrate our efforts onto those topics that are the 'technical drivers' of the IAgrE's core interests. The Institution's role for the provision and exchange of technical information has never been more important.

The six core groups will be renamed Technical Groups to strengthen the emphasis of their role (Table 1).

Table 1 Technical Groups

Technical Group	*Contact*	*E-mail*
Soil and Water Management	Tim Chamen	Tim.Chamen@btclick.com
Forestry Engineering	David Killer	David.Killer@forestry.gsi.gov.uk
Horticultural Engineering	John Weir	putney.john@virgin.net
Livestock Engineering	Christopher Wathes	christopher.wathes@bbsrc.ac.uk
Amenity and Sport Engineering	Malcolm Carr-West	Malcolm.Carr-West@ceme.co.uk
Power and Machinery	Chris Whetnall	CRW@iagre.org

Power and Machinery is a new group. The initiation meeting was held at IAgrE HQ on March 23rd. The outcome of that meeting will be reported in the next edition of *Landwards*.

We know from experience that these groups will function best if they have strong leadership and an active support team to stimulate and drive initiatives. It is intended that their activities will include regular conferences, workshops and contributions to *Landwards*. They will provide IAgrE's voice on issues in their technical area.

It is essential that there is a small team of volunteers to support each of these groups. If you feel that this is a way in which you can contribute to IAgrE then please contact the group leader.

To strengthen their links with the direction and management of the Institution, representatives of these groups will be invited to attend Executive Meetings.

There are, of course, other interest areas within our membership and Council is keen that there are appropriate for a for these. In many cases, these span all of the above technical groups and can provide a vital co-ordination function. These will be called Interest Groups (Table 2). Though ideal, it will be less essential for these groups to have support teams but there will a nominated coordinator who will be the focal point for IAgrE's interests in that area. They will stimulate activities as appropriate, some of which may be delivered by the technical groups.

Council agreed that environmental issues should be an integral consideration within all IAgrE's activities. By and large the Institution's role as a Constituent Body of SocEnv will set the agenda for these interests through the Environment Action Group chaired by Peter Redman.

If you have any observations, comments or contributions on any of the broader aspects of this new structure then please get in touch with either Chris Whetnall or Peter Redman.

Table 2 Interest Groups

Interest Group	*Coordinator*	*E-mail*
Pioneering Technology	William Waddilove	William.Waddilove@Cummins.com
Overseas/International	Malcolm Cutler	mc@fscdev.com
Energy	Gareth Ellis	gareth@greenenergy.org.uk
Food Chain Engineering (inc storage and packing)	Chris Bishop	cfhb@writtle.ac.uk

VISIT TO THE DUNSFOLD COLLECTION

It was particularly fitting that the *Pioneering Technology Specialist Group* and *West Midlands Branch* joined forces in taking the opportunity of a presence at the 2003 Dunsfold Land Rovers Open Day, not least to celebrate an initiative in automotive technology which has enjoyed such enduring success over the years. One might speculate on what its design team at the time thought of its future prospects when the first vehicle christened 'Land Rover', rolled off the production line in 1948!

Located deep in Surrey's rural heartland, Dunsfold Land Rovers, with 69 of the 'earliest, rarest and strangest' models, can boast of having the most comprehensive collection of the Land Rover marque in Britain. The Dunsfold Collection together with the unique John Parker Collection of nearly 3000 scale model Land Rovers, just part of a fully fledged business specialising in servicing, supplying parts (vintage in particular) and accessories exclusively for Land Rovers, was founded by Brian Bashall in 1968. Although still involved in the business, Brian has now handed over the day-to-day running of this essentially family enterprise to his son Philip.

An amphibious Land Rover – one if the rare items in the collection

Housing and maintaining such a large number of vehicles together with the models display in a properly laid out museum for day-to-day visitor access would be a major task well beyond Dunsfold's resources and so the Open Day approach has been their preferred option. In fact, an almost better term for these events might be 'Land Rover Clan Gatherings'. Apart from those simply curious to discover more of this marque many dedicated enthusiasts turned up in their own Land Rovers: all to enjoy looking around the collection, model gallery, military vehicle and camping displays, other impromptu exhibits and stalls together with Land Rover rides on their rough-terrain circuit.

Philip Bashall's introductory talk to members and guests was a reminder of the outstanding contribution the ubiquitous Land Rover has made to farming and its related land-based activities over the past 55 years. He also expressed confidence in predicting its continuing high profile in agriculture – certainly for the foreseeable future. How about the next 50 years?

MORE INFORMATION

Dunsfold Collection: www.dunsfoldcollection.co.uk Dunsfold Land Rovers: www.dunsfold.com John Parker Collection, Mike & Padeen Hardiman (Hon. Curators). E-mail: mike@mlhardiman.demon.co.uk (please quote 'Land Rover' or 'Dunsfold')

LETTER TO THE PRESIDENT

Dear Dr Mitchell

Long Service Certificate

Many thanks for your very kind letter of congratulations of 12 January enclosing my 50 year membership certificate of the Institution. I have always felt most honoured to be a member and counted it as a truly professional accolade in my chosen career.

With regard to the second paragraph of your letter I should be most grateful if you would be kind enough to pass on the following 'memorable experiences' to the Editor of the Journal, if you think they would be worthy of inclusion.

I was awarded one of the first *Farm Mechanisation* (a monthly journal) scholarships and obtained my National Diplom in Agricultural Engineering (NDAgrE) at Harper Adams Agricultural College in 1953. My agricultural engineering 'experiences' have been mainly dictated by farming fashions over the years. I spent my first ten years (1954-64) running a mechanised contract hire service for African farmers in Uganda, and when I returned to the UK in 1964, the biggest change in agricultural practice to my mind was the fact that nearly all tractors were now diesel powered rather than the tractor vaporising oil (TVO) of ten years previously.

Other occasions over the past two or three decades have been the changes in forage conservation associated with the advances in bagging, and latterly in wrapping, big bale silage (together with the machinery involved) with which I was closely connected. The mechanisation of the low rate irrigation of 'dirty' water was another technique which occupied a considerable amount of my time.

I have really enjoyed my membership of the Institution (and of course the local South Western Branch which has now sadly suffered a demise) but I have been particularly impressed with the widening scope of the activities and services to its members over the past few years - long may it continue to do so.

Yours sincerely

A J Armitage MIAgrE (No 0083)
The Little House
32 Dawlish Road
Teignmouth
Devon TQ14 8TG

OBITUARY

John Chatterton DFC MSc FIAgrE

East Midlands Branch Member and long time overburdened past treasurer John Chatterton died peacefully on 2nd March 2004 aged 84 years. John will be remembered by all those who knew him as an incredibly modest 'top class bloke' and one who enthused all around him in his passion for life, the land and all things mechanical.

John was born into a Lincolnshire farming family and later encouraged by Lincolnshire's Agricultural Education Organiser to undertake a three year BSc degree course in Agriculture; a rare course of action at that time but one that John was happy to undertake. From that inspirational start, John naturally progressed to obtain his degree and, as a university lecturer at Sutton Bonnington, went on to teach others about farming methods. After 17 years as a lecturer and Experimental Farm Manager, John returned to farming at Low Toynton, Lincs and, in doing so, maintained important, traditional agricultural values.

During the Second World War, John interrupted his university degree course to take to the skies and train as a pilot with the Royal Air Force. He eventually flew Lancasters, completing 30 missions and the sound of Merlin engines always brought him back memories of his wartime service. His home farm was taken over to become East Kirkby airfield where he was later to become an instructor. The site now houses the Lincolnshire Aviation Heritage Centre, with its own Lancaster often doing engine runs. His son Mike joined the RAF and eventually became one of the pilots flying the Battle of Britain Memorial Flight's Lancaster – a unique father and son double.

Members and friends remember John as a humorous and inspirational character. Past students of his remember trips to IAgrE evening meetings with John in the lead, stopping for fish and chips on the way back, pulling over to eat them at RAF Swinderby, whilst watching Javelins night flying.

John was a staunch supporter of IAgrE and looked after the Branch's finances for many years as well as keeping everyone on their toes with the practical relevance and application of machines to the land. His presence would light up the room, we shall all miss him but soon will be able to recall his total commitment for life in his biography, shortly to be published – *Ploughshare and Shining Sword – The biography of John Chatterton DFC.*

Bill Basford

AWARD WINNING WORK

Dr Matthew Home who has just completed his Engineering Doctorate at Cranfield University at Silsoe was awarded the Shepperson Memorial Prize by the South East Midlands Branch at their Annual General Meeting held on 9th February 2004.

The annual prize is awarded by the Branch to the student who produces a thesis of a practical engineering nature that is likely to prove beneficial to the farming community in the near future.

On presenting the award, Tim Chamen, Branch Chairman stated that Matt, having obtained an Honours degree from Cranfield University at Silsoe, enrolled with the University to take an Engineering Doctorate, sponsored by the Douglas Bomford Trust, at Silsoe Research Institute with research focussed on the design of cultivation systems for inter- and intra-row weed control. His remit was to improve hoeing efficiency in vegetable crops with the aim of reducing chemical use.

Two main problem areas were identified:

- how to make cultivations effective at just 20 mm depth - which involved him in many hours searching for glass beads in the soil bin at Cranfield University at Silsoe; and
- how to improve weed control in the crop row.

He devised a rapidly retracting blade whose effectiveness was enhanced by introducing a blade shape that maximised the forward throw of soil. This resulted in soil cover of weeds close to the next crop plant in the row.

Matt went far enough in his research such that 'proof of concept' was achieved and his work is now being taken forward by the Horticultural Development Council.

Matt Home (right) receiving his award from Tim Chamen, Branch Chairman

Keith Hawken (right), AEA Standards Officer, receiving congratulations on achieving CEng via the mature candidate route from the President, Dr Dan Mitchell. Keith is one of eight that Dan is currently mentoring for CEng.

MEMBERSHIP CHANGES

A warm welcome to many new members and congratulations to current members achieving a further phase of their professional development.

Admissions

Associate

D R Stubbs (North Yorkshire)

Student

Askham Bryan College:
T D Bowlser
E Collins
M C Denness
R J Duncan
R B Fawcett
A Fox
B J Hughes
D Hurrell
T J Ottewell
J Peel
J D Phillip
J M Rowlands
J Stephenson
T J Wall
J M Watts
C Yearwood

Barony College:
J Briggs
R Brown
G J Carruthers
A Clingan
S J Cook
S P Cowan
K R Davidson
K Kershaw-Dalby
P Marr
V Milby
T O'Neill
A Rennie
C W Richardson
R R Scott
P Simmons
A Smith
M A Smith
K Templeton
F Thomson
W Wigham
J C Young

Greenmount College:
D R Ford
H W Irvine
R W Sloan

Harper Adams University College:
P F Wilson

Oatridge College:
G Anderson
J A Cockburn
G Dodds
A B Dun
C Dykes
J Fleming
R J Gilholm
J Grant
A Grimsdale
S J Harkness
S Henderson
S Hood
C Lauder
G Louden
D Lowe
D McEwen
J McLean
C J MacDonald
P C MacHale
J R Ogilvie
M C Orr
J R Reid
A Saunders
D E Saunders
C Seath
D Shand
N Singh
G W Spiers
R G Stevenson
K Tierney

Reasheath College:
B J Bennett
B Beard
I Briggs
D J Butterworth
V A Capper
M Carrott
A W Challoner
D R Clay
C L Cowley
B S Dillon
J P Dutton
T Earl
W Ellis
A M Elphick
A Evans
D T Field
G Findlay
S Fletcher
C L Flynn
J C Gadd
W R Gibbs
S J Hughes
J R Hulland
T D P Hunter
D M Jacks
R S Johnson
S Johnson
C Jones
W Kendrick
J Kettle
J Kimberley
O J Knowles
S Mear
S Mercer
I J Millington
R W Morgan
J Myles
T R Noden
A J Palin
M Percival
D E J Petrie
D Ravenscroft-Jones
M J Richards
D C Riley
D J Rogers
M Royle
R M Sheldrick
T Sherwin
A J A Smith
M T Smith
A J Somerville
A P Sutton
A J Taylor
A Thomas
M R Vaughan
D Voutt
C G Wagstaff
A W Waterson
T Whiston
E Williams
A Williamson
M J Williamson
T Wood

Salesian Agricultural College, Ireland:
M F Ambrose
D Burns
R Carty
J Connors
K Conway
B Dillon
L Egan
J Fitzgerald
N P Flynn
J D Gallagher
A A Griffin
M A Hayes
S J P Hayes
E Joyce
P Keville
M Kilgallon
G Leen
S Lucey
C Lynch
P McGettrick
J M Mulcahy
P Murphy
J Nolan
J O'Callaghan
D O'Lone
M O'Meara
M A Pender
F Ryall
B J Sheridan
E F Skehan
C J Smyth
M Toohey
D Wilson

Institute of Technology Tralee, Ireland
J P Barber
C P Belton
J Browne
A Cassells
K P Coleman
T Deane
E P R Fleming
R Fletcher
G Gavin
B George
E Gerety
T Greaney
A T Kelly
K Larkin
J Lucey
C O McCarthy
M McCusker
C Moran
B M Murphy
F T Murphy
M O'Connell
A O'Donoghue
J O'Dwyer
D O'Leary
P O'Leary
M J O'Reilly
G P O'Sullivan
M O'Sullivan
M E Quigley
M Reardon
P Ryan
S J Ryan
S M Ryan

Readmissions

D N Hinchcliffe (Cornwall)
C E Owston (Staffordshire)

Transfers

Fellow

N J Paul (Wiltshire)

Member

R C P Green (Shropshire)
A C Newbold (Lancashire)
I M Scotford (Bedford)
S J Shakespeare (Gwynedd)

Does anyone know the whereabouts?

Name	*Last known address*
James O'Regan	6 Carters Wynd, Swinton, Duns, Berwickshire
John Owen	Constable Terrace, University Plain, University of East Anglia, Norwich NR4 7TJ

Academic Members

Askham Bryan College
Askham Bryan
York
YO23 3FR

Barony College
Parkgate
Dumfries
DG1 3NE

Cranfield University Silsoe
Bedford
MK45 4DT

Duchy College
Rosewarne
Camborne
Cornwall
TR14 0AB

Harper Adams University College
Newport
Shropshire
TF10 8NB

Oatridge Agricultural College
Ecclesmachan
Broxburn
West Lothian
EH52 6NH

Pencoed College
Pencoed
Bridgend
CF35 5LG

Reaseheath College
Reaseheath
Nantwich
Cheshire
CW5 6DF

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

Sparsholt College
Sparsholt
Winchester
Hampshire
SO21 2NF

Wiltshire College - Lackham
Lacock
Chippenham
Wiltshire
SN15 2NY

Commercial Members

Autoguide Equipment Ltd
Stockley Road
Heddington
Calne
Wiltshire
SN11 0PS

Douglas Bomford Trust
44 Drove Road
Biggleswade
Bedfordshire
SG18 8HD

Bomford Turner Limited
Salford Priors
Evesham
Worcestershire
WR11 5SW

John Deere Ltd
Harby Road
Langar
Nottinghamshire
NG13 9HT

FEC Services
NAC
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2LS

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

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

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

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

Silsoe Research Institute
Wrest Park
Silsoe
Bedford
MK45 4HS

White Horse Contractors Ltd
Lodge Hill
Abingdon
Oxfordshire
OX14 2JD

Willowdene Farm Training Centre
Willowdene Farm
Chorley
Bridgnorth
Shropshire
WV16 6PP

Long service certificates

Name	*Grade*	*Date of Anniversary*
50 years		
Samaraweera Arachchige Gunapala **Perera**	IEng FIAgrE	12 Jan 2004
Colin Victor **Brutey**	EngTech FIAgrE	13 Apr 2004
Geoffrey **Fletcher MBE**	FIAgrE	13 Apr 2004
John Blackwood **McGrouther**	IEng MIAgrE	13 Apr 2004
Francis Pepys Durie **Moore**	FIAgrE	13 Apr 2004
35 years		
Richard Mayes **Hibbott**	IEng MIAgrE	5 Apr 2004
David John **Cooper**	MIAgrE	17 Apr 2004
Michael Sinclair **Neal**	IEng MIAgrE	17 Apr 2004
John Fryer **Washbourne**	CEng FIAgrE	17 Apr 2004
Walter Mutimur **Osborne**	EngTech MIAgrE	17 Apr 2004
John Howard **Russell**	AIAgrE	17 Apr 2004
Hayden Colin **Wickington**	AIAgrE	17 Apr 2004
Ralph **Alcock**	CEng FIAgrE	17 Apr 2004
Gino Paul Cameron **Henry**	CEng MIAgrE	17 Apr 2004
Anthony Russell **Key**	CEng MIAgrE	17 Apr 2004
Richard Roy **Morrison**	MIAgrE	17 Apr 2004
25 years		
Anthony Charles Martin **Linfield**	EngTech MIAgrE	5 Mar 2004
David Anthony **Crolla**	CEng FIAgrE	8 Mar 2004
Jonathan Michael **Chapman**	CEng MIAgrE	11 Mar 2004
Ian Richard **Maddock**	IEng MIAgrE	12 Mar 2004
John Michael **Walton**	MIAgrE	4 Apr 2004
Trevor David **Beaumont**	MIAgrE	24 Apr 2004
John Lloyd **Williams**	IEng MIAgrE	29 Apr 2004

The Editor apologises for the name incorrectly presented in the Early Spring issue.

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

INSTITUTION of AGRICULTURAL ENGINEERS, WEST END ROAD, SILSOE, BEDFORD, MK45 4DU, UNITED KINGDOM. Tel: +44 (0)1525 861096 Fax: +44 (0)1525 861660

Novel food packaging techniques

Edited by : Raija Ahvenainen
Publisher : Woodhead Publishing Ltd, England, UK
Price : £150/US $235/€235 (plus p&p)
ISBN : 1 85573 675 6

With contributions from a 'distinguished international team', 'Novel food packaging techniques' aims to present an 'authoritative and comprehensive review of key trends'.

As shoppers we might find ourselves consuming (quite literally) some of these new innovations in the future but in the meantime, this is a publication directed at the more academic reader. It is particularly aimed at those in the food industry concerned with 'optimising the use of packaging to improve product safety and quality'.

Of the techniques covered, there are innovations recognised for their potential; and concepts which have yet to be introduced to, or accepted by consumers at large. Each respective topic is presented and discussed within a research-style chapter making this book very suited as a reference work.

Chapters are organised into four, clearly identifiable sections, which include:

- introducing the active and intelligent packaging techniques available;
- outlining the developments in modified atmosphere packaging and its role in enhancing product safety and quality;
- discussing the application of such novel packaging for particular products; and
- identifying other key issues (such as legislation, consumer attitudes, recycling, and the problems of green waste).

The topics discussed in this last section may also be of interest beyond the food packaging industry, with offerings which should appeal to those particularly in the environmental and recycling sectors.

SMWS

MORE INFORMATION

Woodhead Publishing Ltd, Abington Hall, Abington, Cambridge CB1 6AH, UK. Tel: +44 (0) 1223 893694. E-mail: sales@woodhead-publishing.com

Technology of Indian Milk Products

Authors : R.P. Aneja, B.N. Mathur, R.C. Chandan and A.K. Banerjee
Publisher : Dairy India Yearbook, India.
Price : US$150 + $45 (handling and postage).

Indian milk products are becoming known and appreciated throughout the world and many of them are now manufactured in regions outside India, especially in areas with large Indian populations. However, until the publication of this 462 page handbook, there has been a lack of up-to-date and reliable information on the manufacture of these products, which has hindered progress in their most effective and economical manufacture.

This remarkable book, written by four of India's leading dairy professionals, includes detailed descriptions of the manufacture and characteristics of hundreds of national and regional milk products and, where appropriate, gives flow diagrams of the industrial manufacture of many of these products. The many coloured photographs and diagrams throughout the book add considerably to both its information content and its aesthetic appeal.

The book is divided into seven sections under the broad headings of: Overview; Principles of processing; Technology; Industrial production; New vistas for industrialisation; Nutrition and health; and a Buyers guide and who's who. The wealth of information in these sections, which goes well beyond the detailed descriptions of the manufacture and characteristics of Indian milk products, is supported by 250 statistical tables, 60 charts and diagrams, and 25 beautiful colour photographs.

At a time when increasing globalisation is changing the ways in which consumers are looking at food and are constantly looking for new products and flavours, ethnic dairy delicacies such as those described in this book play an important role. The market for traditional milk products in India now exceeds US $10 billion and the transformation of the manufacture of Indian traditional milk-based sweets' from an age-old art into an exact science forms the core of the contents of this handbook.

It is difficult to realise that it is only about 20 years ago, that India's first plant was set up to manufacture these specialities, using modern technology. This has no doubt contributed to the setting up of ethnic milk product plants in the USA and in Canada.

This unusual book deserves to find its way onto the bookshelves of dairy and food professionals throughout the world who have an interest in the manufacture, characteristics, and marketing of ethnic milk products, as well as, of course, the hundreds of libraries in colleges and universities where dairy and food science and technology is taught. Last but not least, many public libraries could benefit their readers by having copies of the book on their shelves.

Ernest Mann

MORE INFORMATION

Mann prepared this review for International Journal of Dairy Technology of which he is Editorial Board Chairman Dairy India Yearbook, A-25 Priyadarshini Vihar, Delhi 110092, India. E-mail: yearbook@vsnl.com Websites: www.IndiaDairy.com and www.IndianMilkProducts.co

Tree and Forest Measurement

Author: P W West
Publisher: Springer-Verlag, Germany
Price: £23.00/
$39.95/€29.95 (net price)
ISBN: 3 540 40390 6

Trees and forests are large and complex, but even something as difficult as the amount of wood they contain can be measured with quite unsophisticated equipment. Everyone, from professional foresters to the layperson, who works with forests and needs to measure them no matter where in the world, will appreciate this book. It summarises modern forest measurement techniques and describes why forests are measured, how to measure them, and the basis of the science behind these techniques.

Professor Phil West has been a forest scientist for over 30 years. His research speciality is the mathematical modelling of forest growth behaviour. He is presently a forestry consultant and teaches forest measurement in the forestry school of Southern Cross University in northern New South Wales, Australia.

MORE INFORMATION

Springer-Verlag, Book Review Dept./ PR Fachpresse, Tiergartenstrasse 17, 69121 Heidelberg, Germany. Tel: +49 6221 487 8130. Fax: +49 6221 487 8141. Website: www.springeronline.com

AMENITY

Kerry Ridgeway accessible to all

Forestry Commission (FC) Wales has been successful in its bid for a £624,000 Objective 2 European Funding grant to develop a range of forest tourism projects, including new facilities on the historic 24 km regional walk, Kerry Ridgeway, in Powys.

As a road of considerable cultural and historic importance, Kerry Ridgeway is a popular venue for historians, walkers and cyclists. The aim of this project is to improve the facilities at the Ridgeway to encourage more visitors to one of Wales's best kept secrets for Welsh walks. FC Wales, in partnership with Powys County Council and local landowners, is constructing new car parks with interpretation boards to provide a focus for visitors to the Ridgeway.

FC Wales began working on this project late last year, and have now built a car park at Sarn Hills, with a picnic area suitable for disabled access. Before the autumn, when the project is due to be completed, signposts will be built and erected on routes leading to the Ridgeway, and interpretation panels put up at key points along the site to provide information on history, the landscape and wildlife. A second new car park is proposed at the western end of the route, near Cider House.

Richard Siddons, Forest District Manager, said, "FC Wales is leading the way in using expertise and knowledge to develop forests throughout Wales for tourists in order to increase visitor spend.

"In collaboration with Powys County Council, FC Wales will design and implement facilities which when completed will make the woodlands friendlier places for thousands of people to enjoy. Wherever possible locally produced environmentally sustainable goods and services will be used, and it is envisaged that work will also be generated for local businesses."

The Ridgeway, situated on the Powys-Shropshire border, is one of the oldest drover roads in the UK and was once a major highway for cattle and sheep on their way from Mid Wales to the markets of England. Now a regional long distance path, it has spectacular panoramic views across Wales and England. The new facilities will provide opportunities for diversification into tourism, in an area dominated by the agricultural industry.

The suite of projects (new facilities at Lake Vyrnwy, new horse riding trails at Dyfnant and new walks and facilities at Hafren and the source of the Severn) will hope to attract more visitors to stay longer and spend more money in Powys. The projects aim to improve the attraction of these areas as a tourist destination in order to generate economic, and tourist benefits to Powys. These improvements will generate a sense of welcome to rural areas and attractions, and encourage visitor relaxation, enjoyment and purchasing of local products, goods and services.

Forestry Commission Wales is the government department responsible for forestry policy and looks after 130,000 ha of public forests owned by the Welsh Assembly Government.

FURTHER DETAILS

More information on the Woodlands of Wales can be found on the Forestry Commission's website: www.forestry.gov.uk

FOOD QUALITY MANAGEMENT

Pilot of electronic identification and electronic data transfer for sheep

The Department for the Environment, Food and Rural Affairs (Defra) has awarded a contract to ADAS to conduct a trial of electronic identification (EID) and electronic data transfer (EDT) within the English sheep industry. The trial will assess how easy the equipment is to use and will look at training and support requirements for use of EID and EDT on farms, and in abattoirs and markets. It will also identify potential benefits of EID/EDT for the sheep industry.

The trial will take place within three cluster areas, in the North East, South West and Midlands and will include a minimum of 50 lowland, upland and hill farms in total, selected to ensure a full range of environmental conditions, production systems and farmer attitudes to the technology.

Around 70,000 sheep will be electronically identified using a range of eartags and boluses. In addition, use of EID and EDT will be examined and tested in a small number of markets and abattoirs at key stages during the sheep production cycle.

Practical work will commence on selected farms, which will be drawn from lists provided by industry representatives, between March and May 2004 and ADAS will train participants in the use of EID/EDT equipment (which will be provided) and supply advice and guidance throughout the course of the trial. ADAS will monitor and report back to Defra as the trial progresses and interim findings are expected by the end of September 2004. The study will conclude with the production of a final report in June 2005. Information on progress will be available on the Defra website throughout the trial.

The project has widespread support from the farming industry.

FURTHER DETAILS

Defra, Nobel House, 17 Smith Square, London SW1P 3JR. Tel: +44 (0)8459 335577. Website: www.defra.gov.uk

HISTORIC HERITAGE

Sherwood Forest branches out!

A mosaic of woodland, heathland and orchards, criss-crossed by hedges and water courses, is taking shape as Sherwood Forest's heritage is restored to its former traditional glory, thanks to the Sherwood Forest Initiative.

Stretching over 40 km from north of Worksop, down to Bestwood village and across from Mansfield in the west to Retford and Farnsfield in the East, and with more than 40 landowners and organisations involved, large areas of characteristic Sherwood Forest habitat and landscape will be restored in one of the largest partnership schemes of its kind in the country.

Programme manager, Norma Saunders, said: "We are very lucky in Sherwood. We have one of the finest areas of ancient trees in Europe, if not the world. We have a brilliant team of experienced partners working together to protect our cultural and environmental heritage for the benefit of local people and visitors alike, and to look after our wildlife. We are now planning historical and cultural activities to help people enjoy our beautiful landscape and bring historic Sherwood Forest to life."

Work began a year ago and people can now begin to see the transformation as the project reaps the social, environmental and economic benefits. Around 3479 m of new hedge has been laid; four orchards have been created; more than 150 ha of woodland and over 30 ha of heathland have been created; and 175 ha of land have been restored by grazing under the heritage landscape project.

Heathland, wet woodland and fen habitat is being restored on Rainworth water, in Clipstone Forest with involvement from the Forestry Commission, one of the Initiative's biggest partners. A two kilometre water course and a 30 ha reed bed habitat have also been created. On other sites, two backwaters, five hectares of flood plane, wader scrapes and otter holts, and 1200 m of riverbank have been created.

At Thoresby Park, an ancient water meadow has been restored and signage will soon be erected to explain the uniqueness of sites like this in Nottinghamshire. This five year programme worth over £5 million is being co-ordinated by the Sherwood Forest Trust with nearly £3 million from the Heritage Lottery Fund.

Public understanding, appreciation and involvement is encouraged. Four Sherwood Forest Community rangers based in Ollerton, Manton, Blidworth and Rainworth develop activities and link landowners and communities.

Hugh McCahon is Heritage Education Officer and works with local schools and colleges, administering a visit fund to help children into the countryside.

WOODLAND MANAGEMENT

Thinning the urban jungle

Anyone who manages an urban wood can pick up professional advice, hints and tips from the Woodland Trust's latest addition to its popular series of Urban Woodland Management Guides. As the UK's leading woodland conservation charity, the Woodland Trust is delighted to share its expertise gained from over 30 years of urban woodland management.

Written by experienced urban woodland managers, the new guide – *Thinning and felling* – takes the reader through the challenges and opportunities presented to the urban forester. It is a comprehensive introduction to everything the urban forester needs to know about Health and Safety, management access, community relations, finding contractors, stacking timber and the many other challenges specific to working in urban woods.

Thinning and felling is a continuation of the original guides on *Litter and Fly-tipping, Complaints, Misuse and Tree Planting.* The new guide suggests practical solutions to the problems faced when felling trees near people's back gardens and near public utilities.

Norman Starks, UK Operations Director for the Woodland Trust, says: "These guides are built on our many years experience of working in urban and rural woodlands and the difference that people living in close proximity to trees makes to woodland management. I would recommend them to anyone managing an urban woodland."

FURTHER DETAILS

The Woodland Trust, Autumn Park, Dysart Road, Grantham, Lincolnshire NG31 6LL. Tel: +44 (0)1476 581111. The complete series of guides is free to download. Website: www.woodiand-trust.org.uk/publications

ENVIRONMENTALLY RESPONSIBLE ELECTRONICS

Unique recycling service helps business compliance

Maxitech.biz re-uses old electronic equipment by reconditioning it and then providing it, at low cost, to charities and individuals with low incomes, start-up businesses and other groups that can benefit from this socially and environmentally responsible scheme. This provides an attractive and responsible alternative to businesses. Equipment that cannot be reused can be taken apart and only those parts that cannot be recycled are then disposed of in the most environmentally friendly way possible.

Maxitech.biz' client list includes five London councils and the businesses within their boroughs, among which are Carlton Media and Central Middlesex Hospital. Peter Paduh, Managing Director, said: "What sets maxitech.biz apart from other asset recovery firms is our commitment to environmental stewardship. Our unique system ensures that from anything we process, no harmful components are sent to landfill, and no harmful waste is sent overseas for disposal. The fundamental belief upon which we base our business is quite simple – any assets that cannot be reused will be recycled.

Building a disposal strategy into information technology (IT) purchasing is becoming essential for all businesses wishing to operate within the law and with an environmentally responsible ethos. Working in partnership with our clients we help them achieve these aims." Incorporated in 2003 and sponsored by London Remade – the public agency set up to encourage markets in recycled goods and supported by the Mayor of London – maxitech.biz provides a solution to the legal, environmental and social issues of disposing end-of-life electronic equipment.

Hugh Carr-Harris, Chief Executive of London Remade, said: "It's a high priority for London Remade's programme to invest in projects that are diverting e-waste from landfill. The social enterprise sector has an important role to play in developing re-use alternatives for waste electrical equipment. By supporting (such) organisations, we are also helping London capitalise on the potential economic and social opportunities the new directive presents."

Maxitech.biz will collect old electrical equipment from business premises and ensure all data is removed using tools that meet the Government Defence Department's standard for wiping hard-drives clean. The company's own research and test trading has shown that fear of sensitive information stored on old personal computers being used maliciously is one of the biggest obstacles preventing environmental disposal and re-use of old IT equipment.

Under one of the charitable schemes operated, surplus IT equipment is purchased – providing it is up to date – and the money donated to charity, thus helping businesses discharge corporate social responsibility and comply with the European Union's Waste E;ectrical and Electronic Equipment (WEEE) 2003 Directive at the same time.

CONTACT

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INNOVATIVE RECYCLING

Xmas trees 'fir' the tigers

Whilst most of us are now welcoming the birth of Spring, with the Christmas tree 'chipped' weeks ago, old Christmas trees are proving to be a roaring success with Edinburgh Zoo's tigers. Delivered from the Forestry Commission Scotland's Blairadam forest, near Kelty, the trees can be found at the big cats' enclosure. The tigers appear to find the trees irresistible to play with.

Donald Balfour from Forestry Commission Scotland delivered the trees: "This is an unusual one for us because we've never had cats this size purring up to our trees. We were only too happy to help out. The trees were due to be recycled, but in this way you could also say that they are going right back to nature – but in a very big way!"

Zoo keeper Gillian de Felice say the trees are a big hit with a lot of the animals: "It's really great that the Commission have donated these trees, as we can certainly make good use of them in many of our enclosures. The tiger cubs especially love the scent, and they really enjoy leaping on them, dragging them around and generally demolishing them!"

RECYCLING

Grant helps farmer go green with compost

A West Midlands farmer is installing a 'green' composting plant, providing an environmentally friendly alternative to disposal of green waste in landfill sites, with help from a Department of the Environment, Food and Rural Affairs (Defra) grant worth nearly £50,000. Clive Briscoe of Home Farm, Berkswell near Coventry was awarded the Rural Enterprise Scheme grant from Defra to set up the composting plant to turn green household waste into compost, which he can then use to fertilise his fields.

The funding has paid for a concrete pad on which the compost is made and a weighbridge to monitor the amount of green waste arriving. It has also funded improvements to the site entrance and a site cabin.

Mr Briscoe said: "Until now, I have been using chemical fertiliser on my land but this project enables me to 'go green' with compost. This is the perfect way to supplement my income and reduce my costs. And I will have compost available on-site, as and when I need it. Once we're in full swing, we'll have the capacity to process up to 10,000 tonnes of green waste annually, which in turn will produce 6,000 tonnes of compost. It's good to be making a contribution to the protection of the environment."

Ken Downward, a project officer from Defra's Rural Development Service in the West Midlands, said: "Mr Briscoe has come up with exactly the type of 'green' project that we are keen to fund. Green waste decaying under the ground in landfill sites produces the greenhouse gas, methane. But recycling green waste as compost above ground means that most of the gas released is carbon dioxide, which is mainly taken up by new plant growth. There is a limit to the amount of waste that can be put into landfill, and compost represents a productive and efficient approach to reducing this in an environmentally friendly way.

"Home Farm is ideally placed in the Meriden Gap to offer this composting service. It is close to some of the largest conurbations in the country and with people becoming increasingly conscious of the benefits of adopting sustainable lifestyles then the need for composting will rise."

The initial process of converting green waste into compost takes about 5 months. The compost stands in 60 m long triangular rows called windrows. Machinery is used to turn the windrows weekly in order to introduce oxygen into the compost, which helps reduce the production of methane. Finally, the compost is left to mature in field stores for 3 months.

FURTHER DETAILS

Defra, Nobel House, 17 Smith Square, London SW1P 3JR. Tel: +44 (0)20 7238 1133. Fax: +44 (0)20 7238 5529. Website: www.defra.gov.uk

CONIFER RESEARCH

Forest research student scoops honours

Research into compression wood has earned an Edinburgh student the chance to rub shoulders with the world's top scientists at an international convention in Sweden. Emily Payne spent two summers working with scientists from Forest Research helping to develop a method to detect compression wood in conifers. Her sterling work scooped the talented teenager the honorary prize at the prestigious European Union (EU) Contest for Young Scientists.

She is now preparing to travel to the Stockholm International Youth Science Seminar, where she will attend the Nobel Prize ceremony and have the chance to meet the Nobel Laureates. Emily worked with Barry Gardiner and Elspeth Macdonald at Forest Research's Northern Research Station, near Edinburgh, for six weeks between her fifth and sixth year at school and for a further month this summer.

Her work formed part of an EU-funded project investigating compression wood, which can be a cause of major problems in the wood processing industry. Her project placement was organised through the Nuffield Foundation as part of its science bursary scheme.

"Compression wood forms on the leeward side of trees exposed to strong wind, on leaning or crooked stems, and in the lower part of trees growing on a slope," she explained. "It has a different structure and chemical composition to normal wood. My work at Forest Research involved developing a technique for classifying wood samples as compression wood or normal wood at the laboratory level. This involved using a combination of light microscopy and image analysis software."

Project team member Barry Gardiner, who supervised Emily's work, said: "I am delighted at Emily's success. She is an outstanding student and helped to progress our work enormously." Emily is now studying studying actuarial maths and statistics at Heriot Watt University. The three-year compression wood project, coordinated by Forest Research, involves an international team of research institutes and industry partners. It aims to increase knowledge of the way in which compression wood is formed with a view to linking raw material properties to the end product performance of construction wood.

CONTACT

Details are available at www.forestry.gov.uk/compressionwood

FRESHWATER MANAGEMENT

Forests and water – new guidelines out

The latest advice to help foresters and woodland managers protect and enhance the freshwater environment through careful planning, consultation, forest design and management is now available.

The Forestry Commission's Forests and Water Guidelines have undergone a major revision to reflect the most recent regulation, research and experience. They recognise that forestry provides many opportunities for benefiting water and the rich variety of freshwater life.

Now in their fourth edition, the Guidelines provide important background information on water and the law, the movement of water through a catchment, the ecological value of the freshwater environment, and the effects of forestry on that environment. At their core is a set of comprehensive advice on catchment planning, site planning and the conduct of all forest operations.

The Environment Agency, Scottish Environment Protection Agency, Forestry Commission, Forest Research, the Joint Nature Conservation Committee and the Northern Ireland Forest Service joined forces to draw up the revised guidance. Lord Clark of Windermere, the Forestry Commission's chairman, welcomed the new publication, saying it would be of great practical use. "The location, design and management of forests and woodlands can affect not only the freshwater environment at a local level but also downstream," he said. "Forested areas provide important aquatic habitats for a whole range of flora and fauna some requiring special protection. Through their effect on the quantity and quality of water, forests also influence many important water users.

"The Guidelines translate current understanding of these processes into practical recommendations so that future benefits can be secured and negative impacts minimised. As a result, forestry is well placed to make an important contribution to safeguarding the sustainable use of the UK's water resources."

MORE INFORMATION

The Forest and Water Guidelines are available, priced £9, from Forestry Commission Publications, PO Box 25, Wetherby, West Yorkshire LS23 7EW. Tel: +44 (0)870 1214180. E-mail: forestry@twoten.press.net

FARM MANAGEMENT

The new LEAF audit

The original Linking Environment and Farming (LEAF) Audit was developed in 1993, in response to requests from farmer members for a method of demonstrating their compliance with Integrated Farm Management principles and enabling them to set priorities for future change. It has been regularly updated and each year's responses are collated by LEAF and form a record of changes in practice.

The New LEAF Audit is a whole farm management tool that builds on LEAF's experience of providing farmers with a way of honestly appraising and improving their practices. It is a fully computerised system and provides the following new features:

- comprehensive help facility
- on screen access to advisory publications and information
- a range of answers to give a true reflection of the on farm situation
- audit reports, action reports and performance profiles at the click of a button
- on screen benchmarking facility
- simple on-line submission of the completed Audit
- easy retrieval of Audit updates

The New LEAF Audit offers new features and new opportunities – for example an exemption from the Crop Protection Management Plans will be given, and LEAF are working with others to ensure that duplication is avoided, so farmers efforts are recognised and rewarded. The New LEAF Audit also is equivalent to 4 Continuing Professional Development (CPD) points.

What you need to do to get your copy of the New LEAF Audit

1. Fax or e-mail your contact details (name, address, postcode, membership number and e-mail address). Please note, it is essential you provide your membership number (if applicable) and your e-mail address, so an authorisation code can be issued.
2. LEAF will send you the New LEAF Audit and e-mail you with your authorisation code
3. Complete the audit – which will give you instant feedback and help
4. Send your completed audit back to LEAF via the internet – this allows LEAF to create the benchmarks and for you to get updates, new information, and your CPD points

MORE INFORMATION

The New LEAF Audit is available FREE to members. Fax form details to +44 (0)24 7641 3636. E-mail: audit@leafuk.org A paper version is available for an additional charge of £15.00 + VAT for the processing. Non-members can apply for a free demonstration disc or purchase the New LEAF Audit by becoming a member: £35.25 (<120 ha) or £58.75 (> 120 ha).

STEEL FABRICATION

Humber galvanized fencing resists charges

Humberside Galvanizing of Hull has successfully completed the galvanizing of over 4.5 tonnes of steelwork used in the construction of a magnificent new rhino house and refurbished 'big cat' enclosure at Flamingo Land Theme Park and Zoo, Kirby Misperton, North Yorkshire.

MA Fabrications of Pickering, North Yorkshire, carried out the steel work for both enclosures, which included the fabrication of a variety of structures including cage fronts, walkways, penning and security fencing.

Director Mike Agar comments: "The contract was one of our biggest and most demanding projects yet, with a rapid and flexible response required from the galvanizing contractor to meet tight schedules. Humber Galvanizing was able to meet our requirements with a consistently high standard of product, backed up by a quality, professional service."

Humber's Commercial Manager Tony Linsley adds: "We have recently invested in an extension to our storage facility in order to significantly increase the speed of delivery and collection times for customers. With our excellent existing process facilities, and the addition of twice as much space to accept deliveries and store completed galvanized items ready for collection, Humber Galvanizing was available to offer an express service to MA Fabrications."

Galvanized steelwork forming part of the new Rhino House at Flamingo Land Theme Park and Zoo

Flamingo Land Theme Park and Zoo is the fourth most visited theme park in Britain and its new rhino house and refurbished big cat enclosure form part of an imaginative new 'Lost Kingdom' development at its North Yorkshire site. The rhino house is home to two powerful white rhinos, while the completely rebuilt big cat enclosure incorporates vastly improved viewing facilities including an overhead walkway for zoo visitors.

Flamingo Land is home to over 1000 animals such as tigers, zebras, camels, monkeys, sea lions, reptiles and penguins, and the zoo operates a special breeding programme for endangered species. It is also famous for its pink flamingos, the largest flock in the United Kingdom

Wedge Group Galvanizing, awarded the 'Investor in People' status, is one of the largest and most modern metal treating organisations in Europe with sixteen plants nationwide. Wedge has pioneered innovations and set new benchmarks for plant, process and environmental matters in the UK and worldwide. Wedge is member of the British Constructional Steelwork Association and works to stringent British Standards.

CONTACT

Contact: Trevor Beech, Sales Director, B. E. Wedge Holdings Ltd, Stafford Street, Willenhall, West Midlands, WV13 1RZ. Tel: +44 (0)1902 630311 Fax. +44 (0)1902 366353 E-mail: info@wedge-galv.co.uk Website: www.wedge-galv.co.uk

SITE DEVELOPMENT

AGCO sell 'Banner Lane' to Persimmon plc

AGCO Ltd has completed the sale of its Banner Lane site in Coventry to Persimmon plc.

As part of the terms agreed, AGCO Limited will leaseback its current offices and various other facilities at Banner Lane whilst progressing with its plans for alternative premises in the Coventry vicinity. The Massey Ferguson Sports and Social Club will remain at the Banner Lane site under a long-term lease.

Persimmon are to meet shortly with Coventry City Council to discuss redevelopment proposals for the site.

Declan Hayden, AGCO's Vice President Marketing said, "The agreement that the Company has, with Persimmon plc, to lease back its current offices will give us the time to select the best location for AGCO's new European headquarters in the Coventry area."

Five hundred people are employed by AGCO at the Coventry location which remains the headquarters of the Company's Europe, Africa & Middle East Sales and Marketing operations. The European Headquarters manages approximately half of AGCO's global turnover. It is responsible for AGCO's Challenger, Fendt, Massey Ferguson and Valtra agricultural machinery brands.

Declan Hayden continued, " AGCO's business continues to grow and the Coventry Headquarters is playing a major role in this development. 2004 promises to be another year of growth for the Company. The sale of the site will allow the development of a new Headquarters location which reflects the importance of our Coventry operations."

CONTACT

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Integrated tractor control system boosts efficiency

With its new Integrated Tractor Control System (ITCS), Massey Ferguson offers a new level of field monitoring and tractor control. The industry leading device is available as an option on the MF 6400 and MF 7400 Series tractors and offers an operator friendly control system with key features of the benchmark Datatronic II Monitoring and Control system.

Farmers can therefore either specify Massey Ferguson's Integrated Tractor Control System or the fully featured Datatronic II system depending upon their application requirements.

With simple and intuitive operation, the new system controls and manages four important functions:

- wheelslip;
- spool valve management;
- hydraulic flow priority; and
- fuel use.

These functions help operators to precisely control and monitor the tractor to boost output, improve operation and increase efficiency.

The unit uses a touch sensitive panel, mounted to the right of the instrument console, to scroll through menus and select settings that are shown on a display on the left of the dash. In operation the display's working screen shows forward speed, wheelslip, PTO speed and two pre-set engine speeds (when option fitted).

MF7400 series (MF7480 shown) won 'Machine of the Year 2004' and sports the integrated tractor control system, considered an industry leading device

Wheelslip Control

Massey Ferguson operators now have access to Wheelslip Control on both ITCS and Datatronic II options. Until now, Wheelslip Control, first introduced by Massey Ferguson in 1986, has only been available with the fully featured Datatronic II Monitoring and Control System.

Equipped with a radar the monitor compares actual ground speed with rear axle revolutions and is able to calculate and display wheelslip level as a percentage. By automatically controlling wheelslip the system maximises traction, cuts fuel consumption and reduces tyre wear.

Operators can set the maximum permissible wheelslip using the keypad in conjunction with the display. When the pre-set wheelslip limit is reached the system automatically adjusts the linkage to maintain traction.

Spool Valve Management

The flow and timing of two spool valves controlled by the Spool Valve Management (SMS) joystick on the armrest are adjusted via the touchpad on the right. After setting the flow required to the specific port the kick-out time is then adjusted to suit. Memorising these settings ensures precise operation with minimum operator effort. Alternatively, if the valve is being used with a motor, the oil can be set to flow continuously - as shown by the infinity symbol.

Hydraulic priority control

Oil flow to the linkage can be adjusted to suit specific applications so there is always sufficient supply to the spool valves. The priority control function ensures optimum tractor and implement operation by allowing operators to reduce the flow to the lift control valve. The oil available to spool valves then increases proportionally.

Fuel Monitor

Accurate monitoring of fuel use helps to improve overall efficiency. The screen shows total fuel used and trip amounts simultaneously. The trip is quickly reset at the touch of a button.

CONTACT

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BRAND CHANGE

Kleine brand fully integrated with Kverneland

A revised brand name and a new colour scheme now adorns the former blue liveried Kleine precision drill range for 2004. It is a move that finally completes the integration of Kleine drills into the Kverneland Group's UK portfolio.

While remaining technically unchanged for 2004, the Unicorn and Multicorn precision drill models will now be branded Rau-Kleine and will be finished in Rau's distinctive red and yellow livery.

"This move adds further commitment to simplifying and strengthening our strategy of providing two distinctive brands within our portfolio," explains David Furber, Kverneland UK's sales manager for Vicon and Rau equipment.

"While the red-liveried Vicon brand continues to focus closely on the needs of predominantly grass based customers, the red and yellow liveried Rau brand is becoming more and more bespoke for those involved in arable operations," he says.

The Rau-Kleine range includes Unicorn beet drills from 6 - 18 rows and Multicorn maize drills from 4 - 12 rows, with sales, service and parts supply continuing to be distributed through the extensive Vicon dealer network.

Unicorn models can be equipped with mechanical or electric drive seed placement, while the Multicorn variants can be equipped with the synchro-drive electric seeding system for precision placement.

Both drills can be use used on conventional seedbeds, mulch and no-till systems, with prices starting at £6820 for a four-row Multicorn and £8315 for a six-row Unicorn.

Although technically unchanged for 2004, the Unicorn and Multicorn precision drill models will now be branded, as Rau-Kleine, and will be finished in their distinctive red and yellow livery

FURTHER DETAILS

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APPOINTMENT

John Deere's Alec McKee returns to the UK

John Deere Limited is pleased to announce the appointment of Alec McKee as Managing Director of their UK and Ireland operations which came into effect as of the 1st of February 2004.

Having joined John Deere in the UK in 1972 as a trainee territory manager, Alec has successfully undertaken a succession of increasingly important positions within the organisation. At the end of 2000, he was appointed as Vice President, Worldwide Marketing, based in Kansas. During 2002, Alec transferred to Moscow and was responsible for establishing a presence in the market and implementing John Deere's strategic business plan for Russia.

Alec replaces Clay Sherrill, who is returning to Deere & Company's world headquarters to take up a key position, responsible for implementing the Company's customer focus initiative and to support strategic planning activities.

FURTHER DETAILS

Chris Meacock, John Deere Ltd, Harby Road, Langar, Nottingham, NG13 9HT. Tel: +44 (0)1949 863261 Fax: +44 (0)1949 860490 Website: www.johndeere.co.uk

New small tractor makes a big entrance for CASE IH


CASE IH JX1075C; new addition to the top line range

Case IH is rapidly expanding its range to offer world class products that work together to create a seamless, total farming solution. Well known for its large horsepower tractors, Case IH will launch the new JXC, in the United Kingdom and the Republic of Ireland, in the first quarter of 2004. A utility tractor, in name only, this well specified machine offers many of the features that customers expect from the top line Case IH ranges.

Designed to offer power and prowess in a compact and lightweight package, the Case IH JXC is determined to make a bold entrance. Two models make up the new range - the naturally aspirated 45 kW (ISO) JX1060C and the turbo charged 57 kW (ISO) JX1075C. Smaller and lighter than its predecessor, the CS Compact, the JXC benefits from enhanced productivity features such as Powershuttle and electronic hitch control.

Powerful and responsive engines

The Tier II emission engines have been developed to be powerful, responsive and quiet as well as offering great fuel economy. Running at just 78 db(A) maximum cab noise level, the smooth three litre, three cylinder Case IH engine offers comfortable operation all day in both the cab and Roll-Over Protection System (ROPS) format.

Available in two or four wheel drive in either the cab or ROPS version, the JXC ROPS model can be further specified with either a full ROPS or semi-foldable ROPS setup. There is also the option to add a canopy. The ROPS model features a suspended platform on silent blocks, to soak up the rough terrain, and an air suspension seat, to provide drivers with comfort and support which complements this.

Spacious working environment

Two cab specifications are offered with the JXC. Both offer a light and spacious environment with large, single piece glass doors and wide set 'A' pillars for excellent visibility. The standard cab comes with the option of thermostatically controlled air conditioning but customers may wish to choose the special pressurised cab that features air conditioning, with recirculation as standard, as well as the option of four large carbon air filters. This cab is ideal for high dust or spraying applications where the filters screen out all particles and the pressurised cab ensures a tight protective seal is maintained. Cab roof-mounted high front and rear working lights keep the JXC going into the night.

Both the ROPS and cab models of the JXC are equally well specified with many drivers' aids to assist with routine tasks. With the potential to work in many varied applications, the JXC can be tailored to suit the customer's individual requirements.

Transmissions to meet all needs

Six transmission options are offered from a 16 x 16 synchroshuttle gearbox to 44 x 16 Powershift gearbox with powershuttle and creeper gears. Powershift allows the driver to make clutchless speed changes in all gear ranges, while under load. Powershuttle simplifies cycling manoeuvres, such as headland turns or loader work, providing both ease and control. Simply move the left hand powershuttle lever from forward to reverse and the tractor will slow, stop and then reverse without the use of the clutch. Placing the lever back to the forward position will then repeat the process, this time the tractor will smoothly accelerate forward to the original forward speed.

An electro-hydraulic rear differential lock is fitted as standard with the option of front lock available on four wheel drive models for those who want the highest levels of traction. Mechanical or electro-hydraulic four wheel drive engagement offers an excellent balance of traction and economy, allowing the JXC to be driven in the more fuel efficient two wheel drive mode for less demanding tasks and roadwork.

Hydraulic power is massive with a standard 47 l/min or an optional high capacity 64 l/min providing a lift capability of 2100 kg - impressive for a tractor of this size. Power can be directed to a maximum of six remote valves, including two mid-mount valves to power front end equipment.

Electronic hitch control with lower link flexion bar sensing can be chosen over the standard mechanical draft control for precision ploughing management. The availability of large tractor features in an advanced compact platform offers real improvements in versatility and productivity.

Smooth pto take up

Selection of rear pto speeds can be made from the comfort of the driver seat. Five pto choices up to 540 / 540E / 1000 with ground speed, cover all situations and are complemented by servo assisted clutch engagement which smoothly ramps up the power to the pto for use with high inertia implements. Mechanical or electronic hitch control is also operated from the driver's seat, making life simpler.

Optional chassis mounted front lift and 1000 rpm front pto extends the capabilities of the JXC. An electro-magnetic clutch, controls the engagement of the pto while electro-hydraulic control of the front linkage, with minimum and maximum lift height settings and a fast raise and lower switch, makes operation easy.

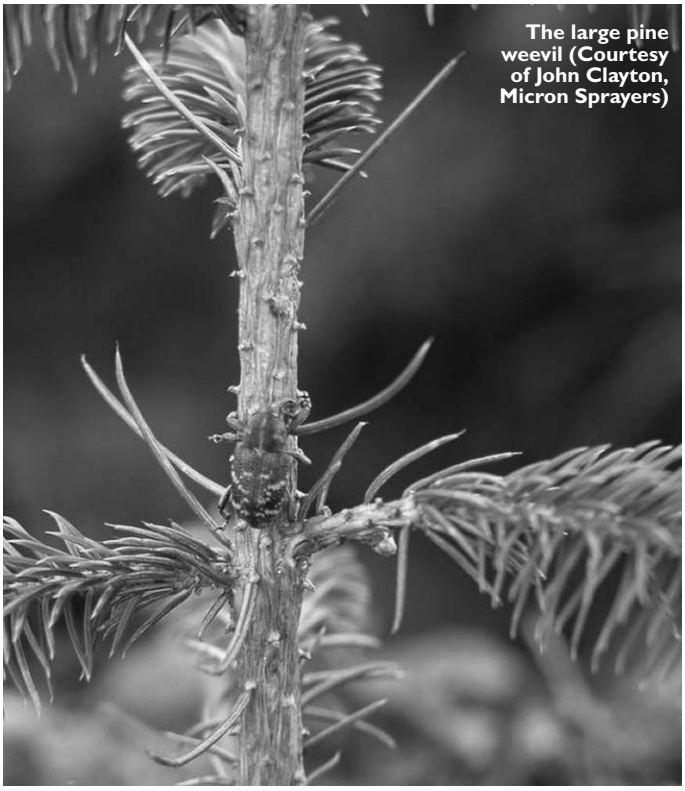
The new Case IH JXC is destined to be used in many functions from speciality farming applications and amenity work, to a mainstream workhorse role or indeed anywhere where a powerful fully featured tractor in a light, compact frame is required. Case IH has blended usability and practicality to create a first-class tractor.

CONTACT

Website: www.cnh.com

FORESTRY SPRAYER

Modified micron 'Autodos' targets large pine weevil



The large pine weevil (Courtesy of John Clayton, Micron Sprayers)

Large pine weevil (*Hylobius abietis*) is responsible for a combined loss and cost of £8 million per annum to UK forestry. Pre-planting treatment of tree seedlings complemented by post planting top up sprays of insecticide is required for successful management of this pest.

Large pine weevils selectively feed on the lowest 15 cm portion of the main stem of newly planted saplings 25 - 40 cm tall. Targeted spray using lever operated knapsack sprayers to apply roughly 20 ml of spray liquid per seedling tree is usual. However, this is the average volume delivered rather than an exact 'dose' intercepted and retained by each tree.

In practice operators use the full contents of a 20 litre sprayer over 2000 seedling trees planted on one hectare of land. Although this is how the spray is applied, they freely acknowledge the imprecise nature of such application, both in the volume received per tree and accuracy of deposition. There is considerable room for improvement in:

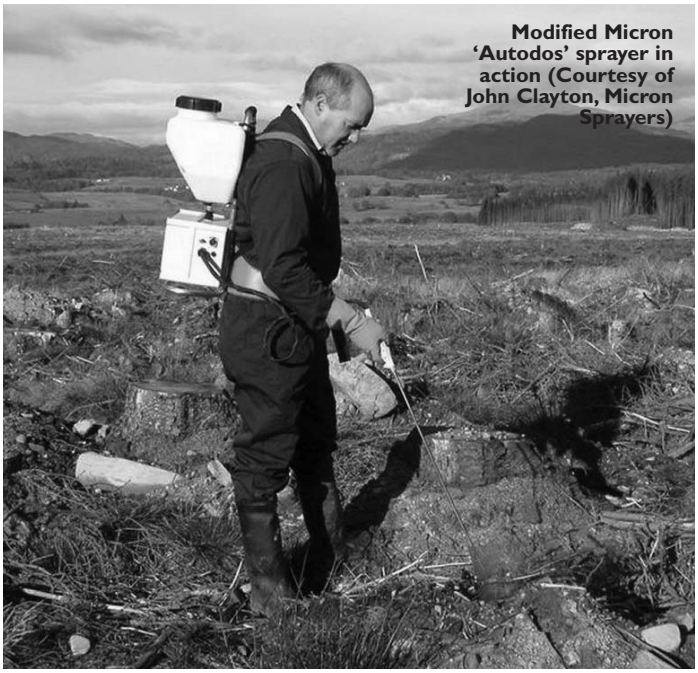
- operator comfort;
- more accurately apportioned and targeted spray;
- reduced run-off; and
- reduced drift of pesticide into the environment.

New application technology based on the 'spot-gun' principle is achieving these requirements. Leading the way is the Micron 'Autodos', a new automatic metered volume dispenser, manufactured by Micron Sprayers of Bromyard Herefordshire and designed to deliver repeatable, accurate volumes of spray.

The Micron 'Autodos' has a 10 litre tank and a sealed electronics/battery unit mounted on a lightweight tubular frame for operation in the normal knapsack mode. The back frame and straps are ergonomically designed to maximise operator comfort. The battery is re-chargeable via a re-charging port on the sealed unit which has a simple three way function switch for metered dose, continuous delivery or off. The operator simply selects the dose and spray pattern required from one of six different nozzles and liquid is delivered via a robust lightweight lance every time the trigger is depressed.

The 'Autodos' is supplied with a wide range of nozzles and a lightweight control flow valve that fits between the end of the lance and the nozzle. Filling is safe and easy via the wide necked spray tank. This is fitted with a basket filter and closed with secure lid complete with chemically resistant seal and ball valve. Comfort and stability is provided during movement and operation by broad, cushioned shoulder straps and a wide and supportive waistband.

By removing the need for pumping, the 'Autodos' eliminates the variation in pressure commonly associated with conventional lever operated knapsack sprayers, as well as reducing workload for operators. Overall, the Micron 'Autodos' is fulfilling the application requirements, related to efficiency and accuracy, increasingly demand-



Modified Micron 'Autodos' sprayer in action (Courtesy of John Clayton, Micron Sprayers)

ed for control of large pine weevil in the UK forest industry.

Modified Micron Autodos

J. R. M. Thacker and S. D. Carroll, of the Pesticides Research Group at the University of Paisley in Scotland and supported by the Forestry Commission and Micron Sprayers, have modified the spray delivery components of the 'Autodos' for more accurate targeting of spray and control of large pine weevil.

This new custom design features a horseshoe shaped lance attachment (75 cm long) holding four hollow cone nozzles with 23 cm between each nozzle. The modification includes a Perspex sheet surround (screen) projecting to a depth of 45 cm. All four nozzles direct the spray inwards and on to the vulnerable bottom portion of the stem. The Perspex sheet retains any spray that misses the target.

A trial to compare the Modified Micron 'Autodos' with a conventional knapsack sprayer was carried out in Scotland on a clear-fell site, replanted with two year old and previously untreated Sitka Spruce (*Picea abies*) tree seedlings. Weevil damage in treated and untreated plots was recorded and the physical parameters of spray distribution measured.

The 'Autodos' applied an exact 20 ml of spray to each tree. Further modification may allow a reduction in volume application rate to the more economic and practical volume of 10 ml/tree. These include:

- changes in the design of the 'horseshoe' attachment;
- reducing nozzles from four to two;
- selecting reduced flow rate nozzles; and
- raising spray pressure from 1.5 bar to increase fineness of spray and improve deposition.

Feeding damage levels were roughly the same for both types of sprayer. However closer observation in relation to differences in deposition suggest that the 'Autodos' may be better equipped to deal with the acute lethal damage caused by stem girdling (ring barking) at the base of the main stem.

Knapsack sprayers are used to spray from above and over the tree seedling. Spray runs down the stem and most comes to rest on the end of the main stem and branches - not the most vulnerable parts of the tree. The base of the main stem, where ring barking occurs, is the most vulnerable part of the tree seedling. This is where spray targeting with the Micron 'Autodos' and especially with the 'horseshoe' modification pays dividends.

The modified 'Autodos' was comfortable to work with, required no pumping and delivered a repeatable controlled volume of spray applied to where it was required.

Opportunities for reduction of spray application volumes to 10 ml/tree by changing nozzle design and spraying pressure look promising.

The standard Micron 'Autodos' is also used to apply chemicals that seal and protect the cut surface of stumps after felling, and targeted application of herbicides for efficient weed control.

CONTACT

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PROCESSING

Loders Croklaan to build Europe's largest palm oil processing plant

Loders Croklaan, part of the Malaysian IOI Group has announced that it will build Europe's largest palm oil refinery and fractionation plant in Rotterdam. Construction is scheduled to begin mid 2004 and be completed twelve months later. The associated investment in the project is not disclosed but the plant will employ 70 people.

The plant will be put on an 18 hectare site, by deep water at the Maasvlakte, in the Port of Rotterdam. The facility will be able to process between 2500 and 3000 tonnes per day and will be by far the largest palm oil refinery in Europe.

The IOI Group bought Loders Croklaan from Unilever just twelve months ago. Its chairman,Dr Lee, stated that "This investment forms part of the new Loders Croklaan strategy, "Growing with Palm" based on the benefit of linking IOI's large and most efficient palm plantation business in Malaysia with the highly reputed speciality business of Loders Croklaan in Europe. This synergy creates an opportunity to enter the larger volume supply of palm oil based ingredients. Our objective is to serve major food processors at attractive prices and offer complete control of the supply chain including identity preservation which is becoming ever more important to our customers and consumers alike."

"We see tremendous opportunity in palm oil and believe that our vertical integration gives us a distinct competitive edge in the market place," states Loders Croklaan CEO Etienne Selosse. "Our more than 100 years of experience in speciality oil products give us a huge advantage so we can advise our customers on how to incorporate palm ingredients in their product. We are looking forward to providing palm oil products to food processing companies of all sizes producing products like, for example, biscuits, industrial breads and pastries, fried fast foods, soups and sauces."

"Palm oil is key in providing an alternative to hydrogenated products containing trans-fats." Mr Selosse continued. "Palm opens real market opportunities for Loders Croklaan, as well as for our client companies who are looking to eliminate trans-fats from their food products."

CONTACT

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CLEANING SYSTEMS

Fancy a dip?

The Washmaster Superdip (WMSD) cornpact cleaning system from Ransohoff plc has been developed to meet the needs of manufacturers with component washing headaches. Economy, ease-of-use and low maintenance are just some of the priority factors that have been integrated into this innovative machine.

Thanks to their versatility, 'dunker machines' are a commonly used type of wash plant, and the WMSD continues the theme of flexibility. The 'all-purpose' nature of the WMSD ensures that manufacturers are able to rapidly process a wide range of components, either as batches or as individual piece parts.

The new compact cleaning machine from Ransohoff plc offers economy, ease-of-use and low maintenance, with additional high performance ultrasonic cleaning option also available

The Superdip machines, constructed from 304 stainless steel, guarantee thorough cleaning of all types of components via a combination of immersion and agitation, generating spotless results. This is further enhanced if users decide to incorporate optional ultrasonic transducers that can be immersed in the wash solution. These are manufactured by Ransohoff's sister company, Blackstone-Ney Ultrasonics, the market leader in the ultrasonics field, and would be advisable if precision cleaning is required of components with difficult to access features.

The robust WMSD comes in three sizes of machine. The smallest in the range houses a stainless steel mesh basket measuring 530 mm by 380 mm by 200 mm, that can take a maximum load of 40 kg, while the largest machine has a 1020 mm by 760 mm by 200 mm basket, accommodating loads of 135 kg. With a 50 - 100 mm agitation stroke and a variably controlled agitation frequency, rapid processing is guaranteed.

The Superdip range is also extremely compact in terms of footprint, with even the largest machine, which features an 840 litre tank, measuring just 1320 mm x 1525 mm. Standard features include digital temperature control, automatic liquid level detection and a weir tank and sparge pipe. Other options include a process timer, in-line fine filtration, a hand-held spray gun, a skimmer for tramp oil removal, a seven day time switch and high performance 25 or 40 kHz ultrasonics.

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RENEWABLE ENERGY

McAlpine to deliver first UK windfarm to utilise V80 2 MW turbines

McAlpine Business Services has secured a multi-million pound contract with Airtricity, to construct the UK's first windfarm, to utilise the giant V80 2.0 MW wind turbines, manufactured by the worlds leading wind turbine supplier, Vestas. The project based at Ardrossan on the Ayrshire coast in Scotland is worth £21m and is the first of many similar schemes planned by Europe's leading renewable energy company, Airtricity.

A total of 12 turbines, 100 m high will be constructed in a green field site overlooking Ardrossan, along with the necessary electrical infrastructure, foundations, control buildings and site access roads. The new windfarm is set to generate some 24 MW of electricity directly onto the National Grid and is due for completion in March 2004.

Bill Turner, Director of Energy Services at McAlpine Business Services said, "This landmark project which is central to our growing reputation and success in the energy services sector was won against stiff competition. It is evidence of our expertise within the energy services sector to deliver solutions that will increase the amount of electricity produced without polluting the atmosphere. The Department for Trade and Industry has committed the UK to generating 10% of its electricity from renewable sources by 2010 and this contract is yet another step towards achieving this figure."

CONTACT

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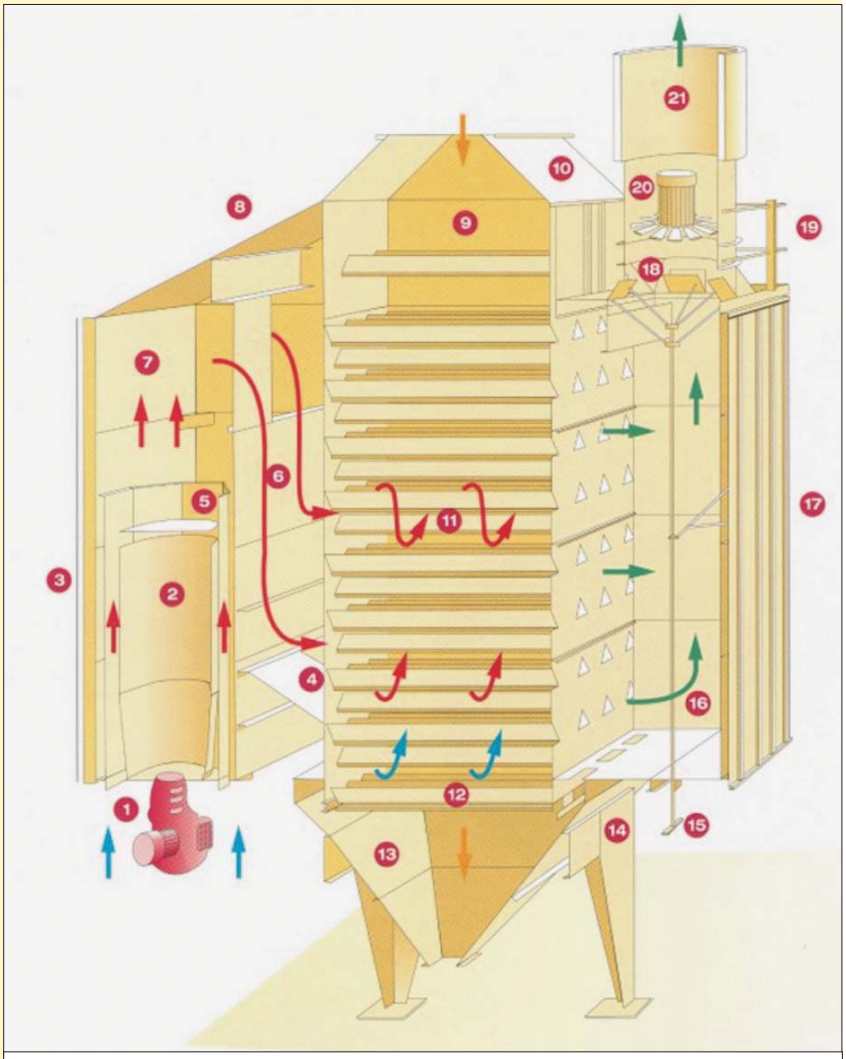
Law-Denis dryers grow larger and cleverer

All too often we hear of manufacturing industry leaving our shores, fleeing to the cheaper labour markets of China or India and of manufactured goods from these fugitive industries being imported back into this country. However Law-Denis continue to buck the trend by exporting dryers (rather than jobs) to China and India and, in fact, have just shipped the largest Law-Denis dryer ever, a model SCN 16160, to a new client in China. Our agent reports that there are many companies in China who appreciate the quality, performance and advanced design features of these products.

This state of the art dryer, in bright yellow cladding, employs Law-Denis leading edge technology, such as the equalisation plate (EP) lateral drying system and the advanced control panel means that it can be controlled, monitored and reprogrammed when and if needed from the UK. The dryer has a further unusual feature whereby the drying air is heated by a steam to air heat exchanger. When erected it will tower 24 m above ground level. The dryer will not, be drying rice but soya beans for human consumption at a rate of 1 tonne/h.

For Law-Denis, 2003 has been the year of the higher capacity dryer, of which the China dryer described above, is only one example. In the UK, their long experience of manufacturing and installing the larger dryers meant that Law-Denis were the natural choice for merchants, cooperatives and maltsters, with such well known companies as Hampshire Grain Ltd, Allied Grain Ltd and Crisps Malting Group having invested in Law-Denis multi column dryers.
It is significant that a high percentage of the dryers supplied this year, including 'on farm' drying systems, were equipped with the Advanced Control Panel. This revolutionary programmable logic controller (PLC) system gives the operator simple and fail-safe control of the dryer and handling equipment, logging all relevant temperatures and events, saving drying programs, and giving fault diagnosis and help menus. The system may be operated and monitored remotely even by means of a mobile phone text. System up-dates, fault diagnosis and rectification are available instantly on-line, meaning that existing customers can take advantage of Law-Denis advances.



The SCN industrial dryer: (1) 3-stage oil fired industrial burner; (2) stainless steel combustion chamber; (3) insulation of the hot air plenum; (4) adjustable cooling doors; (5) outer heat shield; (6) division wall; (7) hot air plenum division; (8) hot air plenum sloping roof; (9) reserve section; (10) centre roof; (11) drying sections with advanced lateral design; (12) discharger pneumatically operated; (13) discharge collection hopper; (14) sub-frame height to suit; (15) air volume control handle; (16) exhaust plenum smooth wall; (17) external cladding on all sides of dryer; (18) air volume regulating doors; (19) handrails and access ladder; (20) axial flow fan; (21) silencer

MORE INFORMATION

Law-Denis Engineering Ltd, Millstream Works, Station Road, Wickwar, Wotton-Under-Edge, Gloucestershire, GL12 8NB. Tel: +44 (0)1454 299700 Fax: +44 (0)1454 299701 E-mail: law.denis@virgin.net Website: www.law-denis.com

Land Use and the **Environment -** Delivering Solutions

Opening address - Baroness Young, CEO Environment Agency

Chaired by **Professor Brian Legg**, *Director of NIAB*
Morning plenary session speakers include:

- **Professor Dick Godwin** - *Cranfield University - Silsoe*
- **Professor Christopher Wathes** - *Silsoe Research Institute*
- **Tim Rollinson** - *Director Forestry Group - Forestry Commission*
- **Chris Bourchier** - *Head of Rural Estates - Crown Estates* - will sum up the morning session

The afternoon sessions (two each in parallel) will allow more detailed consideration of the solutions proposed. There will be three twenty minute papers in each session.

Parallel Session 1
- **Livestock**
- **Amenity/Sport**

Parallel Session 2
- **Crop Production**
- **Forestry**

Chairman
- **Prof Christopher Wathes**
- **Peter Redman**

- **Prof Dick Godwin**
- **Geoff Freedman**

IAgrE Annual Conference May 13th 2004

Venue: Royal Agricultural College, Cirencester

***The Conference*:**

For most of the last century land use systems were focused on meeting the needs of society through the economic production of food, timber and other raw materials. During the closing decades there was an increasing realisation that this policy brought with it some negative consequences for the environment in all its forms.

However science, technology and engineering in particular have been used to both to alleviate and eliminate environmental damage through the development of new technologies and by informing improved practices.

This Conference aims to highlight the most significant of these developments as applied to the production of crops, livestock and forestry in the United Kingdom in response to the challenge from Baroness Young who will set out the areas of most concern in the opening address. Chris Bourchier will conclude the morning session by assessing the solutions proposed from the perspective of a major land owning interest.

In the afternoon delegates will be able to join more specialist groups to work on the concepts in more detail.

Under the chairmanship of Professor Brian Legg, this conference will provide a unique opportunity to be informed about the full spectrum of developments and hear the reaction from a broad cross-section of interests and expertise. It will point the way forward to the most environmentally sensitive systems of production from the land and the technologies that can be used to create and enhance its amenity value.

IAgrE

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