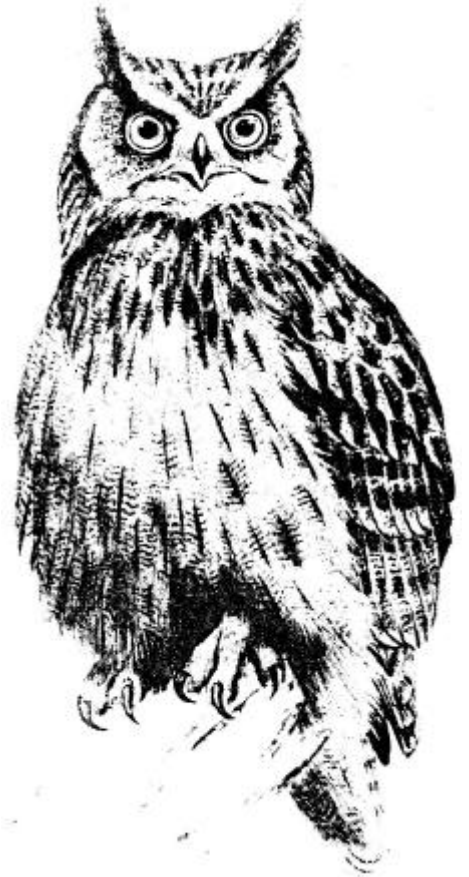


ALAM

Newsletter

Winter 2003



**The Association of
Lecturers in Agricultural Machinery**

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ALAM NEWSLETTER

WINTER 2003

One-Day Events - Air Conditioning

Our Chairman, John Gough, of Rodbaston College, is anxious to get a full programme of one-day events running again, but as I type, there are problems with our planned Hydraulics day in February. Therefore John has found an alternative, namely **Air Conditioning** at Motor Climate, Bordesley Green, Birmingham, to be held on **Wednesday 18th February**. The cost will be £125 per person, which is considerably less than the option we investigated last year. Contact John Gough for more information and bookings - his number at Rodbaston is 01785 712209.

To keep our one-day event programme viable and active, please try to support them with your attendance, and also by letting us know if there are subjects you would like us to arrange, or any events you have seen elsewhere that may be of interest to our members.

2003 Conference

The 2003 Conference has now been and gone, and was another successful conference, this time at Walford College, organised by Graham Higginson; our thanks go to him for putting the conference together in a short time.

2004 Conference

Next year, Peter Walley is putting a programme together based at Warwickshire College, and further details are included in this Newsletter – put the dates in your diaries, and start working on your staff development and personnel departments!

Treasurer's New Address

On an administrative note, please note that the treasurer has moved house. Could you please ensure that any correspondence and payments are sent to his new home address. In particular, could you make sure that **College Finance departments update their records**. The new address is:

David Heminsley, ALAM Treasurer, The Old Byre, Lower Street, Doveridge, Ashbourne, DE6 5NS

Subscriptions

On April 1st, your standing orders should be moving £10 from your bank to ALAM – a big thank you to everyone who pays their subscriptions this way, as it saves a very great amount of time, postage and effort each year.

It's now a few years since we last updated our membership records, so could **EVERYONE** please fill in a membership form and send it the treasurer, so we can update or confirm our records. If you already pay by standing order, then put a line through the lower half of the form, but please fill in the top and return it anyway. There's a list in this newsletter of those who paid by standing order last year. If your bank is taking your money and you're not on our list, please have words with your bank!

We looking to forward to seeing you again at Warwickshire!

The Committee

Chairman	John Gough	Rodbaston	john_gough60@tesco.net
Secretary	Peter Walley	Warwickshire College	pwalley@warkscol.ac.uk
Treasurer	David Heminsley	JCB Training	david.heminsley@jcb.com

ALAM MEMBERS 2003-04

Those who paid by Standing Order	Those who paid by Standing Order (contd)
G H Anderson Member No. 03/101	R W Langley..... Member No. 03/046
M B Badger Member No. 03/083	D J Lankester..... Member No. 03/040
T J Ball..... Member No. 03/103	R G Lee Member No. 03/095
M Baxter..... Member No. 03/099	G N Macpherson..... Member No. 03/078
N E Bevan..... Member No. 03/007	P McLeod Member No. 03/032
R Blackford..... Member No. 03/100	L Milne..... Member No. 03/006
C L T Bound..... Member No. 03/011	C E L Morgan Member No. 03/015
G E Broughton Member No. 03/089	W T Morgan..... Member No. 03/036
M Brown..... Member No. 03/106	A R M Newman..... Member No. 03/043
Cains..... Member No. 03/102	B W Nicholls Member No. 03/033
S D Cartmel..... Member No. 03/061	T K Northmore..... Member No. 03/010
H Catling Member No. 03/066	P705629403 Member No. 03/093
S D Christie Member No. 03/004	S R Parker..... Member No. 03/057
R S Clarke..... Member No. 03/086	R E Patmore..... Member No. 03/063
P D Cockrell Member No. 03/028	E Pearce..... Member No. 03/098
K Coldwell Member No. 03/075	M C Percival Member No. 03/085
I Coleman..... Member No. 03/008	C A Perrins Member No. 03/055
P Coleman..... Member No. 03/047	B W Poulson Member No. 03/090
M G E Couchman..... Member No. 03/003	R R Rattray Member No. 03/053
S Cousins..... Member No. 03/009	A J Roberts Member No. 03/018
R K Creasey..... Member No. 03/035	D W Ross Member No. 03/076
C J Creasey Member No. 03/054	J Rostron..... Member No. 03/087
K J Davenport Member No. 03/059	J D Sanders..... Member No. 03/002
A J Davey Member No. 03/039	J Sarsfield..... Member No. 03/097
J F Dixon Member No. 03/067	D A Scotchmer..... Member No. 03/050
Dodd Member No. 03/024	M J Sidlow Member No. 03/031
O Dunthorne Member No. 03/108	A P Soar Member No. 03/058
P Durant..... Member No. 03/094	D Sparkes..... Member No. 03/005
T Edwards Member No. 03/020	J D Stephenson Member No. 03/049
P S Eland..... Member No. 03/077	R F J Sunderland Member No. 03/037
D H Elliott..... Member No. 03/048	P Talling Member No. 03/012
W A Ellis Member No. 03/096	A J Taylor..... Member No. 03/013
R M Embrey Member No. 03/056	I Taylor..... Member No. 03/027
C V England Member No. 03/041	E P Thomas..... Member No. 03/068
F T Facey Member No. 03/052	R S Tiller..... Member No. 03/088
L A Fagg Member No. 03/070	M Towsey Member No. 03/021
L S Foreman Member No. 03/082	M J Tyson Member No. 03/029
N Fox Member No. 03/105	P Walley..... Member No. 03/080
A T Frank..... Member No. 03/016	S C Warr Member No. 03/044
J Gough..... Member No. 03/030	R J Waterson Member No. 03/084
J G G Greenman..... Member No. 03/034	S Watson..... Member No. 03/073
R I Gregory..... Member No. 03/081	J C Welwood..... Member No. 03/026
S J Hackett Member No. 03/045	G Williams Member No. 03/060
D C Harris Member No. 03/051	D E Williams Member No. 03/112
P M Harrison..... Member No. 03/091	D G Wilson..... Member No. 03/017
J G Hartley..... Member No. 03/042	P W Woodliffe..... Member No. 03/065
S J Hasell Member No. 03/038	P Wray Member No. 03/113
R P Heath Member No. 03/014	
W A Helen Member No. 03/019	
D M Henley..... Member No. 03/064	
G Higginson..... Member No. 03/104	
P Hill..... Member No. 03/025	
V Hird Member No. 03/079	
P Homer Member No. 03/069	
A J Houghton..... Member No. 03/092	
D J Howells Member No. 03/001	
C Hughes..... Member No. 03/072	
P B Hurrell Member No. 03/074	
C M Johnson..... Member No. 03/022	
A Johnston Member No. 03/023	
J R Jones Member No. 03/062	
C A Keeble..... Member No. 03/071	
	Those who paid by other means
	T C Fackrell Member No. 03/107
	D Heminsley..... Member No. 03/114
	K Howard Member No. 03/111
	R Roberts Member No. 03/110
	C Szabo..... Member No. 03/109
	Honorary members
	J G Bumby
	M O'Dowd
	T Turney
	A Walker

ALAM ANNUAL TECHNICAL CONFERENCE 2004

Dear member

Below is the proposed programme for the 2004 conference. The main items are in place and I hope that it will wet your appetite. I still have a few more things to look at for the evening where I hope to include something on motor sport, but I am still have to fully confirm these.

The full cost will be about £180 to include all accommodation and meals with a supplement for any non-members

So go and see your HRD person and get the funds booked. Booking forms will be sent out in the Spring newsletter

Warwickshire College

PROPOSED PROGRAMME

Monday 12th July 2004

Lunch @ Warwickshire College

pm Developments in spraying technology - Hardi Ltd

eve COVE development - Warwickshire College

Conference Dinner and AGM

Tuesday 13th July 2004

4 wheel drive vehicle development and testing - Gaydon Test centre

Gaydon is the test and development site for Ford & Land Rover. We will gain access to basically any development area, provided there is not sensitive material in there at the time.

We should also gain access to the Land Rover test track. We will be divided into small groups and it promises to be a very informative day

Wednesday 15 July 2004

am Constantly variable transmission - Massey Ferguson Ltd

pm Rubber tracked Tractors - Massey Ferguson Ltd

Thursday 14th July 2003

am Combine electrics and hydraulics - Massey Ferguson Ltd

Massy Ferguson will split us into 3 groups to spend half a day on each topic. The above topics are not set at the moment and may change dependent upon the availability of instructors.

IAGRE EDUCATION & TRAINING MEETING SEPTEMBER 2003.

The current chair is now Alastair Taylor, formerly of Reaseheath College.

Representatives of Lantra, industry and FE/HE Centres attended the meeting.

Apologies were sent by BAGMA rep.

ETB/EC(UK) has produced a new Careers Resource Catalogue. Copies have been mailed to schools, colleges and careers centres/advisors. This has resulted in several requests for careers literature referred to in the catalogue. IagrE has a "full page" spread.

BAGMA is looking to raise 50K to raise awareness of MAs from its members.

Lantra is working on a L4 qualification. Chris Whetnall, CEO of IagrE has asked for information regarding MA enrolments.

AEA manufacturer members are not suffering from staff retention of skilled personnel as the dealers are. If a follow up of the 'Manpower Conference' is to be run, AEA have asked to be party to it.

The next meeting is mid March 2004.

ALAM CONFERENCE 2003 MICHELIN TYRES

Monday 14th July 2003, 1.30pm, Walford College, Baschurch, Shropshire was the place to be if you wanted to learn about traction and tyres, as this was the venue for the opening session of our annual conference presented by two knowledgeable gentlemen from Michelin.

Mr Peter Debenham and Mr Robin Audaer from the agricultural tyre division of the company were our speakers for this very informative session. Firstly we were given an overview of the company and its European manufacturing and distribution operation. As an introduction to the subject of agricultural tyres it was felt that a review of the farming industry and its machinery trends and requirements would be worthwhile as a means of explaining the situation that we find ourselves in today.

There has been a reduction in the number of farms in the UK over a number of years but farm sizes have increased. There has also been a reduction in the number of people employed in farming. This has led to an overall reduction in the number of new tractor units sold each year but the size of those tractor units has increased in horsepower year on year. Machinery and equipment has increased in size to match the tractor power available at that stage of the cycle. As the tractor size and power has increased so has its capacity to undertake more than one operation at a time, resulting in combination machines and front and rear mounted equipment. This ability to carry out a number of operations in one pass is popular with farmer and contractor alike but has led to previously unanticipated tyre failures. Tyre manufacturers were at the front of the firing line for the disgruntled end user faced with a hefty replacement bill; but things are rarely quite what they seem!

Tractor manufacturers have come under increasingly competitive and financial pressure due to the reduction in the number of units sold into the market. One of the results of this has been the paring of costs in the manufacturing process, which has included an examination of wheel and tyre equipment. The outcome of this has been that standard specification wheel and tyre equipment is adequate for routine tasks but insufficient to cope with the full capability of the tractor and machine combinations that may be used. The dealer sales staff, always keen to secure a deal, are sometimes unaware of the need, or reluctant to introduce the subject of increased tyre specifications due to the extra cost involved and the likelihood that it may jeopardise the deal.

The effect of this sorry tale does not come to light for some time as the tyres take the punishment but they eventually give up the unequal struggle and fail. It is now that the questions get asked and the truth may come to light.

A number of examples were then presented and examined in detail; the results clearly indicated that the standard tyre equipment was inadequate for part of the range of tasks it was expected to undertake in the majority of instances. In many cases the transport weight of mounted machinery combined with the tractor weight was beyond the capacity of the tyre even at full inflation pressure. Road transport speeds also needed to be carefully considered together with inflation pressures to match the capability of the tractor transmission.

From all this it was concluded that a compromise would need to be struck on tyre size and pressures if the tractor machine combinations were to operate in a reliable manner in both field and transport situations. The tyres would need to be of sufficient size to carry the imposed loads at transport speeds but may need to be run at a little above ideal pressure for field work as most operators do not have the facility to adjust pressures on site.

A practical demonstration was then undertaken, using:

John Deere 6510 SE with a 40 kph transmission.

Kverneland 4 Furrow Reversible mounted plough.

Front tyres - Pirelli TM 200s 14.9/R24 125 A8 /123B

Rear tyres - Pirelli TM 300s 16.9/R38 141 A8 /138B

This tractor combination was used as a working example straight off the farm and was put through the normal procedure that Michelin staff would use to determine the correct specifications for the tyre equipment.

Firstly the tractor axle weights were established using portable weigh plates, for both work and transport situations and the current tyre pressures were recorded. Listed below are the findings.

	Pressure psi	Plough Raised kg	Plough Lowered kg
Front Left	18	730	1425
Front Right	17	730	1425
Rear Left	18	2700	1300
Rear Right	19	2700	1300

The tyre technical data book was then used to check the weights, speeds and pressures over the operating range that may be used and the following facts were established:

- The front tyres will carry 1460 kg at 17 psi at 40 kph.
- The rear tyres will carry 2760 kg at 23 psi at 30 kph (or 2500 kg at 40 kph,) but are not able to carry this load at 40kph. In order to carry 2700kg at 30kph for any distance in transport the existing pressure would need to be raised if tyre damage is to be averted.
- Therefore this tyre is too small for this tractor if these sorts of load are to be carried regularly in transport at 40 kph.

Without rear suspension, ride discomfort on the road at pressures exceeding 20 psi often cause operators to reduce the tyre pressure to < 20 psi. This reduction of pressure causes rapid deterioration of a tyre that is undersized to start with.

So a few facts and other pieces of useful information:

- There are likely to be considerable differences in axle and tyre loads between transport and work situations.
- The weight distribution for a standard 4 wheel drive tractor should be 40% front, 60% rear.
- Ground pressure is proportional to inflation pressure.
- Ideal inflation pressure for fieldwork is 1 bar / 14 psi.
- Ideal tyre contact patch -- 3 lugs in contact with the hard ground.
- The static laden radius quoted in manufacturers tyre specification tables gives an indication of the correct tyre pressure for the load carried. Adjust the tyre pressures accordingly to obtain the laden radius within the maximum inflation pressure parameters.

Casing factors - these figures were derived from research tests carried out at Silsoe some years ago.

Good Radial 1-2psi

Ordinary Radial 4-5psi

Cross Ply 7-12psi

Tyre PSI + Casing Factor = Ground Pressure.

Increase the tyre pressures if the tractor is to be used on slopes where the angle is greater than 20% as this will improve stability.

Independent front suspension causes uneven tyre wear due to track and camber variations during road operation when the setting is not calibrated correctly for roadwork, (to suit the adjustable ride height).

Casing torque wind up destroys the tyre casing when the tyre size or pressure is insufficient. To accommodate the increased torque through the tyre casing the structure construction has been increased from two to three plies for high power machines.

Tyre rim creep is becoming more common due to the high torque loadings being generated by the larger tractors coupled with tyre size and pressure issues. Current rim bead taper angle is 5 deg. for agricultural earthmoving and industrial wheel equipment. Truck tyres use 15degree bead taper angle to reduce rim creep, but international standards would have to be changed to accomplish this --- that may take a little time! To counteract torque loadings during draft work the tyre pressures should be set using the 30 kph pressure schedule.

In conclusion it was suggested that larger tyres should be considered in any situations where existing spec. equipment is working at or near the limit of it's capability. The larger tyre provides the extra volume and surface area through which to distribute the load and allows a compromise inflation pressure to be used to accommodate both field and road work with little undue effect on the tyre or its performance.

This presentation ably demonstrated the need to do your homework thoroughly before you go out to work and to not make assumptions that the tractor manufacturer has automatically catered for all eventualities. A very informative session with many wiser delegates by the end of the afternoon. Our Thanks to the Michelin Men!

J.Gough
Rodbaston College

ALAM CONFERENCE 2003 JCB TRANSMISSIONS

A.L.A.M. Summer Conference, 15th July 2003

It was nice to get an opportunity to visit the Transmission Production site at Wrexham, following a previous visit back in 1987. The, then, state of the arc fly-by-wire system had been outdated within five years, and brought home the importance of continued investment and development of any business, if you wish to stay in the game.

Our hosts, Keith Bridges and Len Earp, certainly made it clear that JCB are doing their utmost to keep up with technology and produce machines using the latest techniques to provide reliability and quality. JCB, with a turnover of £800m. and 5,000 employees, are now branching out with production in India, Brazil and recent penetration in the USA.

The Transmissions Section is providing £100m. turnover annually producing gearboxes and axles for use in their own machines, as well as 20% of their production being sold to other companies for fitment in other applications.

It soon became evident that the 50,000 axles and 30,000 gearboxes produced may have looked like a small range, with 16 and 9 basic units respectively. The options with different gear combinations provided 360 axle configurations and 200 gearbox options.

The 400 strong workforce were involved in the machining, assembly and distribution of the axles and gearboxes. With a turnaround time of two days for many castings entering the premises to departure as a gearbox or axle assembly. The axles leaving the site on the Tuesday we visited would be in machines on the production line by Thursday for shipment to a customer by Friday. All production was built to order and the facility had a lot of extra capacity at hand if required. Particular attention was drawn to gearbox developments which had been influenced by design changes in other areas of machine applications. This brought about the removal of the main hydraulic pumps from the end of the engine to re-fitting on the end of the gear box, thus allowing the lowering of the coolant radiator and provide improved visibility in machine applications in lift trucks and fast tracks as well as back hoe loaders. The straight drive shaft through the top of the gear box and increased strength to the overall casting also allowed further development to improve gear change ease on some of the gear boxes.

The development of the Fast Track gearbox, through its previous 12 years of production, was clearly evident with the most recent box providing 54 forward and 18 reverse gears. The box weighing in at 760 Kgs requires more than one man to fit, but development of a wet master clutch between it and the engine has provided 100% reliability over the last two and half years.

Production at the Wrexham site has been running over 25 years and the throughput the previous week had been 700 gearboxes plus axles. The anticipation was to grow by at least 25% over the next ten years.

On a tour of the production line, it soon became evident that with expected growth and continued production, investment and manufacturing techniques were always being watched carefully. One in ten castings were checked for detailed accuracy, as well as regular checking in the production process of every unit as it was assembled, by measuring loadings on bearing assembly installation and rotational forces of completed units indicated correct machining and assembly. Cleanliness and cleaning systems deployed throughout the assembly process were receiving particular attention, due to the increased use of proportional valves for hydraulic control. From the last three years since the introduction of more stringent cleanliness during production, the payback on reduced warranty claims has been staggering.

Progress on the supply of components to the plant is removing the need for supply of goods in cardboard packaging and investment in plastic moulded storage bins returned to gear manufacturer, etc. in Italy, where most units are sourced from.

This will eliminate cardboard waste from the plant by the end of the year and has had the additional effect of supply of gears, etc. in much better condition for assembly, resulting in less failure later.

The gearbox site was planned to have a continued development over the next 5 to 7 years according to production demands.

The axle assemblies were manufactured and assembled to within 25 micron tolerances throughout the process and it was good to see the setting, adjustment and backlash checks on the differential (in three places), as well as rotational torque requirements in final assembly. The completed axle and final reduction units, when assembled, were pressure tested to 3 Bar (45 psi) before final spraying and filling with oil.

Our thanks to JCB for another very informative, open and honest presentation with a tour of the plant providing many opportunities to get in and really look at the processes being used.

William Helen
Sparsholt College

ALAM CONFERENCE 2003 INFINITY AND BEYOND

A Presentation by Valtra Tractors at the ALAM Conference, July 2003 at Walford College.

Jim Potter: After Sales Development Manager

Gareth Jones: Regional Sales Manager.

Wil Helen introduced the two speakers from Valtra kicking off with Jim Potter giving an overview of where Valtra (Valmet) started out from 50 years ago with a 3 cylinder, 15hp tractor not unlike our "Grey Fergie" costing at the time £500; bringing us up to date with the £50K 'T' Series tractor.

He went on to explain how the tractor had evolved as the company saw it driven by five overarching factors: -

Changes in technology...

- increases in engine power requirements
- transmission developments (CVT)
- developments in hydraulics and electronics
- changes in implement design
- onset of global positioning systems.

Marketing...

- introduction of the original 'Ferguson (hydraulic) System'
- introduction of Fiat's original 4WD design
- introduction of Q cabs and operator comfort.

Customer Needs...

- aesthetic styling
- performance
- comfort
- running costs.

Legislation...

- safety
- noise
- pollution.

Costs of Ownership...

- reliability & durability
- economy
- extended service intervals
- resale value
- availability of local dealers for servicing...

.....all of which have an impact on continuing research & development.

Some references were made at this point to the problem facing the industry with the lack of suitable dealer service-engineer recruits and the low current pay scales. Valtra are going to be targeting schools for offering work experience. They are more than happy to offer training packages and presentations to colleges. Anybody wanting to take up this offer please contact them at their offices in Runcorn.

Gareth Jones then took over, showing us some very early films of tractors which was very evocative of the old traditional way of farming at harvest time and, in another film, early tractors working in the forestry in Winter; cutting logs, blocks of ice out of lakes etc. and what we saw was quite 'gob-smacking' with unguarded saw blades and belts just inches away from operators... health & safety just never came into it!

We then had to pay attention as Gareth took us into the Technical Bits of their Sisu engines and Tier I & II emissions technology before looking at transmissions and hydraulics. But at this point the presentation was frequently interrupted by a monumental thunderstorm overhead which persistently cut off all power thrusting us into darkness which meant the computers having to reboot every 30 seconds or so! We were just getting back to the slide we were on when...

Anyway, Gareth just managed to squeeze in an impressive interactive display/simulator of their control panel and joystick operation before all power was lost again!

So although under the circumstances the last two topics were very glossed over, the two and a half hour presentation was well received by the 20 odd delegates in attendance, which rounded off the week nicely. Brian Kessell gave a vote of thanks before we all made a mad dash across the car park in torrential rain for a spot of lunch... we must have looked a right bunch of drowned rats as we sat at our tables up on the stage in full view of a busy dining hall!!

Neal Dodd

ALAM CONFERENCE 2003 VISIT TO KUHN FARM MACHINERY

Following a brief interlude for an evening meal, we were on the road again desperately trying to catch up time. The evening visit was to the UK Headquarters and distribution depot of Kuhn Farm Machinery at Telford. A warm welcome greeted us in the form of refreshments and a weighty pack of literature covering all of the Kuhn products available in the UK. Additionally, we found on our chairs a very smart conference folder and pen.

Suitably refreshed and impressed, Ryan Roberts introduced our guides from Kuhn for the evening:

- Duncan McLeish Sales Manager
- David Rose Area Manager for Wales and West Midlands
- Robert Garthwaite Technical Manager

The initial presentation covered the history and product line of the Company. Kuhn is the largest company within the Bucher Guyer Group, a family owned business based in Switzerland which apart from Farm Machinery is also involved in hydraulics and plastics. All of the group's factories are in France and each factory concentrates on a product line although some factories do supply specialist parts to other factories.



Kuhn Saverne was the original factory commencing production in 1828 and remains the headquarters of the group. It produces approximately 50 000 pto driven machines (e. g. power harrows) each year and employs 1 200 employees.

In 1987 HUARD become part of KUHN group. This introduced the soil working implements (Ploughs, discs, direct drills etc.) and the 290 staff produce some 5000 implements each year. Based on a 17ha site at Chateaubriant, the Kuhn / Huard range has a 24% share of the plough market in the UK.

The Audureau factory joined in 1993 and expanded the product range into feeding and bedding equipment for livestock production. Here 210 staff produce 3500 machines each year from a small (in Kuhn terms) 5.5 ha site.

In order to expand their drill and sprayer range, Kuhn acquired the Nodet company in 1996. With a workforce of 205, some 2 500 precision drills, mechanical drills and sprayers are produced each year. The sprayers are not imported into the UK as they are 4.1m high when folded in the transport position which exceeds the UK height limit by 100mm!

The companies latest acquisition is the Knight manufacturing Corporation of the USA, which produce mixer feeder wagons and manure spreaders. Our hosts were quick to point out that this is the American company, not the British company with a similar name.

For those of you of a numerical nature, some annual figures for the Kuhn group as a whole are:

- Total machines produced60 000
- Total Employees2 436
- Turnover399m euros
- Investment 13m euros
- Exports59% of production
- Patents.....owned 1 500
- R & D Investment4.5%
- Growth5%
- Of the exports, 28% go to Germany, 21% to USA and Canada and 8% to the UK market.
- Kuhn UK are based at Telford and import about 5 000 machines worth £20m each year.
- 26 employees are based at the site which receives and distributes the machines as well as all the spare parts.

PRODUCT RANGE

The Kuhn Product range includes (although not all are imported into the UK):

Ploughs	2 – 12 furrow mounted and semi-mounted
Discs	1.9 – 7m
Soil Looseners	Subsoiling tines fitted in front of power cultivators
Rotavators	0.8 – 4m
Power Harrows	1.2 – 6 m including folding models. All rotary although one reciprocating power harrow was sold last year.
Pneumatic Precision Seed Drills	2 – 12 rows
Mechanical Seed Drills	2.5 – 4m
Pneumatic Seed Drills	3 – 6m
Direct Seed Drills	3 – 6m
Twin Disc Fertiliser Distributors	10 – 36m
Pneumatic Fertiliser Distributors	12 – 24m (at present but a 36m version will be available soon). Of the 70 machines sold in the UK each year, 50 are made by Kuhn.
Sprayers (not UK)	10 – 30m
Mulchers (Grass flail mowers)	1 – 3m
Bank Mower	Similar to a hedge cutter without the long flexible arm and used for roadside verges. Mower pivots from 60° down to 90° up.
Field Shredders	For set-aside / straw chopping
Bag Lifters	Up to 1 tonne
Disc Mower	1.2 – 3.1m. Both front and rear mounted giving wider widths in combination.
Mower Conditioners	2 – 5m
Tedders	2.6 10.6m
Rakes	3.2 – 9.3m
Silage Feeders / Bedders	Mounted, Semi-mounted and Trailed
Diet Feeders	8 – 14m ³ . Both Vertical and Horizontal augers

Following the presentation, the group were shown the parts and machine distribution facilities. 26 staff work at Telford but there are only 3 receiving and making up parts orders and 3 loading and unloading machines. The parts computer is in France and Telford only has a terminal. Distribution is by TNT and Kuhn have access to the TNT distribution computer to enable them to track the position of the delivery between Telford and the dealers. 4 TNT lorries per day collect the parts for onward delivery.

All the machines are moved within the warehouse by overhead crane which saves space. At the time of the visit, most of the machines were ploughs but within 4 weeks, they will have been shipped out and replaced by mowers.

PRODUCT INNOVATIONS

At the end of the tour, some of the innovations were demonstrated on the implements. This was complemented by a summary talk. Notable comments included:

Disc Mowers and Conditioners

Did not take off in USA until their ability to pulverise ant hills was identified.

Oval discs allow a better overlap and the optimum peripheral speed of the blades is 80m/s.

Protectadrive – a shearing shaft on the disc which provides a quicker / improved safety device for impact damage. Protects the gear train.

Lift Control – An adjustable hydro-pneumatic floatation / suspension. Also used as a break back device as it reduces the ground pressure as the mower swings back allowing the mower to float over the obstacle.



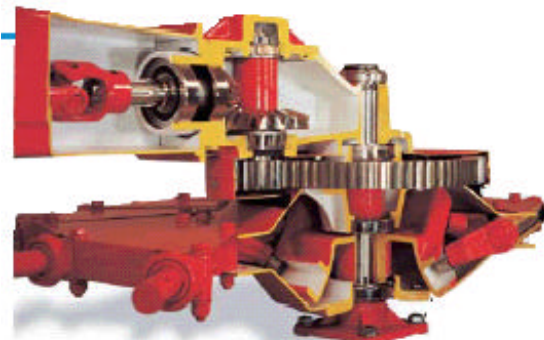
Tedders

Digidrive – A system that replaces a conventional UJ. Allows the shaft to bend through 180° whilst still maintaining the drive.



Fully enclosed gearboxes

Masterdrive – A 2 stage rotor gearbox that maintains the correct crown wheel / pinion tolerances on the larger rakes. All the movement and wear is minimised by the spur gear second stage rather than taking place in the crown wheel and pinion.



Ploughs

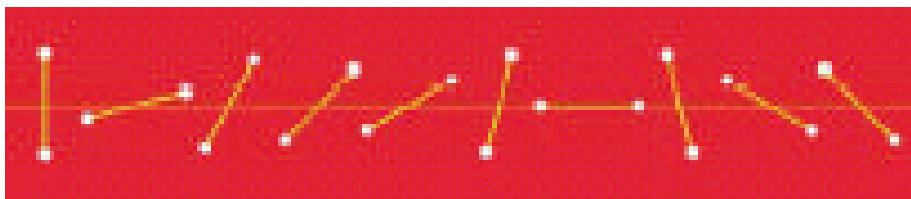
Traction Bolt – A system that replaces a shear bolt. The bolt runs in the line of force and the bolt and its holes never deform. The bolt also falls out when it breaks and never becomes trapped.

Non Stop Hydraulic (NSH) System – Allows continuous ploughing with the plough legs automatically folding out of work if an obstacle is encountered. The leg immediately returns into work when the obstacle is passed. It also acts as a shock absorber in pebbly or flinty ground by absorbing the vibrations.

Power Harrows

Taper Roller Bearings for rotors – Roller bearings and spacer all in the same housing giving greater reliability

Rotor Angles – Not at 90° but arranged in a helical pattern that allows a progressive crumbling of the soil thereby reducing vibration, stress and power consumption.



Quick Fit Tines – The tines are held in with a lynch pin and a plate which allows easy removal of the tines.

Twin Fit Tines Used for Stubble Incorporation and provides greater soil loosening and increased mixing of crop residues.

THE FUTURE

Finally we were provided with an insight into the likely developments and machines to be introduced by the Kuhn Group in the future:

- Combined pneumatic fertiliser and seed drills
- Min Till Units
- Front / rear mounted mowers (8.1 – 8.8m)
- Grouper / swather mower
- Hydraulically driven twin rotor swather up to 9.3m
- Hedge cutters
- Self-propelled mixer / feeder wagons
- Sprayers

Finally John Gough thanked the three presenters for taking their time to provide us with an in-depth account of the Kuhn Group's activity within the UK.

Nigel Fox

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