Greensward

1997

JOURNAL OF THE SOUTH WEST AND CENTRAL SCOTLAND GRASSLAND SOCIETIES

No. 40

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FOREWORD

1996 was marked by one of the most serious crises ever to hit the livestock industry in Britain, sparking off a sequence of challenging reverberations ever since. Ironically, the public announcement in Parliament of the possible link between BSE and the human equivalent, Creutzfeldt Jakob Disease (CJD) was made on the very same day that the 1996 winner of the UK National Silage Competition, Will Taylor, was being declared, also in London. The Chairman and vice-Chairman of the SWSGS personally visited the chamber of the House of Lords on that fateful day, after having shared in the recognition of excellence in grassland at the BGS Silage presentation. This is a very stark reminder that, come what may in the political or national scene, we should not be deflected from the pursuit of excellence and professionalism in our daily and annual cycles of farm and grassland management.

The current issue of **Greensward**, recording the activities of the South West and Central Scotland Grassland Societies for 1996-early 1997, contains many examples of this constant striving for excellence among our members in commercial, environmental and scientific endeavours. It is significant that the Hydro-Agri Grassland Farmer of the Year Award was bestowed on a family dairy farm in north Ayrshire, after two of our previous entries had narrowly missed the first prize. This honour was awarded for a simple combination of grassland excellence in year-round and whole farm management, linked with the youthful enthusiasm and eagerness to achieve among students from SAC Auchincruive. Several other articles look to future possibilities in grassland which are being actively sought in research projects in many countries, in response to perceived public needs. The niche market success of the value-added products of both Galloway (p 11) and Italian Parmesan cheese (p 73) points a way to what may be necessary in many farming products.

The Editor gratefully acknowledges the encouragement and contributions of many members of the two Societies in compiling this issue. Particular thanks are also extended to Lorraine Reid (RBDU, SAC Auchincruive) for her indispensable help in typing and layout, and to staff at the Printers, Walker & Connell. The support of advertisers and the sponsors of the two Grassland Societies is also acknowledged.

G E D TILEY - Journal Editor

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Co-opted Members:	Dr G E D Tiley, SWSGS, SAC Auchincruive, Ayr, KA6 5HW

Hydro-Agri UK Grassland Farmer of the Year 1997 - The Winning Team: Wallace and Angela Welsh (centre) with the Viking Trophy, flanked by Hydro-Agri staff, together with Rod Gooding (standing far right) and the successful Student Team from SAC Auchincruive.

HYDRO AGRI "GRASSLAND FARMER OF THE YEAR" COMPETITION

Rod Gooding, Lecturer in Grassland, Food & Farm Systems,
SAC Auchincruive and Team Coach

This Competition is open to all Agricultural Colleges in the UK. The Colleges nominate a local grassland farmer to enter the Competition. A team of students monitor the grassland management practised on the farm for one year with respect to:

- sward composition
- grazing management
- silage/hay production and utilisation
- nutrient management
- water management
- overall farm business performance
- adherence to the codes of good agricultural practice

The student team then compiles a report (including a clearly argued critique, tables, graphs, photos, etc) of grass production and utilisation within the context of the whole farm business. These reports are submitted for judging. The three best college reports are selected for 'on-farm' judging of their nominated farmers to pick the final winner.

In the three years of the Hydro Agri Competition, the SAC Auchincruive team were Runners-up in 1995 with Dr Stewart Jamieson of Kirkland and Rosehill, Thornhill, Dumfriesshire; and again in 1996 with our Chairman, Archie Borland of Altonhill, Kilmarnock. In 1997, together with Wallace and Angela Welsh of Arness and Warnockland, Fenwick, Near Kilmarnock, the Auchincruive team were **Overall Winners** of the Competition. The report emphasised that the Welsh's run a very efficient dairy farming business with well managed grazing and high quality silage. They have also planted woods, developed and maintained 'A'-shape hedges with hedgerows rich in plant species, created wildlife corridors/habitats and generally farm in an environmentally friendly way. Wallace and Angela received a prize of 10 tonnes of fertiliser and were presented with the splendid Hydro Agri 'Viking Long Boat' trophy. The College students were awarded £1,000. The winning team were Wallace and Angela Welsh with the following SAC Auchincruive students:

Students	Course
Paul Birch, Auchareoch Farm, Kilmory, Arran	Bsc AP&AS 3
Wim Bosma, Sunnyside Farm, West Linton, Peebles*	BTechnol FP&LU 4
David Burns, Bowfield Farm, Howwood, Johnstone	FP&LU 3
Claire Gormley, Low Glengyre Farm, Ervie, Stranraer	BTechnol Agri. 1
Richard Houston, Brantrigg Farm, Torthorwald, Dumfries	BTechnol Agri 1
Wendy Hutton, Buittle Mains Farm, Castle Douglas	HNC Agriculture
Stuart Mitchell, Grougar Mains Farm, Kilmarnock	HND Agriculture 2
Alister Neil, Aird Farm, Crossroads, Kilmarnock*	HND Agriculture 2
Louise Parker, Crosbie Mains Farm, West Kilbride	BTechnol Agri 3

* not in the photograph.

WARNOCKLAND
Angela & Wallace Welsh
Winners, Hydro Agri Grassland Farmer of the Year 1997

Warnockland farm extends to 243 ha, predominantly grass, with 50 ha of spring barley grown annually. There are 170 pure British Friesian cows and followers; the bull calves are finished as steers at just over 2 years. The dairy heifers calve down at 28 months to an Aberdeen Angus bull, the heifer Aberdeen Angus cross calves are sold as bulling heifers to suckler herds and the bull calves finished at 18 months as steers. The cows are batch calved, August/September and February/March. The heifers calve a month to 6 weeks earlier, which allows them to compete better with the herd. The cows currently average 6,300 litres at 4.24% butterfat and 3.46% protein, whilst keeping cell counts below 100,000 and TVC below 80,000. The aim is to produce as much milk as possible from forage, currently 4,500 litres, but always trying to improve on this.

The cows are usually turned out during the first week in May, and are rotationally grazed on 47 ha increasing to 53 ha after the 1st cut of silage. The grazing land receives 100 kg ha^{-1} of 25:5:5 in April and then every month throughout the summer, unless growth is good enough later in the season not to require an application. This has become more noticeable as the clover content in the sward has increased. The silage ground is spread with slurry in March at a rate of 33,720 litres ha^{-1} and in April receives 200 kg ha^{-1} of 25:5:5 in a split dressing, since it can often be wet at this time of year. Second cut also receives 200 kg ha^{-1} of 25:5:5 and 22,480 litres ha^{-1} slurry.

The silage is made using farm machinery. The crop is cut with a mower conditioner and left to wilt for 24 hours, swathed and left for a further 6 hours

before lifting. No additives are used unless the season is very difficult. A total of 160 ha of silage is made in two cuts, aiming for silage of high quality, high dry matter and, most importantly, high palatability. 1997 analysis was DM 37.7%, ME (MJ kg^{-1} DM^{-1}) 11.9, D value 74, crude protein (g kg^{-1}) 157, pH 4.9, intake factor 123. The dairy cows get only 1st cut silage, whilst 2nd cut is for the followers and beef cattle.

The cows are rehoused as late as weather permits in the autumn, usually at the beginning of October. They are split into two groups, both fed on self feed silage plus barley, maize gluten mix: 3 kg day^{-1} for the high yielders, 1.5 kg day^{-1} for the low yielders. This is topped up in the parlour with 22% crude protein, 12.7 ME home mix of soya, ground nut, rapemeal, beet pulp, grains and a little barley plus molasses and minerals. The total concentrates fed per lactation currently amount to 1098 kg.

The barley used is all home grown from 50 ha sown annually in rotation with the silage. After 4-5 years the barley is undersown to a dual-purpose perennial ryegrass mixture with clover and some timothy. This rotation has been found to be very beneficial in maintaining soil fertility and also keeping the silage fields young. Lime and copious amounts of FYM are incorporated in the barley phase. During the winter 600 hoggs are grazed from 1 October to 1 April to clean up the pastures, reduce winter kill and to generally thicken up the grassland, which is especially beneficial for the sow outs.

Living in a wet area with a fairly large dairy herd has led to the building of more than 3 miles of cow and machinery tracks to cut down on both poaching by stock and tracking by machinery. In addition, all fields have more than one gateway. Tractor work is always kept to a minimum, eg: only rolling the new sow outs in spring. Attention is also paid to cutting the hedges to an 'A' shape and leaving them quite high (1.8-2.5 m) which provides both shelter for the stock and cover for birds. Any unproductive corners or areas around the farm have been planted with trees for the benefit of wildlife and improvement of amenity.

WINTER FARM VISIT IN AYRSHIRE

A visit of the SWSGS to West Tannacrieff, Kilmaurs on 28 February 1996, by kind invitation of John Cuthbertson

G E D Tiley

This was a joint meeting with the SAC Auchincruive Evening Class.

West Tannacrieff comprises a 120 ha unit which is part of a 3-farm enterprise managed by the family partnership of R Cuthbertson & Sons. 56 ha were purchased in 1985, the remaining 64 ha being rented at neighbouring East Tannacrieff. There were 105 Friesian cows spread over 3 dairies and being graded up to Holstein, using AI. Herd average was 6,900 litres, quota 375,000 litres. In addition, there were 40 bulling heifers, dry cows and bought-in stores. All bull calves were intensively reared as bull beef. The bulls were fed silage, maize gluten and barley, and finished much better on bedding than on slats, where they tended to get swollen knees.

72 ha cereals (barley and winter wheat) were grown for feeding. The grass fields were mainly HF 11 mixture, but a new grazing mixture was also being tried. The grazing fields received about 200 kg ha^{-1} 29:5:5 NPK fertiliser and the silage less than 112 kg ha^{-1} N with slurry. N rates had been reduced in recent years. First cut silage had been cut late (June) in the previous year due to being the last farm in the cutting schedule. DM was 30.8%, 72D (11.5ME), 11.4% crude protein with Ecosyl additive. The second cut suffered secondary fermentation because it was too dry. The walls and 1m of the floor of the silage pits were sprayed with bitumen every alternate year, to prevent effluent seepage.

Many of the buildings had recently been converted or upgraded. The frame of the 36.5m x 27m shed had been erected by a contractor in 1989, the rest of the building being completed by farm labour. New cubicles and feed passage were installed last year. Cow Comfort mats were preferred by the cows compared with pasture mats, which were only guaranteed for 3 years. The calf houses still awaited upgrading to overcome a pneumonia problem. All the fields had been drained and ploughed, and there was an area of woodland.

The SWSGS wishes to thank the Cuthbertson family for arranging this visit, and for their warm hospitality on a crisp bright winter afternoon.

SWSGS SPRING VISITS IN WIGTOWN

A Visit to Caledonian Cheese Company, Stranraer and Craigencrosh, Stoneykirk on 9 May 1996

Caledonian Cheese Company - by kind permission of the Manager and Directors of the Company

Members of the Grassland Society were welcomed to the Creamery in the morning, with an instruction to remove all watches and items of jewellery - an early indicator of the precautions and care taken to maintain quality in this modern factory. The factory was built on a greenfield site in 1990 and opened by Princess Anne on 4 October 1991. Tankers deliver milk from nearby farms and are weighed over a weighbridge, with loads paid on weight (986 litres per tonne). There are 4 milk storage towers each with a capacity of 250,000 litres plus 4 additional raw milk silos giving a further capacity of 432,000 litres. All incoming milk is tested before off-loading and any suspect milk (eg: with antibiotics) is rejected. The tankers have 3 separate compartments. Once received, the milk batch comes under computer control for whichever product route is to be taken. Cleaning of tanks and pipes with chlorine or detergent is also controlled, and indicator lights at the control centre show the status and progress of each section by means of sensors in the equipment line. Contamination is thus prevented. The computer runs from an uninterrupted power supply which could operate a controlled shutdown of the plant in the event of a power failure, using compressed air to operate the valves. All quality control tests were conducted in a fully equipped laboratory.

A similar control panel overlooks the completely modern cheese room, installed in 1990 at a cost of £15 million and operated by 6 staff. All operations in the 10 cheese vats are controlled from this panel. Milk is pumped to the vats at 54,000 litres per hour through a Pasteuriser. Starter (plus Annatto vegetable colouring for coloured cheese) is added after 15 minutes and the vat is filled to its capacity of 22,500 litres. Rennet is then sprayed onto the milk and mixed for 5 minutes before all agitation is stopped and coagulation allowed to occur. Once the cheesemaker is satisfied with the coagulum, the cutting process begins and curds & whey are produced. The temperature in the vat is raised to approximately 40^{0}C to scald the curd before being transported to the Alfomatic cheddaring system for 2 hours and then onto the blockformer pressing system. The whey is removed for separation, evaporation and drying. The current daily capacity of the cheese plant is 4,600 20 kg blocks per day and an annual production of around 10,000 tonnes with 104 employees.

Each tall blockformer holds 30 blocks of cheese. These are automatically cut and weighed to a target size of 19.7 kg, the actual weight being automatically recorded and adjusted by computer control. Each block is vacuum sealed, checked through a metal detector and transferred to the cold store for maturation. End-of-run cheese, misshapen due to low pressure in the column is sold off for food processing (2 blocks per day). The working capacity of the cold store (8^0C - 10^0C) is 6,500 tonnes on pallets. Cheese has 3 maturity grades: mild, medium and mature. Grade and location are computer-recorded. After 10 weeks, cheeses are tested and graded based on representative sampling. Regrading of cheese is carried out at 6, 9 & 12 months of age. Mild required 3-4 months, Medium 6-7 months and Mature 10-12 months. 10,000 litres of milk are required to make 1 tonne of cheese. Whey is sold as white or tinted in 1 tonne bulk lots or in 20 kg bags. Skim milk powder, cream, butter, low fat, other cheeses and specialist starters and cultures were also produced.

The Grassland Society is most grateful to the staff of the Cheese Company for the time they spent in showing its members around the factory, and for describing in detail how their milk was transformed into value added products.

Craigencrosh, Stoneykirk - by kind permission Hew Chalmers & family

On a cool, but bright, afternoon the Society was welcomed onto the farm of the Scottish Regional Silage Champion, Hew Chalmers. On the peaks of the Galloway Hills in the distance, the snow still lingered. Hew explained that he was the 5th generation on this family farm, originally tenanted but purchased in the early 1970s. A further 60 acres (24 ha) had been added in 1986. The 160 acres (64 ha) was now all grass except for one field of wholecrop spring barley.

There were 95 Canadian Holstein cows, all registered, plus followers. These were set stocked on 35 acres (14 ha) with an annual stocking rate of 2.75 livestock units ha^{-1}. At the time of the visit, average milk yield was 6,500 litres, 4,002 litres cow^{-1} from forage, at 0.19 kg conc. $litre^{-1}$.

The grazing fields received 250 kg ha^{-1} 20/15/5 at the beginning of every month from March-August, costing £95 per cow. Some fields poached and soil compaction was a problem: extra gateways had been used to try and relieve this. Docks were sprayed in the regrowth after the 1st silage cut. Reseeding was on a 9-year rotation undersown to barley. A typical seeds mixture from Watsons Seeds contained Profit, Merganda, Merlinda (T) and Condesa (T) perennial ryegrasses with Dalita Hybrid ryegrass, Comtal Timothy and Milkanova white clover.

Compacted soils were subsoiled in dry summers and all fields were topped up to 4 times to keep the grazing fresh and stimulate sward thickening. 200 lambs were winter grazed from October to the end of January.

The silage fields receive the same total amounts of fertiliser as the grazing fields, beginning early March. Slurry is applied for the first, but not later, cuts to avoid herbage contamination. The silage is cut by the farm using two 2.4 m disc mowers, the first cut taken around 19 May. A 9 cm stubble is left to avoid soil contamination, and encourage the next cut. The swathes are immediately scattered to accelerate drying aiming for 25-28% DM, from a 24-36 hour wilt. The time of cutting is critical. A 5-day weather forecast is checked before starting, and cutting takes place as far as possible in the afternoon to ensure maximum sugar contents. Harvesting is by contractor with Bioferm additive in 1995. Land drainage pipes are placed at the bottom corners of the pits to collect effluent which is pumped to the slurry tower, though the higher DM silage has reduced effluent problems. Four cuts were taken last year. The clamps were double sheeted and the edges sandbagged to eliminate waste. The self feed system precluded the use of side sheets. The floors of the pits were being gradually dug out and renovated.

Craigencrosh was one of a nation-wide network of farms co-operating with Kemira Fertilisers in some simple demonstration plots comparing several fertilisers. Yields were monitored using the New Zealand falling plate device which records the density of the sward. At Craigencrosh, there was a 6 percent advantage in early growth (6 weeks after fertiliser application on 5 March) when Early-bite (27/10/0) was used compared with Swardsman (25/5/5), thus indicating the benefit of an NP combination used early in the year. Another comparison showed a benefit from using an NPK compound compared with a blend, even though the latter contained more N. This was considered due to a more even distribution of the fertiliser components within the compound.

The Scottish Regional Silage cup was presented to Hew Chalmers during the farm visit on behalf of the British Grassland Society by Michael Milligan. He emphasised that the whole secret of success with silage had been highlighted by Hew's achievement of the milestone of 4,000 litres plus milk from forage, through **attention to detail.** It was within the grasp of anyone following this principle to greatly improve performance in making and feeding silage.

The Society is very greatly indebted to the Chalmers family for the success of this farm visit, and for their warm hospitality.

GRASS REIGNS WHERE COAL WAS KING

The BGS Summer Meeting, Durham 7-10 July 1996

G E D Tiley & John Marshall

The Grassland Societies from the Counties of Durham and Northumberland in north east England were hosts for the 1996 BGS Summer Visit, based in the historic and beautiful cathedral city of Durham, with accommodation in Durham Castle.

Formerly, the area was heavily industrialised based on coal and shipping, the densely populated urban coastal strip between Newcastle and Durham contrasting sharply with the sparsely populated extensive moorland further west. Agriculture is very largely based on grassland, with some arable mixed cropping in the east. Beef and sheep farming predominates in Northumberland, but there are more dairy farms in Durham. In all 10 farms were visited in the main programme, while the alternative Tourist programme visited an impressive range of historic and amenity locations.

Upland Improvement - Parkhead Netherwitton (J Craigs Ltd)
The main purpose of a visit to this 262 ha upland farm (180 m) was to see reclamation and pasture improvement from a previously run down extensive hill unit. This had been achieved by

1 Fencing into manageable sized fields;
2 Tight grazing with cattle to remove rough herbage;
3 Control of unpalatable rushes by spraying;
4 Heavy lime applications;
5 Draining where crops or silage to be grown.

No reseeding had been done but the swards were maintained by a careful fertiliser programme and close grazing with sheep and cattle. The suckler cows were the key to success in the pasture upgrading. Stock were 750 ewes, 240 ewe lambs and 125 Simmental X cows. The lambs were finished and most of the cattle wintered on a lowland dairy unit.

Profit, education and research - Cockle Park Farm, Morpeth (University of Newcastle upon Tyne)
The home of the historic 'Cockle Park Mixtures' developed a century ago was the subject of the second visit. Now a commercially run farm of 262 ha some 20 miles north of Newcastle, Cockle Park provides a modern demonstration unit with a

wide range of crops (cereals, oilseed rape, grassland) and dairy, beef and sheep. The Holstein herd of 150 averages 6,300 litres and 100 plus bulls are finished each year. There are over 500 Mule ewes crossed with Suffolk, giving up to 195% lambing percentage. As well as demonstration for students and others, a number of research projects were seen, including the palatability of grass varieties and the use of pedometers for heat detection in dairy cows.

Dairy Sheep - Rugley, Alnwick (E A & L Jackson)

A tenanted farm of 280 ha at 100-150 m with exposure to cold east winds. As well as wheat, barley and set aside, there were 161 ha grass, of which 61 ha were permanent. A 80-ewe Pedigree British Milk Sheep unit formed the basis of the self contained sheep flock of 800. A breeding policy to improve prolificacy and milk production was in progress. Finished lambs were sold by computer auction, where bonuses for quality were available. Flock recording, clean grazing and purpose-built sheep housing were vital elements in flock management, which achieved over 200% lambing. 420 continental cross cattle were also finished annually on silage and by-products.

Pioneer Cattle Breeding - Bays Leap Farm, Heddon on the Wall, Newcastle (Genus MOET)

On the second day the home of the Genus MOET cattle herd was visited. This was established in 1987 and is an important source of genetic material for UK dairy farmers. Females are evaluated in the MOET herd for production and type to identify superior animals as a source of embryos. Semen is also sold from the male progeny of the best females with performance evaluation. Surplus female stock are sold annually to provide high profit index breeding material.

Bays Leap Farm itself was 1781 ha reclaimed from open cast mining, now largely permanent pasture with 49 ha winter wheat mainly for wholecrop. The nucleus herd of 220 cows is permanently housed and fed on grass/wholecrop silage with added concentrates. There were a further 1700 followers, bulls and beef cross recipients. All calves are reared in a nearby 90 ha farm until they join the main herd at 19 months old.

Quality Stock from Difficult Land - A & M Watson, Dykehead, Cambo, Morpeth

This farm received Severely Disadvantaged Area payments from the Hill Livestock Compensatory Scheme. The 170 ha faced south at 230-270 m and was mainly peaty but also with some heavy clays. The soil is very liable to poaching so that a considerable number of buildings had been erected to house livestock during the long winter. The farm was tenanted from the National Trust. Grants had been received over the years to improve the original rough grazings through

drainage, lime and phosphate and heavy stocking to increase production. Recently Alistair Watson has entered the Stewardship Scheme which is now encouraging reversion of the land through stock reduction! Shelterbelts and 3 miles of new hedging have also been planted. There were 150 Limousin and Blonde d'Aquitaine cross sucklers calving to AI throughout the year. The sheep were 400 Blackface, 400 Mules plus 260 Mule hoggs. Most of the ewes are away-wintered, and 40-60 ha were summer-rented to reduce grazing pressure at home.

Urban Fringe Dairying on the 'Sahara of the North' - R Holmes & Sons, Whitburn Moors Farm, Sunderland

Disadvantages of a different sort affected the 210 ha dairy farm at Whitburn Moors. Situated on the east coast at near sea level, the soil was of heavy clay and subject to mining subsidence. Rainfall was very low (20 inches, 500 mm) and cold east winds and sea erosion interfered with grass growth. In addition there were problems from being at the urban fringe, although this was an advantage for the milk retailing and sales from the yoghurt manufacturing facility. Apart from 15 ha of permanent pasture on an old airfield, the grassland was on a 5-year rotation, with establishment in the autumn after winter wheat sometimes cut for wholecrop. The 200 cow Holstein herd was set stocked or strip grazed according to summer rainfall, backed up with buffer feeding. Wheat, barley and oilseed rape were dried, stored and marketed through a local grain co-operative.

Estate Farming - Raby Estate, Staindrop, Darlington (Lord Barnard)

The first of four stops on the 3rd day was at the Raby Estate. This is made up of a hill farm in Teesdale, an arable farm of 688 ha in Shropshire and 7 farms totalling 810 ha in Durham. In the latter, arable crops (wheat, barley, oilseed rape and set aside) are grown on 485 ha, the set aside mostly sown to provide cover for wildlife and game birds. 324 ha is devoted to grass for 2000 mule ewes, 25 pedigree Longhorn sucklers and followers and 400 deer (half red, half fallow deer) at the Home Farm. 'The Park', 116 ha of unfenced amenity land, which however received 2 dressings of spring fertiliser annually, is grazed by the deer, Longhorns and 500 ewes. Silage is cut from 40 ha as clamp and bales. 1000 of the ewes are now lambed outside in May to reduce feed, labour and veterinary costs. It was planned to reduce the sheep herd to 1800 ewes to release 28 ha for arable crops.

High Yield Dairy Farming - Scaife House, Staindrop, Darlington (Peter and Rosemary Gill)

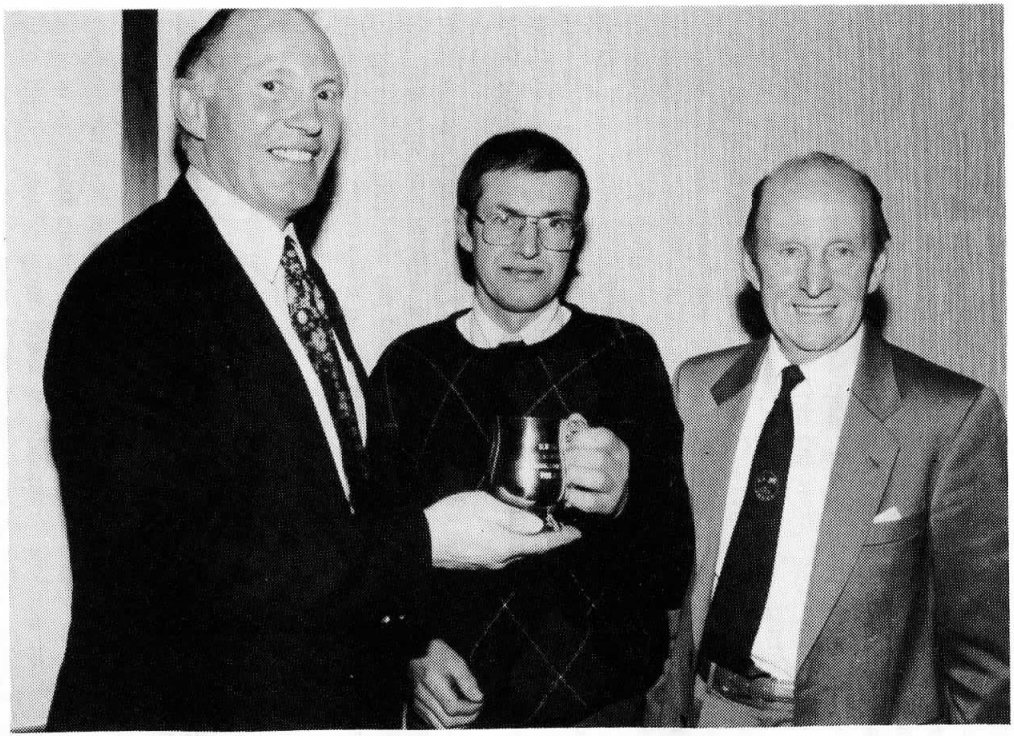
The second farm in Staindrop was at Scaife House (part of the Raby Estate) where the Gill family had been tenants for over 100 years. At Scaife House there were 68 ha at 150 m and a further purchased 34 ha at Strickland at 240m. The 145 cow herd averaged 7,500 litres (3,300 litres from forage). Peter's philosophy was to feed quality forage from grass to appetite. Regular reseeding was practised without including clover which was abundant naturally at Scaife House, in spite of frequent spraying to control weeds.

Zero Grazing for High Stocking - Walker Hall, Winston, Darlington (John & Stephen Kirkup)

Walker Hall is 218 ha at 150m, with 700 mm (28 inches) rainfall. There were 70 ha of cash crops, mainly wheat, and set aside, with an additional 8 ha of wholecrop wheat. The wheat is grown in rotation with grass leys. 230 Holstein-Friesian cows were zero grazed until December using a 'Zero' 2 mower and purpose designed trailer/feeder. Grass must be fed within 2-3 hours of cutting to avoid heating and 75 kg (14 kg DM) are fed per cow. The ryegrass swards are harvested at 24-26 day intervals and receive 87 kg N ha^{-1} after each cut. Herd average was 6,750 litres at a stocking rate of 2.9 cows ha^{-1}. Silage was contractor-made.

Beef Production from Championship Silage - Newton Ketton, Brafferton, Darlington (Don & Julie Wilkinson)

The final visit was to the Host Vice-President's beef farm. Don has judged the South West Scotland Silage Competition and is a former UK National Silage Champion. 550 bulls from 2 weeks to 15 months old were housed all year and fed all home grown silage and moist wheat. Calves are purchased at 2 weeks old or weaned and are reared by Julie. The 120 ha consist mainly of short term temporary grass cut usually 4 times a year (50 ha) and winter wheat (56 ha) with small areas of permanent grass and set aside. High DM (40%) silage is the aim, achieved by frequent spreading of the cut grass. The farm is at 76m in a 24 inch (610 mm) rainfall area, on heavy clay. Precise farm records are kept with careful monitoring of feed intakes being a more reliable indicator of performance than liveweight. The feeding policy requires up to 5 hours of empty troughs to improve DM intakes. Grass varieties used were: Polly, Merlinda and Fennema. The visit ended at an area of species-rich grassland in a SSSI on the farm which had been unfertilised and unmanured for 54 years and neither cut nor grazed for 10 years.



Bobby Kerr (centre), Merkland Wells, Crocketford Road, Dumfries receiving the Kemira Prize for the Best Grassland Idea 1996 from Ian Main (left), Kemira Fertilisers Ltd, with Archie Borland, SWSGS Chairman (right).

SWSGS GRASSLAND IDEAS COMPETITION 1996

G E D Tiley

There were 2 entries in the 1996 Ideas Competition:

Entry 1 Mechanised Tyre Thrower

A Twose rear-mounted PTO driven elevator purchased cheaply (at implement sale for £20). After removing the side rails/bale guides from the top sides of elevator, the wooden slats can convey the tyres quickly and easily from ground to the top of the silo 9-10 feet above. This has been used successfully for 3 years.

Entry 2 Moveable Stock Control Gates

These have been installed as 'pass through' gates in the circular collecting area for the milking parlour of the new dairy which has been in operation since mid-April 1996. The novel design of these gates derives from the fact that they pivot from **the same** post which is situated in the centre of the circle, and that the constructional profiles of the gates are designed so that they **pass through each other** in both directions. One gate is set to guide the cows into the parlour, the other acts as a backing gate and also carries a slurry scraper fitted to the bottom. The slurry is pushed into a small slatted channel three-quarters of the way across the circle. One quarter is left clear for cows unsure of slats or newly-calved cows from the adjacent calving box. The gates are supported on the ground and will set at any position on the circle without being pinned to the wall, for shedding cows into any exit on the circumference of the circle such as the calving box, parlour, the passage exits at each end, etc.

The main benefit is that different batches of cows can be brought into the collecting area at any time without altering the gates. When one batch is finished, the backing gate passes straight through to the fixed gate to allow the next batch through without altering any catches. The 80 x 80 x 4 mm box construction is suitably braced to withstand bending, and it is torsionally rigid. The 'T' design has proved to be the correct height, and strong, but light enough to allow the gates to be pushed easily. After milking, both gates are set out of the way to allow the mixer wagon access to the feed passage.

Entry 2, from R Kerr, Merklands, Crocketford was considered by the Executive Committee to be the best and was awarded the Kemira Prize for the Best Idea submitted.

CENTRAL SCOTLAND GRASSLAND SOCIETY
FARM VISITS IN 1996

15 May - Tibbers, Buccleuch Estates Ltd, Drumlanrig, Thornhill Dumfries (by kind invitation His Grace the Duke of Buccleuch and Alan Stannett).

The new dairy unit at Tibbers was the main focus of this visit in May. For details, see Greensward 1995, No. 39, pages 11-12.

9 July - Dalmoak, Dumbarton (by courtesy of Willie Turner)
This visit was made on a beautiful sunny summer evening. Tractors and trailers were used to make a tour of the farm. The farm rises fairly steeply and the highest point afforded spectacular views of the Clyde.

Dalmoak is a well run family dairy farm worked by Willie and his son Jim, who had themselves constructed most of the buildings plus a new silage pit during the previous years. Roofs were slatted to improve ventilation. Total farm area was 435 acres (176 ha) including 20 ha of woodland. There were 24 ha spring barley and 48 ha silage cut twice. Of the 82 ha of grazing, 34 ha were rented. The 100-cow Holstein-Friesian herd averaged 5,500 litres and were fed silage by forage box plus a blend in the parlour. Dairy replacements were housed on slats, straw courts and cubicles and fed silage and barley. 40 spring calving Simmental x Friesian sucklers put to a Simmental bull, were outwintered and fed silage. Bull calves were finished as bull beef at 12 months off barley, Stimuflav and fishmeal. Heifer calves were finished at 18 months.

The Central Society is grateful to the Turner family for this visit, and for their hospitality. However, the farm visit left a lasting impression on the CSGS Secretary who was bitten on the rear end by an Alsatian guard dog while putting up signs indicating the farm location!

13 November - Moat Mains, Lesmahagow (by courtesy of the Struthers family).
The enterprise visited comprised 3 units totalling 219 ha run by John and Gavin Struthers. Silage was made from 126 ha of permanent grass, and was self fed to give maintenance +10 litres. There were 200 summer calving and 100 spring calving cows kept in 2 separate herds. A dual purpose breed, Mensa Rhine Issel (MRI), comparable to the Friesian for milk production and quality, had been chosen. This was because of the shortage of good Friesian bulls to produce calves for export and replacement heifers.

The Central Society wishes to thank the Struthers family for the privilege of this visit, and for their kind hospitality.

CENTRAL SCOTLAND GRASSLAND SOCIETY

Silage Competition 1996

HF Seeds Prize-Giving Meeting of the CSGS
at the Newhouse Hotel, Newhouse on 16 January 1997

C M McCombie

Silage Judge: **Murray Brown, Muirhouse, Carnwath**

The competition results were announced by the judge, and the prizes were presented by Ian Watson, HF Seeds, who sponsor the Competition. The 3 leading silages in 1996 were all extremely close in the marks list, and could hardly be separated.

HF Seeds Cup:	1st Prize	J & R Kerr, Kirklands, Dunsyre
	2nd Prize	R Reid, Glen Farm, Falkirk
	3rd Prize	J P Baird, Nether Affleck, Lanark
Hamilton Reco Salver for Best Beef & Sheep Silage:		D M Lyle, Mid Cambushinnie, Dunblane
Best Big Bale Silage by Analysis:		D M Lyle, Mid Cambushinnie, Dunblane

The points awarded were as follows:

	Analysis (35)	Inspection (65)	Total (100)
J & R Kerr, Kirklands, Dunsyre	26.4	55.0	81.4
R Reid, Glen, Falkirk	28.8	52.5	81.3
J P Baird, Nether Affleck, Lanark	27.2	54.0	81.2
D M Lyle, Mid Cambushinnie, Dunblane	27.9	51.7	79.6

SWSGS EVENING FARM VISITS - 1996
G E D Tiley

Dumfries - J Dunlop, Searigg, Carrutherstown - 23 July

This was a very popular visit to a progressive dairy unit at the southern end of Dumfriesshire. The Dunlop family had moved from a difficult rented farm in Fenwick in 1956 and had purchased 140 acres (56 ha) for £16,000. Additional pieces of land were purchased and the cows were settled into byres in 1967 when Jim left school. The first cubicle shed was built in 1981, and has since been gradually improved and increased by stages. Currently, the farm was 272 acres (109 ha) with a further 100 acres (40 ha) rented grass parks. Silage could be carted to allow more grazing area near the steading. The farm was originally long and narrow, with all the grazing in the middle, but added land purchases had made the steading more central.

The cows had to walk around the new road bypass. Some of the hollows in the undulating grazing fields had been levelled, giving some 60 acres (24 ha) grazing for 140 cows. First cut silage was taken from 155 acres (62 ha), and second cut from 120 acres (48 ha). Crops were 15 ha Spring Barley, 10 ha Winter Barley and 8 ha Winter Wheat, the latter used flexibly either for grain or wholecrop. The crops were grown in the lower flat, more fertile fields with a rotation of 2 years Winter Wheat, Winter Barley then a sow out to HF 11 mixture. Wintering geese damaged the barley. The grass seeds were broadcast after Cambridge rolling. Thinned out swards after repeated cutting for silage were thickened by oversowing, eg: Italian ryegrass, using an old hydraulic grain drill. Heavy dock infestations in the night grazing fields were controlled by glyphosate before the barley crop.

The silage crops received 420 kg ha^{-1} 23/8/10 with slurry equivalent for each cut after a spring dressing of 250 kg. Grazing fields received 250 kg ha^{-1} 25/5/5 per grazing, until July when 125 kg ha^{-1} 34.5 N was used.

The dairy herd of 160 pure Holsteins averaged 7,200 litres. Quota was 1.1 million litres, with a target of 1.2 million. 80,000 litres of quota was purchased in 1995 at 39p/litre, and a further 50,000 litres were being leased. All calves and replacements were reared and 40 bull beef finished, other beef animals sold as stores. An Angus bull was used with the heifers and several sires with the cows to give 80 beef calves per year. Jim got a lot of satisfaction in knowing that all his cows milked well, and aimed to do all the milking himself.

There had been problems with drainage of water and wastes due to the farm being situated at the bottom of the hill, and therefore receiving all drainage, and also because the farm was built over a burn. The silage clamps were thus placed away

from the burn, and effluent drainage controlled and kept separate from rainwater. An irrigation system could dispose of both dirty water and slurry in winter, though the disposal fields were up to 100 m higher than the steading. A 5 kW 3-phase submersible pump was used. A local blacksmith had installed separator brushes to remove fibres and solids and prevent the irrigator from becoming choked. The separated solids were easy to handle and spread when dry and friable. The Wright Rain irrigator was easy to set up and move in the field, with a power drive and gear to control and periodically shift the line. The irrigator system had dramatically reduced tracking and gateway damage, and the diluted slurry was easily washed off the herbage by rain, thus relieving worries about stock ingestion.

The visitors saw the well laid floor of a new silage clamp, which had been worked twice. The joints between sections were made water-tight by sealing, and a pressure washer had been used to blow the cement from the concrete to give a pebble-dash effect on the outer wall. The cubicles were at the end of their working life, and required renewal. Some of the mushroom type may have to be renovated. An extension was being considered to increase space. All cows were fed the same diet with maize gluten, beet pulp, soya and fishmeal, feeding to 22 litres in winter, reducing to 18 litres.

The remains of a circular Roman Camp surrounded by trees gave a commanding view at the highest point of the farm. This area was also favoured by the cows on a summer's day. On the low lying ground, an area of trees had been replanted by Jim and his wife; conifers in 1986 and a broad-leaved mixture in 1993. Both the Dunlop family and their neighbours looked forward to seeing the growth of these trees in years to come.

The Society is most grateful to Jim, his family and staff for an extensive tour and description of Searigg.

Ayrshire - J Hodge, Bogwood, Mauchline - 8 August

This evening visit to a dairy unit in the centre of Ayrshire was primarily to view a new parlour recently installed. The Hodge family had been at Bogwood for 33 years. One son had moved to a beef/sheep unit at Auchinleck and a separate dairy unit was to be built up at the nearby farm of Scoutts, purchased 14 years earlier.

There were 170 acres (68 ha) at Bogwood, 150 acres (60 ha) at Scoutts, plus 40 ha rented. Cow numbers varied between 120-130, with average yield 6,700 litres, but aiming for a genetic potential of 7,500 litres, more quota having been purchased. Calving was year-round and big bale silage was fed all summer to improve protein intakes. Rations were fed from mid-August: 6 kg caustic treated wheat and 6 kg of supergrains.

The one year old shed had concrete sleepers with a passage for a feeder wagon. Mats were bedded into the concrete in the cubicles. Hydraulic scrapers had been installed to replace chains which were costly to renew. Much of the building work had been done with farm labour using a tractor-mounted mixer and working with the builders. There was also a new sheep shed used in the summer for feeds for the mixer wagon using a simple blend. The silage pits were limited by the railway which runs at the side of the steading.

All silage was cut and lifted by the farm. 120 acres (48 ha) silage at first cut, 100 acres (40 ha) at the second and 50 acres (20 ha) at Scoutts. 24 ha were hauled through the town of Mauchline. Polypropylene sheeting was used on some pits and all effluent collected into a brick built tank, very carefully to prevent polluting a burn flowing through the steading.

A layer of supergrains was usually placed under the second cut, sometimes causing the clamp to slide. Winter wheat had been grown for 3 years, with the wholecrop harvest urea treated. In 1996 the intention was to use fermentation. The variety Riband seen at the time of the visit had been direct drilled too thickly and was lodged. The wheat received 4/20/20 in winter and 190 kg 26/8/8 at the end of February. The grazing grass fields received 26/18/0 every month and the silage 20/6/0. Docks were spot treated with glyphosate in the autumn, though dock seedlings appeared in the sow outs. Slurry was spread by tanker in the summer, and by sprinkler in the winter.

Milking Parlour

Staff from McCaskie Farm Supplies (Andrew Rettie and Stuart Hutton) were present to describe the newly installed milking parlour. The McCaskie staff stressed that properly designed, well maintained and efficiently operated milking

equipment was vital to the future success of dairy enterprises to give maximum returns, in increasingly competitive and challenging times.

The original parlour was a low level 12 point jar parlour with a low ceiling and traditional loft for feed storage. This required updating so it was decided to start from scratch. The work undertaken extended the parlour pit to allow a 14 point parlour, removing the old loft and replacing it with a bulk bin and auger. All walls of the parlour and collecting area were hygienically clad to meet regulations.

The old 12 stall parlour which was a conventional herringbone with the cow standing at 30° to the parlour pit was replaced with a new 14 place unit with the cow standing at 50°. This parlour allowed more cows in the original space and the cows better presented for milking through the back legs.

A milk bail was loaned for 5 weeks while the new parlour was being installed. The milking equipment was a large bore Fullwood direct line system ('Speedline'), complete with in-line milk meters linked to automatic cluster removers. The milk meters in turn are linked to a personal computer to give automatic milk recording on a twice-daily basis, and full cow calendar information with printouts when required. Time required for milking 120 cows was 1.5 hours. The most difficult task was washing the cows. The computer could change in-parlour feeding and transponders could also be added.

The Society extends its thanks to the Hodge family for the most interesting farm visit, and for their warm hospitality, and also to the McCaskie Farm Supplies staff for their participation.

Kirkcudbright - D & R Kerr, Crochmore, Crocketford - 13 August

The Society was privileged to be able to visit the recently constructed dairy complex at Crochmore. The visit began at neighbouring Merkland Wells where the Society was welcomed by Douglas and Bobby. During the farm walk they demonstrated that the key to success and profitability in milk production lay in good grassland management.

A total of 500 cows were kept on 1,300 acres (425 ha) on Crochmore, Merkland Wells and New Farm. There were 3 dairy units, each with its own self-contained dairy herd. At Merkland Wells there were 130 cows with a herd average of over 7,100 litres, 200 cows at Crochmore, 170 at New Farm. Averages at the last 2 farms were around 6,500 litres. Grassland of the highest possible quality, both for silage and for grazing, is the target in the management process.

Silage

Five hundred acres (200 ha) are cut twice a year using 3 Claas mowers, a 3rd cut being taken as necessary. Additive (Genus Live system and also Bactosile) is used. D-values well into the 70s are achieved, with consequently high MEs. In 1996 D values up to 76 and good protein levels, 13-16%, were achieved. A total weight of some 8,000-9,000 t of silage are made annually in 8 clamps across the 3 units.

Two new earth wall silage pits, each with over 1,000 t capacity, were completed in the new buildings complex. There was good effluent control with slopes to central sumps and collection either to the slurry tower, dirty water system or to dairy slats. Provision has been made for the separate collection of clean and dirty water; the latter spread on the grass fields. The Kerrs have their own independent water source from a borehole pumped into two 1,000-gallon (4,550 litres) tanks which are located at the highest point between the two farms. Gravity feeding supplied the steadings and all troughs, and the installation costs of this water supply were expected to be recouped within 2-3 seasons. Adequate storage for slurry has been provided in a 320,000-gallon (1.45 million litres) tower at Crochmore, slatted capacity at Merkland Wells and a further tower at New Farm. Slurry is applied to the grass in winter and also after 1st cut silage. The nitrogen content of this waste product is taken into account, thus reducing the amount of bag N. Fertiliser rates are not more than 125 kg N for 1st cut silage, 100-110 kg for 2nd cut. For grazing, up to 375-450 kg N are used at 70 per grazing, according to the season. The swards are based on SAC recommended varieties of intermediate and late perennial ryegrasses, including some tetraploids for added quality. Clover is not used, due to the high nitrogen regime in the silage fields, but some is included in the grazing mixtures. Weeds are not normally a problem, and the aim is to try and keep on top of the docks.

Grazing

The fields are well secured by stone dykes which have been carefully maintained by farm staff without grant assistance. These were protected by a mains electric fence wire to prevent cattle damage. The cows were set-stocked and grazed very tightly, especially in early spring. The calves were reared in individual hutches, which have been very successful health-wise. Sheep were taken for grazing from autumn to January with considerable benefit to the grass.

A feature in the new dairy was the system of rotating and interlocking gates around a central pivot for handling and directing cows during milking. This was self-designed and constructed by engineer-trained Bobby (see page 19). The parlour was an Irish Dairy master 20/40 unit and a rope scraper was used in the cubicle shed.

Despite the scale and intensity of their commercial enterprise, the Kerr family were not too busy to neglect the appearance and environmental quality of their farms. Many trees had been planted in the previous year, up the road-side and beside the new dairy. Apart from keeping the dykes neat and tidy, all the hedges were carefully maintained and some new shrubs were to be planted on the earth walls of the silage clamps.

During the visit, Society members were taken to the high point between Crochmore and Merkland Wells. Here the marches and layout of the 2 farms could be viewed, as well as how the water system was installed and operated. Here also was seen the impressive amenity of the surrounding landscape in the rich dairying area of south-west Scotland, where the Kerrs' enterprise is a leading example.

The Society is deeply grateful to the Kerr family for the privilege of this visit, and for their kind hospitality.

TEMPERATE FORAGE LEGUMES

J Frame, J F L Charlton and A S Laidlaw

Published by CAB International, Wallingford, Oxford, 336 pages £27.50.

The benefits of legumes, known since Roman times, have recently come back into the limelight, with pressures to use less fertiliser and to trim costs. However, management and utilisation of legumes in the modern grassland scene have encountered a number of problems. It is therefore extremely timely that this review of the existing knowledge of the growth, biology, management, utilisation, herbage quality and animal productivity of temperate legumes should become available now.

The essential facts on white and red clover and lucerne occupy two thirds of the book, with the rest devoted to less common species such as subterranean clover, trefoil and sainfoin. Written by authors from South West Scotland (JF), New Zealand (JFLC) and Northern Ireland (ASL), the text is concise and very readable with a strong practical bias, emanating from the lifelong advisory and research experience of the three authors. All those aiming to make better use of legumes will gain from reading or referring to this excellent volume.

A LAND WITHOUT GRASS

A Visit to Phoenix, Capital of Arizona, USA, October 1995

G E D Tiley

An opportunity arose to make a short, literally flying, visit to Arizona in October to attend an International Workshop on Invasive Weeds. This was held in the Arizona State University which has a very attractive, well laid out campus, and marvellous facilities for its students and staff. As with many of the residential houses of Phoenix, the gardens were planted with ornamental palms and cacti, all very drought resistant. The only grass to be seen was Bermuda grass in the campus lawns, which were automatically irrigated every night. Annual rainfall in these parts is about 7 in. (18 mm) and the main river, complete with bridges, is a dried up river bed, which however can have a sudden flood from up country. Water supplies for Phoenix are piped hundreds of miles from dams in the hills.

October temperatures were higher than our mid-summer, but the air was extremely dry. Phoenix has an out of town zoo, and a nearby cactus garden, with an internationally famous collection of cacti.

Highlight of the visit was a day coach tour to the Grand Canyon, 225 miles to the north. Empty straight roads but speed limit 55 mph!

The surrounding countryside is basically desert, with the impressive Saguaro cactus - famous in western films, the emblem of Arizona State, and a protected plant. Near the Grand Canyon which is over 7,000 ft (2,130 m) at its rim, there is a dry pine forest. A wonder of the world, the Canyon takes your breath away with its beauty and grandeur; also if you start walking down into it and have to hurry back to catch the bus! At night fall, the rock at the sides of the path becomes ice cold.

Looking from the bus, there was little sign of agriculture, except some irrigated cotton and lucerne (alfalfa) fields. Few, if any, livestock were seen and there were only a few withered grasses occasionally growing among the cacti.

ELECTRONIC IDENTIFICATION OF CATTLE

A Meeting of the SWSGS at Murray Arms Hotel, Gatehouse of Fleet on 7 November 1996

Mike Nelson, EID Stock Management and
Kate Kerr, Animal Health Office, Dumfries

This Meeting was sponsored by ***Stockland Computers Ltd, Denham Farm, Quainton, Aylesbury, Bucks***

Mike Nelson

Mike Nelson, Barnkirk, Newton Stewart, ran a local company EID Stock Management, which marketed electronic tagging equipment and systems. He was a qualified animal scientist who had previously worked with animal feeds, as a butcher and as an auctioneer.

The electronic ear tag contained a chip, produced under patent from Texas Instruments by Allflex, which could be read using equipment from Oxley Systems. Stockland Computers provided a central Database Service and associated software. EID Stock Management undertook distribution, fitting and maintenance of the whole system to farmers, markets and abattoirs. Though the system was new to cattle and agriculture it had been used in other fields including pigs for a long time. Agricultural use was expected to expand greatly.

The **electronic ear tag** made to ISO (International Standards Organisation) standards came in 2 types: Official (white - with Ministry number and farm number) and Management (yellow - for farmer's own number), each of which could store any number from 1-13 billion. The tag was passive and required no battery as it was activated by short radio waves transmitted from an antenna. It had unlimited life and was preferable to an implant which was invisible and could be tampered with or could end up in the food chain. The tag could be scanned by 3 types of **Reader**: *Portal*, antenna fixed in the frame of a door in markets, etc; *Panel*, antenna fixed at the side of a passage or cattle race; *Hand held portable* with different designs, suitable for farmers.

The **Database** held at Stockland was designed to offer a service to industry allowing details to be held centrally from each electronic identification number licensed to the database. Markets and abattoirs were linked via high speed ISDN lines to send or retrieve information for individual animals. Calves could be registered on the database and with the ministry, using a prepaid postcard which accompanied each tag.

The **Needs of the Industry** were summarised as follows:

- Consumers want traceability
- Supermarkets want an easier and more reliable way to provide traceability
- Meat companies need a way to reduce paperwork and guarantee traceability
- The government requires complete accuracy in identifying animals for any reason
- Markets need a more efficient way to control cattle identity, ownership and documents
- Farmers need accurate records and LESS paperwork

The electronic tagging system met these needs by:

a) **In the Market**

- At intake to a market, a beast is identified electronically without being restrained, details being retrieved from the database and shown on the screen in a flash.
- Official No., breed, sex, age, CCD status and ownership is verified and can be checked with the animal's documents
- Lot numbers are allocated
- As the beast enters the ring, relevant information is displayed for buyers
- On completion of the sale, the market logs the movement on the Central Database.

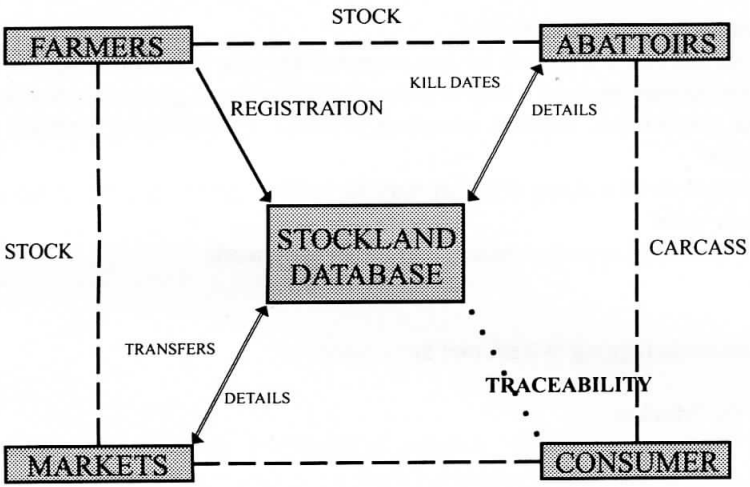
b) **In the Abattoir**

- On intake, beast identity is confirmed the same way as in the market
- The tag stays with the carcass along the kill line
- On cutting an abattoir code tag is given to every cut which links the cuts back to the tag
- At any time the abattoir can verify carcass details and log of movements
- The abattoir confirms to the database that the animal has been slaughtered.

The **Benefits to the farmer** were:

- Obvious benefits of efficiency at the market when selling stock.
- Beef is more marketable because it is traceable and tagged cattle are more efficient in the industry.
- Accurate identity reduces fraud and ensures a fair price for the animal.
- Also, there are 'on farm' benefits.

HOW THE SYSTEM WORKS



On the farm, the aim was to tag calves for accountability and traceability:

- Use a hand held reader to keep records when working outside with cattle.
- Never need to use paper and pen.
- Use a hand held reader to 'flag' selected cattle.
- Works best when used with a PC and Stock record keeping program.
- All records and ear numbers are 100% accurate.
- Generate claim forms automatically.
- Have access to management information which was not previously available.

The system has 16 functions and can be used to keep stock records of calving, medicines, movements, electronic weighing, worming, etc treatments, subsidy and claim forms.

The **reasons** given for converting to electronic tagging were that it

i) saved time in reading and writing ear numbers, filling in forms, checking CCDs;
ii) improved traceability, avoiding much paperwork;
iii) improved marketing, by undisputed accountability and traceability, increasing value to the buyer.
iv) improved management, giving access to electronic aids, weights for information to help decisions;
v) improved welfare - animals are restrained less often with less stress to farmer and animal, with improved performance and meat quality.

In 1996, electronic tags had been given the official Tag Status and the ISO standard qualification. Some abattoirs and Carlisle Mart had the system installed. Software was being developed for use in markets, abattoirs and farms. The government had agreed to incorporate an electronic number field in its databases. The system could also be used by breed societies, the dairy industry, Ministry officials, vets, AI companies. Costs at the time were: Tags £3.50 each, management tags extra because these had to be fitted; farmer hand held readers £600; computer £1,000-1,500, with £500 for a program; EID weighcrate according to type. A summary of the **key benefits** were:

- Assured traceability of stock.
- Accurate identification and record keeping.
- Savings in time.
- Improved management opportunities.
- Because these benefits apply to all sections of the industry, the farmer has a more marketable product.

Kate Kerr

Kate Kerr, a Ministry vet in South West Scotland concerned with Animal Health and Welfare, spoke briefly on the official requirements for animal identification and mentioned some developments which were being considered. At the date of the meeting (October 1996), all animals were required to be labelled with an official ear tag. The ear tag was the only link between the animal and official documentation, which was broken if the tag became lost. Because of this, it was intended to introduce compulsory **double tagging**, to provide a guard against loss of identification. One of the two tags had to be 'distance-readable' to allow reference without restraint of the animal. It was likely that numbers only would be used on the label.

A Consultative Document had been circulated to obtain a wide spectrum of views before the European Commission finalised legislation. Views were being sought on ear tag size and colour and size of reference numbers. Black figures on a yellow tag was the favoured colour combination. Lost tags were to be replaced by the same number with 'R' in front or a new number if an older single tag was lost. All animals had to be tagged before movement off the farm, and numbers would be surrendered on slaughter or death. The tag numbers of fallen animals would also be recorded by knackers or other disposing units.

There would be a restriction on the number of ear tags issued to each farm, and those issued must be securely stored. Procedures to avoid tampering or other fraudulent use of the numbers had to be in place. Ear tag allocation was also being

co-ordinated with the Cattle Passport System with the development of computer handling. Electronic identification was being studied by the European Commission. Electronic ear tags were acceptable provided these complied with the standards for non-electronic tags. The lack of a commercially available reader which could read all makes of internationally accepted tags was a restriction on the adoption of electronic tagging, which should also be usable on animals other than cattle.

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KEEPING THE HILLS ALIVE

A Meeting of the SWSGS at the Douglas Arms Hotel, Castle Douglas on 5 December 1996

John B Cameron, Balbuthie, Leven, Fife

The Meeting was sponsored by ***Soil Fertility Dunns Ltd***

The Chairman introduced John Cameron, a Past President of the Scottish NFU and current Chairman of Scotrail. He was a well known hill farmer and landowner, with wide interests in the Scottish farming scene. He began by expressing pleasure at being in the 'real stock country' of SW Scotland, but said he was concerned to keep the hills alive both in the short and longer term. Politically, there may not be much change in the short term, until there was another major movement in the Common Agricultural Policy. The public were more and more concerned with agricultural subsidies and how the farmer received them. Less than 2% was spent on agriculture in the EEC and it represented less than 1% of the Gross Domestic Product. In spite of political uncertainties, farmers must look ahead.

Currently, the sheep trade was satisfactory though finished cattle would be more difficult to sell until the export trade returned. If beef was safe for UK why was it not in Europe? A selective cull would be required to bring confidence back to the market, though in the long term beef was likely to be difficult. Thus it was necessary to concentrate on the system best suited to the available natural resources. In the hill situation he was moving to a low cost extensive system with minimum concentrates and thinking where to cut costs. If maximum output was the aim costs would rise. Nevertheless, consideration was being given to finding any opportunities which might benefit from some high cost investment.

Cows were fed first with straw and treacle, later plus cobs with minerals. Lambs were fattened on fodder rape and turnips, without concentrates. Lambing percentage ranged between 70% and 80%, but a high cost lambing shed raised the gimmers to 96%. He had decided to go for a high cost veterinary policy of prevention of fluke and ticks, and prophylactics for the cows. Pneumonia in small lambs was a problem. It was necessary to ensure marketing was correct. Lambs were reared for the French market. Old ewes were run on set-aside kale which could not be sown until July nor grazed until January. Management had to be controlled to get the lambs ready and not too fat at the appropriate time. Small animals came straight off the hill onto old grass and then turnips. Fat stock were sold through an agent. Markets should go out to procure directly for the abattoir.

The beef industry was in difficulty, but every effort was required to put red meat back on the menu. Management without high costs was necessary to improve viability. Sheep would be fed only if necessary and lean ewes lambed in the shed. Demonstrator machinery was used where possible to economise on costs. Deer used to be trapped for export to Denmark until Scottish deer became infected with TB. Suitable areas of hill were selected each year for lime and slag without seeding.

Medium term changes that may come along included: moving away from support on a headage basis - this will be phased out as also will support buying for intervention storage. Export restitution payments will not continue as these are unpopular. LFA payments will be put on a firm basis, though the public are more perceptive as to how farmers get their money. Diversification, such as forestry and tourism, is unlikely to replace the lynch pin of sheep and cattle farming, which therefore deserve to be supported.

There may be new financial measures such as environmental payments and wage subsidies to maintain farming and population in the remote rural areas, since none of the EEC countries wanted these areas depopulated. Farmers were the best people to look after their environment, so it must be ensured that they themselves do not become an endangered species. Quality assurance schemes should be meaningful and simple to operate. Quotas were unlikely to remain long-term.

SWSGS PHOTOGRAPHIC COMPETITION

This is a minor recreational Competition arranged by SWSGS during their Competition Evening. Members attending the prizegiving evening are invited to display photographs on any farming-related topic. These are judged anonymously by the audience present, and the winner chosen by a show of hands.

Winner of the Photographic Competition in January 1997 was: John Nelson, Cogarth, Parton, Castle Douglas, who received an engraved crystal glass as prize.

Silage Judge Peter Gill (first right), Scaife House, Staindrop, Darlington presents the SWSGS Silver Rosebowl to Silage Champion Brian Will (second left), Coopon Polwhilly; with Bill Scott (first left), Senior Manager, Bank of Scotland, Castle Douglas and SWSGS Chairman Archie Borland (second right).

SWSGS SILAGE COMPETITION 1996

The Competition Evening of the SWSGS held at the Embassy Hotel, Newbridge, Dumfries on 16 January 1997

G E D Tiley

Sponsored by ***The Bank of Scotland, Castle Douglas***

Silage Judge: Peter Gill, Scaife House, Staindrop, Darlington, Co. Durham

The Chairman, Archie Borland, opened the evening by welcoming the audience and wishing them the compliments of the season. He introduced the silage judge, Peter Gill, who had journeyed from Darlington to judge the Silage Competition. Peter Gill began by thanking all Society members who had taken him around and 'wined and dined' him. In all, he had inspected 14 different farms and he made brief comments on every farm visited. The best farms were very impressive with top quality silage and showing great attention to detail, and where it was very difficult to find fault. One or two farms were less tidy, sometimes through slippage of the clamp. He felt it was wrong not to use a shoulder sheet to prevent waste. The beef/sheep farms surely should keep costings. He was impressed when some farms used low-cost machinery, and home-mixed diets.

1996 Results

Analysis and inspection marks awarded and final placings of the short leet farms judged are given in the Results Table 1.

First prize in the Dairy Class and overall Silage Championship Silver Rosebowl was awarded to Brian Will, manager at Coopon Polwhilly, Newton Stewart. Runner-up was David Yates, Meikle Firthhead, Haugh-of-Urr, with Michael McCreath, Garlieston Home Farm, third. The Beef/Sheep Silage prize and BP Nutrition Trophy went to Robert and Caroline Dalrymple, Crailoch, Ballantrae. Runner-up in the Beef/Sheep section was John Nelson, Cogarth, Parton for the third year in succession.

The Best Big Bale entered (on analysis) came from Simon Brown, Fishercroft, Borgue; Best New Entrant prize went to John Cuthbertson, West Tannacrieff, Kilmaurs (see page 10) and the Michael Milligan prize, being a copy of John Frame's book: "Improved Grassland Management", was awarded to Alex and Isobel Irving, Largs, Twynholm.

Table 1 - 1996 SILAGE COMPETITION - SHORT LIST FOR JUDGING
(In Order of Analyses Marks)

Prizes		*Analyses (35)*	Marks *Inspection (65)*	*Total (100)*
	Dairy Class			
3rd	T C McCreath, Home Farm, Garlieston	32.80	52	84.80
1st & Rosebowl	B Will, Coopon Polwhilly, Newton Stewart	32.40	59	91.40
2nd	D Yates, Meikle Firthhead, Haugh-of-Urr	31.05	58	89.05
	T C Beattie & Sons, Wyseby Mains, Kirtlebridge	30.00	48	78.00
	J Forrest, Meinfoot, Ecclefechan	29.65	55	84.65
	R Paton, Torr, Auchencairn	29.15	55	84.15
	J Mackie, Dalfibble, Parkgate	28.55	51	79.55
Best New Entrant	J Cuthbertson, West Tannacrieff, Kilmaurs	27.45	53	80.45
	A H Borland, Altonhill, Kilmarnock	27.30	57	84.30
	R J R Ramsay, Lodge of Kelton, Castle Douglas	26.1	55	81.1
Michael Milligan Prize	A & I Irving, Largs, Twynholm	25.45	59	84.45
	H Parker, Inchparks, Stranraer	24.75	52	76.75
	Beef/Sheep Class			
	J Nelson, Cogarth, Castle Douglas	26.75	50	76.75
1st & BP Trophy	R & C Dalrymple, Crailoch, Ballantrae	26.10	51	77.10
	S D Brown, Fishercroft, Borgue	25.50	48	73.50
	Big Bale Class			
1st	S D Brown, Fishercroft, Borgue	25.50	-	-

Prizes for the highest Silage Analyses marks in each County for 1996 went to:

Ayrshire	A Reid, Clauchlands, Lamlash, Arran
Dumfries	T C Beattie & Sons, Wyseby Mains, Kirtlebridge
Kirkcudbright	D Yates, Meikle Firthhead, Haugh-of-Urr
Wigtown	M McCreath, Garlieston Home Farm, Newton Stewart

Plasti-Covers (Irvine), cash tokens, generously donated by that company, were additionally awarded to the 1st Prize winners in the Dairy and Beef/Sheep classes.

Silage Quality 1996 (Ray Allbrooke, SAC Dumfries)

1996 had seen a higher number of silage entries to the Society's Competition than ever before. Table 2 summarises the average analyses figures for each County and class of silage.

Table 2 - SILAGE COMPETITION 1996 - ANALYSES MEANS

Overall Means

Group (Number)	DM (%)	D (%)	CP (%)	ITF (c)	ME	Ammonia (% Total N)
Dairy (146)	24.8	71.7	14.6	107	11.5	6.9
Beef/Sheep (41)	29.7	68.7	12.9	114	11.0	7.5
Big Bale (11)	35.4	67.6	13.7	116	10.8	8.0
Dairy						
Ayr (37)	25.2	70.9	14.4	109	11.3	7.4
Dumfries (45)	23.5	71.3	14.6	106	11.4	6.8
Kirkcudbright (23)	24.6	72.1	14.0	109	11.5	5.6
Wigtown (41)	26.1	72.5	15.3	106	11.6	7.1

Table 3 - FREQUENCY DISTRIBUTIONS (%) 1996

			Dairy				
	Bale	**Beef/ Sheep**	**A**	**D**	**K**	**W**	**All**
D-Value							
>80	0	0	0	2	0	2	1
75-80	9	0	5	20	4	25	15
70-75	27	46	70	47	87	61	64
65-70	37	46	22	29	9	12	19
<65	27	8	3	2	0	0	1
DM							
>40	37	12	3	0	0	12	4
30-40	18	24	11	5	13	12	10
25-30	18	27	27	28	22	7	21
23-25	0	17	35	22	26	32	28
20-22	18	15	19	27	26	27	25
<20	9	5	5	18	13	10	12
CP							
>18	0	0	3	4	0	12	5
16-18	9	2	8	22	4	24	17
14-16	37	22	49	40	44	34	41
12-14	27	44	35	25	44	27	31
<12	27	32	5	9	8	3	6
ITF (c)							
>125	46	20	3	2	0	0	1
120-125	18	20	3	2	13	0	3
110-120	9	28	45	34	30	39	38
100-110	9	22	44	42	44	46	44
<100	18	10	5	20	13	15	14
Ammonia-N							
<4	27	20	11	15	31	25	19
4-7	19	27	44	40	39	34	39
7-10	27	33	33	29	26	22	26
10-20	27	20	2	16	4	17	14
>20	0	0	0	0	0	2	2

DM - On average dry matters were very much lower than in recent years, being more like 1993. Thus in Dumfries and Kirkcudbright one fifth of entries had DM <20%, only one quarter >25%. This was because of a late spring and frequent rain in May and June.

ITF - The year of low DM was reflected in the Intake Factor achieved. Though intakes were depressed the cows still performed well.

D Value - D values were very good considering the poor season. Only 1% of silages were <65D compared with 30% in 1994, indicating that silage growers were making progress. Some of 2nd and 3rd cuts had high D last year because of the season.

Crude Protein - Crude proteins had not varied much. N fertiliser was being reduced as slurry applications were better managed. 1996 was generally a year of low sugar contents, either due to low levels in the herbage or to subsequent fermentation in the clamp.

Additives - In Dumfries only one third of silages were treated with additives. Of the 82 additives currently approved, more than half gave a good fermentation and improved performance. Many of the Society's members belonged to an elite group of silage makers. However technological improvements were being made and farmers should not become complacent. Some always used additives, but there may be scope for options if wilting was carried out.

Table 3 indicates the detailed frequency distributions of silage analysis components in silages from different classes and different counties.

Scaife House Farm, Staindrop, Darlington (p17)
Silage judge, Peter Gill, briefly described his all-grass dairy unit situated at 167-215 m in north east England. This covered 250 acres (100 ha) with an additional rented area. There were two farms, young stock being kept at the second, which was 3 miles from the dairy unit. There were 120-150 Holstein cows averaging 7,700 litres. Quota had been increased. A new glass fibre slurry tower had been erected. Although he was in the east, straw could be expensive because many farms tended to chop and spread the straw on the field after combining. Two cuts of silage were taken with a third if weather conditions permitted. A rotary tedder gathered 3 grass rows into two. Clamps were covered with blue building plastic sheeting, including a side sheet. Some neglected land had been purchased which was reseeded after stone picking. Proximity to urban areas

gave rise to considerable problems of theft and vandalism, to the extent that a vigilante farm watch was necessary.

Discussion

In replies to questions, Peter Gill stated that a side sheet might just as well be taken all the way down the side; he used the cheapest additive available. If silage was good, it was essential to challenge it. He aimed for grass only for simplicity of management, and to avoid ploughing up because of stones. Sprays had to be used against leatherjackets, frit fly, docks and chickweed. Unfortunately, clover was often sprayed out though it grew well naturally at Scaife House. Silage was normally cut on 22 May, varying from 17 May - 3 June, because of the high altitude. Rainfall was 700 mm (28 in). All stock was removed from the fields by November, which were then grazed by sheep. Buffer was fed in August, but the clamps were not opened until September. Over 4,000 litres were obtained from forage; a poor cut of silage could lower this by 1,000 litres. 1.5 kg concentrate were given, head $^{-1}$ day^{-1}. It was essential to get a good financial margin in milk production.

His main tips for success were:

- Few clamps, all well-filled - the sky's the limit! Clamps for 1st, 2nd, 3rd cuts are kept separate.
- The critical, most important, figure in silage judging or evaluation is **'what is that silage producing?'**
- No slurry spread on the grass after the March deadline. There must be 56 days clear (2.5 kgN per day) for both silage and grazing.
- Does not set stock. He required grass in front of the cows - *ad lib* grass grazed on a 21-day cycle.

Peter Gill concluded by recommending a much simpler information sheet for Short Leet entrants, containing the essential figures of yield, number of cows and concentrate use per cow. He also extended a warm invitation to the Society and its members to visit his farm in Co. Durham.

SCOTTISH REGIONAL SILAGE CHAMPIONSHIP 1997
Winners - Hallrule, Bonchester Bridge

G E D Tiley

The four farms in the Scottish Regional round of the Silage Competition were again judged by Dr Ron Harkess OBE. The 1997 winner came from the East of Scotland Grassland Society, being a sheep unit run by David MacTaggart, Hallrule, Bonchester Bridge (26.87 analysis marks, 61 inspection marks). This is a 770 acre (308 ha) upland stock and arable unit at an elevation of between 125 and 365 m. The lowland soils are heavy and poach easily under heavy stocking. There were 920 sheep, including 210 hoggets, and 84 cattle. The area includes 290 acres (116 ha) arable, 220 acres (88 ha) rotational grass, 210 acres (84 ha) hill in 2 blocks and 40 acres (16 ha) of permanent haugh pasture/hogg wintering.

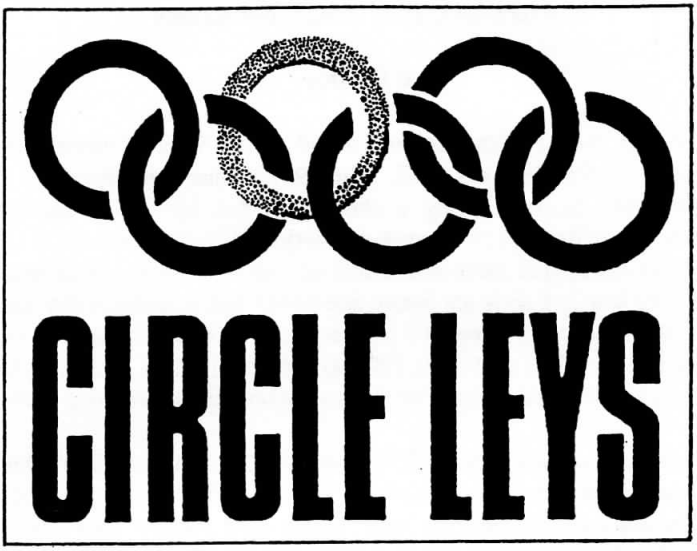
The mule ewes are crossed to Suffolk with an average of around 150% lambing. The lambs are fed on 8 ha kale in the back end and sold fat. May lambing was pioneered on Hallrule in 1991 to save labour and reduce feed costs. An increased lamb value compensated for a reduced lambing percentage.

470 tonnes of Ag-bag silage were made from 16 ha (40 acres) cut once. This high quality silage with no waste is fed *ad lib* to 740 ewes from 10 days pre-tupping to early April, with a run back to pasture. Winter feed was costed at £7.62 per ewe for silage plus £1.69 for beet pulp fed during tupping. The ewes are clipped in two stages: 7 March, bellies and tails; 15 July, the remainder. This was a simple low-cost sheep production system with minimum capital outlay. Lambs were marketed through Border Livestock Exchange.

Runner-up in the Scottish Regional Competition was **Andrew Moir, Thornton Mains, Thornton** (North of Scotland Grassland Society), with a 9,100 litre per cow dairy unit and very high quality silage (12.6 ME).

CSGS AND SWSGS SILAGE COMPETITIONS 1997-1998

The local silage competitions, 19th CSGS and 25th SWSGS will be run again for the 1997 silage season, with prizewinners announced in January 1998. All silages sampled from members of the two Societies and analysed by SAC are automatically entered into the Competitions. There is always a keen competitive approach among the leading silage makers to achieve a maximum quality product and also to be able to **use** it for maximum profitability.



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SOUTH WEST SCOTLAND GRASSLAND SOCIETY

NICKERSON SWARD COMPETITION

R F Gooding & G E D Tiley

Through the generosity of **Nickerson Seeds Ltd**, a Sward Competition was launched in 1996. The purpose of this Competition is to encourage high quality swards through establishment and continued management.

While the great majority of stock farmers know what is a good, indifferent or poor sward, either by 'intuition' or by technical skill, a large proportion of new sow-outs are less than actively engineered for optimal performance. Often there are quirks of weather, timeliness or pressures of subsequent management which can lead to a sub-optimal start in life for many swards. However, the successful establishment of grass of the required composition can give a very solid start on which later performance over the years can be built, with beneficial consequences on profitability and management flexibility.

There was insufficient time to fully judge swards in 1996 so, on the recommendation of the silage judge, Peter Gill, (based on the most economical silage utilisation system in the silage competition short leet entrants), the Nickerson Grass Seeds Prize (5 acres or 2 ha of grass seeds) was awarded to **Archie Borland, Altonhill, Kilmarnock**.

In future years, 3-5 year old fields under a silage/grazing management can be entered for judging in the autumn. Details of sowing date, age, mixture, fertiliser will be considered and the Judges will award 50 Inspection Marks in the field. The Inspection Marks will be made up of : Uniformity (10 marks), Vigour (5), Botanical Composition (15), ie: sown species, weeds, clover & herbs (5 each). Density will be marked on visual score (5) and also on Grass Tiller numbers and length of clover stolon in 20 x 5 cm diameter cores, sampled over the area. Finally, there are a further 5 Judges' discretionary marks.

Beef/Sheep Silage Winner, Robert Dalrymple (left) was presented with the BP Nutrition Trophy 1996 by Peter Gill, Silage Judge (right), with SWSGS Chairman, Archie Borland.

THE BGS GRASSLAND MANAGEMENT COMPETITION 1996

*Scottish Regional Winner - **Hew Chalmers**,*
Craigencrosh, Stoneykirk, Stranraer

G E D Tiley

The Grassland Management Competition run by the British Grassland Society was tried for the second year in 1996. The aim of the Competition was to widen the scope beyond the silage event and attempt to include all aspects of grassland management for effective stock production from the farm. The judges were asked to assess each farm within its own situation, looking for the most efficient grassland farming in relation to the natural resources of the farm, whether the end product be milk, beef or lamb.

The Marking Schedule was divided into 6 main sections: Grassland Policy in relation to Farming System and Situation; Grazing management and condition of the grassland; Forage conservation; Livestock output from Grass and Forage; Pollution and Environmental awareness; Overall inspection. Each section was sub-divided into several subsections for the purpose of marking. Emphasis in judging was placed on the farmers' rationale for his management decisions, what the judge could see on his 2-hour visit and records of production kept by the farmer.

Each of the Grassland Societies in Scotland were asked to nominate a farm to enter the Competition. The 1996 judge was Dr Ron Harkess OBE, and Hew Chalmers, Craigencrosh, nominated from South West Scotland, was declared the winner. The prize offered by the BGS was 2 complimentary places on the BGS Summer Visit or at the BGS Winter Meeting.

After two years of the Grassland Management Competition, the BGS have decided not to try to pursue this as a National Competition. Local management competitions have been run in Ulster and in Wales for several years. But clearly on a nation-wide basis it is not at all easy to devise an objective system of marking for comparing systems in widely divergent physical and climatic regions. This applies even in Scotland where local geography of farms can be very different. The Competition did however, serve to highlight some of the key features of grassland management which farmers need to question in order to achieve the most economical outputs.

THE HEADLANDS FOR WILDLIFE AND GAME PROJECT - DEVELOPING CONSERVATION HEADLANDS FOR FARMERS

Karen Haysom,
Food & Farming Systems Division, SAC Crichton Royal Farm

Headlands for Wildlife and Game is a new, Dumfries and Galloway based, project which is aiming to develop habitats and management techniques to benefit gamebirds and other forms of wildlife at the margins of grass fields. This is a 3-year collaborative project between SAC and the Game Conservancy Trust, which began in April 1996. It is jointly funded to September 1999 by SOAEFD, Dumfries & Galloway European Partnership and the Game Conservancy Trust. The concept of conservation headland management on grass builds on the success of arable conservation headlands developed in the eighties by the Game Conservancy Trust. Arable conservation headlands are crop edges that are kept free of insecticides used in other parts of the field, although they may receive reduced rates of fungicides and selective herbicides. Increased numbers of beneficial weeds and insects survive in these headlands and there is a better survival of gamebird chicks, and benefits for other wildlife. The project aims to find out if new management practices could bring similar benefits to grassland farmers interested in encouraging pheasants and other game birds.

This is a research and demonstration programme that has links with other agricultural research projects in Scotland. Based at SAC Crichton Royal Farm and staffed by Karen Haysom, George Fisher and Anne Dowdeswell, the project is partly supervised by the Game Conservancy Trust (GCT) headquarters in Fordingbridge (Nick Sotherton) and liaises with the GCT Scottish Lowland Research Project at Dundee. An advisory group comprises 12 members of Dumfries & Galloway based farming, conservation and shooting organisations, private farmers and estate managers, meeting regularly to discuss the direction and progress of work. SWSGS' representative on the advisory panel, Robert Ramsay, Lodge of Kelton, Castle Douglas, has enthusiastically provided much assistance to the Headlands project team.

The project works at three levels to achieve the aim of developing management techniques for the headland areas of grass fields. **Small-plot research work** at SAC Crichton Royal Farm in Dumfries has been investigating the effects of different cutting regimes, and different herbicide applications on plants and insects in trial headland plots since 1996. **Field-scale** experiments were set up in spring 1997 on 3 groups of farms: Buccleuch Estates at Thornhill, Hoddom & Kinmount Estates, Ecclefechan and Barlocco Farm, Auchencairn, investigating the effects of herbicide application and of grazing protection on chick-food plants and insects. These farms are also taking part in the Game Conservancy

Trust pheasant monitoring programme which will assess base line pheasant counts. There will also be a **farm-scale economic study** to quantify the costs and benefits associated with grass headland management.

Research is still in an early stage, but already changes in the plants and insects in differently managed areas are being observed. The project was explained to farmers and land managers at a one day meeting held at the Crichton in March 1997, and the headland trial plots are demonstrated to visitors on Crichton farm walks. There will be further opportunities for farmers to see the headland work in the field as the project progresses. Anybody wishing to find out more about the Headlands for Wildlife and Game Projeet, or who might be interested in having a demonstration headland on their farm, can contact Karen Haysom at Midpark House, SAC Crichton Royal Farm, Dumfries DG1 4SZ (Tel: 01292 525289/01387 263961).

IT'S ALL IN THE NAME!

J Frame

What we call things in life often influences the value we place on it. Silage used to be referred to as roughage. As a consequence, its making and feeding out were rather carefree and careless. The real costs of making and its real value were later increasingly appreciated, and the word roughage disappeared.

Perhaps the value of **silage effluent**, either as a stock feed (20 litres of so being equivalent in energy value to 1 kg barley), or as a dilute manure ($25m^3$ diluted in a 1:1 ratio with water contains approximately 15 kg N, 7.5 kg P_2O_5 and 55 kg K_2O), would be better appreciated if it was referred to as **silage juice**? **Slurry** is a more striking example. In the past, it was regarded as a waste product with a disposal problem. This attitude has changed, but would it change further if it was referred to as an **organic manure**? Farmyard manure was always regarded as a useful manure, not a waste product, and was applied rationally to the land, so why not the same with slurry? It should be regarded as a valuable resource and treated accordingly. Obviously, the plant nutrient content depends on the type of livestock, the rations fed and the storage conditions. Our farming forefathers knew the value of the urine function in animal excreta and made special efforts to collect and use it. This fraction is rich in N and K. The dung fraction of excreta is rich in P, Ca, Mg, S and trace elements, although microbial action in the soil is necessary before they become readily available to plants. Taking dairy cattle slurry diluted in a 1:1 ratio of slurry to water, the readily available main nutrients in 50 m^3 are approximately 60 kg N, 20 kg P_2O_5 and 115 kg K_2O. Hardly a waste product!

THE FUTURE OF MILK QUOTAS - BUY OR LEASE

A meeting of the CSGS (AGM) at the Newhouse Hotel, 13 November 1996

Jim Ritchie, Senior Rural Business Adviser
Rural Business Development Unit, SAC Auchincruive

The **financial background** to Scottish farming was first briefly sketched with summaries of Farm Income trends over the previous 10 years. Total advances to Scottish Agriculture by all banks had risen to a peak of £953 million in 1986, but since 1990 had stabilised at around £870 million. The **balance sheet** for Scottish Agriculture estimated by the Scottish Office between 1990 and 1995 showed a figure for Total Assets fluctuating between £7390 and £9785 million. Total Liabilities were showing a steady increase from £1085 to £1305 million, with a corresponding trend to a fluctuating decline in Net Worth. Percent ownership of farms remained steady at around 86%. The Index of Net Farm Incomes in real terms for Dairy farms had peaked at 120 in 1989, falling below 100 in 1991 but rising again to just over 100 by 1994. This index represents the return to the farmer for his manual and managerial labour, and to the tenant type assets that he has invested in the business. Analyses of Dairy farms showed that high output units could show a higher Net Profit than group averages, in spite of higher variable, labour, machinery and interest costs.

Extra Quota - Buying or Leasing

The annual costs of Purchased Quota with different purchase costs and repayment periods are given in the Table:

Annual Costs (pence litre^{-1}) of Purchased Quota

Purchase Price	*Interest Only (8%)*	Repayment Period (Capital & Interest) *5 Years*	*7 Years*	*10 Years*
45	3.6	11.3	8.6	6.7
50	4.0	12.6	9.6	7.5
55	4.4	13.8	10.6	8.2
60	4.8	15.0	11.5	8.9
65	5.2	16.3	12.5	9.7

Farms most likely to benefit from acquiring extra Quota were:

- Dairy herds achieving above-average gross margins per litre.
- Those who can utilise extra quota without requiring to purchase extra dairy cows.
- Those whose main fixed costs (labour, power & property) will not increase significantly as a result of producing extra milk.

The **Advantages** of purchasing Quota were:

- It is easier to plan long-term without having to negotiate annually for Quota.
- It can be purchased at any time of the year.
- Provided quotas remain, it should help to protect income.
- It may build up a farm asset.

and the **Disadvantages**:

- It requires substantial capital and cannot be justified in the short-term.
- The purchased quota will be subject to any future cuts.

If Quota was **leased** the advantages could be

- Quantity can be varied to requirements each year.
- No loss of capital if quotas abolished.
- Any future cuts in quota will not affect lessee.

and the **Disadvantages**:

- Planning difficult because quota available each year is unknown.
- Quota has to be leased by 15 December.
- The price of quota may fluctuate between one year and another.
- No opportunity of building up a farm asset.

From the point of view of Taxation, **Purchased Quota** was:

- Treated as a capital expense.
- Subject to capital gains tax on sale.
- No indexation on allocated quota.
- Qualifying asset for roll-over relief.

Leased Quota was:

- Treated as a trading expense.
- Can be offset against income tax.
- Tax advantages may be lost by non-producers.

The **Future** of Milk Quota was currently guaranteed until the year 2000. Discussions on its reform by the European Union were due in 1997. The Options were:

Option 1

- Complete removal of the milk quota system.
- Free market economy.
- Production increases.
- Price declines, possibly to World Market price (currently 16p/litre).

Option 2

- Two tier quota system.
- "A" Quota - current quota held - paid at guaranteed price.
- "C" Quota - future quota cuts - paid at World market price.
- Favoured option for UK.

Option 3

- Headage payment.
- Subsidy payment per head.
- Likely to be modulated.
- UK disadvantaged.

The **Future Financial Outlook** involved:

- Increased financial pressure from 1996/97.
- Increasing cost of CAP.
- UK public attitude.
- Environmental/Welfare lobby.
- Reform of CAP in 2000.
- GATT
- Support likely to be channelled towards environmental concerns and public access.

During the same evening meeting, **Peter Brown, Chief Executive of Farm Assured Scotch Livestock** gave a presentation outlining the main features of this Scheme.

GRASSLAND IN THE ISLE OF MAN, 1996

Caroline L Perry
Knockaloe Farm, Peel, Isle of Man
Secretary of the Manx Grassland Society

The Manx Grassland Society held three farm visits on the Island, in February and June, two 'overseas' trips in April and May as well as the usual silage and grassland competitions later in the year.

20 February 1996, Ballamona Hospital Farm (Martin Lambden)
Winner of the 1995 Dairy Grassland Management Competition, Ballamona has only 52 ha: 42 ha grass, 6 ha spring barley, 4 ha potatoes. Milk and potatoes supply the local hospitals. The 45 Holstein dairy herd averages 7,200 litres, 3,300 litres from forage. The cows are put to Holstein, Limousin or Charolais; 65 steers and heifers are finished for sale at 26 months at around 300 kg deadweight. Silage was cut in mid-May using Axphast; 2nd cut in the third week of July using Triplesile. First cut analysed at 19% DM, 12.0 ME (75D), crude protein 15.5%, ammonia-N 4.2%. The silage fields receive approximately 280 kg N ha^{-1} for 3 cuts with slurry in February and sometimes in May. The grazing fields receive about 250 kg N ha^{-1} over the season. Rainfall is 55 inches (1375 mm).

Booilshuggel, East Baldwin (Caley family) is a 700 acre (280 ha) beef/sheep farm at 150-450 m and rainfall of 73 inches (1825 mm). Cropping includes 20 ha spring barley, 4 ha forage rape, 3 ha hay, 32 ha silage, the remainder rotational and permanent grass. The farm is stocked with over 100 sucklers, calving half in spring, half in autumn, plus 20 dairy/limousin heifers replacements purchased each year. Cows are inwintered and fed *ad lib* silage. The calves are sold at 1 year old, steers averaging 400 kg, heifers 300 kg. There are also 670 ewes (mules and half hill breeds). The mules are crossed with Suffolk and lambed inside from 23 March. After scanning, ewes with triplets and twins are brought in first for feeding with 18% protein nuts and hay. The hill sheep, crossed with Blackface or Leicester, lamb outside from 12 April. Lambs are sold at 16-17 kg deadweight. Silage is cut in June following sheep grazing, and receives 190 kg ha^{-1} 25/5/5 in March for the grazing and 430 kg ha^{-1} 20/10/10 late April for the silage. Hay fields receive 430 kg 17/17/17 and grazing fields 190 kg 25/5/5 followed by 190 kg 20/10/10, or a single 310 kg 20/10/10 on steeply sloping fields.

13 June 1996, Smeale, Andreas (Chris Martin)
A 2 farm unit of 120 ha producing sheep and cereals, in a low rainfall (28 inches, 700 mm) area on sand, prone to summer drought and over-run by rabbits. 41 ha of cereals included 32 ha winter barley and 9 ha spring barley. The rotation is 3-4 years cereals 4-5 years leys, direct seeded after winter barley. Grass mixtures are carefully chosen to include varieties with good early spring growth: Moy, Rosalin, Dromore, Trani and Portstewart perennial ryegrasses with Huia and Menna white clover. Great reliance is placed on clover and only 210 kg ha^{-1} 25/5/5 is applied in late February. The grass area is divided into 14 ha for hay (2nd year ley) 43 ha better grazing for twins, 16 ha less productive grazing for singles, 6 ha sacrifice area for wintering of sheep. There were 545 breeding ewes (Suffolk, Texel and Cheviot Leicesters) put to Suffolk, Charollais, Border Leicester and Bleu du Maine tups. Ewes are outwintered with hay from December and fed with concentrates 6-8 weeks before lambing, which takes place inside in March. Lambs are finished on grass, aiming to finish as many as possible in June; the remainder are finished on hay aftermaths and new reseeds in autumn.

29 April-1 May 1996, Trip to Cumbria This was a 2-day visit to 2 farms at Ulverston, Lancaster and 3 farms in Cumbria plus an evening meeting with the Cumbria Grassland Society. The two farms at Ulverston were Old Hall, a dairy farm running 150 Horned ewes and Rath Vale, a farm run together with Old Hall. Rath Vale carried 1000 Swaledales and beef stores, which were finished at Old Hall. The Cumbria farms included a dairy/beef/sheep farm, a dairy farm and a sheep farm with a successful retail meat business. Penrith Auction Mart was also visited. All farms fed a range of Pye Feeds products.

22 May 1996. Visit to Kemira Grassland 1996, the National working grassland demonstration held at Stoneleigh under the auspices of Kemira Fertilisers.

Competitions 1996
The dairy farm, Ballawanton, The Lhen, Andreas (Paul Fargher) was winner of the Manx Society's Silage Competition, having been a previous winner. Paul also won the **best kept silage pit** and **best buffer feeding** prizes and the dairy grassland award. Silage judge was Jim Altham, Penrith. Ballawanton runs 60 cows using zero grazing on 40 ha in a summer drought area.

Prizes were also awarded for the **best hay, best contractor made silage, best big bale silage** and **best set up**.

KALEAGE AND NEW DEVELOPMENTS IN BIG BALE SILAGE

A Meeting of SWSGS at the Muirend Inn, Symington, Ayrshire on 20 February 1997

David Allan and Sarah Banks, Volac International Ltd, Royston, Herts.

Meeting Sponsored by ***Volac International Ltd***

David Allan

Volac had evolved from one of the largest manufacturers of dried milk powder to a company with wider feed interests, Volac International, two years ago. They became involved with Kale in bales through the use of additive and film.

Big bale kale silage - KALEAGE - was originally developed in 1990 by Ron and Malcolm Patey who farm at Westleigh Barton, near Totnes in Devonshire. Kale had always been grown there but because of its shortcomings in wet weather, they tried it as big bale silage. The area of kale grown had been steadily declining while that of maize had increased. However, kale was easy to grow and could be harvested 12-16 weeks after sowing, producing a palatable high protein feed capable of increasing milk yields or for fattening lambs.

It was best drilled or broadcast into ploughed land after first cut silage, then cut in August-September. Keeper and Pinfold were the recommended varieties which complemented each other in growth, and had high DM content and good leaf:stem ratio. Fields for kale could be used for liberal disposal of slurry.

Stems at harvest should be no thicker than the middle finger, and should be cut at the 15 cm level. The conditioner speed of a mower-conditioner must be reduced from 600-300 rpm. A rape harvester had proved successful in Ayrshire. Soil contamination must be avoided to prevent poor fermentation. An additive was essential owing to the buffer effect of kale delaying acidification for up to 7 days, and Agros had proved very effective. Bales are carted to the stack for wrapping to avoid excessive handling and damage to the wrap, and wrapped bales should be stored only one bale high. A minimum of 6 layers of film is required to prevent the stalks from piercing the bale. The kale silage was very palatable and nutritious, but low DM (14-15%) was a drawback in Scotland. When the bales are dumped in a ring feeder the kale falls apart easily and can be mixed with grass silage. A trial at Crichton had produced a regrowth from the stubble after 9 weeks which could be used for lambs after youngstock had first taken the crop down. Undersown stubble turnips were an option to produce winter feeding and increase economic returns. Stock found the kaleage highly palatable and there had been no taint problems in milk.

Kaleage - Average yield and feed value

Conserved Yields	25-30 tonnes per ha (33-36 bales @ 800 kg per bale)
Dry Matter	22-25%
Crude Protein	19-25% (DCP 16-19%)
D-Value	70
ME	11-12 MJ kg DM^{-1}
Average pH	4.25

Cut kale could be left lying longer than grass; desiccation would not be recommended as it would destroy most of the nutrients. The crop should not be left to mature beyond 12-16 weeks because the stems get too thick; the stalk must be pliable or moisture is lost is it cracks. The regrowth crop is required to justify outlay costs and a good yield is required, which is helped by liberal slurry application. Direct drilling would reduce weeds and soil contamination at harvest.

Sarah Banks, Technical Services Manager, Volac International

Recent developments in the plastic wrapping materials for big bales were shown. There were 2 types - Green, a lighter type much used in the southern hemisphere; and black. Silawrap was the very first bale wrapping film, originally developed in Australia by Integrated Packaging. Silawrap is now also manufactured in Ireland, in a new factory purpose-built to produce Silawrap film for farmers throughout Europe. New Zealand trials had shown the benefit of green plastic which reflected the heat of the sun giving a cooler bale. High temperatures result in the breakdown of the protein fraction which results in a silage of lower nutritional value. Green film stretched less in hot weather so that the wrapping machinery could be more accurately set; also the correct thickness of wrapping could be more easily seen. The green film was strong and tacky, producing a good airtight seal.

Big Bale Faults

1 The most common fault was not to apply sufficient layers of film to the bale in an attempt to economise. If there are less than 4 layers applied, the film could be punctured and air could get into the bale.

2 Splitting film - black film can be prone to overstretching when exposed to the sun and heat, which can cause the film to neck down to a narrower width, resulting in insufficient coverage on the bale.

3 Tackifier on the outside of film can stick to the stretch roller in hot weather and build up causing slipping (aquaplaning) and splitting problems on application.

4 Make a few simple checks at the beginning of a session to set the pre-stretch unit at the correct stretch (70%) and continue to check, especially in hot weather.

Should bales be stored on side or end? View from IGER is store on the basal side. Bales on end can only be one bale high. If DM is low bales should not be more than 2 high or the bales will 'pancake'. Check frequently for rodent damage. For patches pull back a couple of layers, put the patch under and tap down on the outside.

Black film contains carbon black, which may have slight impurities sometimes causing application problems. Green film is more uniform, and is preferable because it keeps the bale cooler and is perceived as "environmentally friendly" as it blends into the countryside. Green costs more to manufacture as the polymer is more expensive, but is easier to judge if there are enough layers.

Some films have uneven Ultra Violet protection and will soon degrade. These do not stand up to tests with moulds, etc. The use of paint on bales can sometimes deter birds, however the chemicals in the paint can cause deterioration of the film. Beans, lucerne, vetches have also been tried in big bales.

SWSGS GRASSLAND ENVIRONMENTAL COMPETITION

This Competition is run annually in South West Scotland and it seeks to encourage and identify farms which are demonstrating sympathy and genuine desire to care for the environment, while carrying out their daily commercial farming. The first 8 years of the Competition were generously sponsored by **Dairy Forum**. In 1997 SWSGS will be welcoming a new sponsor **Trident Feeds**. Rules and Judging will be the same as in previous years.

ASPIRATIONS AND ACHIEVEMENTS - GRASS AT HOME AND OVERSEAS

Jerry C Rider, Horton House, Devizes, President of the British Grassland Society, 1996-1997

The British Grassland Society (BGS) with its unique membership mix of farmers, advisers, scientists and commercial companies plus its 60-odd affiliated local societies, is the envy of every other Society in the world. Many other societies would give the earth to have such a structure and the BGS must be the most effective purveyor of the nineties buzzword: Technology Transfer (TT). BGS is a truly international organisation, with 20% of its 1200 membership from overseas. Both the European and International Grassland Congresses have taken place during my year of office, and Roger Wilkins and I have hosted receptions for BGS members and guests in both Grado in Italy and Winnipeg/Saskatoon in Canada. These occasions are essential to keep in touch with existing members and to recruit new ones.

Overseas Visits

What have I as a UK farmer learnt from my attendance at these two major grassland congresses and the tours associated with them?

Firstly, the importance of lucerne as a major forage across North America and the southern countries of Europe. I am amazed that the UK has embraced North America dairy cow genetics and forage maize, but not the third component, lucerne. This is despite the fact that over 1 million hectares in the UK are suitable for growing the crop, and most of the major racing stables in the UK use the conserved product from Canada when it could be grown almost next door to them at home. Perhaps if we called it Alfalfa, people would take to it! I am glad to report that work is now starting on this valuable forage at both CEDAR and Bridgets and the BGS special interest group on Forage Legumes is up and running. There are indicators from Lethbridge in Alberta that a grazing variety with lower bloat potential will be commercially available after the year 2000. Caucasian white clover (*T. ambiguum*) a rhizomatous type could have a place in intensive ryegrass leys where *T. repens* is variable in persistency and subject to clover crashes.

One doesn't often get the chance to see Italian Ryegrass production in the Po delta one day and a reseed on the ski slopes of Cortina the next. Parmesan cheese production in the Apennines was fascinating. Unfortunately, only hay rather than silage could be fed, but I could be a very good haymaker with milk worth 70 pence litre^{-1}.

Canadian Farming

Canada is a huge country, the second largest in the world and 90% uninhabited. Hospitable people in a land with an inhospitable climate. There are only 120 days to grow crops between the snows, and only 100 frost free days! Hot summers, but the temperature extremes go from -40^{0}C with at least 60 cm of snow to +40^{0}C or more and very little rain (except when we were there!). Most of the arable crops are spring sown as are a high proportion of the "tame" (sown) grasses. To UK eyes disregarded grasses such as Timothy, Cocksfoot, Smooth stalked meadow grass and Fescues are the predominant species. Perennial ryegrass is a non-starter, as it cannot survive the hard winters.

Canada suffered from a late spring this year, and conditions were especially bad in the Maritimes (East states of Nova Scotia, Prince Edward Island and New Brunswick) where freeze/thaw conditions led to frost heave and death of even alfalfa. There, and in Manitoba, dairy farming is largely confinement, year-round housing and conserved feeding. High yielding large Holstein herds about 50-100 head support the farming family. Milk price was about the same as ours - a level daily production by quota, but an opportunity to produce extra at world market prices without penalty. Input costs are high, in most cases feed costs would be greater than our own herds' variable costs. Additional income up to 20% and in some cases 50% could come from pedigree sales of surplus females, etc. As in our own dairy industry, life was restricted by quotas.

By contrast, the beef and other livestock farming was far more innovative and unsubsidised. Manitoba, Saskatoon and Alberta were the prairies where the bison roamed and grazed on the short and tall grass. These were ploughed up and cropped by the early settlers until the drought years and dust bowl conditions of the 30s decimated the land, and high winds blew away the soil. Great efforts have been made to stabilise these fragile soils by the restoration of short grass prairies, the introduction of crop rotations involving sown grasses and alfalfa or cropping on a 1 year arable/1 year undisturbed fallow. We saw rotational grazing systems combining both tame and native grass fields producing elk for velvet production for the Asian market, pregnant mare urine for the oestrogen market and meat production from bison.

Canadian Beef Production

Beef production takes two forms. Cow/calf production in the more difficult areas such as the foothills of the Rockies at 4000 feet (1200 m) where cows graze at 10 acres (4 ha) per cow on a mixture of tame and native grasses plus wholecrop barley usually swathed for late autumn consumption. Wolves are welcome as they keep away elk and moose from cow pastures and destroy the coyotes which could threaten calves. Cows can graze the native type grasses

through the snow. Remember its a dry cold and the days are sunny even at -40^{0}C.

The cows are mainly Angus red or black and Hereford X to terminal Charolais sire. They get supplementary feed when the temperature drops below -20^{0}C. Its better for them to lick the snow rather than have a thawed water supply. Calves at weaning in the autumn weigh 350 kg and are destined for feed lot finishing. Feed lots are monstrous affairs, holding anything up to 75,000 cattle. Finishing takes 6 months so the throughput can be 150,000 per annum. They are situated in the South of the plains counties, near to packing stations or to the USA border where they are sent to be slaughtered.

Often a dung-for-straw swap is practised with neighbouring arable farmers. Local farms are contracted to produce wholecrop barley silage, which is fed with some chopped hay or straw and varying amounts of rolled steeped barley according to the stage of finishing. Both steers and heifers are implanted with growth hormones and feed supplements contain romesin type compounds. Pens usually hold 300-400 cattle, separated by Yorkshire boarding style fencing and sloped to let liquids seep away into an evaporation pond. No roof! Cattle have straw 2-3 times a week and the pens are cleared out in Spring and Autumn. The biggest feed lots need 10,000 acres (4,000 ha) on which to spread the dung each year! Very few sheep are kept in Canada - the coyotes find them too tasty!

UK Meetings

Naturally for me, the highlight of the conference round was our own winter meeting "Grass and forage in the diet of high merit cattle", combining beef and dairy cows. We got an excellent attendance despite Smithfield Show and the BSE problem, with a very good mix of researchers and farmers. The discussion sessions were fast and furious, and the invited speakers from abroad made the conference a truly international affair. A joint conference at the RAC on legumes also attracted a large audience - farmers prefer 1 day conferences.

The New Zealand visitors John Simmonds and Paul Bird have done a splendid job in the Grazing Discussion Groups, in highlighting the potential of grazing. Articles in *Farmers Weekly* and the reports on their activities have kept BGS firmly in farmers' eyes. Younger farmers who would not normally attend evening meetings, have been attracted to the discussion groups.

R & D

The BGS R & D Committee drew up a list of grassland research priorities, but government funds were directed largely to behavioural studies, environmental issues, molecular biology and plant breeding with no extension work. During

the last year MAFF have realised that very little of its sponsored research has reached the producer. BGS was asked to help spread the word - resulting in the roadshows we ran last October. MAFF have enlisted the help of a commercial partner to market the results of its plant breeding initiatives, and is in the process of setting up several College demonstration farms. 3 years ago the Milk Development Council was formed as a statutory body with powers to obtain levy funding from all milk producers. They have commissioned a review on grass and forage and have now approved work from IGER, SAC and Bridgets ADAS.

Rex Paterson, that great farmer and innovator and one of the great BGS Presidents, was worried in 1963 at the gulf between research and the farmer. That gulf is now a chasm. Few farmers attend non-BGS research conferences. In Canada, apart from some Canadian farmers involved in the organisation of the Congress and its towns, there were less than a dozen *bona fide* producers, out of nearly 1200 delegates from 93 different countries. As Alan Nation (the Gordon Newman of the USA) remarked in the final paper to conference - we should be looking at whole farm systems, the animals best suited to those systems and to review the work done 30 years ago. He said researchers and farmers are not good communicators or they would have been salesmen!

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With his wife Carol and son Jonathan, Jerry runs a 264 ha farm in the Vale of Pewsey, Devizes, Wiltshire. He has been the main organiser of 'Grass 99', the BGS Grazing Discussion Group, in which the New Zealand philosophy of making maximum use of grazed grass is being promulgated. Jerry has now convinced himself of the economic value of the increased use of grazing. 450 Holstein cows are kept on 160 ha of grass with milk yields averaging 5,400 litres, 5000+ from forage. More than 90% of the ration is grazed grass, which is used for 9 months of the year. Youngstock are reared on 48 ha rented in Cheshire.

GRASSLAND ENVIRONMENTAL COMPETITION
SOUTH WEST SCOTLAND 1996
G E D Tiley

This was the 8th year of the Environmental Competition which has been sponsored from its inception by **Dairy Forum**, to whom the Society extends grateful thanks. The judges in 1996 were Wallace Welsh, Warnockland, Fenwick, the 1995 winner, and Chris Chin, FWAG Adviser, Dumfries & Galloway. Of the 4 farms entered, Marcus Maxwell, Viewfield, New Galloway was declared the winner by the narrowest of margins (1 point) from Michael Milligan, Culvennan, Castle Douglas, who received Runner-up prize. Marcus Maxwell received the Forum Environmental Trophy. The judges remarked that they had much enjoyed visiting the candidates' farms and found it very rewarding that progressive grassland farmers were taking such a keen interest in wildlife conservation work.

Viewfield was an upland sheep farm in a difficult wet area, with 1800 ewes but with plans to expand to 2000. There was some flat inbye pasture which was subject to waterlogging. Six acres (2.5 ha) of previously felled woodland had been planted to mixed broad-leaved trees, and several ponds had been stocked with fish. Management of hedges had been changed to cutting every 2 years to stimulate vigorous growth, provide more shelter and encourage the presence of wildlife. Neighbouring land recently purchased had a potential for wildlife conservation. Ponds had been dug and landscaped, management introduced into an oak wood and new areas planted with trees. An old steading had been restored to a very high standard. From the work done and future plans envisaged, the judges clearly detected a keen feeling both for sheep farming and for attention to the environment.

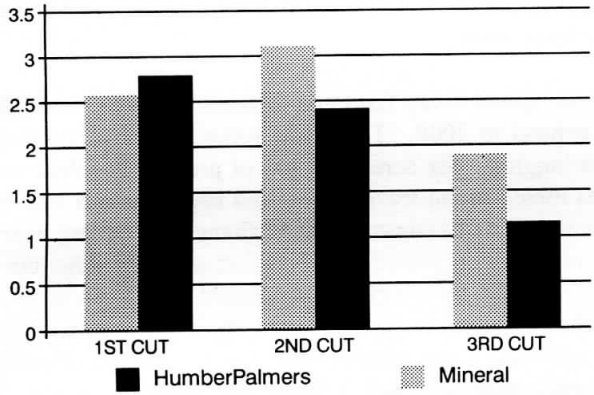
This also was very much in evidence on **Culvennan**, where there was tremendous dedication to both grassland management and to the amenity and wildlife value of the farm. Broad-leaved trees has been planted, farm ditches carefully and sensitively managed, barn owls attracted to farm buildings and hedges and fences maintained to a high standard. There was no pollution from silage effluent, as this was all saved for feeding to the cows. No slurry was applied to grass, only to the stubble fields. N application was precise using liquid manure. Other farms in the Competition had shown many positive contributions to conservation by planting new areas of broad-leaved tree species, managing their hedges sympathetically, controlling farm pollution and making use of home grown timber resources. All this was done alongside top class commercial farming.

IMPROVING RESULTS WITH *HUMBERPALMERS* GRANULAR ORGANIC BASED FERTILISERS

Alan J Moon, Sheppy Fertilisers Ltd, Rushenden Road, Queenborough, Kent ME11 5HH

Organic based fertilisers have been around for many years, but since Sheppy, Palmers and Humber fertilisers came together, research has been conducted and the resulting product has now been considerably developed to meet modern farming requirements. In experimental work, *HumberPalmers* produced a 35% higher dry matter content silage than conventional fertilisers. This means that livestock gain weight quicker, silage run-off from the clamp will be greatly reduced and overall palatability will be improved.

Figure 1 Ryegrass Dry Matter Yield



From soil analysis taken in the Dumfries/Strathclyde region, the majority of results show phosphorus levels as being good and potassium levels low. At *HumberPalmers* we have developed a fertiliser programme for grass silage that has been very successful in recent years. Taking typical soil analysis results as above, and with no slurry or farmyard manure applied, our fertiliser recommendations would be: *HumberPalmers* No.2 at 2.5 bags/acre (6 bags/ha) applied before the end of January, followed by *HumberPalmers* No.18 at 4 bags/acre (9.5 bags/ha) in the Spring. In the current climate, it is true to say that if a cow's diet could be increased from an average of 45% grown on farm to 55%, the gross margin per cow could be increased by £100 per annum, which is obviously worth achieving. *HumberPalmers* contains a high level of humic substances which give it the ability to release trace elements already in the soil. We have many customers who tell us that since they started using *HumberPalmers* their vet's bills have been halved. In addition, all *HumberPalmers* fertilisers have a significant sulphur content, sufficient for all crop requirements.

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Nature and Technology Hand in Hand

GRASS UTILISATION ROADSHOW - WINTER FEEDING FOR PROFIT

A Meeting of the British Grassland Society at The Shepherds Inn, Carlisle on 15 October 1996

G E D Tiley

This meeting was one of four Roadshow meetings arranged by the British Grassland Society across the whole of Britain in 1996, with the theme of 'Winter Feeding for Profit'. The declared aim of the Roadshows was to make research findings more immediately available for farmers by inviting presentations from research leaders in the science of grassland productivity. These were David Beever, Richard Phipps from Centre for Dairy Research (CEDAR), Reading; David Hides, Ray Jones, Institute for Grassland & Environmental Research (IGER), Aberystwyth; Basil Lowman, Cled Thomas from SAC Edinburgh & Auchincruive; David Leaver, Wye College; Bruce Cottrill, ADAS Dairy Research. The Roadshows were jointly sponsored by the Ministry of Agriculture (MAFF), the Milk Development Council (MDC) and the Meat & Livestock Commission (MLC). The Carlisle meeting was attended by a good representation from SW Scotland, with sponsorship from SWSGS.

Silage Making

Dr Ray Jones described some recent studies in silage making which had been conducted in Wales, including work with the alternative crops: maize, kale, oats and red clover. 50 million tonnes of silage were made in Britain annually but the resulting product was very variable and with a huge range in analysis. The first silage was made in 2000 BC but we were still a long way from achieving a consistent product. Fermentation is affected by i) crop characters, such as species, fertilisers, sugar content and weather; ii) silo management - speed, overnight sheeting; iii) silage additives - whether used and which type. The quality of fermentation could affect intake and animal performance. Dr Jones stressed that grass quality was highest in early May when it was 15 cm tall and had a D-value over 80. But the optimum cutting date was slightly later with a lower D but higher sugar content, to achieve best fermentation. The new Additive Regulatory Scheme helped farmers to choose additives with more confidence.

Silage was very expensive to make, costing around £90 per tonne of DM, but it was startling to know that annual losses in silage averaged 30%, amounting to £6,000 in a 1,000 t clamp. These losses could be reduced but not eliminated by reducing air contact and using an additive. Losses in big bales were much less (10%) if these were properly wrapped, using 6 layers of film. Effluent escape

was also reduced by stacking the bales on end. Dr Jones felt that rapid wilting would be one of the future new technologies and he mentioned a machine that helped this by removing wax from the grass leaves.

Silage Analyses

Dr Bruce Cottrill discussed some of the problems in making accurate analyses to determine silage quality. Silage was a very variable material, and different laboratories would not produce uniform results, as for example they could with a concentrate. Hence a large number of features were analysed now to try to increase the reliability of predictions of silage feeding quality. NIR (near infra red) techniques and improved protein analyses, backed up by feeding trials at SAC Auchincruive and at Hillsborough, were making predictions more meaningful. There were new standards for laboratories using recognised analytical techniques, as indicated by the M/E logo. Dr Cottrill reminded the audience of quality variations within a clamp, and also that silage composition could change over the winter. American farmers found it necessary to have several analyses per year to monitor such changes. Future work would try to predict rates of digestion of starch and cell walls in the rumen, and how these affected milk protein contents. It would also help if there was a better knowledge of **grass composition** before cutting - this was much easier to analyse and could be used to predict silage quality.

More Milk from Silage

Prof. David Leaver emphasised that grass silage would be the basis of animal production systems for a long time, particularly in Scotland/Northern England where maize was marginal. The high producing cow would want to eat large amounts of feed, and this would have to be of good quality for high intake. D-values decreased by 1.5-3% per week at cutting time, equivalent to a decline in milk yields of 0.65kg per day. New machinery was becoming available to speed up wilting. However, the increased DM achieved did not increase intakes or milk yields, though milk butterfat and protein contents increased. Similarly, with additives, intakes and milk yield responses were marginal or zero, with possibly slightly better milk proteins.

As regards management during making silage, Prof Leaver thought the biggest advance made in recent years was to stop the farmer making silage and to get a contractor to do it. This led to greater uniformity of the final product, which was all-important, as highlighted by the other speakers. Intake characteristics were the central factor in feeding quality. In short, better silage, more intake, more milk production.

Total Mix Rations (TMR) were well-established in the USA and could lead to high yields in cows of high genetic potential. Alternative forages such as maize improved intakes wherever they could be grown. Wholecrop cereals introduced a new flexibility but would not replace very good grass silage. Prof Leaver could see a potential for marginal improvements in silage making with the new technologies, and also the prospect of manipulating milk composition by varying the composition of the feeds. However, profitability would depend as always on how resources were managed within the system.

More Meat from Grass

Dr Basil Lowman extolled the virtues of **grazed grass**. Due to the high fixed costs of machinery, making silage was very expensive. Maximum and most efficient use should be made of grazed grass which was worth up to £1,250 per hectare. He reminded the meeting of the simple rules of sward height which allowed the efficient use of grass at its most nutritious stage. The lifelong ambition of a grass plant was to run to seed and then rest. Grazing grass at 10-12cm prevented this and enabled grazing at the peak stage of grass production. An animal's chief ambition was to fill its rumen with the least work possible. This was possible in about 6 hours grazing time when the sward was over 15cm high. Cattle would never graze for more than 10 hours in a 24-hour day. The basis for Sward Height rules were: 8-10cm for high producing cattle, 6-7cm for finishing and 3cm for ewes (spring values). Sward heights could be measured using the hand. Because of seasonal fluctuations, flexibility was required in the system using a buffer area with a back fence. In the spring, grass should be stocked at 3000 kg liveweight per hectare, any surplus being cut for silage. Fertiliser rates of 12 kg N per 100 kg liveweight in spring were recommended, spread out in frequent dressings through the season.

In the discussion, chaired by John Moffit, Milk Development Council, it was considered that high genetic cows could not graze enough for their required intake because of the 10-hour restriction. Strip grazed cows also showed lower intakes because they were anticipating that the fence would be moved tomorrow! One of the main conclusions of the meeting was that, although new technology may bring marginal improvements, the mainstay of future profitability will still be **good grass** and **very good grass silage**.

Practical Steps to Improve Your Grassland Management - Milk Development Council. This booklet summarises the papers presented at all the Grass Utilisation Roadshows organised by the British Grassland Society. It is available from MDC Publications Unit, Cornerstone House, Stafford Park 13, Telford TF3 3AZ. Tel: 01952 291950; Fax: 01952 291491. Copies of the speakers' full papers are also available.

GRASS INTO CHEESE - THE ITALIAN WAY

The European Grassland Federation Meeting,
Grado, Northern Italy - September 1996

G E D Tiley

Visiting another country is always a worthwhile and memorable experience where inevitably farming methods and history are compared with those at home, and where fresh ideas and potential new methods are eagerly sought. Attendance at the European Grassland Federation meeting in Grado, northern Italy was indeed a privilege and a real pleasure, with the opportunity to rub shoulders with both farmers and scientists from neighbouring European countries. Particular mention is made of the delegation from Russia, whose trip had been paid for by the farmers back home in Russia who had profited from the advice they had received from the scientists! It is not long before it is realised that the aims and ambitions in grassland are similar all over the world. The dry warm autumn climate of southern Europe is somewhat beguiling and a welcome change from the cool dampness of SW Scotland. Everywhere in north Italy there was a desire to improve the lot of local farmers and to find ways of transferring information from research to commercial farming.

As well as a 3-4 day programme of lectures and posters, there were pre- and post-Congress tours, with the opportunity to see a range of local farming and research in a guided tour, and to enjoy the hospitality of the Italian hosts. As most regions of Italy produce wine and local spirit (**grappa**) in addition to agricultural and vegetable produce, the conviviality of the tour party tended to increase by the day, allowing a much freer interchange of ideas and information.

Pre-Congress Tour, Northern Italy - September 1996

The 3-day tour of northern Italy gave an insight into the farming of the area through visits to experimental farms, a seed factory, a Parmesan cheese factory, a working machinery demonstration and experimental plots on a ski slope at 2000 m, in addition to running commentaries on the surrounding agriculture from the bus.

Travelling from Venice northwards through Verona province and Lombardy we were told it was an intensive dairy region, with forage maize just harvested. But there was not a single cow to be seen! - emphasising the almost universal practice of zero grazing. The sandy soils of the Po valley were inherently of low fertility, but this could be changed by irrigation and liberal manuring.

A traditional meadow rotation had been replaced by 1-year Italian ryegrass, sown in October, with silage maize. This gave higher production, lower costs and a simpler work pattern. Some farmers had changed from cattle to monoculture maize for seed production. The experimental farm research programme followed similar topics to the UK: nitrate leaching, over production, slurry ,variety breeding (Italian ryegrass, lucerne, ladino clover for drought tolerance), nutritive value.

Another farm at St Lucia carried out trials to improve hay quality, eg: by blowing. The Ceccato Seed Company had a network of branches in Italy and elsewhere in Europe. North Italy was an important area for the seed production of Italian ryegrass and other grasses, which was contracted out to farmers. The factory visited had modern drying plant and bagging equipment. It was situated near a large scale reclamation area of land 3m under sea level which was co-operatively farmed for grass and legume seed, also for tomato and rice production. Maize did not grow well due to salinity. Cocksfoot and tall fescue were also yellow for the same reason. It would be dangerous to erect buildings.

From the fertile valleys the large Iveco air conditioned coach ventured up the narrow roads through the foothills of the Dolomite Alps, where magnificent snow covered peaks rose to over 3000 m. The party was taken by cable car to a ski station at Arabba (2000 m). Here there were establishment and re-vegetation trials to try and stabilise the steep mountain slopes eroded by skiers. The growing season here was less than 60 days, with an ice-cold reminder when the sun clouded over. The strident tones of a mobile telephone were an unwelcome and unexpected shattering of the utter silence of such an isolated spot. Lunch at the ski camp included boiled maize flour - the 'posho' of East Africa. During the descent from Cortina next day, occasional 'small' big bales wrapped in white were dotted about the tiny alpine meadows, which would have traditionally produced hay. The final visit was to a working demonstration of tractors and machinery suitable for small hilly pastures, and sponsored by Galignani, who distributed complimentary peaked hats to the visitors. The tractors and grass cutting machinery shown were designed for operating on the steepest possible conditions (maximum $30\text{-}35^{0}$). The tractor had a very low profile and low centre of gravity. A particular feature was a facility for a very rapid reversal of the seat and two each of PTOs and powerlifts.

A baler and bale wrapper suitable for steep conditions were also working, and produced a 850 kg bale, well compressed, 1.2m in diameter. Wilting was for 24 hours to give a 40-45% DM, bearing in mind these were herb-dominated meadows. A particularly impressive tractor had 4-wheel drive with steering at both front and rear wheels in two directions allowing it to move around the hill

in a crab-like fashion. The whole demonstration took place in warm midday sunshine, with a backdrop of snow covered peaks.

The lecture and poster sessions of the Meeting began with an outline of the grassland scene in Italy which varied from alpine meadows in the north to dry Mediterranean scrub in the south. An Association for Grassland Improvement had been formed in 1955. Papers on more detailed aspects of the theme of the meeting: Grassland and Land Use Systems followed, and any spare time could be spent scanning the posters on display. The Meeting covered a very great range of grassland topics from very many countries in four main sections: I Grassland on a Regional Basis; II Crop Physiology, Variety Breeding and Seed Production; III Grassland Production, Grazing and Conservation; IV Grassland, Soil Conservation and Environment. Full details can be found in the published proceedings.

Extra mural activities included a reception hosted by the British Grassland Society, which gave a profile to UK grassland and also launched the BGS Journal: Grass & Forage Science, as the official journal of the European Grassland Federation. A memorable evening concert by the Rumanian Philharmonic Orchestra took place in a mediaeval Basilica church with ideal acoustics. There was a truly wonderful performance of Dvorak's violin concerto, Op.53 by a talented 18 year old German violinist, Tanja Becker-Bender.

Parmesan Cheese

The world famous Parmesan Cheese is manufactured from milk produced within a limited area of northern Italy 150 km x 50 km in the regions of south Parma, Bologna and Padua. It is forbidden to produce it in any other part of Europe. It is made in a network of small local cheese factories each of which is supplied on a co-operative basis by 20 or fewer farmers delivering milk to the factory. 1,000-10,000 tonnes milk are used per year, some 15% of the total Italian production. The cheese is ripened for up to 2 years and the producers are not paid until the cheese is sold. Traditionally, the Reggiano breed of cow was used, which was well suited to Parmesan cheese, but there were now only 1,000 left.

Feeding

The unique character of the cheese requires restrictions in feeding. No silage can be fed because the silage bacteria would spoil the cheese. Instead, the cows are fed fresh grass and alfalfa in the summer, some fresh maize or sorghum in autumn, and alfalfa hay in winter. Some farms have switched to hay only all year round to give a consistent quality to the cheese, and to reduce mastitis in the spring. The cows are still tied up in byres, though a few larger units now house in cubicles. Concentrates may have to be fed in the mountains where the energy

content of the hay is low. Attempts are made to ventilate the hay to maintain a high protein content.

Processing

Milk is collected twice a day and processed raw; its temperature must not fall below 18-20^{0}C otherwise it is not suitable for Parmesan cheese. The evening milk is left for the cream to rise, then partially skimmed and put in the cheese vats for mixing with the morning, full cream milk. Each vat holds 1,000 litres of milk and extends in a cone shape 2.5 m into the ground. 25 litres of whey starter from the previous day is added to produce a pH of 3.1-3.2 when the vat is heated to 32^{0}C by a steam jacket and natural rennet from calf stomachs is added. After resting the milk for 10 minutes to get the first curd, the cheese maker breaks the curd into very small particles (*Grama*) using a paddle. This is done manually because the process is delicate and the correct consistency can only be gauged by hand, since milk composition varies from day to day. Stirring is slow initially, but becomes faster with frequent finger checks as mixing progresses. The temperature is then raised to 55^{0}C with continual finger checks to feel how the heating process is expelling moisture from the particles, before they finally agglomerate and precipitate. The cheese mass is left under the whey in each vat for 45 minutes before cutting it into two forms. The forms are put into linen in a mould, and after 2 hours the linen is substituted and left until evening. The cheese is then removed from the mould and a plastic sheet labels it with date and factory code. Next morning the plastic sheet is taken off and the cheese placed into a smoother mould in its final form for a further day. The cheese is then placed in saturated salt and turned daily to ensure even salting. After 25 days any external salt is cleaned off and the cheese taken for ripening.

Ripening in stacks of 15 cheeses high requires approximately 2 years, when the colour and texture changes and weight decreases by 25%. After 9 months each cheese is tested with a cheese hammer for quality. If a cavity has developed, possibly due to errors in feeding, eg: of fermented hay, no quality mark is given to the cheese, instead an X! The faulty cheeses can be traced back to the vat and these are all put together for sale as lower priced fresh cheese, because cheeses with cavities would deteriorate. After 18 months another quality mark is added to signify guaranteed higher quality for export. The temperature of the ripening store tracks seasonal temperatures to achieve natural ripening, within a range 5^0-23^{0}C, winter-summer. The humidity must be high (70-80% RH) to prevent the crust becoming too hard. The cheeses are inverted and the bases cleaned every 10 days, traditionally by hand but now by robotic machine. 16 kg milk were required to make 1 kg ripe cheese which was sold for 17,000-23,000 Lira. Milk prices in 1996 were 1,300-1,400 Lira litre^{-1}. The specialist cheese maker, Faustus, worked a 9-hour day at 3 million Lira per month.

WEATHER DATA FOR 1996
SAC AUCHINCRUIVE (35°29'N 4°34'W) Alt 45m

	Mean Air Temp °C		Mean Soil Temp °C	Rainfall		Sunshine
Month	*Max*	*Min*	*At 10 cm*	*Total*	*No of Days*	*Total Hours*
January	6.7	2.6	3.8	27.4	15	-
February	6.1	-0.3	1.9	59.6	17	-
March	7.4	1.4	3.5	19.0	7	-
April	11.2	4.8	7.0	92.6	24	-
May	12.4	4.0	9.0	42.0	18	-
June	16.5	8.9	13.2	58.2	13	-
July	17.3	10.5	14.4	49.4	12	-
August	18.7	11.6	14.7	48.1	16	-
September	17.1	9.0	12.3	27.8	7	169.2
October	13.7	8.3	10.1	146.7	26	74.7
November	8.1	1.8	5.1	102.7	21	81.0
December	5.9	0.4	3.2	67.6	15	58.7
Means/ Totals	**11.8**	**5.3**	**8.2**	**741.1**	**191**	-

Max air temperature: 23.8° on 19 July. Min air temperature: -10.7° 27 December 1995. Last frost: 17 May 1996. First frost: 7 November 1996.

WEATHER DATA FOR 1996
SAC CRICHTON ROYAL FARM (55°3'N 3°35'W) Alt 65m

	Mean Air Temp °C		Mean Soil Temp °C	Rainfall		Sunshine
Month	*Max*	*Min*	*At 30 cm*	*Total*	*No of Days*	*Total Hours*
January	6.3	3.3	4.9	91.2	14	17.4
February	5.7	-0.8	2.8	224.7	13	89.1
March	7.0	1.5	4.7	96.0	10	66.0
April	10.7	4.3	7.5	81.8	22	88.5
May	12.5	4.6	9.8	50.8	16	152.4
June	17.1	8.5	13.5	42.5	10	233.8
July	18.8	10.5	15.0	38.3	12	173.4
August	19.7	11.4	15.5	50.1	11	171.2
September	17.1	8.6	13.8	37.3	8	147.0
October	14.2	7.8	11.6	234.5	21	84.9
November	8.9	1.8	7.4	111.0	18	72.5
December	5.6	0.0	4.5	75.0	15	54.1
Means/ Totals	**12.0**	**5.1**	**11.1**	**1133.2**	**170**	**1350.3**

Max air temperature: 24.1° on 19 August. Min air temperature: -5.8° on 8 February. Last frost: 18 May 1996. First frost: 7 November 1996.

The 1996 weather was noted for a cool wet late spring, dry late summer and very wet autumn. February and October rainfall was much heavier in the Dumfries area.

Meteorological data reproduced courtesy SAC Auchincruive and SAC Crichton Royal Farm

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