

GREENSWARD

*Journal of the South West and
Central Scotland Grassland Societies*



No. 45

2003



British Grassland Society
Summer Visit
to
South West Scotland
13 - 17th July 2003

ACKNOWLEDGEMENTS

The British Grassland Society and the South West Scotland Grassland Society wish to express their thanks to the following local and national firms and organisations for their generous support of the Summer Visit. This is acknowledged as an expression of commitment to the rural industries of South West Scotland.

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The Local Organising Committee wish to sincerely thank all who have given their help in the arrangements over the past three years. In particular, thanks are due to the host farmers and their families, to SAC advisers and hard working secretarial staff, BGS office and many others who have made the task of organising much easier.

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Special Issue to mark

THE SUMMER VISIT OF THE BRITISH GRASSLAND SOCIETY
TO
SOUTH WEST SCOTLAND 13-17 JULY 2003

Also, in recognition of the
40th ANNIVERSARY OF
SOUTH WEST SCOTLAND GRASSLAND SOCIETY
which occurred in 2002

Front Cover Photograph:
Meikle Firthhead, Haugh of Urr, Castle Douglas (David Yates)

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Prizewinners at the Silage Competition Evening, held in Castle Douglas, January 2002. Centre: David Yates (Silage Champion) receives the Silver Rosebowl from Silage Judge, David Webster MBE (first right), with Beef/Sheep winner, David McCombe (first left), 2nd Dairy winner, Andrew Robertson (far right) and Gordon Tiley, SW/SGS Secretary (far left).

FOREWORD

“.... *Rich grass for grazing cattle*” Church of Scotland Minister, Ayr. 29 June 2003.

This issue of **Greensward** is a special edition to mark the Summer Visit of the British Grassland Society to South West Scotland in July 2003. It is indeed an honour to be able to host this visit by the National Grassland Society, and to have the opportunity to offer the hospitality of a selection of our many excellent grassland farmers. We hope all visitors will enjoy not only the farms, but also the countryside and tourist attractions of the area – in endeavour to fulfil the promise: “Naturally Best from Scotland South West”.

As the programmes of the Central and South West Scotland Grassland Societies were severely curtailed in 2001, due to the Foot & Mouth Disease outbreak, this edition records activities from 2002 and early 2003, together with brief contributed items. The development of High Sugar hybrids and varieties of grasses is highlighted, since these offer the potential for better milk and meat outputs. Control of pollution and improved management of water around the steading are also currently to the fore, giving rise to public concerns which are being addressed in the 4-point plan. Possible future trends in farming are indicated in the summaries of the Silage Research Conference, EGF Meeting, evening meetings and farm walks. Intensification, specialisation and increases in unit size are some trends apparent, with pressures on the small family farm. It is hoped these changes will be those voiced by the outgoing BGS President “Evolution not Revolution”.

This issue of Greensward also marks the 40th anniversary of SWSGS during 2002 (CSGS is one year younger). Quoting from Greensward No1, issued in November 1962: “*We, the undersigned, believe that the formation of a Grassland Society for the four south western counties of Scotland would serve a useful purpose and we are circulating this letter to farmers in the area who are well known for their skill and enthusiasm in this important branch of farming*”. I V Hunt and Malcolm Castle were the main initiators, later joined by a Committee of farmers, chairman, Ian Jennings and a membership of 233. Enthusiasm for all aspects of grass and its products remains undiminished amongst members of both the South West and Central Scotland Societies.

The two Societies wish to record special thanks to host farmers at their farm walks, to speakers at evening meetings and to commercial sponsors, SAC staff and Committee Members for their valued support. Thanks are also expressed to all authors and advertisers for their contributions to this issue. It is a pleasure to thank Lorraine Reid (SAC Rural Business Unit, Auchincruive) for her indispensable skills in the word processing and layout of the entire Journal, particularly this year with the additional demands from helping with the BGS Summer Visit. The Society is also most grateful to the staff of its local Ayrshire printers, Walker & Connell, for the excellent design, printing and publication of the Journal.

G E D TILEY - Journal Editor

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EVOLUTION NOT REVOLUTION
Don Wilkinson, Rokeby Close Farm, Hutton Magma, Richmond,
North Yorkshire
President of the British Grassland Society 2001-2002

My Presidential year should have started at the summer meeting in Bangor, North Wales in July 2001. Unfortunately, due to the restrictions of FMD, the summer meeting was postponed and I am the first, and probably the only president, to be installed electronically with e-mail exchanges between David Leaver, BGS Office, and myself, welcoming me to office. My responsibility was one of ensuring BGS remains at the centre of grassland issues, and of ensuring research is disseminated to advisors, trade, and, most importantly, to the consumer, farmer, land manager, herdsman and all those who are the recipients of R&D outputs.

Who are my customers? What are their needs and expectations from my product? All too often questions of expectation are not asked. If we don't know the needs of our customers, how can we ever hope to provide customer satisfaction? This is equally applicable to basic R&D as it is to the production of milk, meat, grain or wildlife habitats.

Some give the impression there is a revolution in the countryside from producing food to doing everything environmentally. There is no revolution, only continual evolution. Our present position in the developed world is one of adequate supplies of safe food and a countryside that is the envy of the world. Progressive transfer of R & D to the users/customers has not been achieved by accident, but by ensuring everyone in the chain knows what the other requires.

With more and more people taking an interest in how food is produced and what effect this may have on the environment, there is a greater need than ever to have constructive debates between all who have an interest. This will ensure that achievable targets are set and that the way forward is based on sound R&D and not on the whims of single issue groups or by politicians with little or no understanding of the complications of working with nature.

During the past year, there has been the usual full BGS programme following the lull caused by Foot & Mouth. The 2001 winter meeting focused on grazing and grassland management. This was followed by participation in the Legumes for Silage meeting in January. The major conference in 2002 was a joint one with the British Ecological Society entitled: **Conservation Pays**, held at Lancaster University. Though only a few farmers attended, the gradual evolution of different priorities in farming was evident; environmental payments will increasingly supplement future farming incomes. However, successful

conservation would be based on profitable commercial farming. In addition to the annual Summer Visit to North Wales (see page 36), the BGS was present at Grassland 2002, Stoneleigh, where there was a large display of working grassland machinery. The National Society also attended the EGF Meeting at La Rochelle (page 50) and the International Silage Conference at Auchincruive (page 52). The first of the new UK Grassland Management Competitions got off the ground. The winners were announced at the Winter meeting, which discussed 'Meeting the needs of Farming and of Society'.

I am honoured to have had the opportunity to be a small part in BGS; by ensuring all those interested in debating in the continual evolution of the countryside have an opportunity to do so. The BGS calendar of events bears testimony to the broad interest of issues covered each year. Looking ahead, BGS will enjoy the hospitality of SW Scotland Grassland Society during the 3-day Summer Meeting to the area from 13-17 July 2003. Later, in September, young (and some not so young) research workers will present papers at the 7th BGS Research Conference to be held at the University of Wales in Aberystwyth. To close the year, the annual Winter Meeting will look at a very topical issue 'Success and Succession: responding to today's pressures'.

My greatest and lasting impression of my presidential year is the respect and admiration given to BGS not only in the UK, not only in Europe, but also in every continent in the world. A reputation gained through dedication to excellence will only be retained by more of the same.

IN CLOVER

In Clover by Ian Rhodes (2001). 24 pp. Published by IGER, Plas Gogerddan, Aberystwyth SY23 3EB. Price £10.

Ian Rhodes was formerly Head of Legume Breeding at Aberystwyth. This booklet is a concise, thoroughly readable and up-to-date distillation of all the essential facts about white and red clover. It is written primarily for farmers to give an understanding of the benefits to be obtained from using clovers, including potential financial benefits. White clover in particular can be the cornerstone of sustainable livestock production, production of home grown protein and of organic systems. Practical advice is given on varieties, establishment problems and management of both white and red clover, with a guide to sources of further information. This booklet is recommended for anyone contemplating greater dependence on clover in their livestock system.

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**Ian Kenny, Agricultural Support Manager
Royal Bank of Scotland, Edinburgh**

Joint Meeting of SWSGS and Scottish Branch of the Institute of Agricultural Engineers, held at SAC Auchincruive, Ayr, 11 December 2001

Against the current financial background of Scottish farming, with trends in falling income and profit, Ian Kenny sought to suggest a forward strategy and point to some of the options available to farmers.

Lending to Scottish agriculture had markedly increased from £900m to £1200m from 1990-2001. Advances to tenant farmers was tending to decrease, but to contractors to increase. The UK bank base rate had fallen from 14% in 1990 to c.5% in 2001. Total interest paid in Scotland decreased with base rate to 1993, but increased subsequently as borrowings went up.

Net Farm Income on Scottish farms had fallen drastically on all farm types from the 1996-1997 level. The lowest incomes being on LFA sheep, LFA beef and dairy farms. Total Income from farming was also showing a long term decline in the last 5 years, primarily due to significantly lower produce prices, although Input prices remained steady and the Retail Price Index was rising.

Forward Strategy. It was recommended that all farm businesses making a loss or low profits should review their cost structures and market returns to check if the potential of their business was being maximised. Clearly, each business must take its own responsibility for its ultimate performance. Analysis of one's reasons for farming were necessary to set a course for the future. Was this for profit, lifestyle or family reasons? A long term goal had to be set, and a business plan identified, preferably in discussion with advisers.

Farming as a **Business** required objectives to be set, the business analysed, preparation of a Forward Plan and provision for monitoring performance. Guideline indicators to the distribution of gross output were:

Forward Strategy Indicators

	<i>% of Gross Output</i>
Gross Output	100
Variable Costs	30-40
Gross Margin	60-70
Labour	15-18
Power & Machinery	15-18
Property & General	4-6
Rent & Interest (Finance) (rental equivalent)	Max 15
Net Profit	Min 15
Rent, Interest & Personal Drawings	Max 30

Key focus should be on: what is making money, what is not making money and what is the priority item on which to spend to make more money. The solution to greater profitability lay in: Technical efficiency, the right system, reduced overheads, controlled personal drawings, improved return on capital.

Profitability was being affected by reducing Gross Margins together with increasing Fixed Costs, especially of machinery. Income from farm diversification was not yet sufficient to compensate falling Net Farm Incomes.

Surveys of dairy farm profitability showed that the Top Performers could still produce good returns compared with the lowest performers. The Top Performers were motivated, focused, methodical, adaptable, prudent and open to advice.

In Summary, the choices available to farmers were: to make better returns from farming, generate income in other ways or to leave farming. As in any business, farmers were exhorted to know **where** they were going, know **how** to get there and to do whatever they did **better**.

**CENTRAL SCOTLAND GRASSLAND SOCIETY
SILAGE COMPETITION 2001**

*HF Seeds Silage Competition Prizegiving Meeting of
CSGS at the Newhouse Hotel, Newhouse on 20 February 2002*

D Harvey, Secretary, Central Scotland Grassland Society

The Chairman, CSGS, Gavin Millar Jnr, announced the winners of the 2001 Silage Competition and presented the prizes. Because of Foot & Mouth Disease restrictions, the silages entered were judged by the Committee on analysis only. Dairy winner was R Baillie, Longlea and Beef/Sheep winner was R Mackie, Goodockhill for the second year in succession.

HF Seeds Cup & 1st Prize
2nd Prize
3rd Prize

R Baillie, Longlea,
T Brown, Muirhouse
R Millar, Newlands

**Hamilton Reco Salver for
Best Beef & Sheep Silage:**

R Mackie, Goodockhill, Newhouse

Big Bale Prize:

D Henderson, Auchinrivoch

The presentation was followed by a talk on Nitrate Vulnerable Zones (NVZs) by Mark Garrett, Kemira Technical Manager for Scotland.

**NITRATE VULNERABLE ZONES
Mark Garrett, Kemira Grow How**

The new Nitrate Vulnerable Zones (NVZs), covering 13% of Scotland, come into force in December 2003. Farmers in a NVZ will receive documents from SEERAD. It looks and feels like a difficult job to comply, but this need not be so, as most of the requirements are considered as "good agricultural practice". These would benefit the farm and business, even if not already in place. The main points are:

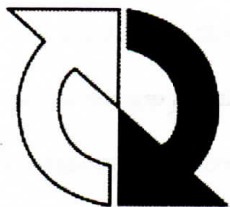
- Restrictions on the timing of bagged fertiliser applications. Organic manures with high available N as broiler litter and slurry when applied to sandy and shallow soils also have restricted application timings. Dates vary for arable and grassland operations.
- A requirement to have enough slurry storage capacity to cover the closed period.

- A requirement to apply no more N than the crop can actually use.
- Restrictions on the amount of N that can be applied as organic manures.
- No fertiliser (bagged or manures) can be applied to waterlogged, flooded, frozen or snow covered land, nor to steeply sloping fields.
- All fertilisers must be applied evenly and accurately, and in a manner that avoids water pollution. In particular, organic manures must not be applied within 10 m of watercourses.
- Good records of fertiliser and manure use should be kept for at least five years.

If bought-in fertiliser is looked upon as the extra that your resources on the farm, ie: your soil and organic manures, cannot provide, the points above are **common-sense**. If these are operated correctly they will, in most cases, result in a saving of bought-in fertiliser.

SWSGS COMPETITIONS

In addition to the Silage Competition, SWSGS also runs an Ideas Competition, Sward Competition, Environmental Competition and Photographic Competition. The **Ideas Competition**, sponsored by **Kemira Agriculture** seeks original ideas and innovations in use on livestock farms. The **Sward Competition**, sponsored by **Nickerson (UK) Ltd** aims to draw attention to quality in the growing sward, arising from dense, weed-free grass, with clover where required, following on good establishment and subsequent management. The Society is looking for entries from Beef/Sheep farms, and would encourage them to try their luck in this Competition. The **Environmental Competition**, sponsored by **Bank of Scotland**, seeks to recognise sympathy and care for the environment and wildlife in every day successful commercial farming operations. The **Photographic Competition** is a recreational adjunct to the Competition Evening, when skills at selecting photographic subjects on a rural theme are displayed informally.



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SWSGS SILAGE COMPETITION 2001

*Competition Evening of SWSGS held in the Douglas Arms Hotel,
Castle Douglas on 24 January 2002*

G E D Tiley

Sponsored by **Trident Feeds, Ecosyl Products Ltd, Biotal Ltd, Nickerson (UK) Ltd, John Watson Seeds and BP Agri Ltd**

Silage Judge: David Webster MBE, Crichton Royal Farm, Dumfries.

Chairman Hugh Parker began the Competition Evening with a warm welcome. He then offered congratulations on behalf of the Society to the Silage Judge, David Webster on his New Year Honours award of the MBE. The format of the 2001 Silage Competition had been changed due to the aftermath of the Foot & Mouth Disease outbreak which had precluded on-farm inspections.

Silage Quality 2001 – D Mowat, SAC Advisory Office, Dumfries and Dr N Offer, Animal Biology Division, SAC Auchincruive

Commenting on the Analyses Means (Table 1), Dr Offer considered that all the silages in the Competition were of good quality and were remarkably dry. Not many years ago, DM would have been a lot lower. The Beef/Sheep silages were particularly dry. CPs were not very high and lower than last year. ITFs were good and MEs and D-values were close to the 5-year mean and indicated good, high energy silages. Mean of 1000 silages across Scotland was only 64, much lower than the SWSGS Competition mean. David Mowat commented that there was an enormous range in the silage analyses in the Competition this year. NH₃ levels were higher than expected, as also were pH and Volatile Fatty Acids. Thus the forage in the pit was not as good as usual. He felt the reasons for this could have been: i) sugar contents could have been low because of wilting; ii) possible soil contamination. Proteins were low even though energies were high, so there would be problems in ration formulation and additional cost as proteins were more costly. A major change was the greater use of contractors than in the past, leading to a speedier silage operation. But had pit management changed to cope with this?

Silage Judge's Comments

Silage Judge, David Webster, had been Farm Manager at SAC's Crichton Royal Farm for many years, and was about to retire. He had generously agreed at short notice to carry out a judging assessment of the Silage Competition this year. Normal farm visits for inspection were not possible due to the high level of caution necessary after the serious outbreak of Foot & Mouth Disease in

Dumfries & Galloway during 2001. The Judge therefore asked the society to accept that this was a completely abnormal year for judging. He had devoted a considerable amount of time and thought to devise what he considered to be a fair system of marking. This was based on the Analysis Marks augmented by information obtained by telephone. A complicating factor was that the Judge was familiar with farms in Dumfries and Kirkcudbright but not those in Ayrshire and Wigtown. Also, all entrants stated that the best time for telephone contact was 12.30 pm!

Judging marks were awarded on 4 parameters:

- 1 **Milk from Forage** – 5,000 litres (20 marks); 2,500 litres (10 marks).
- 2 **Intake Factor** – 130 (20 marks); 100 (10 marks). This was very important for optimum cow performance.
- 3 **Percentage of Silage in Total Ration Fed** – 100% (10 marks); 50% (5 marks).
- 4 **Calving Pattern** – autumn calving (10 marks); spring calving (5 marks). Autumn calvers use the most silage.

2001 Results. Placings of farms in the Short Leet judged by a modified written sheet/telephone contact method are given in Table 3. Overall winner and Silage Champion 2001 was David Yates, Meikle Firthhead, Castle Douglas with Peter Bull, Coopon Carse, Palnure second. All prizewinners are indicated in the Table.

Wholecrop and Maize Silages 2001

	DM (%)	pH	CP (%)	Starch (%)	ME
Wholecrop (6 entries)	40.6	4.1	9.6	25.5	10.8
Maize (4)	25.4	3.7	9.3	22.2	10.8

Table 1 - SILAGE COMPETITION 2001 - ANALYSES MEANS**Overall Means** (Grass Silages)

Group (Number)	DM (%)	D (%)	CP (%)	ITF (c)	ME	NH₃ (% total N)
All Dairy (76)	27.0	68.1	14.4	100.0	10.9	13.6
Beef/Sheep (6)	33.0	69.2	11.9	113.3	11.1	11.6
Big Bale (3)	36.2	63.3	14.0	114.3	10.1	17.3
Dairy						
Ayr (23)	26.7	67.2	14.2	100.1	10.8	14.4
Dumfries (21)	25.8	67.1	14.2	96.3	10.7	13.3
Kirkcudbright (18)	29.7	69.3	14.8	106.1	11.1	12.9
Wigtown (14)	25.9	69.3	14.4	97.8	11.1	13.8

Table 2 - FREQUENCY DISTRIBUTIONS (%) 2001

	Bale	Beef/ Sheep	A	D	<i>Dairy</i> K	W	All
No of Entries	3	6	23	21	18	14	76
<u>D-Value</u>							
>75	0	17	0	0	0	7	1
70-75	0	33	18	29	56	29	32
65-70	33	33	65	57	33	64	55
<65	67	17	17	14	11	0	12

Table 2 - FREQUENCY DISTRIBUTIONS (%) 2001 cont.

	Bale	Beef/ Sheep	A	D	<i>Dairy</i> K	W	All
<u>DM</u>							
>40	33	0	0	0	5	0	1
30-40	67	50	13	19	56	14	25
25-30	0	50	57	38	17	50	41
23-25	0	0	4	14	0	7	7
20-23	0	0	26	19	17	22	21
<20	0	0	0	10	5	7	5
<u>CP</u>							
>18	33	0	13	5	0	7	7
16-18	0	0	9	5	17	14	10
14-16	0	17	35	48	61	50	47
12-14	33	0	22	38	17	22	25
<12	33	83	21	4	5	7	11
<u>ITF (c)</u>							
>125	0	0	0	0	5	0	1
120-125	0	33	4	0	17	7	7
110-120	100	17	13	14	39	7	19
100-110	0	50	39	29	6	21	25
90-100	0	0	22	24	11	36	22
<90	0	0	22	33	22	29	26
<u>Ammonia-N</u>							
4-7	0	0	4	0	0	0	1
7-10	0	17	4	9	6	7	7
10-15	33	83	44	67	83	57	62
15-20	33	0	39	19	5	29	24
>20	33	0	9	5	6	7	6
<u>ME</u>							
>12	0	0	0	0	0	7	1
11.5-12.0	0	17	4	10	39	21	17
11.0-11.5	0	33	30	24	22	29	26
10.5-11.0	33	33	44	48	28	36	40
10.0-10.5	33	0	13	9	11	7	11
<10.0	33	17	9	9	0	0	5

Table 3 – 2001 Silage Competition – Short Leet Entrants

<i>Prizes</i>		Marks		<i>Total (100)</i>
		<i>Analyses (35)</i>	<i>Inspection (65)</i>	
Dairy Class				
1st & SWSGS	D Yates, Meikle Firthhead, Castle	30.40	49	79.40
Rosebowl	Douglas			
2 nd	P Bull, Coopon Carse, Palnure	29.25	49	78.25
3 rd and Best	A Shankland, Langdale, Ballantrae	22.70	48	70.70
New Entrant				
	W S Jamieson, Kirkland, Closeburn	24.00	46	70.00
	R Wilson, Mayfield, Castle Douglas	27.95	40	67.95
	J Dunlop, Bishopton	28.70	39	67.70
	W J W Hogarth, Knockrivoch, Saltcoats	25.15	41	66.15
				<i>Analyses (35)</i>
Beef/Sheep Class (on analysis)				
1 st & BP Trophy	W T McCombe, Trohoughton, Dumfries			29.95
Big Bale Class (on analysis)				
1 st	J McAuslan, SAC Auchincruive			24.20
Best Silage in County (on analysis)				
Ayrshire	W J W Hogarth, Knockrivoch, Saltcoats			25.15
Dumfries	W S Jamieson, Kirkland, Closeburn			24.00
Kirkcudbright	D Yates, Meikle Firthhead, Castle Douglas			30.40
Wigtown	C J McKay, Broughton Mains, Sorbie			29.20
Best Maize Silage (on analysis)				
Biotal Prize	D Yates, Meikle Firthhead, Castle Douglas			40.7%
Best Wholecrop Silage (on analysis)				
Nickerson Prize	J Renwick, Castlehill, Moniaive			63.4%

Best New Entrant prize donated by John Watson Seeds Ltd
1st Dairy, Beef/Sheep and Big Bale winners also received cash tokens
donated by BP Agri Ltd

THE SILAGE ANALYSES REPORT

Dr Nick Offer, Animal Biology Division, SAC Auchincruive

Nick Offer then gave a short presentation on how to interpret the Silage Analysis Report. This contained a large amount of information, but two figures were the most important in determining production to be obtained from the silage: 1) D-value or ME, and 2) Intake Factor (ITF). This is because these governed how much the animal was likely to eat and how much it was likely to get from what it did eat.

Intake Factor

What is it? ITF is a measure of how much an animal would eat per unit of body weight if only given this one feed. How is it obtained? Forage intake potential is measured from NIR calibration. The wavelength of scattered light in the NIR spectrophotometer effectively gives a fingerprint of the silage sample. It is a measure of the overall composition of the silage. Repeated calibration is required to check the reliability of measurements. Factors affecting intake are: fibre, crude protein, D-value and DM.

DISCUSSION PANEL

The meeting concluded with a Discussion Panel of winners, together with the Silage Judge, Nick Offer and Dave Mowat.

The Panel felt that dull weather prior to cutting had resulted in low sugar levels and poor fermentation last year. **David Yates** generally began cutting as early as possible and tried to predict when the weather would be suitable. Early cutting was essential because he had contractor commitments and could not afford to get behind, so sometimes had to sacrifice yield. By using alternative forages he was not totally reliant on a large bulk at first cut. Additionally all grazing fields were cut before the cows went out, again necessitating early cutting.

The merits of using an acid additive were mentioned and, although there was a risk to machinery and in handling, acids always worked. Due to the hazards of acid additives, the Crichton Royal Farm had changed to inoculants, which were much easier to use with recent improvements. Because of higher DM silages (30%+) there was a risk of secondary fermentation on the face of open clamps. Generally, farmers who took more care tended to use additives. There was evidence they did work, but there were differences. Half rates of inoculant were ineffective – only full rates had the correct bacterial numbers. R Wilson felt a tedder was more useful to dry the forage and get a good fermentation. The

proposed NVZ regulations for Nithsdale could affect slurry spreading and storage and contractors would need to adapt to the new regulations. Monitoring of sugar levels in grass was hampered by the cost of getting samples to the lab.

The Competition for the **best photograph** displayed during the Competition Evening was won by Tom McCombe, Trohoughton, Dumfries. A raffle for a bottle of whisky was won by Graham Morton, Carsenestock, Newton Stewart.

The evening ended with a vote of thanks by Robert Sommerville.

SCOTTISH REGIONAL SILAGE COMPETITION 2002


Dr Ron Harkess, OBE

Scottish Regional Silage Judge 2002

The Scottish Regional Silage Competition was also judged without farm visits, on analyses marks only.

Winner: David Yates, Meikle Firthhead, Castle Douglas, SWSGS

Runner-Up: David Hamilton, Nether Pirn, Innerleithen, Peebles.



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SWSGS SPRING FARM VISIT IN WIGTOWN 2002

G E D Tiley

Visit by SWSGS to Spittal House, Portpatrick, Stranraer on 7 May 2002

(By Invitation: John Matthews & Family)

Visit Sponsored by **Tarff Valley Ltd**

This was the first farm visit by SWSGS after the Foot & Mouth Disease outbreak in 2001. It was particularly poignant as John Matthews' previous herd of Friesians and Jerseys (total 247 animals) had to be culled on 14 April 2001 because of a dangerous contact on a neighbouring farm to 3 pet pigs. After undergoing the required cleansing procedure, an all-Jersey herd of 190 pedigree, high-genetic cows had been established. The opportunity had also been taken to fit a brand new 24/48 New Zealand style milk parlour, aiming for simple management at milking, and an all-paddock grazing system introduced.

Total farm area was 82ha with a further 29ha grazing rented. Soils were mainly sandy loams, with patches of peat in low areas. The farm is in a windswept, treeless area and all grass. The fields were reseeded only when necessary to perennial/hybrid ryegrass with white and red clover. Since moving in September 1999, many of the fields have been limed. Nitrogen is applied at 150 kgHa^{-1} for grazing and 375 kg ha^{-1} 25:5:5 to silage (split dressings in mid March and mid April) plus slurry. To increase white clover in the swards, clover seed had been fed to the cows through the complete diet feeder at the rate of $0.5\text{kg seed day}^{-1}$ from the end of April to mid-July as a trial.

Restocking had begun in September 2001, purchasing cows of very high genetic merit from top herds in England supplemented by 55 heifers imported from Denmark. All cows were bred to AI, aiming for block spring calving followed after 6 weeks of AI by Hereford sweeper bulls. The emphasis of the business was to produce maximum milk from grazing grass and high quality silage without compromising health or fertility. Grazing was by rotational set-stocking for 4-5 days on each field. Access was on home-made cow tracks 5m wide consisting of 1m depth of broken stone quarried on the farm. Using a hired digger for 2 weeks, 1200m of track had been laid for a cost of $\text{£}2 \text{ m}^{-1}$.

The new 24/48 New Zealand style parlour had been designed by Helen Costello from the Pasture-to-Profit discussion group. It was built at a cost of $\text{£}15,500$ with home and local labour and part second-hand equipment. The parlour capacity was $200 \text{ cows hour}^{-1}$, with low running costs and was designed to reduce cell counts and minimise mastitis. It was well earthed for stray static voltage – considered a major cause deterring cows from entering a parlour and also of

mucking in the milking area. Labour was father and son, Richard, and there was no expensive machinery, silage making and slurry disposal being contracted.

The SWSGS wish to thank John Matthews and his family for this farm visit, and for their warm hospitality.

Spring 2003 Update.

Total cow numbers were 260, following a purchase of an additional 60 cows and calving of 47 heifers. Youngstock were 143, bulls 4. Rented area had increased to 33 ha, giving a stocking rate of 2.85 LSU ha⁻¹.



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SASA/IGER OPEN DAY
G E D Tiley

*Open Day of Scottish Agricultural Science Agency (SASA) joint with Institute of
Grassland and Environmental Research (IGER), held at Gogarbank Farm,
Ingliston, Edinburgh, 8 May 2002*

This Open Day was held at the SASA experimental farm for the benefit of farmers, advisers and members of the seed trade and sponsored by David Bell Seeds Ltd, part of Germinal Holdings. On show were grass and clover evaluation plots, particularly of varieties under development, together with talks on variety testing and reseeding and also on farmer experience of organic grass. There was an opportunity to meet and talk with leading grass and clover breeders from IGER, Aberystwyth.

John Weddell, SAC Aberdeen outlined the procedure for adequately testing new varieties of grass and clover before these could be recommended for use by farmers. This was a comprehensive process, requiring several years of detailed measurements at sites throughout Scotland. **John Hamilton** spoke of his experiences of converting to organic farming. He felt conventional farming had a lot to learn from the organic system. However, grass production was more expensive and the conversion grants and market premiums were necessary to ensure profitability.

IGER staff highlighted the new generation of ABER grass and clover varieties bred at Aberystwyth under an exclusive partnership with Germinal Holdings. Edinburgh-based **David Bell Ltd** are part of this group, and include ABER varieties in their seeds lists. Of particular interest are the **High Sugar** varieties of perennial ryegrass and new, more persistent white clovers. Examples of those recommended by SAC are AberDart perennial ryegrass, AberExcel tetraploid hybrid ryegrass and the medium-leaved white clovers: AberDai and AberHerald. The high sugar varieties provide livestock with readily available energy, allowing rumen microbes to utilise protein in the herbage more efficiently. Trials with “Aber” high sugar varieties have shown that they can significantly increase the milk yields of dairy cattle and improve liveweight gains in beef and sheep. They are tolerant of cold conditions, withstand grazing by sheep and will persist for up to 10 years under relatively high applications of nitrogen fertiliser.

Further information on these new varieties is in leaflets available from IGER (01970 823000), MDC (01285 646510) or from your local seedsman.



IGER/Hybrid ryegrass breeder, Llinos Jones (right) with Michael Shannon, David Bell Ltd, Penicuik, in front of a plot of AberEcho tetraploid hybrid, at SASA/IGER Open Day, 8 May 2002.

HIGH SUGAR GRASSES FOR SCOTLAND

Pippa Sellwood, Agribusiness Communications Ltd, Shrewsbury

The Institute of Grassland and Environmental Research (IGER) has pioneered the development of High Sugar Grasses – varieties bred specifically to contain very high levels of water soluble carbohydrate (WSC). IGER’s scientists discovered more than two decades ago that livestock grazing grass with high sugar content produced more meat and milk. Grass breeders at the Institute have, therefore, focused on the development of new varieties with this quality trait, combined with other important characteristics, such as high yield and disease resistance. All IGER-bred varieties carry the “Aber” prefix, which denotes their origin and pedigree. However, not all “Aber” varieties are High Sugar Grasses.

High Sugar varieties recommended specifically for use in Scotland include two newcomers to be added to the SAC list this year: AberEcho and AberZest. **AberEcho**, a tetraploid hybrid, has been described by John Weddell, SAC Aberdeen, as one of the best new varieties of 2003 because it offers a real step forward for Hybrids in terms of high yield coupled with high quality. Rated as a

“First Choice” variety, AberEcho produces yields similar to those of Italian ryegrasses, coupled with a high D-Value and an “A” rating for Ground Cover, when compared against other Hybrid and Italian ryegrasses.

SAC variety evaluations do not measure sugar content at present, but in IGER’s own small plot trials during 2002, AberEcho recorded the highest output of WSC per hectare of any High Sugar Grass yet developed. **Aberzest**, the second newcomer, is a late perennial diploid ryegrass, also recommended as a First Choice variety. It gives high yields, especially for grazing, and has a very good D-Value.

These two join three other Aber High Sugar varieties, already recommended for use in Scotland. In the early category is the Hybrid tetraploid ryegrass, **AberStorm**. Tested under the same management regime as perennial ryegrass varieties, AberStorm has high yields under both conservation and grazing, with exceptional early growth. It is provisionally recommended as a First Choice variety. First listed in 1999 as an intermediate perennial ryegrass is the diploid **AberDart**, which shows excellent growth throughout the season, coupled with high quality and good ground cover. This variety performed exceptionally well in independent trials carried out by DARD at the Plant Testing Station, Crossnacreevy, Northern Ireland. Compared with 12 other diploid and tetraploid perennial ryegrass varieties in the same evaluation, AberDart had the highest WSC content of all tested varieties. With a high yield of 15.8t of dry matter per hectare, it also came top for total WSC yield. The late diploid perennial, **AberAvon**, was added to SAC’s list in 2001 as a First Choice variety. It has achieved the top score for yield under grazing and its superiority as a pasture grass is confirmed by its high rating for the new evaluation of “mid season digestibility”.

IGER’s grass breeders are continuing to develop High Sugar grasses, and believe that the current recommended varieties are just the beginning of a new era of varieties with even greater potential to lift milk and meat production.

NOTES FROM THE MANX GRASSLAND SOCIETY
Caroline L Perry, Secretary, Manx Grassland Society

Following a blank year in 2001 when all Grassland Society activities were suspended due to Foot & Mouth Disease restrictions, the Manx Society resumed its programme in February 2002.

19 February 2002. Annual General Meeting and Video Session. *Glen Helen Hotel.* After a buffet supper, video footage of previous grassland visits by the Manx Grassland Society was shown by John Masson. There was also a Photo Competition: Guess the what, the where and how, arranged by Ian Quayle.

30 July 2002. Visit to the Ayres National Nature Reserve, with Barbecue. The Ayres (Norse meaning: gravel bank) is a sand and shingle raised beach at the north of the Island. It was declared a National Nature Reserve in 2000. The main feature of the Ayres NNR is the extensive area of lichen heath, a vegetation type restricted to the Ayres and a few small patches on the UK mainland. The area is also called The Grey Dune, from the overall colour given by the lichens. There are several declining bird species such as the Lapwing and Skylark, and also rare plants such as orchids and the Isle of Man cabbage.

12 November 2003. Visit and Grading Demonstration. *Wool Control Office, Douglas.*

3 December 2002. Slide Show by John Harris. Agriculture on the Isle of Man and Manx Grassland Society tours. *Glen Helen Hotel.*

16 January 2003. Silage Competition. Talk by Silage Judge *John Sanderson, Kirkham, Nr. Preston, Knockaloe.*

17 January 2003. Trip to Lancashire Dairy Farms. Farms within 15 minutes of each other: 1) *Osbaldston Hall, Blackburn* – very high yielding herd; 2) *Radholme Laund, Clitheroe* – extended grazing system; and 3) *Withgill Farm, Clitheroe* – 1200-herd unit. Cows managed in different groups; 48 point rotary parlour. *Sponsored by Bibbys.*

27 February 2003. Ballaherd Bride. (*Frank & James Callow*), after AGM and lunch at Andreas. Farm made up of four separate pieces of land totalling 200 ha, rising from sea level to 100m. Range of soil types and rainfall 513 mm with severe summer droughts. 160 cows winter housed; 16:32 herringbone parlour. Two earth walled silage pits, one for grass; one for maize. Current cropping is 24 ha maize, 20 ha triticale, 14 ha barley, remainder in temporary and permanent leys. Herd average 8,500 litres. 430 sheep wintered on dry ground. Management and cropping has been adapted to the low rainfall, and extreme variability of soil type.

CENTRAL SCOTLAND GRASSLAND SOCIETY

FARM VISITS

16 May 2002

D Harvey, Secretary, Central Scotland Grassland Society

Following a blank year in 2001 when no visits were possible due to the outbreak of Foot & Mouth Disease, the Spring Farm visits took place in May 2002.

Morning Visit

Chapelton Farm, Edzell, Brechin (*Courtesy: Messrs Alston*)

A dairy farm with 125 Holsteins averaging over 8,500 l. Farmed by the Alston brothers plus 4 full time employees. Total area is 340 ha, together with 60 ha grass parks, comprising: arable 200 ha, silage 80 ha, grazing 120 ha. Heifer calves are reared as replacements and the bull calves sold. 100 store cattle were bought in the autumn to finish over the winter. Lambs finished were from 200 Texel x Suffolk ewes. 40 pedigree Texel ewes were also kept.

Afternoon Visit

Craignathro, Forfar, Dundee (*J & A Steel*).

Arable/beef/sheep enterprise of 260 ha: cereals 160 ha, potatoes 28 ha, peas 20 ha, set aside 20 ha, grass 32 ha. 200 store cattle were bought in and finished, while 300 store lambs were bought and finished off grass. 60 breeding hogs were reared. Labour was family plus one full time worker.

The CSGS wishes to thank the Alston and Steel families for these excellent farm visits.

SWSGS PRIZES 2002

The SWSGS Vice-President's Prize was awarded in 2002 to the best Grassland Student in the Higher National Certificate in Agriculture course, **Charlotte J Reid**.

The Malcolm Castle Memorial Prize was awarded to **Elaine M Wilkie**, Knocklearoch Farm, Ballygrant, Isle of Islay, for her excellent work in the Bachelor of Technology in Agriculture degree course. The South West Scotland Grassland Society offers warm congratulations to both Prizewinners, and wishes them well in the future.



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FWAG MAKING A REAL DIFFERENCE IN AYRSHIRE & ARRAN

Andrew Thorne, Ayrshire & Arran FWAG

Within Ayrshire and Arran FWAG is going from strength to strength. The past year has seen record numbers of farmers contacting FWAG for advice and expertise on best environmental farming practices and grant schemes. The Rural Stewardship Scheme (RSS) has been the main vehicle FWAG has tapped into for providing grant assistance to farms that wish to undertake environmental improvements. In the most recent round of applications for the RSS FWAG has put in 60 applications for farms in Ayrshire and Arran and we are hopeful of a high level of success. The RSS is the main agri-environmental scheme put in place by SEERAD farmers to undertake a range of management activities encouraging:

- Management of Wetlands
- Management of Water Margins
- Management of Hedgerows
- Management of Grass Margin or Beetlebanks in Arable Fields
- Planting of Unharvested Crops
- Pond Creation

So if you are driving around Ayrshire or Arran and you see new hedgerows being planted, water margins being fenced off and ponds being excavated it is more than likely you are looking at a farm that is in the RSS.

The RSS also has a number of management options which are designed to enhance the quality of **grasslands** and the habitats they provide. One of these is the management of existing areas of species rich grassland, with the following specifications:

- A payment of £100 per hectare, per year (for Five Years) for the management of Species rich Grassland.
- The site must not be grazed by livestock or cut for a period of at least 3 consecutive months between 15 March and 15 August.
- Following this period the grass must be grazed down or cut. The site must not be used for supplementary feeding of stock.
- Fertiliser, slurry or farmyard manure must not be applied to the land.
- Pesticides should not be used on the site, except with the prior consent of the local SEERAD office.

In 2002 Ayrshire & Arran FWAG was responsible for getting 146.25 hectares of species rich grassland into management under the RSS Scheme.

Other options that are related to management of grasslands attracting payments ranging from £100-250 ha⁻¹ include: Management of hay and silage fields for the benefit of ground nesting birds; Extensive Management of Mown Grassland for Corncrakes; Managing grazing land for the protection of ground nesting birds and their eggs and fledglings; Management of Wet Grassland for Waders; Creation and Management of Species Rich Grassland.

It is not just environmental benefits that the RSS and FWAG bring to Ayrshire and Arran. There is a financial dimension also. FWAG in 2001-2002 brought some 2 million pounds of funding into the Ayrshire and Arran economies helping to keep “farmers farming” and “fencers fencing”. Projects FWAG has undertaken on the RSS this past year include Woodland Grants and a bathing waters project in and around the River Cessnock. Future work will include:

- First time educational “Landwise” visits for Ayrshire and Arran farmers. To highlight opportunities for farm improvements under various environmental grant schemes.
- Entering farms into the new Natural Care and Scottish Forestry Grant Schemes.
- Visiting Sorn Milk farmers to agree a suitable programme of environmental improvements as part of their commitment to “White and Wild” milk.

The Ayrshire and Arran FWAG Team now comprises Tommy Loudon (Farm Conservation Adviser), with two new members of staff Liz McKinnell (Administration Assistant) and Andrew Thorne (Assistant Farm Conservation Adviser). This growth at a local level should allow FWAG to cover more areas of Ayrshire and Arran and most importantly continue to make a real impact on the improvement of valuable habitats throughout the region.

“The time of conservation through farming is here. We at FWAG are here to make sure that opportunities are taken and the message is spread!”

(Contact details: Ayrshire & Arran FWAG, SAC Auchincruive, Ayr KA6 5HW. Tel: 01292 525206 or e-mail ayrshire@fwag.org.uk).

SWSGS EVENING FARM VISIT 2002

G E D Tiley

Visit to Monktonhill, Monkton, Prestwick on 28 August 2002

By Invitation: Farmcare, Jim Davidson

Visit sponsored by **Harbro Farm Sales Ltd**

Due to the very unfavourable wet season, this was the only summer farm visit in 2002. Monktonhill Farm is situated in coastal Ayrshire on the outskirts of Troon. Rainfall is low and the soils are easily worked mainly on Grade 2 land. The farm is owned by Farmcare, part of the Co-operative Group (formerly CWS) and managed by Jim Davidson. It was bought by the Coop in 1943 and stocked with 47 Ayrshire cows. It was developed as a dairy/arable enterprise, including pick-your-own fruit for a while.

Total area is 208ha cropped in 2002 with 30ha winter wheat, 15ha winter barley, 14ha oilseed rape, 19ha potatoes (leased), 14ha forage maize, 55ha silage, 37ha grazed grass, 24ha woods, buildings, etc. Due to a declining cereal market, cow numbers were 250 (Holsteins), divided into High and Low yielders. Milk yield was 8,400 litres. Heifer replacements were contract-reared on another farm. Three times daily milking was introduced in 1988, but this reverted to twice daily in the late 1990's, which fitted in better for farm staff.

As grass growth was always excellent in spring but unpredictable during summer (except in wet years, as 2002), the emphasis was on growing and feeding silage. The rate of feeding this year had been 50kg day⁻¹ falling to 30kg + 7kg concentrates in August. Low yielders received less silage and little concentrate. Grazing was by rotational paddocks first by the high yielders, followed by the low yielders. Due to exceptional wetness it had been easier to feed inside this year. Even so, dense patches of chickweed infestation had occurred. These were sometimes sprayed with herbicide and the grass rejuvenated. In winter fully TMR rations were fed using crimped barley in home made mixes.

Forage maize had been grown for 4 years. This crop required a good seed bed and was expensive when sown under plastic, which however was vital to stimulate growth. Where the plastic had blown off in the spring the maize plants were yellow and short (150 cm). However, the plastic residues could be a nuisance at harvest and at ploughing. The maize crop received slurry and 250kg ha⁻¹ 16:16:16.

Developments in buildings included a large new shed used for storing straw and installation of new cubicles 116cm wide with an extension of the cubicle house.

An innovation in the milking area was a New Zealand backing gate, electrically operated from the parlour.

A new Clean and Dirty Water System had been designed by SAC with associated storage tanks. The Clean water collected from the roofs was used in dairy washing and resulted in a saving of one-third in the water charges (see following notes on how to improve water management).

Dirty water was pumped to the fields *via* an umbilical system. Slurry could only be stored for 4 weeks, but could readily be spread on the arable land.

SWSGS is grateful to Farmcare and Jim Davidson for this farm visit, and for their warm hospitality.

WASTING WATER WASTES MONEY **Adrian Jones, Engineering Department, SAC Auchincruive**

Some Notes on Improving Water Management on the farm to reduce costs.

- 1 Mains water cost is £0.61p/m³ (£2.77/1000 gals) (SW). A 100-cow dairy unit can consume 12m³/day (2,640 gals) with stock drinking, washing and milk cooling. The cost of this will be £2,760/annum (excluding standing charges).
- 2 Water is often wasted by leakage, over use and leaving taps turned on – this will further increase the annual cost. A water meter can show leakage and usage. The cost of fitting a meter is often recovered very quickly.
- 3 Wasted water often ends up in slurry channels and slurry stores. It costs in excess of £0.80p/m³ (£3.00/1000 gal) to spread slurry onto land. Reducing water wastage reduces water cost and often reduces waste handling costs.
- 4 Recovering rain water and plate cooling water will reduce water costs. A 100-cow dairy unit in the Dumfries area can collect and re-use water with a value in excess of **£900**, ie: **reducing the water cost by £900/annum**.
- 5 Ensuring roofs are drained away from slurry channels and effluent drains reduces the cost of waste handling.

HAFOD A HENDRE
The BGS Summer Meeting, North Wales, 14-18 July 2002
G E D Tiley & J Frame

The 2002 British Grassland Society Summer Meeting was held in North Wales, and hosted by six local Welsh Grassland Societies. The area visited encompassed the mountains of Snowdonia, coastal fringes and the Isle of Anglesey. '*Hafod a Hendre*' is Welsh for 'From summer hill grazings to the lower sheltered homeland'. This concisely summarised the variety of both scenery (mountains and valleys) and farming enterprises which were on show. Dairy, beef/sheep and hill enterprises were visited to see examples of how current problems of declining farm incomes and environmental, public and welfare pressures were being addressed. The whole visit was blessed with warm sunshine, though the host farmers emphasised that winter had only just finished on the previous Friday! The Summer meeting, which had been postponed for one year from its originally planned date of July 2001, was based in the University of Bangor. Host Vice President was WI Cyril Davies. As with many of the Committee and host farmers, Cyril could equally well address the visitors in either Welsh or English. After-dinner speaker, Haydn Jones, actually began his address by singing in Welsh (see page 40).

This was an altogether excellent and entertaining Summer Meeting and the Organising Committee are to be congratulated on its success.

Tonnes of Yoghurt from a small dairy farm. *Llaeth y Llan, Tal y Bryn, Llanefydd* (Gareth and Falmai Roberts).

A small dairy farm of 21 ha with 50 cows now produces 5 lorry loads of yoghurt per day (30t week⁻¹) for distribution across Britain and Europe. Unable to expand his dairy farm, Gareth began a milk round 25 years ago. He eventually bought a cream separator to enter the low-fat milk market, selling the cream to the same customers to consume at the weekends! The small yoghurt factory is based within the farm steading, employs 12 staff and necessitates the strictest microbiological hygiene. All BGS visitors were clothed in white protection gear to view the production line. The enterprise attracts many visitors who also see Falmai's well laid out attractive garden. More than 10 years of struggle were necessary to develop credibility of the yoghurt. 4,500 l of milk are purchased daily. Gareth's own cows average 7,000 l, with paddock grazing, but are buffer fed with big bales all summer to maintain high milk fat levels for good yoghurt quality.

Extended grazing among the oak trees. *Croenllwm, Llanefydd* (Alun and Arthur Owen)

A short trip by tractor and trailer brought the visitors to the immediately neighbouring farm at Croenllwm. This was part of a 273 ha enterprise farmed by brothers: Alun and Arthur, each with a dairy. 250 milking cows were grazed on a 2-4 day paddock of around 3 ha and herd average was 6,600 l aiming for 10,000 l ha⁻¹ with 1.2t concentrates. Milk was sold to the local creamery for cheese production. All fields were topped before grazing from the 3rd grazing. "If the animals are offered the best possible grazing they will do the job for you". Alun felt more damage would be done by undergrazing than overgrazing. If reseeding was required in less than 10 years there was something wrong with the grazing management. The cows were calved from February to June and grazing was possible from mid-March to mid-December using tracks. Some very fine oak trees from previous old woodland were scattered across the farm, giving it an aspect of parkland. Alun's philosophy was "whatever you enjoy you will do well".

Land improvement followed by nature conservation. *Plas Matw, Llangernyw* (Tecwyn Evans).

The third farm was an upland beef and sheep enterprise specialising in Welsh Halfbred sheep. Total area was 56ha working with a 34ha hill farm 3 miles (5 km) distant in the mountains. On taking over in 1954 (price £2,900) the farm was in a very neglected state. Tecwyn chopped down oak trees for fence posts, and won a competition for splitting posts. Government grants were obtained for drainage, land clearance and building upgrades. During the last 10 years, conservation grants have helped to replant oak trees and hedges, together with other conservation management. The Welsh equivalent of the Rural Stewardship Scheme is Tir Gofal. The best Halfbred lambs were sold for breeding, the remainder being fattened. Forty seven suckler cows produced Limousin X store animals.

Tecwyn had been winner of numerous awards for grassland, stock, farm buildings and farm conservation. Plas Matw was an IGER focus farm, with grass, clover and oversowing trials. It was also a demonstration farm for the traceability of meat from farm to the consumer. A novel design of cattle crush with a unique sliding gate was also seen in the steading.

Farming for Conservation and the Public on Wales' highest mountain. *Hafod y Llan, Beddgelert* (The National Trust).

The second day began with a walk up the lower slopes of Snowdon. An area of 1652 ha extending to the summit of Snowdon on its southern flank had been purchased by the National Trust in 1998. The funds were raised by the public Snowdonia appeal, raising £4.5 m, including £1 m from Antony Hopkins. The original hefted flock of 3000 Welsh Mountain ewes and 1000 ewe lambs were to be reduced to 1400 ewes and 500 lambs under an extensification agreement with

the Countryside Council for Wales. The farm was also under Organic Conversion and in partnership with the Forestry Commission to manage the semi-natural woodland. A herd of 65 Welsh Black sucklers had been introduced for which new housing and handling facilities were being planned. The sheep have to be removed from the mountain from October-March and organic status 'tack' grazing has been difficult to find. The main path to Snowdon brings 60,000-80,000 people through the farm every year. Management therefore is primarily aimed for public access, landscape and conservation. An increase in heath and woodland was being sought, plus enhanced visitor facilities. Though stock numbers were reduced, workloads had in fact increased.

Organic Farming on a large Estate *Rhug Estate, Corwen* (Lord Newborough). The visit was to the home farm (950 ha) of the Estate, which comprised some 2,500 ha of let and in-hand farms, woodland, sporting and industrial interests. The land was all LFA with arable crops and livestock run under organic status. A rotation of 5 years grass/clover and 2 years oats and triticale was used. Wheat and barley did not suppress the weeds sufficiently. There were 3000 ewes, Welsh, with North Cheviot and Rouge/Cheviot crosses put to Charolais and Texel tups; and 100 Aberdeen Angus sucklers crossed to Limousin. As far as possible, finished stock were marketed to supermarkets or direct to the public. Organic green waste was collected from nearby townships, shredded and composted. Red clover was grown in the rotation to provide N. The farm had been entered into the Stewardship Scheme (Tir Gofal).

Pedigree Welsh Blacks on a traditional hill farm. *Rhiwlas Home Farm, Bala* (Robin Price).

The virtues of the Welsh Black cattle breed were highlighted in this visit to the lowland segment of this traditional hill farm. The cattle were a very hardy native breed, originally dual purpose but now bred for beef and would thrive at high altitudes. The Breed Secretary, Andrew James, emphasised their longevity (12 calves) and fertility, with a great depth of barrel and could be reared on grass/silage diets only. Rhiwlas home farm extended to 350 ha lowland and 750 ha hill, rising to 708 m with 2500 mm rainfall. The farm had been in the Price family for more than 500 years and is now well known as a source of top quality Welsh Black breeding stock. Currently there were 140 cows, calving February-April, and 2000 Welsh mountain ewes. The sheep stock had all descended from 47 ewes which were all that survived the 1947 winter from an original 1100.

Self-sufficient beef, sheep and arable unit making maximum use of grass. *Castellior, Menai Bridge, Anglesey* (Wyn, Aun and Dylan Jones).

On the third day, two farms on Anglesey were visited, the first a beef/sheep and arable farm making maximum use of grass to finish 500+ cattle and 1400 lambs per year. Castellior was run as a Jones family partnership, largely self-sufficient

with everything done by themselves. Grassland management was targeted at quality and extending the season, as grass was a cheap source of food. The soils were free draining and stock could go out through most of the winter. Anglesey's climate was mild without severe winters. Spring barley (36 ha in 2002) was grown in rotation around most of the farm, for undersowing to perennial ryegrass, timothy and white clover. This was cut twice for silage in the first year, once the second year and grazed thereafter. Pastures were topped in summer and baled if sufficient. A dry mix of a bale of silage or straw with 1 tonne of barley was fed in the field to sheep and cattle for finishing. Lime (5t ha⁻¹) was necessary where barley was to be grown. Trees had been planted and hedges managed under the Tir Gofal Scheme. Wyn was Chairman of Welsh Lamb and Beef promotion.

Pedigree Holstein herd providing breeding stock and achieving high yields from forage. *Rhos Badrig, Ty Croes, Anglesey* (Harri Evans).

A specialist tenanted dairy farm of 95 ha on level land. As in the previous farm, some of the boundaries were of soil banks faced with stones and growing hedge plants, similar to those in the Isle of Man.

The Ceinwen herd had a long history of pedigree breeding for both type and production, selecting on capacity for high intake of forage dry matter. Yields were currently 10,000 l, 5,050 l from forage, from 100 cows. Milk was sold to Express Dairies and 25 bulls were sold annually for breeding, some to Genus. The cows were turned out in late April, strip grazed using an electric fence and moved twice daily, with buffer feeding. In 2002, the first cut was all in big bales because of the wet weather. Slurry was applied before the end of February and sulphur given for 2nd and 3rd cuts of silage. Other crops grown were 16 ha winter wheat for wholecrop and 2 ha each of Italian Ryegrass sown in May for silage next year, 2 ha red clover and 2 ha sorghum. The red clover, intended to last 2 years, was block grazed by sheep or cut high to avoid damage to the growing points. The sorghum was a virtual failure in 2002 due to the cool season, being only ankle high instead of 1m. Maize was expensive to grow and difficult to harvest. There was a 5 ha area of willow scrub SSSI at the edge of the farm. Due to lack of grazing, the willows had shaded out a rare flowering herb.

Research relevant to land management in the hills and uplands. *Henfaes Research Centre, Abergwyngregyn* (School of Agricultural and Forest Sciences, University of Wales, Bangor).

The University Farm is now centred at Henfaes, following disposal of a dairy unit. There were 49 ha of lowland adjacent to the sea, occupied by 24 ha of a silvopastoral experiment. Sycamore and red alder (*Alnus rubra*) trees were interplanted with ryegrass and clover grazed by sheep. A major research project studied the potential effects of climate change (enhanced CO₂ and higher temperatures) on yield, quality and species biodiversity of grass swards. These

studies were conducted under simulated global warming under glass solar domes, which resembled a futuristic space station. Results indicated that carbohydrate levels would rise and protein levels fall. Another greenhouse study measured the effects of different atmospheric N loading on grassland, lichen and bryophyte species. The possible consequences of increased summer droughts on grass growth and physiology were being investigated in a field grazing study. Varieties of hemp and flax were compared for fibre production. The upland area of the farm (203 ha) was being developed as a Centre for Hill and Upland Management. Under the Tir Gofal Scheme, previously improved land was being allowed to revert by reducing fertiliser and herbicide use and through stock reduction (2200 to 1200 ewes). The upland area was bordered by 2 SSSIs and a National Nature Reserve.

The Alternative Programme included visits to Bodmant Gardens, Llandudno, Portmeirion; Beaumaris Castle, Llanfairpwll on Anglesey, the Welsh State Museum, Llanberis and the Ffestiniog narrow gauge railway.

SERENADE (in Welsh) TO GRASS
Hadyn Jones MBE, FRAGS, Newcastle Emlyn, Carmarthen

*Os hoffech wybod sut mae dyn fel fi yn byw
Mi ddysgais gan fy nhad grefft gyntaf dynol ryw
Mi ddysgais drin yr og ar weirglodd ffrwythlon dir
A chodi daear las ar wyneb anial dir.*

The message of this little song is of the farmer's son learning the rudiments of farming from his father, how he ploughs the barren land and returns it into fertile soil. It then goes on to say that he learnt to grow two blades of grass where only one grew before, and also how to look after a fine pair of work horses. It concludes by recommending getting up at dawn and going to bed early.

MAKING A PROFIT IN 2003

Fenwick Jackson, Kersaugh Farm, Jedburgh

*A Joint Meeting of SWSGS and Auchincruive Discussion Group
At SAC Auchincruive, 19 November 2002*

The speaker, Fenwick Jackson, farmed an arable, beef and sheep unit on 400 ha of Grade 3/2 land in the Borders south of Edinburgh. His father, also Fenwick, had been a silage judge for SWSGS in 1984. Fenwick junior was Chairman of the local Young Farmers Club and had spent a year in Australia and New Zealand producing rice and beef. His experiences there had had a great influence on his present approach to farming. This was defined as 'Easy care management of livestock'; that is livestock which could look after themselves with the minimum of supervision. A profitable phase of arable farming had allowed Fenwick to diversify into livestock production. He had taken grazing lets in various locations, some up to 50 miles (80 km) away. All fixed costs had been reduced as much as possible. More arable land will be laid down to grass.

Sheep Management

There were 2700 Lleyen ewes (1800 own flock; 900 managed flock) which were all lambed at grass in May and set stocked. The tups were Charollais – Lairg Cheviot crosses for easy-case management. Lambing was normally marked at 150 per cent and grass growth was available for the nursing ewes. They were given a minimum check and then left as they were bred to cope on their own. Ewes were overwintered on minimum feed of baled silage or oats & oatfeed *ad libitum* – they did not know what a bag was – and grazed tightly to prevent condition becoming too good which could lead to lambing problems.

The Selection Criteria for Easy Care ewes were:

- 1 Ewe must have a large pelvic opening to ease lamb birth.
- 2 No hung lambs.
- 3 Lambs must be quick on their feet and be searching for the teat quickly, as a full stomach will protect them from the weather and also stimulate the dam to mother them. Only hungry lambs get lost.
- 4 Ewe must have a good udder type, so the lamb has the best chance of sucking successfully. Small teats well placed are best. No big goat teats!
- 5 Ewe should have a strong mothering instinct to let the lamb suck and fill up.
- 6 A quick birth helps, as a ewe will mother 2 lambs at the same stage better than a ewe with one lamb sucked and the other just born.
- 7 Ewe must be able to count, as ewes that can't consistently mis-mother.

The Selection Criteria for Easy Care tups were:

- 1 Sire must produce lambs which are quick on their feet and quick to suck.
- 2 Sires must produce lambs with no horns and small heads to reduce the risk of hanging.
- 3 Sires should be born and reared on an outside system, and be grass reared.
- 4 Feet and legs should be correct and strong.

Handling was reduced to six occasions:

- 1 Dose with long-acting wormer and vaccinate ewes.
- 2 Marking and dosing lambs. Castration not practised to allow faster growth to +1kg and +1 grade of conformation.
- 3 Clipping. Could also dose or give fly treatment.
- 4 Shearling, dosing. Begin drawing lambs.
- 5 Pre-tupping.
- 6 Scanning.

All handling was in a New Zealand portable unit. The introduction of Anglesey sheep with no wool was being considered (*2003 – 20 rams have been purchased*), to eliminate shepherding costs at clipping. Also if there was no dag there would be no flies.

Cattle Management

200 Saler cows, 75% pure, were kept, 130 spring calving; 70 autumn calving. Saler beasts were hairy and not good looking, but graded well. They had strong herd instincts and were difficult to separate. Cattle were also managed on an Easy Care basis. Because suckling was easy, there was no mastitis. Agbag pea silage (contractor-made) was self-fed at each end, controlled by an electric fence. This was moved daily (10 mins) to feed 100 cows on the woodchip corral. The rest of the cattle were fed with a Keenan from clamped grass.

Selection Criteria for Easy Care cows were:

- 1 Must have a large pelvic opening to ease birth, with no assistance.
- 2 Calves must be quick on their feet and be quick to suckle.
- 3 Must have a good udder. Small teats well placed are best. No pendulous bags.
- 4 Should have a strong mothering instinct.
- 5 Should be hardy.
- 6 Should be long lived.

Woodchip Corral

This was located in the open field around the self feed Agbags and electric fencing. The cattle fed standing on 30cm depth of woodchips. Free draining

soils were necessary plus adequate rainfall to wash the dung through the chips. Percolating run-off was considered acceptable to drain into watercourses, though corrals must be at least 50m from open water. Woodchips preferably from Scots Pine should be at least 75mm x 12mm in size and approximately 2t timber are required per cow.

Points raised in discussion included: Lack of schemes in UK to encourage young farmers to get into farming; advantages of Farm Assurance for marketing both meat and barley.



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There is no doubt that slurry should be viewed as a valuable asset. It is one of the natural resources of the farm and should be considered first before fertilisers are bought in. By including slurry in your fertiliser calculations costs can be made without cutting corners.

However, calculating the nutrient value of the slurry applied is not as straightforward as you might think. It depends on soil type, yield potential and, to a large extent, on the feeding system followed. If you feed a lot of concentrates then the P and K content of slurry will be higher than in a largely forage-based system. For example, if cows are receiving a summer concentrate feed of 0.5 tonnes per cow (12kg P ha^{-1}) and stocking rate is 2.5 cows per hectare (1 cow per acre) then the concentrate will deliver 12kg P ha^{-1} and 10kg K ha^{-1} . The nutrient content of slurry can be calculated through our **Encompass** software, which uses the highly respected MANNER system developed by ADAS. A typical 50 cubic metre ha^{-1} application of slurry with 3% dry matter will contain 38kg P ha^{-1} , 125kg K ha^{-1} and around 100kg N ha^{-1} . But only some of the nutrients in the slurry are in a form which is readily available to the grass. The MANNER system calculates that just 19kg ha^{-1} of the P, 112kg ha^{-1} of the K and 47kg ha^{-1} of the N will be available to the crop.

Depending on the yield removed from the field and, of course, the original soil nutrient status, that may or may not, be enough P and K to maintain reserves. However, even if you are going for a short period of say just six weeks between first and second cut, it will be nowhere near sufficient Nitrogen. You are going to need around another 60kg over and above that.

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NITROGEN EXCRETION BY GRAZING DAIRY COWS

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Modelling approaches have been used to assess the environmental impact of nitrogen (N) returned through excretions of grazing dairy cows on the potential losses from the system, where localised concentrations may lead to higher levels of pollution than would arise with spatially uniform spreading. The quantity of N excreted per day by a grazing dairy cow is approximately 240g in urine and 120g in faeces. Taking into consideration the size of a dung and urine patch this equates to approximately 2000 kg N ha⁻¹ and 240 kg N ha⁻¹ in a dung and a urine patch respectively. These nutrients can be utilised by growing plants if they are available to the crop at an appropriate time, but they can also lead to environmental pollution if they are leached. A simplistic approach to describing the distribution of N excreted by the grazing animal is to assume that the dung and urine is evenly spread across the whole sward like a thin application of slurry. However, this ignores the fact that dung and urine patches are concentrated in small areas and it also ignores the impact of cows congregating for shelter, to lie down or around drinking and feed troughs within the field. Consequently, the impact of localised high concentrations of excreted N on the potential losses from the system is not taken into account.

The results from weather driven simulation models indicate that there are four main take-home messages.

1. The rapid transport of ammonia from urine through the soil has been shown to cause leaching of over half the ammonium N during the first two days following deposition. However, this only happens when ground is very wet, which has the important implication that the grazing season should not be extended into the late autumn. If grazing is to be extended into the autumn, there are substantial benefits if it can be restricted to days with reasonably dry ground conditions, ie: avoid grazing during or following spells of wet weather.
2. The effect of cows congregating in a small area of a field, for shade, shelter, feeding or drinking, is to give a substantial increase in leaching losses over that area, and a modest increase in losses when averaged over the whole grazing area. Hence there are environmental benefits from excluding livestock from areas adjacent to watercourses, to prevent drainage water with high nitrate concentration from reaching watercourses before being diluted by water from field areas with lower stocking densities.

3. The effect of concentration of urine and dung in patches is to increase leaching losses from those areas, particularly if urine and/or dung patches overlap within one grazing season. However, when averaged over the whole field, leaching losses were similar to those found by assuming even spreading at the same overall stocking rate. Nevertheless, this could be an issue if there is a concentration of excretions close to a watercourse.
4. High leaching losses occur during grazing in late summer, or if grazing is extended into late autumn. These can be attributed to the deposition of N after the period of rapid grass growth when the crop is unable to extract much inorganic N, which then remains in the soil to be leached over the winter period. In general, leaching losses are higher from grazed fields where significant amounts of N are deposited at this non-optimum time, than for fields receiving slurry applications and cut for silage, because the slurry can be applied within the period of rapid crop uptake of N.

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DIRTY WATER AROUND THE STEADING – A POTENTIALLY EXPENSIVE ISSUE

Rebecca Audsley, Project Officer in Water Resource Management, SAC

Water – it can be an expensive issue. Reducing the amount of water you use, or minimising the volume of dirty water produced around the steading is not always as difficult as it may first appear. Some straightforward actions can begin to cut back on the amount you use, thus reducing water bills and the amounts that you have to collect, store, handle and dispose of. Even if you benefit from a private water supply, using more than you need could mean that you are still incurring other hidden costs in collection and disposal.

Minimising dirty water

Dirty and clean water should be kept separate; this seems an obvious statement and is not always as hard as it may seem. Dirty water will still have to be collected, but by keeping water coming from clean sources separate, for example clean water from roofs, the overall volume that needs to be dealt with can be minimised and hidden costs associated with storage, handling and spreading reduced. Potential dirty water minimisation hotspots around the steading include areas like un-roofed stock routes, stock collecting or feeding yards. Keeping clean water off dirty areas can be as straightforward as repairing a gutter or down pipe, making sure water is not overflowing from drinking troughs, turning off taps or fitting a trigger gun to a hose pipe.

Reducing water use

Take hosing down as an example. The type of hose used will make a difference, as a high volume or volume washer could be using five times more water per minute than a standard high-pressure hose.

Approximate volumes of water used by different hosing systems

Type of hose	water used per min, litres (gallons)	water used per 30 min, litres (gallons)	water used per 7 days, litres (gallons)	water used per month, litres (gallons)
High pressure	20 (4.5)	600 (130)	4,200 (925)	16,800 (3,700)
Standard tap	40 (9)	1,200 (265)	8,400 (1,850)	33,600 (7,400)
High volume washer	80 (18)	2,400 (530)	16,800 (3,700)	67,200 (14,800)
How do you compare?				

The flow rate of a hosing system can be easily worked out, using a container of a known volume, for example a gallon bucket. Noting the amount of times the container can be filled over an minute and then multiplying this figure will give the flow rate over 30 minutes. This can then be compared with the table above for a quick comparison of water used by the system.

Reducing the amount of water used whilst hosing down can be as straightforward as changing the hose type. However, there are other options. For example, water use can be reduced by scraping down the parlour or yard to remove the more solid areas of muck prior to hosing. Alternatively, a bucket or so of water to lightly wet the parlour or yard first will also make the muck stick less and reduce hosing later.

Other tips on reducing water use

- Check troughs. Overflowing troughs can waste a significant amount of water; and waste bedding in a housed situation.
- Small maintenance jobs such as replacing broken guttering or adjusting ball-valves to lower the float can reduce water loss and associated hidden costs.
- Leaks, especially under floors, can be difficult to detect. It may be worth installing a flow meter to monitor the amount of water used on a monthly basis. Any unexplainable rise in regular readings could indicate a more serious leak.

Helpful guidance on minimising dirty water around the farm and other topics has been published in **The 4 Point Plan**, a recently produced guide posted to all Scottish livestock farmers aiming to help reduce the risk of diffuse pollution from farming activities whilst benefiting the business at the same time. The plan was produced through a partnership between SEERAD, SAC, FWAG Scotland, SNH, SEPA, NFU Scotland, and WWF Scotland and is available free from any of the above named organisations or your local agricultural adviser.

MULTI-FUNCTION GRASSLANDS

G E D Tiley & J Frame

*The 19th General Meeting of The European Grassland Federation
27-30 May 2002, La Rochelle, France*

The European Grassland Federation (EGF) hold their General Meetings biannually, and, with the enlargement of the European family, tend to become larger and more comprehensive each time. This meeting attracted over 630 participants from 43 countries, some outside Europe. There were 75 oral presentations and nearly 400 poster papers. The topics varied from Adapting plants to animal requirements, Quality of milk and meat to meet consumer demand to Environmental concerns, Biodiversity and Sociological impacts. In fact, something for everyone in the domain of grassland production and human use. The title and main theme of the Meeting made it clear that it was no longer possible to consider aspects of grassland in specialised isolation, but that their wider importance in relation to the predominantly urban population, consumer interests, environmental aspects as well as economics, had to be recognised.

Though only a few farmers attend, the EGF meetings create a valuable forum in which research workers and advisers can become aware of up-to-date developments in their fields of interest. The meetings are particularly valuable for young scientists, 73 of whom from 26 countries attended with EU support. Increased research attention is being given to the potential effects of global climatic change, such as drought and CO₂ enrichment on plant response. Many of the European countries were still supporting applied research of direct relevance to farmers, eg: fertilisers, grazing systems and animal nutrition. Strategic forward-looking programmes were also being funded in some countries.

The 5 main topics in the programme were:

- 1 **Forage Quality** – plant components, variations in quality and nutritive value, prediction of quality and animal performance, animal grazing behaviour, sward renovation, physiology and agronomy.
- 2 How forages affect the **quality of animal products**.
- 3 **Environmental effects of grassland management** – especially on chemistry of the soil and run-off and on biodiversity.
- 4 **Grassland management to meet nature conservation** and environmental concerns, including landscape effects.

5 **Reconciling economic and environmental constraints** in grassland systems.

Midway through the Meeting there was an afternoon field trip to a choice of seven different locations (Mid-Tours), selected to illustrate the theme of Multifunctionality. These demonstrated grazing management, dairy, beef and horse farming being conducted to simultaneously benefit biodiversity, wildlife and landscape conservation. The Poitou-Charentes Region is particularly rich in ancient wetland pastures reclaimed from the sea, and traditional management practices are required to maintain these.

The Post-Conference Tour travelled through the Loire valley north to Mont St Michel. The first visit was to see lucerne grown for seed. This was pollinated mainly by a soil insect, so that care in the use of pesticides was required. The first evening was spent in the Muscadet region of the Loire Valley. After a visit to a typical wine cellar, keen members of the party could trail through winding tracks in woodland to hear the corncrake at midnight in the alluvial wetlands. Whilst straining the ears to hear, all one heard was the chimes of a local church clock and then, inevitably, the more strident tones of a mobile phone! However, the next day the characteristic raking croaks of the corncrake (French: "Rattling in the throat") were easily heard at mid-day in a wildflower meadow, when the male bird is normally silent. It is salutary to reflect that this bird could have been heard in the lowland hay meadows of SW Scotland barely 50 years ago.

Very fine Limousin beef cows were seen on flood meadows with careful monitoring of sward height to adjust stocking rate and meet nature conservation requirements. This was followed by a visit to a horse breeding farm where the brood mares grazed with a dairy herd. The quality offspring were seen working out in an automated exercise ring. The tour culminated in Mont St Michel with a tourist visit to the island as well as visiting a beef/sheep unit on the coast producing high quality lamb. From February to October the ewes and lambs graze the natural salt marsh pastures of the Baie du Mont St Michel.

The Post Tour, led by Dr Albert Hardy of Institut Technique des Céréales et des Fourrages, was a well planned overview of the agriculture of the area, where it was clear there was well organised technical support available to farmers.

ADVANCES IN SILAGE RESEARCH – PART 1
Professor Cled Thomas, SAC Auchincruive, Ayr

The XIIIth International Silage Conference, held at SAC Auchincruive, 11-14 September 2002

The 13th International Silage Conference held at SAC, Auchincruive was attended by over 200 scientists from 35 countries and 210 papers on all aspects of silage making were presented. Although the amount of silage research in the UK has declined substantially in recent years, the subject is still an area of intensive study in the rest of Europe, Africa, South East Asia, Australia and New Zealand. Topics of interest in SW Scotland were: the effect of the ensiling process on product quality, the use of legumes for silage, silage for horses and finally new crops and new techniques for silage making.

Silage and Product Quality

Speakers from Finland and the USA emphasised the negative effects of fat consumption on human health, in particular on coronary heart disease. However, in populations with fairly well balanced diets the picture is not so clear and the effect of ruminant fats depends on the balance between favourable and unfavourable fatty acids. The question is - can we through changing the animal's diet influence the composition of fat and as a result improve human health? Chris Reynolds from Ohio State University and Richard Dewhurst from IGER both showed that the fatty acid composition of ruminant milk and meat can be changed to meet the levels currently advised. The polyunsaturated fatty acid (PUFA) content of milk and meat can be markedly increased by feeding rumen-protected vegetable oils to dairy cows. Feeding whole or full fat processed oil seeds can also increase PUFA content but this is a less efficient process.

Fresh grass is high in PUFA and eating this results in high levels in milk of CLA (conjugated linoleic acid, a component of milk fat). The discovery of powerful anti-carcinogenic properties of CLA is the reason why so much research effort is being devoted to it. Milk and dairy products are the main source of CLA in the human diet and increasing the level of CLA in milk could therefore have major benefits to human health. Nick Offer from SAC reported on a trial comparing grazed grass with silage based diets. CLA levels were nearly four times higher in the milk of the grazing cows, though cutting the grass before feeding (i.e. zero grazing) halved the CLA content. Even so the level was still double that measured in the milk of cows given silage. Current research is examining the reason for this difference between grazed herbage and silage, aiming to find conservation/ supplement strategies which ensure high CLA content throughout the year. There is a wide variation in CLA level between cows and there is thus the potential to breed for cows with high CLA in milk.

The major questions arising from this research are: firstly will the potential benefits of consuming products high in CLA be translated into measured health improvements in humans. Secondly will, the milk industry take up the challenge to produce new products based on this emerging technology. Past evidence shows an extreme reluctance from our processing sector to innovate, as in the KPMG report for MDC. Competitors in the rest of Europe are already developing new products claiming health/wellbeing benefits. Finally what financial benefits will accrue to the producer for producing these functional foods or will it all end up at the processor/ retail part of the chain.

Legumes for silage

Recently there has been a renewal of interest in legumes as sources of homegrown protein. Research conducted in the '70s and '80s at the Grassland Research Institute clearly showed that at similar digestibilities, legumes resulted in higher intakes compared with grass, greater production and higher protein in milk and as lean meat in sheep and beef. However the main problems were obtaining consistent yields and good fermentation quality.

Peas, beans and vetch have been tried as forage crops. Vetch proved difficult to ensile even after field wilting for 24h but peas and beans were shown to result in good fermentation characteristics when wilted and with effective additives. Overall the results were encouraging. For example, Legumes ensiled in big bales could prove to be a very useful supplement to grass or whole crop silage-based diets both as a means of increasing intake and improving the protein in the diet. As with Maize the importance of these crops to the South West Scotland will depend on new varieties being bred that will ensure high yields, and even more importantly, consistency of yield over a 3 to 4 yr period.

Silage for horses

There are now more horses in the UK than there were in Victorian times. These are largely used for recreation and every town in Scotland is surrounded by horse enterprises of one sort or another. Hay was the traditional forage for horses but in our climate quality is often low. Further, hay dust particularly if the hay is mouldy can cause hypersensitivity and lung disease. Silage can offer an alternative being dustless and with a high nutritive value provided the material is cut early and is well conserved. Haylage, silage of over 50% DM, is also popular. Research in Finland showed that both grass silage and oat silage could replace hay, though oat silage contained insufficient energy for performance horses. A concern with high quality grass silage is the excessive crude protein for some horse groups.

Typically silage for horses is conserved in big bales but this is problematical for small operations. Staff at the Swedish University of Agricultural Science

investigated the use of high-density balers and a wrapper constructed for small square bales. They found that bale density was difficult to control in ordinary high-density balers and interacts with DM content. A high density is needed to avoid growth of yeasts and moulds. An alternative is to re-bale big bale silages which can give very high bale weights and densities, since already ensiled material is easier to compress. Care was needed during this repackaging stage with good handling to avoid damage.

Part 2 of Advances in Silage Research will appear in next year's issue of Greensward.

COMMITTEE CHANGES – CSGS & SWSGS

CSGS (page 8). **Secretary.** On the retiral of **Colin McCombie** who had been CSGS Secretary for many years, **Donald Harvey** of Galloway & MacLeod, Stonehouse has taken over. **Chairman** is now **Gavin Millar Jnr**, of Gallamuir, Plean.

SWSGS. **Treasurer, Dr Rod Gooding**, retired from the post after some 15 years of capably handling SWSGS books, as well as contributing several new initiatives (Environmental and Sward Competitions). This position has been just as capably taken over by **Angela Mitton** who works in the Student Services section at SAC Auchincruive. **Chairman** is currently **Adam Gray**, Ingleston, Borgue, following Hugh Parker, Inchparks, Stranraer, who saw the Society through the difficult time occasioned by Foot & Mouth Disease.

MAIZE 2002

Jenni Bell, SAC Dairy Research Centre, Crichton Royal Farm, Dumfries

2002 was not a good maize season – one of the poorest for 20 years at Auchincruive.

At Crichton, 11 ha were sown on 4 and 5 May, cv Nancis without plastic film. Some fertiliser was applied at sowing. Pre-emergence atrazine applied 9 May.

May and June were abnormally cold, resulting in such poor growth that ploughing-in was considered. An additional post emergence herbicide treatment (bromoxynil and atrazine) was given on 27 June to try and encourage better growth. Fortunately, late warmth and better sunshine greatly improved growth and maturity, and the crop was harvested with a DM of 24.5% on 26 October.

Silage analysis was:

DM 271g kg⁻¹, ME 11.3, D value 71, pH 4.0, Starch 283g kg⁻¹, protein 92g kg⁻¹.

SCOTTISH REGIONAL SILAGE COMPETITION 2003

Dr Ron Harkess OBE

Scottish Regional Silage Judge 2003

Normal on-farm judging for the Scottish Regional Silage Competition was resumed in 2003. This is now organised within Scotland by the BGS Scottish representative – David Nelson in 2003.

Winner: Andrew McKay, Broughton Mains, Sorbie, Wigtown, SWSGS. 72 marks (Dairy).

Runner-up: Ian Wakley, West Leschangie, Kemnay, Norgras. 64 marks (Dairy).

Third: David Huston, Glenkilrie, Blairgowrie, ESGS. 61 marks (Upland Beef/Sheep).

ADVANCES IN FORAGE LEGUME TECHNOLOGY

J Frame, Ard Choille, 13 St Vincent Crescent, Ayr

In recent years, considerable progress has been made in forage legume technology. Breeding and selection have led to cultivars adapted to a wider range of environmental and management conditions than before. This is of particular importance to regions where the better quality land is used for direct food production, and ruminant production is concentrated on marginal, infertile or degraded land. Such situations may require alternatives to the currently better known forage legume species. Genetic manipulation techniques are increasingly being used, but commercialisation takes many years, and seed supplies can be a problem initially.

The N₂-fixing capacity of forage legumes by *Rhizobium* is important in the provision of home-grown protein, N transfer to grass in mixtures, and an added N supply to subsequent crops following ploughing up. The use of specific *Rhizobium* strains is essential where forage legume seeds are sown into land without a previous history of growing legumes. The amount of N fixed is affected positively by the legume proportion in the stand, and negatively by soil mineral N, and mineralisation of urinary N under grazing. To improve N₂-fixation, more effective strains of *Rhizobium* are being selected from existing strains or produced by biotechnology. The main routes of N transfer from legumes to associated grass are root and nodule decay and cycling of excreted N under grazing. Grasses with an open growth habit are the most compatible companion species for legumes.

The application of fertiliser N to mixed grass/legume swards has a positive influence on grass growth and a negative influence on legume growth, but the negative influence can be ameliorated by tactical N application, eg: in early spring on grass/white clover swards when clover growth is less than grass because of low temperatures. Knowledge of the different factors that affect the grass-legume balance has led to management guidelines on how best to exploit the forage legume component. Loss or leakage of N through leaching, denitrification or volatilisation have proved to be lower from grass/white clover than from grass plus high fertiliser N.

Compared with grasses, forage legumes generally have higher contents of protein, pectin, lignin, carotene and vitamins, some macronutrients (Ca, Mg) and many micronutrients (Fe, Mn, Zn, Cu, Co, B, Mo and Se). Advancing maturity reduces the digestibility, availability of nutrients and voluntary food intake (VFI) by animals. The reticulate venation of legume leaves allows better particle breakdown in the rumen than the parallel venation of grass leaves, and rumen digestion is increased by the presence of legumes.

Efficiency of N utilisation through more non-ammonium nitrogen (NAN) reaching the small intestine is greater in legumes which contain condensed tannins (CT), eg: birdsfoot trefoil (*Lotus corniculatus*), sainfoin (*Onobrychis viciifolia*), sulla (*Hedysarum coronarium*). CT also prevent bloat in livestock, and alleviate the effects of intestinal nematodes in sheep. Forage legumes contribute to enhanced acceptability and VFI relative to grass, leading to better individual animal performance from different types and classes of livestock fed on legume monocultures or legume-rich grass/legume mixtures. Animal products from grazed and conserved legume-based swards are increasingly perceived as being more 'natural' and more environmentally friendly than from highly N-fertilised, intensively managed grass.

Several antiquality factors are associated with forage legumes. Bloat in ruminants is viewed by farmers as a significant risk from grazing legumes such as lucerne, white clover and red clover, but there are several practical prevention measures, including feeding with CT-containing species. Oestrogens in lucerne, red clover and subterranean clover (*Trifolium subterraneum*) can adversely affect reproductive performance of breeding ewes and cows if consumed prior to or during conception. Moderately high levels of cyanogenesis in white clover confer resistance to pests such as weevils (*Sitona spp.*) for the plant and give improved yield and persistence, but high levels may induce goitrogenic effects in livestock. Saponins in lucerne give a degree of resistance to insect pests, but a high content can have a haemolytic effect on lucerne-fed animals.

The value of forage legumes in building up soil fertility and improving soil structure is being rediscovered in extensive farming system. White clover and subterranean clover are being used as a protective ground cover in orchards and vineyards. White clover is also being evaluated as a living understorey that supplies N to cereal crops. Other alternative uses are in the pharmaceutical industry and in nature conservation. The role of forage legumes in sustainable farming in temperate climes is likely to increase, eg: to reduce the use of fertiliser N for environmental or cost reasons, and in countries with vast areas of N-deficient pastures. Exploitation of existing knowledge and further research and development will be required to expand this role.

Summary of a paper given at an international conference in Inner Mongolia, China.

RESULTS OF CSGS & SWSGS SILAGE COMPETITIONS 2002

A Summary of the main prizewinners is given below. Details of the Competition Evenings will appear in next year's Greensward.

CSGS 2002 SILAGE COMPETITION

Competition Evening, Newhouse Hotel, Newhouse on 29 January 2003.

Silage Judge: R McNee

HF Seeds Cup & 1st Prize	A Bankier & Co, Fernieshaw, Cleland
2nd Prize	D Carruthers, Nethertown
3rd Prize	R Struthers, Collielaw

Hamilton Reco Salver for Best Beef & Sheep Silage:	R Struthers, Collielaw
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Best Big Bale Silage:	R Struthers, Collielaw
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SWSGS 2002 SILAGE COMPETITION

Competition Evening, Woodland House Hotel, Dumfries on 23 January 2003.

Silver Rosebowl & 1st Prize	A McKay, Broughton Mains, Sorbie
2nd Prize	J Howie, Langside, Kilmaurs
3rd Prize	W R Wilson, Mayfield, Castle Douglas
Best Beef/Sheep Silage	A Mair, Nether Garrel, Courance, Lockerbie
Best Big Bale Silage	R Marchant, Barony College, Parkgate
Best New Entrant	J Howie, Langside, Kilmaurs
Michael Milligan Prize	A Shankland, Langdale, Ballantrae
Best Silage in County:	
<i>Ayrshire</i>	J Howie, Langside Kilmaurs
<i>Dumfries</i>	W S Jamieson, Kirkland, Closeburn
<i>Kirkcudbright</i>	R Paton, Torr, Auchencairn
<i>Wigtown</i>	M McCreath, Home Farm, Garlieston
Best Wholecrop Silage	A Campbell, Cuil, Castle Douglas
Best Maize Silage	D Watson, Byeloch, Mouswald, Dumfries
Best Photograph Prize	A R Bray, Rose Cottage, Johnstonebridge

BGS NATIONAL GRASSLAND MANAGEMENT COMPETITION 2002

G E D Tiley

Sponsored by Kemira GrowHow and Barclays Bank

2002 was the first year that the BGS ran its new National Grassland Management Competition. This was introduced to replace the former UK National Silage Competition which had been successfully organised, in conjunction with Kemira, ADAS and SAC for many years. It was felt that a new initiative was required to embrace new technical and economic developments, and several local Societies (eg: Ulster and Welsh Societies) already had a Management competition.

Entry Procedure. Nominations from local Societies or BGS members would be put forward to each of the 10 Regional BGS representatives. If necessary, a local competition in each Region would be held to select the nomination. A written submission on the selected farm would be judged by the BGS judging Panel who would choose 3-5 finalists for on-farm judging. The Judging Remit is "To find the practitioner who demonstrates excellence in the management of grass and forage for profitable livestock production and care of the land". Marks are awarded as follows:

Grassland and Forage Policy (10 marks); Grazing Management (25); Forage Management (25); Livestock Output (25); Environmental Issues (5); Overall Impression (10).

The 2002 winner was: David Davies, Gwarffynnon (Welsh Region), who received £500 cash plus the National Trophy. Runners-up were: Robert Craig (Northern Region) and David Yates (Scottish Region).

Congratulations to David Yates and Family for this notable achievement. Meikle Firthhead and the surrounding Stewartry countryside are illustrated in the front cover of this issue of Greensward.

WEATHER DATA FOR 2001
SAC AUCHINCUIVE (35°29'N 4°34'W) Alt 45m

<i>Month</i>	Mean Air Temp °C		Mean	Rainfall		Sunshine
	<i>Max</i>	<i>Min</i>	Soil Temp °C <i>At 10 cm</i>	<i>Total</i> <i>(mm)</i>	<i>No of</i> <i>Days</i>	<i>Total</i> <i>Hours*</i>
January	5.7	0.2	2.7	62.2	18	64.5
February	6.9	0.4	3.2	44.2	16	85.3
March	8.0	1.1	3.7	47.4	13	146.9
April	10.4	3.4	6.7	76.3	19	132.4
May	16.7	7.2	11.6	20.1	11	254.5
June	15.6	9.0	13.2	62.6	17	148.9
July	18.1	11.2	15.1	140.6	18	145.9
August	18.3	11.0	15.0	70.8	15	168.5
September	15.5	9.2	12.3	47.2	15	113.9
October	14.8	10.1	11.7	125.2	27	59.8
November	10.6	4.8	8.4	97.8	23	32.4
December	7.7	0.4	4.6	53.0	15	65.4
Means/ Totals	12.4	5.7	9.0	847.4	207	1418.4

Max air temperature: 24.4° on 11 May. Min air temperature: -7.2° on 1 March.
 Last frost: 20 April 2001. First frost: 9 November 2001.

* Prestwick Royal Navy Air Squadron (HMS Gannett).

WEATHER DATA FOR 2001
SAC CRICHTON ROYAL FARM (55°03'N 3°035'W) Alt 65m

<i>Month</i>	Mean Air Temp °C		Mean Soil Temp °C	Rainfall		Sunshine
	<i>Max</i>	<i>Min</i>	<i>At 30 cm</i>	<i>Total (mm)</i>	<i>No of Days</i>	<i>Total Hours</i>
January	5.7	0.3	3.3	52.2	13	70.7
February	7.0	0.2	3.9	80.6	12	81.9
March	7.7	0.8	4.4	57.9	16	120.9
April	10.7	3.3	7.9	61.6	16	122.0
May	17.2	7.2	12.9	28.5	8	246.4
June	16.3	9.4	14.6	72.1	16	116.6
July	19.3	11.7	17.1	66.6	13	165.0
August	18.5	10.7	16.2	73.0	19	122.7
September	16.6	9.1	14.3	67.1	9	102.8
October	15.1	10.3	13.1	188.5	22	76.1
November	10.6	4.6	9.2	75.3	19	52.1
December	7.0	0.5	5.4	55.5	12	68.1
Means/ Totals	12.6	5.7	10.2	878.9	175	1345.3

Max air temperature: 26.2° on 4 July. Min air temperature: -6.5° on 2 March.
 Last frost: 24 April 2001. First frost: 13 November 2001.

After a frosty start to the year, the spring was moist and dull, with a brief sunny spell in May. Summer was relatively dull and sunless until August and September, followed by a mild autumn before hard frost at the year's end.

Meteorological data reproduced courtesy of SAC Auchincruive, SAC Crichton Royal Farm and RNAS Prestwick.

WEATHER DATA FOR 2002
SAC AUCHINCUIVE (35°29'N 4°34'W) Alt 45m

<i>Month</i>	Mean Air Temp °C		Mean Soil Temp °C	Rainfall		Sunshine
	<i>Max</i>	<i>Min</i>	<i>At 10 cm</i>	<i>Total (mm)</i>	<i>No of Days</i>	<i>Total Hours*</i>
January	9.0	3.3	4.9	122.8	19	27.7
February	8.6	3.2	5.3	169.2	26	47.1
March	10.5	3.8	5.9	79.4	19	121.4
April	12.0	4.9	8.4	57.3	17	145.4
May	14.7	7.2	11.4	53.6	17	165.7
June	16.4	10.4	14.1	110.5	21	115.0
July	17.0	10.8	14.8	86.1	22	96.1
August	19.1	11.9	15.8	100.1	15	155.7
September	17.0	9.3	12.9	48.7	10	132.7
October	11.8	5.2	8.4	146.1	19	74.9
November	10.2	5.5	6.9	103.0	24	37.3
December	6.8	-0.3	4.2	44.8	14	44.2
Means/ Totals	12.8	6.3	9.4	1121.6	223	1163.2

Max air temperature: 24.5⁰ on 1 August. Min air temperature: -6.0⁰ on 18 December. Last frost: 15 April 2002. First frost: 16 October 2002.

* RNAS Prestwick.

WEATHER DATA FOR 2002
SAC CRICHTON ROYAL FARM (55°3'N 3°35'W) Alt 65m

<i>Month</i>	Mean Air Temp °C		Mean Soil Temp °C	Rainfall		Sunshine
	<i>Max</i>	<i>Min</i>	<i>At 30 cm</i>	<i>Total (mm)</i>	<i>No of Days</i>	<i>Total Hours</i>
January	7.6	2.0	4.5	138.5	22	39.6
February	8.7	3.2	6.0	197.4	23	63.7
March	10.8	3.3	6.8	57.7	15	132.1
April	12.7	4.5	9.9	63.8	18	153.8
May	15.1	7.7	13.0	140.9	20	125.5
June	16.5	9.6	14.7	109.8	22	129.4
July	18.3	10.5	15.8	71.4	20	117.3
August	19.3	11.6	17.1	100.0	14	138.8
September	17.7	9.7	15.3	36.9	7	133.3
October	12.3	4.4	10.3	203.4	19	122.4
November	10.0	5.0	7.6	191.9	27	60.4
December	6.5	2.9	5.1	102.8	18	41.2
Means/ Totals	13.0	6.2	10.5	1414.5	225	1257.5

Max air temperature: 23.5° on 4 & 5 August. Min air temperature: -7.5° on 2 January. Last frost: 7 April 2002. First frost: 19 October 2002.

A wet mild, relatively early start to the year was followed by a drier bright spring, which however heralded an unusually wet, cool and sunless summer. This was relieved by warmer, brighter conditions in August and September, before a wet autumn and frosty December.

Meteorological data reproduced courtesy of SAC Auchincruive, SAC Crichton Royal Farm and Met. Office, Bracknell.

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