GRASSLAND

JOURNAL OF THE SOUTH-WEST AND CENTRAL SCOTLAND GRASSLAND SOCIETIES

No. 20

MAY, 1977

CONTENTS

FOREWORD

Taking over I. V. Hunt's 'baby', Greensward, is no mean task but I hope as new editor to maintain the standard he has set.

One of the first problems that arose was whether or not to metricate all data in the text. However, it was decided to allow one last reprieve and to present the information as given to the Societies. But be warned, data in the next issue will be metricated.

The activities reported in this issue illustrate the wide range of interests followed by members of both Societies and their realisation that grass is an important intermediate step towards animal production. Also the complementary role of other forage crops in animal feeding has not been overlooked.

It is apparent from the discussion sessions that there is a general interest in more detailed information on such subjects as silage fermentation, the blending of rations and the balancing of ration quality and animal output. Clearly, with tighter financial restrictions it is the attention to such detail that will make all the difference to the viability of the enterprise at the end of the day. It is the objective of the Societies to enable such detail to reach the farmer, with what we all hope will be effective end results.

Once again we are grateful to advertisers for taking space in the Journal and for supporting our efforts. Do not forget that farmer members themselves can advertise so if you have anything you want to sell and would like a page, or half a page in Greensward, please contact me.

I would finally like to acknowledge the assistance received in typing and preparing the Journal for printing from Miss N. Blaikie and Mrs. G. Hartley.

R. D. Harkess
Editor

INTERNATIONAL CODE NUMBER ISSN-0017 4092

SOUTH WEST SCOTLAND GRASSLAND SOCIETY

EXECUTIVE COMMITTEE 1976 - 77

Chairman 1976 - 77	T. C. McCreath, Garlieston Home Farm, Garlieston, Newton Stewart.
Vice-Chairman 1976 - 77	J. Lamont, Gorsehill, Corraith, Symington, Ayrshire.
Past Chairman	A. J. M. Brown, Roberton, Borgue, Kirkcudbrightshire.
Secretary	Dr. J. Frame, The West of Scotland Agricultural College, Auchincruive, Ayr.
Treasurer	Dr. M. E. Castle, The Hannah Research Institute, Ayr.
Journal Editor	Dr. R. D. Harkess, The West of Scotland Agricultural College, Auchincruive, Ayr.
Ayrshire Members 1975 - 77 1976 - 78	J. R. Ross, Macmanniston, Dalrymple. A. Kerr, Camsiscan, Craigie, Kilmarnock. A. Campbell, College Office, 20 Miller Road, Ayr.
Dumfries Members 1975 - 77 1976 - 78	J. Maxwell, Coshogle, Thornhill. Dr. W. S. Jamieson, Kirkland, Thornhill. J. Thorburn, College Office, St. Mary's Industrial Estate, Dumfries.
Kirkcudbright Members 1975 - 77 1976 - 78	G. A. Hyslop, West Logan, Castle Douglas. A. Irving, Largs, Twynholm, Castle Douglas. M. J. Wrathall, College Office, St. Mary's Industrial Estate, Dumfries.
Wigtownshire Members 1975 - 77 1976 - 78	J. Howie, Auchentibbert, Sandhead. D. Marshall, West Kirkland, By Newton Stewart. C. R. Phillips, College Office, Edinburgh Road, Stranraer
Co-opted Members	Principal J. S. Hall, The West of Scotland Agricultural College, Auchincruive, Ayr. A. E. Parkinson, Advisory and Development Service, The West of Scotland Agricultural College, Auchincruive, Ayr. R. A. Hope, The Central Scotland Grassland Society, College Office, Beechwood, Stirling.

THE CENTRAL SCOTLAND GRASSLAND SOCIETY

EXECUTIVE COMMITTEE 1976 - 77

Chairman	Robert Yuill, Walston Mansion, Dunsyre, Lanarkshire.
Vice-Chairman	Robert Simpson, Duchlage, Crieff, Perthshire.
Past Chairman	James A. Brown, Gaindykehead, Airdrie, Lanarkshire.
Secretary	R. A. Hope, College Office, Beechwood, Stirling.
Treasurer	G. W. Berry, College Office, Portland Place, Lanark.
Committee Members Retire A.G.M. 1977	J. Kaye, Weston, Dunsyre, Lanarkshire. I. Simpson, Elderslie Estates, Houston, Renfrewshire.
Retire A.G.M. 1978	G. Blackhall, Hill of Westerhouse, Carluke, Lanark. J. Currie, Carlinside, Lanark. W. D. Wilson, Camis Eskan, Helensburgh.
Retire A.G.M. 1979	G. Millar, Gallamuir, Plean, Stirling. D. Baillie, Calla, Carnwath, Lanarkshire.
College Representative	C. C. Watson, 73 Craiglaw Avenue, Waterfoot, Eaglesham, Renfrewshire.
Co-opted Members	W. M. Andrew, Crossflat, Kilbarchan, Renfrewshire. Dr. J. Frame, South West Scotland Grassland Society. R. Howie, Drumfork, Helensburgh. G. Ritchie, B.O.C.M., Wright Street, Renfrew.

PROSPECTS FOR SHEEP FARMING

John Cameron

Balbuthie, Fife

A meeting of the SWSGS in the Dumfries Arms Hotel, Cumnock, 28 October, 1976.

John Cameron is well qualified to speak on the subject. He has farms at all altitudes and interests in low ground and upland sheep and in cattle. He represents Scotland on the EEC working groups on beef and on sheep.

Supply and demand, with a little politics govern the demand for sheep meat as for all farm products. 55 per cent of sheep meat needs of the UK are met from home production with New Zealand providing the bulk of imports. In Europe as a whole only 40 per cent is home produced in marked contrast to self sufficiency in most other products. French production accounts for most European production. Consumption is increasing rapidly in Germany and Italy. On the political side, there is no C.A.P. scheme yet for sheep although it may come. An interim scheme may be introduced in about 18 months time if the British, Irish and French interests can be reconciled.

The Fat Stock Guarantee Scheme operates well in Britain. In the last 12 months the price has moved from 42½ to 45p/lb. French farmers who form 24 per cent of the electorate are favoured with double the British price and are anxious to protect their markets against British imports. That is why we have the licence scheme and the levy which can operate to cut entry of British sheep meat even when it has reached France.

The interim scheme with unrestricted entry and a fixed levy is to our advantage. The present delay is because the Irish want a more favourable levy because of their extra transport costs. The UK Government is content with the delay since they fear a marked rise in lamb/mutton prices to the British housewife.

Low Ground Fattening Sheep This is the most suitable enterprise for the farmers on good arable land. Although it is not at the moment as profitable as potato growing, it offers a higher return on capital than cattle feeding because of low capital requirements for the newcomer and because special skills are not called for. A new entrant should study the market and gear his venture to that. He could aim for selling in the premium period from Christmas to Easter.

Grade the lambs as they leave the hill for rapid finishing and orderly marketing. The top lambs could be put on rape in early November after spending September/October on silage aftermaths.

Balbuthie lambs are sold dead weight to a visiting wholesaler who is given his own choice and then negotiates a price.

The ewes are kept on the hill until December for selling fat in February/April.

They are brought down onto old low ground grass and then onto turnip/kale sown out especially for them. Latterly, about a 100 acres of stubble turnips have been set up for them but to date the productivity is erratic and not sufficiently dependable. Fencing need not be ellaborate for this enterprise. Nets have proved satisfactory except for the Blackface.

In addition to the value of the produce, these make a significant contribution to fertility. Following cereal crops can make do on 1 to 2 cwts less fertilizer per acre and still give improved grain yields.

Low Ground Sheep Breeding This enterprise is best for areas less dependent on arable cropping or for associations with dairying. The size of the enterprise is critical since it requires skilled labour or the personal attention of the farmer. 150-200 ewes could be enough where there is no shepherd but there must be more to pay for a shepherd.

The breed is important and one must plan to finish the lambs oneself. The operation should be geared to a selected marketing date and care taken to avoid dealing with calving dates and other active periods of the associated enterprise. As with fattening sheep a veterinary preventative programme is essential.

On a good class of farm this enterprise can be as profitable as barley growing.

Hill Sheep The future is very bright. We know how to improve productivity and the economics now make it possible to apply the knowledge. Advantage must be taken of all available capital grants.

We are assured that grants will be available under the EEC provision for less favoured areas. Productivity, given the grants, can be very high, much higher than on equivalent French and German hills.

Some restrictions on eligibility for grant is applied on basis of units of account/hectare which may exclude a few hill farms already intensified.

Cattle The picture is less rosy. UK already supplies 88 per cent of its needs and European production is running close to 100 per cent of requirements.

Two important points for the future are the need to provide more winter keep from home production and the need to carry 300 lb autumn calves to the spring.

Mr. Cameron presented slides with details of cattle sheds and slurry handling and the discussion centred on veterinary programmes, feeding regimes for cattle, silage programmes and low cost housing.

I. V. Hunt

BRITISH GRASSLAND SOCIETY - SUMMER VISIT, 1976

Report by

Bryan Stones

Crichton Royal Farm

How does a host local grassland society hold a three day visit covering most of the county without any grass. This unfortunate situation faced the men of Dorset after a year's careful planning nearly went up in smoke due to three weeks of 90°F temperatures and ¾ inch of rainfall in 2½ months instead of 6 inches. In fact in a county where the average rainfall is between 30 and 50 inches, only 4 inches had been recorded this year following a dry year in 1975. So for John Watson, Ron Harkess and myself who reside in the land of grass and milk, we could only appreciate the difficulties the farmers of Dorset have faced this year and marvel at our own good fortune to be this side of the border.

This pleasant county is divided up into mainly three types of land areas, Chalk, Limestone and Heathland Clay with a small amount of sandy strips. Crop production is made up of 75 per cent grass, 22 per cent cereals and a small acreage of roots. Surprisingly for a county with a nationally noted breed such as the Dorset Horn only 1½ per cent of the farming income came from sheep and it was a great surprise to me as we travelled around to see such small numbers. In addition to the main industry of agriculture the only other enterprises of any size seemed to be clay pits and seasonal holiday makers. In fact, the host secretary Bernard Hart, B.Sc. painted a very explicit picture of the county in the warm welcome we received on the Tuesday night even though soap seemed to be like so many farm items of equipment, "coming in the very near future".

Our first farm visit on Wednesday was to a large estate farm of some 586.8 hectares situated in an area of Chalky and Flint loams with clay caps. Cereals with grass leys, suckler cows with calves fattened at 15 - 18 months of age made up the farming policy. I considered the suckler cows rather a luxury on this type of cereal growing farmland. The rotation followed a pattern of 2 years grass, 1 year barley, 2 years wheat and 1 year barley undersown, with a Cockle Park type mixture of grass seed. Winter feeding of cattle is self feed silage with cows and calves at foot outwintered. Some 2,000 tons of silage were made from 1st year leys.

Following this, we looked at a farm of 258.6 hectares on flint with loam over chalk but with silty loams in the valleys. This farming family with a 200 cow dairy herd plus 200 young stock used lucerne as one of the main forage feeds. Four cuts are taken during the year and lucerne usually lasts four years. I found little to be enthusiastic about in lucerne growing unless one kept horses, neither did I think it would compete seriously with good grass management.

Travelling on we went to see the old traditional water meadows on a cereal,

dairy farm of some 484.8 hectares. The system of containing heat in the soil during the winter months I found extremely interesting and could only admire the skill needed to perfect this ancient form of grass treatment for early grazing. The water meadows comprise a complicated system of drains and ducts leading from a main brook or riverlet which enables the grass to be immersed in water from November during the frost danger period and drained off at a time depending on the rainfall during the winter. The effect of this was that not only could they obtain mid March early grazing but no fertilizer was needed, 'a very sobering thought'.

In a dry summer the same system acted as an irrigation to the grass and showed up very well this year. So important was this system in the past that farm rentals were based on the water meadow acreage.

Finally our last farm on the Wednesday, we saw how some of these old water meadows had been reclaimed and reseeded on a farm of 330 hectares. Again a mixed dairy farm with a great deal to admire in the way Mike Chandler was making progress with improving his farm and stock, although I would have liked to have seen him take more interest in his dairy breeding programme. We arrived back at Weymouth exhausted after an interesting tour with much to discuss and argue about.

On Thursday our first visit was to look at the problems of reseeding clay land pasture on John Perrin's farm. This dairy farm of 90 acres running a cow to .89 of an acre (.36 hectares) proved to be a very well organised family farm, showing an increase of 250 gallons per cow average during the past 14 years with herd size lifted from 41 cows to 107. His policy of reseeding after draining with the use of Paraquat was obviously successful to a degree though, after hearing that the cost of stone fillin was equal to the cost of the drains, I would much rather have doubled the number of drains especially on clay land and not bothered with fillin stone. I would also have liked to have seen more improvement in stock housing after 19 years. However, John Perrin proved to be a most likeable fellow with a very interesting farm to create discussion.

After lunch we travelled on to be received by the President of the British Grassland Society, Richard Waltham of Dorset Wedge silage pit fame at his Manor Farm near Sherbourne. The theme of this visit was to see a demonstration of direct drilling machines and despite the very dry conditions out of 8 different makes of drills one particular machine impressed me greatly as doing a very good job and was delighted to hear later that the College had already ordered one of these. Others obviously found the dry conditions difficult to cope with, tearing up the turf far too much in my opinion. Richard's decision to change from milk to cereals and beef can never have been more justified than this year, although he still has a great love and interest in grassland production and the British Grassland Society.

Finally on Thursday we took a brief look at Sherbourne Castle, the home of Mr. Simon Wingfield-Digby and here saw how an unusual job had been tackled which involved a twenty hectare lake silted up, and how they had dredged it out on to 25 hectares of adjacent land. The whole operation took three years to complete, pumping out ½ million metres of silt and clay. The problem of

SCOTS TIMOTHY

Tops the list everywhere

STAR FEATURES

★ TWO BIG CROPS OF HAY OR SILAGE PER YEAR

★ LONG LASTING

★ EARLY

★ GIVES BETTER RETURN FOR 60 UNITS THAN ANY OTHER GRASS

★ BRED IN SCOTLAND FOR SCOTLAND

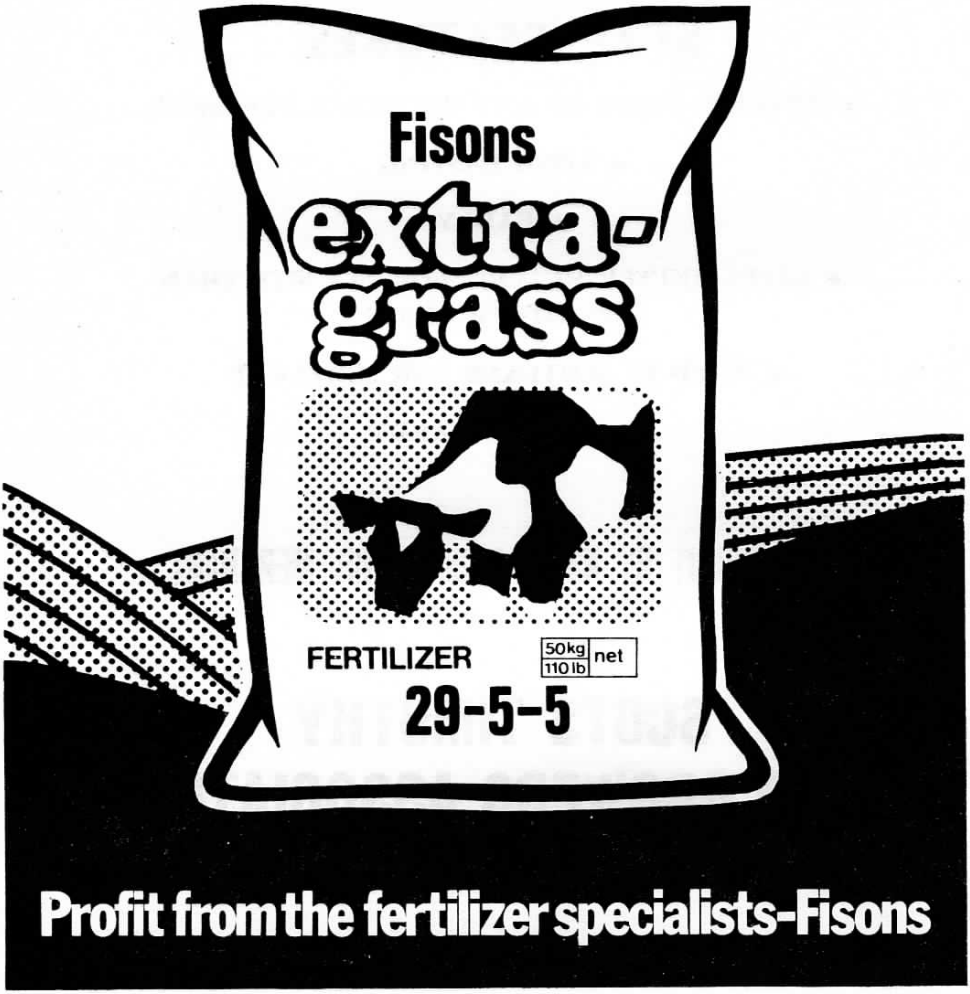
★ WINTER HARDY

ASK FOR IT BY NAME FROM YOUR MERCHANT

SCOTS TIMOTHY SEED GROWERS ASSOCIATION

Hon. Sec. D. Arnott, South Kirklane, Stirling, FK9 4AN

Fisons Extra-Grass gives you up to 17% more grass than straight N alone.



Fisons fertilizers

FISONS

re-establishing grass on the huge area of sludge up to 12 feet deep would seem to me a very long term project especially if we happened to have one or two wet summers. However, former tenant Sir Walter Raleigh would I have no doubt have been very impressed with modern techniques of spending money.

Our last day even managed to produce some rain in the early morning and our hosts began to talk of seeing grass again. However, as we travelled to the West of Dorset to see how hillside grassland improvement was being carried out on Messrs. W. N. Chick and Sons, large farming enterprise, the weather improved.

On this particular unit of 718.5 hectares with altitude varying from 130 - 220 metres above sea level the object on the fairly steep chalkland slopes was to maintain good grazing swards for suckler cows, calves and sheep. Various questions were asked of the visitors with regard to future management of fertilizer policy, weed control, reseeding mixtures and cost justification. Looking at the swards already completed, their future, I am sure depended on good permanent grass management and avoid disturbance of turf and soil as much as possible. An interesting visit though I thought it a pity we could not have seen more of this obviously highly intensive and well run organisation.

Large scale farming seemed to be the order of the day for before our refreshments we boarded our coaches for St. Giles Farms Ltd., Wimborne St. Giles. St. Giles Farms form part of the estate under the ownership of the Earl of Shaftesbury which apart from 300 acres of river meadows comprised of 3,400 acres of rotational cropping. Cereal growing mainly for seed accounted for 1721 acres, 300 acres herbage seeds include such varieties as Sabel tetraploid hybrid ryegrass, Milamo Italian ryegrass, S.23 and S.321 perennial ryegrasses, S.24 phased out in 1975 and S.352 timothy.

165 acres Oilseed Rape, 30 acres Fodder Rape seed, 42 acres Linseed with finally 50 acres Oats and Peas for silage and grazing leys of 2 or 3 year duration completed the cropping.

After lunch on a very hot day we were introduced to the Earl of Shaftesbury who gave us a brief history of the estates before handing us over to the Farm Manager, Mr. J. D. Ironmonger. He explained that our visit had been planned to see the harvesting of herbage seeds but, due to the very hot dry summer most of the harvesting was past. Most of the herbage seeds were ryegrass sown down for two years producing seed in their first year and sheep grazing in the second. As the leys are seldom used solely for conservation it is more difficult with straight varieties of perennial to manage them as efficiently as the generally more productive mixtures. Early perennial S.24 has been dropped on both counts and replaced by mid-season perennial S.321 with S.23 being the most productive, particularly in late July and August. In all swards laid down the proportion of ryegrass amounts to at least 95 per cent. A good percentage of cereal harvesting had also been completed, with yields down by approximately 10 cwt. per acre in the crops of barley. As we toured round the farms one realized the very high standard of crop management needed on an acreage of this size when producing mainly seed and the fact that we were driven round in a fleet of lorries through the kindness of a seed

marketing firm showed the quality and quantity of grass plus cereal and other seeds grown on this farm.

Finally, home to base for the last time to enjoy the annual dinner of the British Grassland Society and be entertained by some very able speakers led by Mr. D. S. Hay, Fertilizer Group Director, I.C.I.

Summing up a most enjoyable summer visit in very good company made very difficult for our excellent hosts by the unusual drought conditions. A special word of thanks to Mr. David Foot our host Vice-President, to E. A. G. Bennet, local secretary who must have worked like a trojan and all the people concerned in making this event so successful against all the odds.

MEET THE CHAIRMEN

ANDREW BROWN - Vice Chairman 1972 - 74
Chairman 1974 - 76

Educated at Rugby School, Andrew went on to do his National Service in Malaya. He then joined the Colonial Service, spending two years as a District Officer in Northern Rhodesia (now Zambia). On his return to Britain he took a course at the Royal Agricultural College, Cirencester. Here he became an enthusiast for the teachings of the late "Bobby" Boutflour on dairy cow husbandry, before coming home to the family farms in Borgue in 1960.

The Brown family have been living in Borgue for very many years, farming there since 1895, first Corseyard, then Roberton and Barlocco. These farms total 612 acres in all and carry 100 dairy cows, 80 beef cows and 200 Mule ewes (Blue-faced Leicester X Swaledale). The land runs down to the seashore and is typical Borgue country; that is, good ploughable pockets of soil among many rocky out-crops. The proximity to the sea does provide good early and late growth and grass is obviously the main crop on the farms. In addition some barley, oats, kale and swedes are grown.

Andrew's main hobby is a 22' clinker-built Dauntless class sailing sloop. This is often seen in the one safe harbourage along his coastline, except of course in the depths of winter. When not actually sailing, much of his spare time is taken up maintaining his boat. He married in 1959 and now his wife and four sons share his interest in the farm, sea and sailing.

In addition to family, farming and sailing commitments, Andrew is also Session Clerk of Borgue Church. - M. J. Wrathall.

MAKING BEST USE OF SILAGE AND HAY IN CATTLE RATIONS

J. H. D. Prescott

East of Scotland College of Agriculture

A meeting of the SWSGS in the Milton Park Hotel, Dalry, Ayrshire, 25 November, 1977.

Grassland is a major basic resource and there is every need to utilise grass efficiently whether for grazing or conservation. Adequate mechanisation is necessary to enable speed at harvesting time and to win a product of high feeding value, particularly where large scale of operation is involved. The use of supplementary feed must be considered in both the long and short term nutrition of cattle.

Production systems independent of supplementary feed are at present of interest but a major concern is the varying quality and nutritional deficiencies in products such as silage. For good quality the D value is important. Controlled fermentation in the silo can produce a good product but intake problems can arise from excessive acidity in the silage. Conventional techniques in silage making, if handled efficiently, should reduce losses from 30 to 15 per cent but further losses occur in terms of feeding efficiency.

Suckler Cows At Edinburgh, Hereford x Friesians crosses are mated to a Charolais for autumn calving. With these cattle, feeding level as opposed to feed quality is important because the cattle are fed in the range of just below maintenance to maintenance plus 1½ gallons milk. Savings by making better silage are rather less than with dairy cows. However, winter feed is a high proportion of production costs and work is underway to see where improvements can be made.

Silage plus mineralised concentrates are being compared with three levels of silage feeding for M+2, M+1 and M. At the intermediate level, effect on milk yield is small, a 50% saving in silage resulting in a 13% reduction in yield but the cattle did lose weight. On the low level of intake the cows lost 300lb compared with 90lb at the high-intake level over 150 days but milk production did not suffer much and the cows regained the weight over the grazing season. Problems did arise with fertility in the low-intake group but those on the medium level of intake showed no ill effect and calf weaning weight was satisfactory.

It would appear that liberal feeding over 3-12 weeks after calving can be followed by a more strict rationing system. Another management factor requiring attention is a tighter calving period to simplify group feeding. This would shorten the period of liberal feeding and enable an improved financial return to the system.

Finishing Cattle It is important to define objectives in a beef finishing

situation. Rate of gain, slaughter weight and length of feeding period are the main criteria and will enable a matching of feed quality to the desired end result.

Breed will also influence feeding targets. Angus x Blue Grey crosses can finish at a low level but Charolais, Hereford and Friesian crosses need high level feeding to obtain their potential growth rate and a longer feeding period to reach slaughter weight. Care is needed in interpreting rates of growth and indeed these can be misleading because the live weight of the cattle influence rate of gain. Big, fast growing and small, slow growing cattle have a 'time to finish' and lb feed/lb gain which are not so very different. So again the type of cattle and the system must be matched to improve the economics of the enterprise.

Dairy Cows There is an interplay between three main factors namely a) milk yield and shape of lactation curve b) feed intake curve c) liveweight gain or loss.

The milk curve is useful as it should be maintained at the ideal over several years. Intake is linked to the milk curve; they both rise over the first 12 weeks after calving. Unfortunately the cow cannot consume enough feed for the first 6 weeks and must milk off her back. However, high quality silage will aid intake and minimise the energy gap. It is important to aim for a high peak yield and apart from feed intake such factors as condition at calving and post-calving problems will also affect the yield level attained. Once the peak is reached it should be maintained as long as possible. To do this we need a) high nutrient intake b) allow the cow to mobilise some body fat and c) offer the correct diet to sustain yield.

Each half gallon onto the peak yield adds 100 gallons to the lactation yield. At this time (circa 6 weeks) concentrates need to be used. Good silage of M+2 or M+3 quality is still insufficient for an M+7 cow and concentrates on offer to support this difference in themselves can reduce the intake of silage. So type of diet to stimulate intake is important and how far can we go with concentrates? It is necessary to retain a minimum level of crude fibre for butter fat and to avoid feed upsets.

With low quality silage we need plenty of concentrates but even with high quality silage if concentrates are already 60% of the intake, the quality is less important.

In mid lactation, full use can be made of quality silage as maximum intake is now possible and dependence on cake can be reduced. At this stage the 6-gallon cow will respond to cake, the 4½ gallon cow will break even but any cow yielding less need not receive concentrates. When on these high roughage diets it is necessary to be aware of the potential danger from mineral deficiencies especially phosphate and ensure supplementation where necessary.

Feeds must be adequately allocated and the concentrates regulated, several small feeds being better than one or two large feeds. On self-feed silage

with cake in the parlour, only around 20 lb is consumed and if the silage is medium quality, a 6 gallon peak and a lactation of 1200 gallon is the limit. However it does depend on the quality and intake of silage. If more milk is required what must be done?

Batch management is worth considering, the high-yielders being kept on their own and offered extra energy, be it in the form of cake, sugar beet pulp or potatoes. Labour problems can arise if feeding four to six times per day and at Edinburgh the late evening feed is now given at 6pm.

The complete ration is another technique but it can be expensive on machinery for mixing the ration and it will also require the proper field machinery for cutting and chopping the grass. Facilities are also needed for splitting the herd and the system is probably best suited to high-yielding large herds. Specific cows can be offered supplementary feeding within the herd by the use of chain and magnet feeders. This enables the cows to 'top up' outwith the parlour. Care is necessary because with poor roughage the cattle may eat too much cake with resultant butter fat or rumen upsets. With good quality roughage these problems are less likely to arise.

There is also the gate system with different keys which can give access to rough concentrate such as oats as well as a high energy concentrate. If the intake of basic roughage is low then it is necessary to feed a concentrate which itself contains more fibre.

Rationed feeding is being fed to halfway through the lactation at Edinburgh and the cows then switch to self-feeding. The response of cows to this system of management is being monitored.

Discussion

In answer to questions on silage quality, the speaker said priority should be given to the dairy cows. Where fattening animals were the main enterprise there was also a premium on good D value silage, perhaps even more so than with dairy cows, since level of concentrate in the diet is likely to be lower. Of course, it may be necessary to consider output per acre and other sources of feed available eg swedes.

Dr. Prescott spoke of 65D silage yet his cows were 1400 gals with 3½ lb concentrates per gallon. Would not a better quality of silage improve the concentrate situation? Better silage should reduce level of concentrate feeding but under climatic conditions in the East a high quality early cut might reduce yield per acre because regrowth crops could not be relied on. In wetter areas where successive crops were obtained the approach to silage making would be different.

The quality of protein in silage was now under question specially for high yielding cows. The speaker had an open mind on the need to feed concentrates with higher than normal protein eg 25-30%.

Dry matter content of silage would influence intake, particularly increasing over the range 18 to 28%. Above that level the effect declines and type of fermentation may then become important. 25% was a good target and would improve intake of high silage diets but would be less significant where cake feeding was high.

Precision chopping was preferable to double chopping but running and maintenance costs were higher with the more sophisticated machines.

To overcome losses when digging out silage, silage face cutters or block cutters may be the answer. A narrow face and fast removal would also help to avoid deterioration in opened clamps.

Comparing easy-feeding with self-feeding, the former system was ideal for high-yielding cows and the latter for lower yielders. At Edinburgh, the change over was in mid-lactation, somewhere around 5 gallons/day and since this change could be important, particular watch was being kept on the lactation curve. Easy-feeding could give up to 10% higher feed intake but many variables other than feeding system can influence intake.

In answer to a question on fertility problems particularly in suckler cows, Dr. Prescott suggested that the rate of fall in body weight when put to the bull may be more significant than the actual condition of the cow. At Edinburgh concentrates are being fed over the mating period to late calving cows in an endeavour to improve conception rates. Some work has suggested that ovulation rate is not affected but embryo mortality is reduced.

Several questions were asked about complete diets. The speaker mentioned four main points. 1) It's difficult to quantify the nutritional advantages of complete diets 2) where concentrates were fed 4 or 5 times per day, feed intake in a more traditional system could be as good as or higher than on a complete diet 3) to make full use of the complete ration it must be possible to split the herd into yield groups otherwise over-feeding can occur, especially with cows late in lactation 4) management considerations such as reduced labour in feeding, improved parlour routine and dispensing of the need to feed concentrates outwith the parlour are all positive factors in favour of complete diets.

In early lactation a complete diet comprising 60 per cent concentrates and 40 per cent silage could stimulate a better intake of energy because a 60-40 diet on traditional feeding would be difficult to achieve due to the substitution effect of the concentrate portion. Concerning the compressed full diet ration, there could be keeping quality problems especially if moisture levels were not correct. Where feed may be kept for 2 or 3 days (eg prepared for the weekend) the combination of feeds can be important. The best deterioration-resistant silage, that is with a low pH (3.8 - 4.0) is likely to be less acceptable to stock. This type of silage mixed with say barley or roots may not keep too well. Chopped kale in the ration will also deteriorate. How thorough the mixing has to be is an open question but its cost is obviously important and chopped silage is necessary as the base and

this in turn means more expensive silage machinery.

Regarding the question of intake, it was suggested that 5 smaller feeds per day may improve feed intake when compared to a ration on offer all the time. In the feed lots in the USA, the augers are sometimes switched on to tempt the stock back to the trough. Work in Denmark had shown problems with varying intake not related to milk yield of liveweight but simply due to the boss cow problem.

How much extra milk is required to pay for all this machinery? Certainly if straights are used in the complete mix some saving can be obtained in ration costs but other savings in the system (eg management and/or labour) may be the answer rather than simply more milk.

5TH ANNUAL SILAGE COMPETITION 1977/78

The Committee has agreed to continue the silage competition for a further year and a few changes have been made in the marking schedules.

The points penalty for high dry matter in clamp silage has been removed and the judges marks have been increased from 40 to 75 for clamp silages and from 40 to 50 for tower silages. This includes a judges discretionary mark of 10. The total marks for chemical analyses for both classes of silage remain at 100.

2ND ANNUAL HAY COMPETITION 1977/78

As for last year entries will be judged entirely by chemical analyses and examination of the hay in the laboratory.

Details of both competitions and entry forms have been sent to all members and we look forward to a lively entry vying for the trophies and cash prizes.

MEAT AND MILK FROM GRASS AND CLOVER

Tom McCreath

Garlieston Home Farm, Garlieston

A meeting of the CSGS in the King Robert Hotel, Stirling, on 26 January, 1977.

It takes something of a nerve to speak on grass and clover when over 90 per cent of dairy farmers and a high percentage of beef farmers who are 'tuning up' their farms are turning towards a high nitrogen system. There are many facts and figures available but the general advice in dairying is to obtain stocking rates of less than one acre per cow. To do this it is necessary to get all the available slurry onto the grass together with an initial dressing of 100 units N for silage ground and 70 units N for grazing ground and subsequent dressings till over 300 units are applied.

I hesitate to criticise this approach having seen the great job done by those involved and the remarkable alteration on many poor farms. However, a lot of nitrates are wasted and in terms of energy value, the return is not as high as the input. Indeed it is a high cost method. Conversely it is questionable where a low cost method can succeed with anyone going into farming at today's land prices.

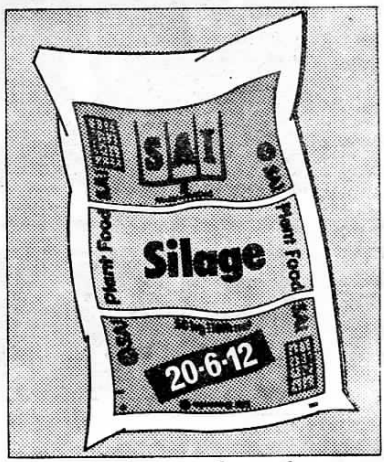
Is then clover farming worth considering? What can it do in terms of outputs and margins? Firstly let me describe our farming operations. We farm 830 acres in two units near to the sea in Wigtownshire. The land is fairly heavy with outcrops of rock and more stones than we care for but it is very good grass growing country with a 40 inch rainfall.

Garlieston Home Farm is a dairy,arable unit of 250 acres with 55 more rented. One third of the acres are in barley, grown for home use and for sale, this being all undersown to seeds or Italian ryegrass. The dairy herd is milked in byres for 104 producing 60 per cent summer milk, the bulk of cows calving in January/February. Dry cows are fed silage and straw until 10 days before calving when they receive 2 to 4 lb barley mix. Following calving up to 16 lb of meal is fed as two feeds in the byre plus 4 lb mixed in with the silage at the feed barrier. Maris Kestrel kale is grazed during the day up to the beginning of April and hay is fed at night. The cows are sometimes allowed to range graze over the silage fields in late March or the first week in April. They are put out at night around 10 April, with the bull, on to grass unfertilised other than by dung or slurry. Following the first grazing 40 units of N are applied for grazing, the silage ground receiving 80 units around 7 April. Feeding is normally reduced by half by 22 April and stopped by 4 May when the herd will be grazing early fertilised Italian, later to be direct drilled to kale. The herd, pedigree Ayrshires, will average over 5 gallons per day at this stage. In a normal year no more concentrates are fed until 10 days prior to the next calving. One third of the heifers calve in January at 24 to 27 months whilst the remainder calve August/September at 2½ years to a beef bull. All autumn calvers are brought in at night around the 28 October and the herd is on half silage and half grass by 5 November. Strip grazing of

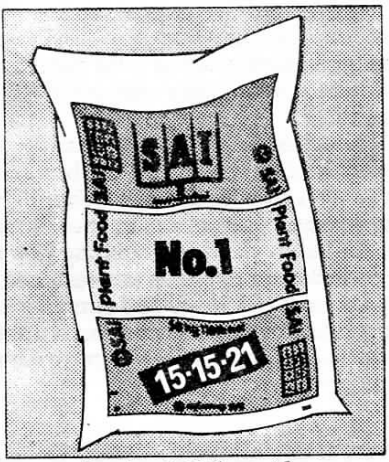
SAI THE GRASSLAND SPECIALISTS

Apply at 5-8 bags/ ha
(2-3 bags/acre) for each
"crop" of grass.

Use at 5-8 bags/ ha
(2-3 bags/acre) where soil
potash reserves are high.



Apply at 13 bags/ ha
(5 bags/acre) for each cut.



Apply at 10 bags/ ha
(4 bags/acre) for a bumper
hay crop.

For detailed recommendations on systems of grassland farming get your copy of "Guide to Growing Profits" from your local S.A.I. office.

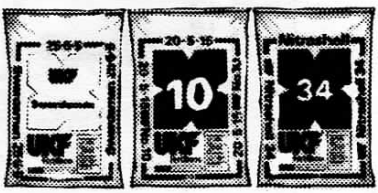
UKF Swardsman Systems. A completely new way to get the maximum out of your grass.

Swardsman Systems are a simple, highly cost-effective way of getting the most from your grass.

Swardsman Systems are in line with modern practice, the latest grassland research, and are based on the use of UKF Swardsman in conjunction with other selected UKF Fertilisers.

There is a Swardsman System for every kind of sward use: grazing, silage, hay, cutting and grazing. Likewise there is a Swardsman System for special situations such as balancing clover, slag, slurry and establishing new leys.

Swardsman Systems are designed for both maximum efficiency and simplicity. The recommendations use the minimum number of products and applications in return for maximum yield.



Growing a greater Britain.

UKF Fertilisers

Please send me details of your Swardsman Systems.

My name is

My address is

Occupation: Farmer ☐ Student ☐

Telephone:

Send this in an envelope to UKF Fertilisers Limited, Freepost (CS50), Ince, Chester CH2 4YZ.

grass ceases around 23 November and the spring calvers are brought in around 1 December and dried off with the kale being retained for milkers only, right through to April.

When first starting at Garlieston Home Farm the clover establishment was not always successful and upwards of 280 units of N was applied to grazing leys. Generally good results were obtained though it could be disappointing in July to September and indeed there was also a poor autumn response to late nitrogen. This situation led to a re-look at red clover employing a front and back fence whilst grazing, and indeed this technique proved to be the breakthrough. With our system there is somewhat less bulk early in the season though providing a good dressing of nitrogen is applied by mid April (or even May) the main cut is just as big. The shorter time from shut off to cutting is less depressing to the clovers. Problems arise at heading and these are overcome by alternately taking silage and then grazing each field or vice versa. If for any reason the red clover is absent then milk yields decline more rapidly in the late summer. The main advantage of our system results from the quality of feed from July to September. After topping in early July we often give a sward 30 units N to get it off the ground. But unexpectedly, if we keep the back fence going until mid October we will graze through November without any autumn application of nitrogen. On balance the system suits the spring calving cows which can best take advantage of the grazing pattern.

Some of the performance figures up to 30 April, 1976 for the 112 cows, 60 per cent spring calving, are: milk per cow - 1060 gallons; acres per cow - 1.03 acres; concentrates per cow - 15.4 cwt; fertiliser used - 84N: $80P_2O_5$: $90K_2O$.

A detailed survey in 1974 concerning all aspects of production indicated that clover contributed in excess of 200 units per acre.

Broughton Mains, a farm of some 530 acres, is run on similar lines by a manager. The present cow numbers are being increased by 50 to 160. Results compare very favourably with Garlieston although using slightly more concentrates - 18 cwt per cow largely as a result of having 200 cross ewes. Ewes are put to a Suffolk tup and lamb on the cows grass mid February so as to fit in with arable work. The sheep are put to graze all the grass fields including the silage and hay ground until late April or early May when the latter are shut up for conservation receiving 50 units N; their first application. Young stock are not put out to join the sheep until later in May when they are stocked at 2 in-calf heifers (6½ cwt) with 2 ewes with lambs per acre. Lambs normally go away mainly in June at 48 to 50 lb. Any left by mid July are speaned and the ewes shut up tight to dry off. Young stock growth rates are around 1.5 lb per day from grass alone till November and when housed, 1.7 lb per day on silage and barley going away fat in April at 20 months. On high quality silage 2 lb per head barley is fed to one month of going away, on poorer quality up to 6 lb per head is fed.

The silage fields are closed up at Garlieston on 7 April with cutting commencing on 20 May. During this time the fresh weight should have reached 12 ton per acre with a D value of about 68. Cutting starts somewhat later

at Broughton Mains. High dry matter, 30 to 35 per cent is aimed at with good wilting and rapid filling techniques, the silo being sheeted down each night. A loss of 2 to 3 per cent in D value due to wilting takes place but secondary fermentation has not been a problem. In the later cut silage at Broughton Mains the lower D value of the grasses is often more than compensated by a higher clover content in the sward. No additive is used now. For haymaking a crimper is essential when working with red clover and some seasons storage drying is necessary. Barley yields are normally around 2 tons per acre although this past year they were back a third.

All the barley is undersown on the same day using a combined seeds/barley/fertiliser drill followed by cross harrowing and rolling. This gives the clover a chance and enables a better job to be made of weed control using a MCPB/MCPA mix at the first trifoliate leaf stage. Both Westernwolth and arable silage have been tried as a cover crop but undersowing is preferred. If an established pasture or bare sow out is sprayed, straight MCPB is used (in humid conditions) as the mix was found to depress the clover for 8 weeks. Dung or slurry is always applied to young seeds in autumn, or to any 'sick' pasture.

To assist clover development relatively high levels of soil phosphate and potash are maintained. Rock phosphate and muriate of potash are applied as necessary in the seed bed or to a bare sward. At the same time a pH of 6+ is maintained, all nitrogen being applied as Nitro-chalk to avoid an acid layer in the soil. Our seeds mixtures have until now been based on early perennial ryegrass, timothy, meadow fescue plus 2 lb of red and 2 lb of white clover. The tendancy now following advice is to sow a blend of mid season and tetraploid pasture ryegrasses, eg. R.V.P. Hay Pasture/Combi/Petra with the clover. S23 and Melle because of their tight competitive growth habits are avoided in order to maintain the clover content. Of the many red clover varieties available, Montgomery and Merkur are preferred, S123 was not so good and Rea 4N was far too competitive for our purposes. We have not tried the Hungaropoly cutting ley.

Regarding the grazing situation we have had no bloat problems whilst employing a backfence strip grazing system which maintains the sward balance. No hormone problems have been encountered affecting getting cows in-calf, but protein poisoning can occur. The crop D value tends to be deceptive, in fact the cows milk much better than the analyses would suggest. One problem, a personal one, is in getting used to <u>not</u> putting nitrogen on when perhaps your instincts suggest otherwise.

Our system is really a collection of 'rules of thumb' especially as research into the various aspects of clover production has overall been disappointing and inconclusive except for the depression due to shading or crowding out. We intend now to look more closely into the time and rate for applying nitrogen and compound fertilisers allied with later heading grass varieties. The effect of slurry application on grazing persistence and the use of set stocking also warrant further investigation.

SILAGE AND HAY NIGHT

SILAGE COMPETITION 1976/77

Judge: M.M. Milligan, Culvennan, Castle Douglas
Speaker: J. McIver, Corrie Tractors Ltd., Dumfries
Reviewer: Dr. M.E. Castle, Hannah Research Institute, Ayr

A meeting held on 24 February, 1977, at the Embassy Hotel, Newbridge, Dumfries.

John McIver: Thoughts on silage machinery

A definition of grass conservation is the removal of excess fodder in time of plenty to store for use in times of scarcity. In planning the mechanisation of grass harvesting and storing it is necessary to consider all operations from ploughing the field for reseeding to feeding the stored product. To do this Mr. McIver discussed 7 major points.

1. Pre-harvest preparation. Good finishing at ploughing and adequate rolling to provide a firm, even, level, seed bed that will not subside. (Repair drains too, to avoid wet, soft patches). Avoid poaching or churning up field with tractors and machinery. Apply the correct fertiliser at the proper time and ensure that it is evenly applied in order to provide a crop of regular density. Use a heavy roller in spring to protect harvesting machinery.

2. Cutting the crop. Drum mowers set the swath up well to aid wilting. Flail mowers have a high power requirement. Mower conditioners are useful but expensive. Some of the modern rotary mowers double cut the crop as it falls over the back of the mower. Up to 8 per cent dry matter loss has been recorded due to this.

3. Conditioning the crop. If the correct mower is used e.g. drum mower, no need to touch swath for clamp silage if using precision chop. In a tower system will have to wilt and row up, so try to avoid soil contamination and stones at pick-up.

4. Picking up the crop. With precision harvesters it is important to keep knives sharp and not to forget to move the shear bar. Too big a gap between blade and shear bar causes a tearing at the grass rather than chopping, increases power requirement and rounds off the edge of the shear bar - this can be turned round or more expensively replaced.

5. Transport. To avoid delays, roadways should be in good condition. Automatic hitching and trailer unloading facilities will reduce lost time in the field and at the silo. Try and avoid having a high throughput harvester sitting idling in the field. Match trailer capacity and forage harvester throughput.

6. Storing crop. Clamp silos are now expensive. New silo wall building regulations must be applied to obtain grant. Remember the secret of good fermentation is to keep air out.

7. Sufficient power. Have adequate tractor power to handle the machinery in use. Large forage harvesters with a high potential work rate require large tractors. Self-powered foragers are very expensive but could consider co-operation among neighbours.

M. Milligan: Judges' remarks

1976 was the most difficult silage making time for first cut silage for some time. The heavy rainfall led to wet crops and cutting and harvesting became a stop-go operation. Effluent problems were encountered where cutting continued, whilst waiting for better conditions led to a fall in D value. The lack of sunshine must have had a deleterious effect on D value because where cutting date was similar to other years the D values were down by 5 - 6 units. Once the first cuts were complete problems continued because of the drought - low second cut yield and for many, no third cut at all.

Despite all the problems of the season, where there was good management, the silage was better than other places. The judge's duty is to evaluate management. The constant publicity for good quality silage from the College or the badgering by commercial firms offering aids to silage making (e.g. additives) are of no avail if management, the M factor, is not correct. If the M factor is right, the silage quality will be good.

Because management is so important, the judge should have more of the total marks at his disposal - even to go as far as reversing the present scoring system to 100 for the judge and 40 for the analysis. At present it is too easy for the high quality man to win. But there are farming systems where a lower quality silage is adequate and justified and more points available for the M factor would make an allowance for this and give a better chance for these systems to be higher placed in the competition.

The judge then went on to comment on each of silages from the winning farms and presented the prizes and trophy. The winner of the clamp silage class was Lady K.P. Moore, Ladykirk Farms, Monkton, the winning entry being from Raith Farm. This silage also won the trophy which was received by farm manager Alex McKay on behalf of Lady Moore.

A. Kerr, Camiscan, Craigie, won the tower silage class.

A complete list of entries and analyses marks is given in Table 1 and the farms inspected and other placings are listed in Table 2.

(In his remarks, the judge referred to a review of the silage quality over the four years of the competition by Dr. Castle. As time did not permit the presentation of this information, Dr. Castle was invited to contribute to Greensward - Editor).

Table 1 1976/77 Silage Competition: Analyses and Marks

Rank	Code	% DM	% CP	D value	Volatility of N (%)	Marks/100
Clamp silages						
1	KS8	23.3	17.1	68.6	7.2	93.15
2	AS5	23.7	17.3	68.1	5.2	92.85
3	KS1	25.4	15.7	66.6	7.7	87.50
4	KS10	22.1	13.5	67.2	5.8	82.35
5	AS6	27.4	17.9	64.1	6.0	82.20
6	AS3	19.1	16.6	68.3	4.5	81.25
7	KS7	37.6	18.7	64.2	2.2	78.60
8	KS6	20.1	16.0	66.1	7.5	76.55
9	AS4	18.7	15.5	67.4	5.0	76.45
10	WS4	25.4	17.7	61.9	8.9	75.40
11	DS1	27.9	14.0	63.1	1.4	75.30
12	DS7	26.9	17.7	61.1	2.7	73.00
13	DS8	27.4	16.4	61.2	7.5	72.00
14	KS4	20.2	15.5	64.3	8.3	70.90
15	WS5	21.4	14.6	63.2	12.8	67.60
16	KS9	16.8	15.5	65.7	8.3	66.60
17	DS5	20.6	17.9	61.4	9.1	65.60
18	DS6	19.2	20.3	62.2	10.0	64.60
19	WS7	22.7	13.2	61.8	15.8	63.00
20	KS5A	18.2	13.8	63.5	6.5	61.80
21	KS11	16.6	16.1	64.7	13.7	60.93
22	AS2	29.1	15.9	58.0	8.5	60.80
23	WS8	24.0	15.6	59.4	18.6	59.35
24	KS2	25.1	13.9	57.6	8.1	58.70
25	KS5	21.9	14.3	59.2	2.0	58.65
26	WS6	29.0	12.1	58.3	5.5	58.00
27=	DS2	20.2	17.6	61.7	22.0	56.20
27=	DS10	25.8	15.0	56.4	3.5	56.20
29	KS15	22.4	15.8	58.6	14.6	56.15
30	WS3	19.4	16.9	62.2	22.2	54.85
31	KS12	16.8	16.3	62.2	14.2	53.75
32	KS14	17.1	19.0	62.1	19.5	51.93
33	WS1	16.8	16.0	61.9	15.8	51.35
34	WS9	25.8	10.4	56.2	8.1	51.00
35	WS2	31.9	15.7	53.1	2.1	48.80
36	KS13	22.0	17.5	57.8	22.2	48.75
37	WS12	21.6	16.3	56.5	23.5	41.68
38	DS4	17.8	18.3	59.9	27.3	41.23
39	KS3	17.3	17.2	58.6	36.2	33.25
40	WS11	19.1	19.1	56.5	36.2	32.25
41	DS9	19.1	20.8	55.8	30.8	30.15
42	WS10	19.3	12.0	52.9	20.8	29.15
43	AS1	17.6	19.1	56.2	42.8	27.60
Tower silages						
1	AS8	37.4	15.7	60.4	9.8	68.90
2	AS7	32.9	14.9	60.2	13.3	62.93
3	AS9	32.9	16.5	51.8	15.2	47.50

Table 2 Short list for judge's visit (in order of analysis)

Clamp silages

Awards		Marks 100 + 40 = 140
4th	D. Brown, Barmagachan, Borgue, Kirkcuds.	93.15 + 24 = 117.15
1st & Trophy	Lady K.P. Moore, Ladykirk Farms, per Bell Ingram, Estates Office, Monkton, Ayrshire.	92.85 + 29 = 121.85
2nd	A.J.M. Brown, Roberton, Borgue, Kirkcuds.	87.50 + 31 = 118.50
3rd	J.A. Houston & Co., Overlaw, Kirkcuds.	82.35 + 35 = 117.35
	Lady K.P. Moore, Ladykirk Farms, per Ball Ingram, Estates Office, Monkton, Ayrshire.	81.25 + 31 = 112.25
	A.C. Irving, Largs, Twynholm, Castle Douglas.	78.60 + 33 = 111.60
	A.C. Irving, Largs, Twynholm, Castle Douglas.	76.55 + 33 = 109.55
	J.R. Ross, Macmanniston, Dalrymple, Ayrshire.	76.45 + 31 = 107.45

Tower silages

1st	J. Kerr & Son, Camsiscan, Craigie, Kilmarnock.	68.90 + 35 = 103.90
2nd	G. Dunlop & Sons, Warnockland, Fenwick, Kilmarnock.	62.93 + 33 = 95.93
	J.H. Sloan, Dormieston, Trabboch, Mauchline.	47.50 + 33 = 80.50

Dr. M. E. Castle: Silage qualities in four years

A summary of the distribution of the D values of the silages in the last four years is given in Table 3. It can be seen that in 1973-4 and 1974-5 only 3 per cent and 2 per cent of all silages were classed as very good whereas in 1975-6 the value had increased to 41 per cent. However, in the last season, 1976-7, no silages were in the top grade, and only 18 per cent were classed as good. At first glance this would appear to be highly disappointing but this result is similar to that in the whole country which showed that 1976 was a year when many poor silages were made. The silages in the competition were made at much the same date as in the previous year but the D values were clearly much lower. One explanation could be the lower dry matter content in 1976-7 compared with the 3 previous years because of the wet weather at the time of ensiling and the lack of wilting. The lower dry matter content resulted in more losses down the drain.

In the 43 silage entries there was an interesting and highly significant relationship between the dry matter content and the ammonia content which was expressed as the volatility of the nitrogen. In the 12 silages with dry matter contents of 25 per cent and over, the ammonia content was less than 10 per cent of the total nitrogen whereas in the samples with less than 25 per cent dry

matter the ammonia values tended to be higher and reached a maximum of 43 per cent. Silages with high ammonia contents are not as acceptable to cows as silages with low ammonia contents, and every effort should be made to keep the ammonia as low as possible. A value of 10 per cent ammonia should not be exceeded if voluntary intake is to be high, and this can be achieved by either dry matter contents of 25 per cent and higher or by using an effective silage additive.

Table 3 CLAMP SILAGES

		% of total in each group			
Quality	D value	1973-4	1974-5	1975-6	1976-7
Very good	> 70	3	2	41	0
Good	65-70	6	34	31	18
Medium	57-64	74	60	26	64
Poor	< 57	17	4	2	18
Mean DM %		28	26	26	22
Number of entries		34	50	54	43

HAY COMPETITION 1976/77

This is the first year that the Society has promoted a hay competition. Hay was judged by its chemical analysis plus a visual inspection by the College analyst, Mr. Ron Alexander. Prizes were awarded to the first and second placed hays in a field cured class and in a cold or warm air-blown class. In addition a tankard was awarded to the best overall hay. The table gives the entries and their scores. Winners were as follows:

Field cured hay -	1st	R.M. Graham, Kirkland, Courance, Lockerbie.
	2nd	R. Fleming, South Milton, Glenluce.
Cold or warm blown hay -	1st	J. Logan, West Bankside, Kilbirnie.
	2nd	F. & J. Hunter-Blair, Marbrack, Carsphairn.

In presenting the awards Dr. Ron Harkess pointed out that 24 per cent of the Scottish hay crop was made in the area covered by the SWSGS. Some of the key points towards improving hay quality includes selection of the most suitable grass species, timely cutting, rapid field work to exploit any dry periods and finally some consideration could be given to a blown air system possibly of the cold air type.

Although entries only totalled fourteen this year it was considered a good start and it is hoped that next years competition will draw a larger entry. There was also the possibility that a further trophy would be donated to the Society.

Field Cured Hay

Rank	Code	% DM	% CP	D value	Analysis marks/90	Visual marks/10	Total marks/100
1	DH 1	84.0	11.0	60.1	57.20	10	67.20
2	WH 2	85.7	15.6	55.6	58.25	6	64.25
3	KH 5	82.2	12.6	57.1	53.50	7	60.50
4	WH 5	83.5	8.7	57.9	47.95	10	57.95
5	WH 1	83.7	6.7	60.4	49.05	7	56.05
6	KH 1	84.2	11.4	53.7	45.30	6	51.30
7	KH 2	84.0	8.3	55.7	43.00	8	51.00
8	KH 4	85.4	9.7	54.7	44.50	6	50.50
9	WH 4	84.5	9.1	54.3	42.05	8	50.05
10	WH 3	84.6	9.4	52.9	39.90	8	47.90
11	AH 1	84.3	9.8	52.0	38.75	6	44.75

Cold or Warm Air Blown Hay

1	AH 2	86.6	17.9	61.4	71.10	10	81.10
2	KH 3	85.9	12.0	54.9	49.75	10	59.75
3	AH 3	84.1	11.1	55.1	47.45	10	57.45

Discussion

The Chairman opened the discussion by asking the winning hay makers to describe their systems. At West Bankside, the aim was to keep the swath on the move and not exceed 4 days in the field. Choice of grass could aid quality but date of cut was very important. Mr. Logan felt that total reliance on weather was too risky, so all hay was conditioned in a six bay cold blow storage system. Blowing started once the ducts were covered by 15 layers of bales and continued for two weeks, then at intervals if heating was detected.

At Kirkland cutting was around the third week in June and reliance placed on sun and wind, so to quote Robert Graham 'good hay is a gift from God!' Cutting was closely followed by turning, on the third day it was turned twice and baled on days four and five.

Turning to the silage competition the Chairman asked Mr. McKay to describe the silage making activities at Raith Farm. 70 acres were cut in three days, Tuesday to Thursday and grass ensiled by Saturday (22 May). Once cutting and carting started it was 'hell for leather'. Seed mixtures were based on HF41 for two year leys (18lb Italian and 16lb perennial ryegrass). Fertiliser for the first cut was around 100 units N with 20 units each of P_2O_5 and K_2O. For second and third cuts 1400 gallons slurry and 60 units N per acre were applied. Silos were covered with plastic sheets but accepting the Judge's remarks this activity will need further improvement!

The discussion was then opened to the meeting. Several questions centred round the lower silage D values obtained in this year's competition. Reasons given included: lack of sunshine caused low sugar contents; the mild open spring gave a longer growing time before cutting; ear emergence was a week earlier than 1975; wet weather prolonged the wilting period; delayed cutting awaiting better weather reduced D values; increased soil contamination; large effluent flows caused losses in soluble carbohydrates.

The discussion then moved on to the feeding of dairy cows and the correct use of roughage and concentrates. Forage analyses were guides but the cow must also be rationed on its merits. The first 100 days of lactation were particularly important and adequate feeding was necessary to ensure peak milk production. The Judge commented that no amount of concentrate feeding will make up for a deficiency in the quality of the basic roughage. Increments of 4lb concentrates do not go on giving a gallon of milk so silage quality was important, perhaps even more so after the first 100 days when full use could be made of silage and concentrate usage reduced. Certainly after 200 days, where silage was good there was little value in feeding concentrates. The Judge had tried self-feed dairy cake but found that cows ate only 10lb per day because the silage was of good quality (ie 69-72D). If silage was poor, they replaced their silage intake with cake. Concerning silage acidity and intake, sodium bicarbonate was on ad lib offer at Culvennan and a silage pH 3.8 - 4.0 was the target.

Concerning the use of concentrates, one contributor suggested it was better to reduce cow numbers than increase concentrate use but at the same time the quality of home-grown feed has to be improved. If acres were scarce drop young stock numbers before reducing cow numbers.

Another member felt it was dangerous to place oneself utterly dependent on bought-in feed, even with cheap hay at £50, which was not going to give much milk anyway.

Complete feeding was a topical subject. If the basic roughage was deficient then a complete diet could be the answer. On the other hand others felt it difficult to justify the capital cost of equipment and were concerned that the system would become too complicated with split herds, different rations and more mechanical problems.

A debate on controlled versus self-feeding drew several answers. Self-feeding was easy whilst controlled feeding (or easy feeding) requires extra machinery and space. Where acreage was limited, however, easy feeding could enable stricter control of the ration ingredients. Controlling the silage face with an electric fence was likely to restrict intake. A tombstone barrier being pushed forward by the cattle was less restrictive and there should always be some feed behind the barrier - if it was cleaned up, the cows were not getting enough silage.

Footnote: One question in the discussion asked if straw lost in covering an outside clamp was offset by silage saved. No immediate answer was given though one or two pocket calculators appeared. IAIN FRASER from Stranraer has been

persuaded by the Editor to put his ideas in writing so here they are:

Straw required

Assume a silage pit 100' x 40' (i.e. 500 - 550 tonnes capacity).

Total surface area = 4000 ft^2.

Assume area covered by 1 bale of straw = 4.13 ft^2, (bale size 18" x 33").

Bales required to cover pit = 968.

Assume bales round edge are put on edge, then 1000 bales would be required.

Assume 60 bales straw = 1 tonne. Therefore 16.7 tonnes are required to cover pit.

Assume price of straw = £18/tonne. Therefore total cost of covering (excl. polythene sheet) = £301.

Silage saved

Loss of silage per 1" of waste = 333 ft^3.

(Assume 1 tonne silage ≡ 50 ft^3) ≡ 6.7 tonnes.

Silage cost

Assume £10.50 per tonne made silage to include growing costs, harvesting and handling at contractors' rates, polythene sheet, additives, etc.

Loss per 1" of waste = £70.

If straw is a complete write-off, the conclusion is that if you can save more than 4" of silage being wasted over the whole pit then you can justify the cost of the straw. Silage costs are estimated at £10.50 per tonne, and this includes all growing and harvesting costs. Obviously if the calculation is done on the variable costs of growing the crop then a great deal more would have to be saved in order to justify the cost of the straw.

P.S. You can get tyres for nothing!

BRITISH GRASSLAND SOCIETY - WINTER MEETING, 1976

Report by

Andrew Brown, Roberton, Borgue

'Forage Crops - A Complement to Grassland' was the theme for the first day. Dr. R. J. Wilkins of GRI Hurley dealt with the limitations of grass for year-round ruminant production. Kale and fodder-radish showed no accumulation of dry matter after November. During the period from November to February, grass rested from August lost 30 per cent of its dry matter whereas kale only lost 11 per cent. In the average year grass failed to achieve its optimum summer growth by about 20 per cent due to water shortage at some time in the growing season and only tall fescue came near to achieving its potential without irrigation.

Dr. Wilkins went on to discuss the merits of adding Sodium hydroxide to upgrade low quality forage and suggested that this showed considerable promise although the machinery at present available was limited. Ground then pelleted grass showed some benefit using low quality material, but well below the results from similar chemically treated grass or straw.

Finally he dealt with the problem of providing feed which can be protected so that digestion takes place in the alimentary tract, rather than in the rumen. As examples only about 22 per cent of protein in ensiled material passes the rumen compared with 32 per cent in fresh grass, 71 per cent in dried grass, 73 per cent in silage with formic acid, and 88 per cent with dried sainfoin. It was suggested that feeding dried grass as part of the ration might be helpful and that more work was needed to find a method of protecting fats so that they too may pass through the rumen.

A. E. Cox of ADAS, Devon, then dealt with the choice of crops which might be grown to supplement grassland. He dealt with maize silage and catch crops such as stubble turnips as well as fodder beet, suggesting that in the S.W. of England the latter gave the highest yields of dry matter per acre.

A combined paper from Dr. J. H. D. Prescott and W. Rutter was delivered by the latter on the subject of the complementary role of forage crops and other feeds in livestock production from grassland. The problems of forage growing being: a) increased stocking rate on the remainder of grassland during the establishment period, b) unreliability of establishment and yield, c) unsatisfactory use, d) possibility of animal disorders such as goitres from heavy grazing of brassicas; 16 - 24 kg per day of kale is enough.

With dairy cows, fodder crops can partially replace roughage in early lactation, in mid-lactation they can reduce reliance on concentrates and in late lactation may replace concentrates provided that vitamins and minerals can be fed. For example, a ration of 30 kg silage may be replaced by 14 kg silage and 24 kg swedes in the feeding of fattening cattle. Swedes of course may be used after lambing to maintain lactation and up to 6 kg per ewe may be fed.

A good crop of swedes will provide food for 6,000 lamb/days per hectare. Compared with this the results from stubble turnips will be economically doubtful in finishing lambs, but they may have a place as a pioneer crop in hill improvement.

The last paper of the day was given by M. Hutchinson of I.C.I., Henley Manor, Somerset on the subject of the practical application of complementary forage crops and supplementary feeds. The aim at Henley Manor being to achieve £650 per acre output with spring calvers averaging 4773 litres, with no concentrates being fed in the autumn until steaming-up at New Year and with all concentrate feeding stopped in May. To prevent staggers grazing pastures are sprayed in May with a magnesium solution. Hay is fed to autumn calvers and this is replaced by straw after New Year. Kale is fed from October until December for these cows.

The second day of the meeting was a series of offered papers on various aspects of grassland farming and a brief summary of each paper follows:

P. Wilkins, Aberystwyth. Selection for resistance to crown rust and tolerance to Ryegrass Mosaic Virus in Italian ryegrass. Disease in IRG is an increasing hazard. RMV is present for the life of the plant whereas rust is a fungus entering the plant after cutting or damage. Population derived from Po Valley material showed high degree of infection by crown rust but minimal infection by brown rust. Selection for resistance to crown rust and RMV generally results in a decrease of soluble carbohydrate content and total annual yield.

A. Scott Laidlaw, Belfast. The effect of heading of perennial ryegrass and date of first cut on red clover/perennial ryegrass swards. The presence of PRG adversely effects red clover if the date of cutting is delayed, but the presence of the red clover maintains the digestibility of the sward well into June. No nitrogen except 1 cwt. of Nitro-Chalk at sowing need be given, though 2 cwt. of muriate of potash should be applied in spring followed by extra phosphate and potash after each cut. Diploid varieties gave better results in the first year but tetraploids were best thereafter, with Hungaropoly being resistant to clover rot.

A. H. Charles, Aberystwyth. Reaction to dalapon. The use of dalapon as a selective herbicide for sward improvement depends on the greater sensitivity of rough stalked meadow grass and Yorkshire fog as opposed to perennial ryegrass though the sensitivity of the ryegrass varies and it is important to use varieties which will quickly fill the gaps left by the killed species. 5 - 6 kg of dalapon per hectare should be used in early July for the best results and the quickest recovery of the ryegrass.

C. Dibb, ADAS, Hurley. Permanent grassland in the West Midlands. Factors affecting output were nitrogen application and the presence of preferred species of grass. There was no correlation between the age of the sward and the dominance of preferred species. As would be expected higher stocking rates were achieved from swards receiving most nitrogen, but the age of the sward made no difference.

A. Younger, Fisons, Devon. The use of fertilizer nitrogen on continuously grazed swards. In 1975 350 kg per hectare of nitrogen applied in five equal dressings produced 10,500 kg of dry matter per hectare, but the results for 1976 were upset by prolonged drought in the area of the trial (N. Somerset) with 80 per cent of the seasons growth taking place during the first two months of the grazing season. The percentage of N in the dry matter was monitored but was never too high to be dangerous to stock.

M. D. Brooke, ADAS, East Midlands. Optimum quality of silage for milk production. It was shown that increasing stocking density is more important in achieving a high gross margin per hectare than trying to save concentrates through very high quality silage. So if an increased number of cows can be carried, a later cutting date is acceptable and a figure of 65 per cent digestibility would appear to be adequate.

P. A. Dover, High Mowthorpe EHF. Fattening store lambs on swedes and silage. Filling-out percentage was higher in all cases where swedes were fed rather than silage. Trials were set up in 1975 and 1976 involving five different feeds.

1)	Swedes folded in situ	Grams/day liveweight gain	49
2)	Swedes chopped and fed in open yard	" " "	160
3)	Swedes chopped and lambs housed	" " "	129
4)	Silage with barley, lambs housed	" " "	117
5)	Silage with swedes, lambs housed	" " "	101

Unlike the lambs kept outdoors on concrete all housed lambs suffered from foot troubles. Small chipped swedes showed a 10 per cent advantage over conventional large slices.

N. E. Young, Hurley. Nutritional demands of ewes in early lactation. The requirement of the ewe is higher in early lactation than in pregnancy. At stocking rates of up to 5.5 ewes per acre the sheep were able to graze enough grass and showed no benefit from concentrate feeding. At 8 ewes per acre there was a significant advantage in feeding concentrates. For the trial the mean lambing date was the 30 March.

FORAGE CROPS

Speakers:

1. R. M. Graham, Kirkland, Courance.
2. F. McIntyre, Kirminnoch, Ervie.
3. W. G. W. Paterson, Agronomy Department, The West of Scotland Agricultural College, Auchincruive, Ayr.

A meeting held on 17 March, 1977 at the Village Hall, Glenluce. (SWSGS)

R. M. Graham - Kale

Kale growing and utilisation was the subject discussed by Robert Graham. Direct drilling has been practised at Kirkland for 15 years because of the problem of making enough silage to feed the 500 head of stock on the farm.

An old pasture due for renewal is first cut for silage then sprayed with Gromoxone and the kale direct drilled. Direct drilling is a 'must' since it gives some firmness to the soil when the dairy cows start grazing. Another 'must' is that the seed be sown by the end of June and the third golden rule is that the crop is strip grazed - cutting and carting are out. In principle, machinery is kept off the fields after October. The electric fence is placed in front of the crop so that the cows graze under or over the wire. This ensures better utilisation. It is important to use the fence efficiently and avoid break-throughs and it is worthwhile taking time during the first day or two of grazing to watch that break-outs do not occur.

The preferred variety is Maris Kestrel because the cows like it, it grows to a sensible size and the proportion of leaf to stem is good.

Advantages A well grown kale crop provides more cow 'munches' than the equivalent acreage of silage. Once the field is partially cleared it can be slurried behind the cows so avoiding mechanical damage to grass silage fields. A change in the cows diet is important especially if the silage is not of the best quality and the daily routine of grazing kale gives an opportunity to exercise the cows. Yards can be scraped more easily once the cattle are out.

Disadvantages Good spraying technique is necessary to avoid missed strips. Since the grass is sprayed 10 - 12 days after the silage cut, it can be difficult to see the wheel marks. If there are docks in the field, their resistance to the spray enables them to thrive when the grass is burned off and the 120 units N/acre applied for the kale also makes them grow well! Despite the dead turf giving some resistance to soil poaching, the cows do get dirty and udders must be properly washed at milking time. Perhaps the biggest disadvantage of kale is when it is frosted. The cows only nibble at it when this occurs and waste is high. Ideally the kale should last from mid October till the first week of January and thereafter the cows are housed for the remainder of the winter. This last winter the cows were kept off for 3 weeks due to frost. Certain nutritional and physiological disorders have been associated

with kale diets, such as kale anaemia and aphosphorosis. Cows at Kirkland do receive high P minerals as a precaution and with a calving index of around 370 days, clearly infertility is not a problem.

Some Facts and Figures The yield of kale is around 35 tons/acre (88 t/ha) of fresh material with a dry matter content of 14%. Chemical analysis indicate: ME11, DCP .4%, D value 69 - 70% (c.f. an average silage analysis: ME 9, DCP 4%, D value 60% - not Kirkland silage).

Allow about 3 yards (3 m) fence per cow, and if possible use a bigger field than area of kale required. This leaves an unsprayed grass lie-back area (eg 18 acres kale in a 20 acre field). Since the fence is in front of the kale and not in the crop, as long a face as possible is best. Kale grazing with plenty of room gives the heifers a chance, especially if they tend to be bullied on a self-feed silage system at other times of the day.

Costs of growing kale in 1976 were approximately as follows (per acre): chemical £5, spraying £2, seed £11, drilling £5, fertiliser 6 cwt (2:1:1) £21 - a total of £44/acre.

The 1977 costs will be in the region of £67/acre due to the increase in chemicals, fertiliser and seed prices. Slug pellets are now recommended costing £1/acre.

What's it worth? The milk produced gave a margin over bought feed and labour of £14,400 between October and January. Two-fifths of the production is accredited to the kale (the remaining three-fifths to the silage) which is £5,760 or £360 per acre. Less the £44 cost this gives a gross margin of £316 per acre.

F. McIntyre - Maize

Maize growing on coastal fields of a Cumbrian farm triggered off Fraser McIntyres interest in this crop. In 1975, 6 acres and in 1976, 3 acres were sown purely as an experiment.

Atrazine was applied at 4pts/acre and seed sown at 50,000 seed per acre in order to produce a dense stand for silage making. Fertiliser was 6 cwt of 15:10:10 per acre and the field was caned and threaded. Despite the fact that the field was overlooked by a rookery, bird damage was negligible.

Results 1975 produced a magnificent crop, 8 - 10 ft tall and 25 tons green material per acre. The dry matter was 31% when harvested on 10 October. The yield of cobs which were fully mature reached 2 tons per acre. The variety was LG11, an early type. An area of Caldera 535 had been less successful and in October its dry matter was only 17%. The cobs did not mature on this late variety.

Harvesting the maize crop was a straightforward operation with the maize attachment - no stones, no wilting, no double cutting, easy to blow into the tower and easy to unload. The analysis of the silage was D value 70, CP 10.85%, SE 48.8 (ME 10.8). 1976 had a long dry summer in which the maize grew well but October was too wet to harvest the crop. So during November the maize was zero grazed for beef cows and calves, a ration which they obviously relished. The 3 acres lasted for three weeks.

Cost and Future Fertiliser £24, seed £12, spray £5, drilling £2 plus a little casual labour, giving a total cost of £44 - £47/acre.

The yield attained from the 6 acres was equal to 6 acres cut twice (ie 12 acres) for grass silage, so maize is an attractive crop on a cost and production basis. The last two summers were ideal maize growing seasons but one of the autumns was too wet to harvest the crop. Much more information is needed and also more appropriate varieties for Scotland before it will be safe to rely on a large acreage of maize. Nevertheless, it is a crop worth watching.

W. G. W. Paterson - Brassica crops

A review of the College trials on the brassica crops - swedes, turnips, stubble turnips and kale showed continuing interest in these forage crops. The harvesting method for swedes and turnips is the Bruce harvester which copes with roots grown on the flat. Kales are cut with a maize attachment on a 717 forage harvester, one drill being cut out at a time. Rape is also harvested with the 717 and stubble turnips are lifted by hand.

Swede varieties were grown for the National List Trials as well as for compiling the Colleges Recommended list. Wilhelmsburger and Rota Øtofte yielded well at 69t/ha fresh or 7.4t/ha dry matter. Doon Major yielded 71t/ha fresh and 6.2t/ha dry matter. Balmoral, a good yielder in the North, was poorer in the South West (45t/ha). Doon Major was a softer type and more susceptible to frost damage but could be useful where there was teething trouble in stock. This variety is unfortunately very susceptible to finger and toe (club root) whereas Wilhelmsburger and Marian (63t/ha) show good resistance to the disease. If swedes are to remain in the field for an extended period it is recommended that several varieties be grown to give a spread of hardiness rather than grow the whole area to one type.

Autumn kale yields 8 - 10t/ha dry matter, Maris Kestrel being a good variety with Proteor as a good seconder. Marrow stem kales are not so hardy.

Winter kale again Maris Kestrel and Proteor are among the best varieties for this purpose and yielded 8.4 and 8.7t/ha dry matter respectively.

Forage rape showed very little difference among the varieties under test. Rapes are the most susceptible of the brassica crops to club root. Nevin is resistant to some races of club root fungus. Yields ranged from 5.0 - 5.7t/ha fresh yield (3.2 - 3.6t/ha dry matter).

AT YOUR SERVICE

Hamilton of Larkhall

can now meet your needs from

FOUR LOCATIONS

LARKHALL	881816
STIRLING	2481
CARNWATH	513
UPLAWMOOR	567

Main Dealers for

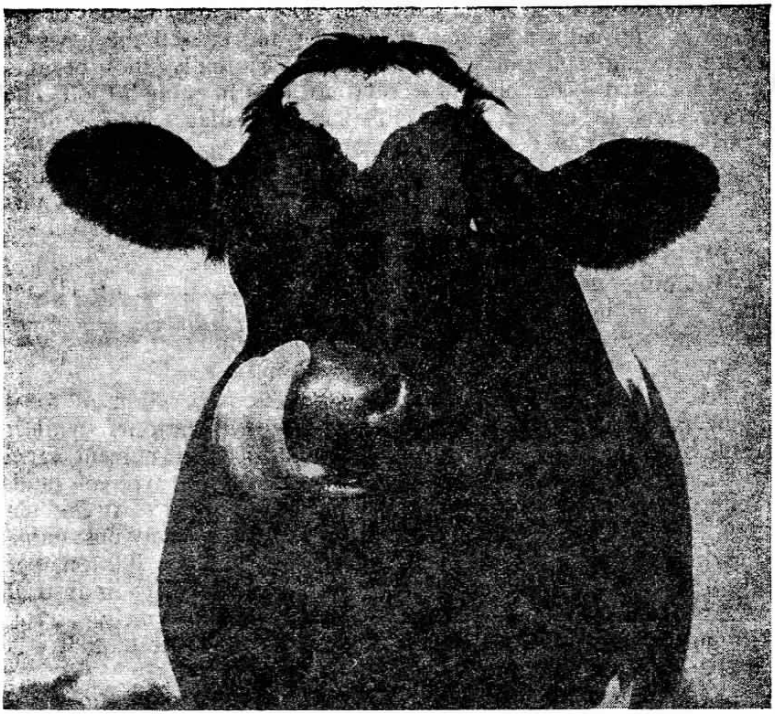
DAVID BROWN

NEW HOLLAND

VICON

P.Z.

HOWARD



Plenty of what she fancies does you good

Circle Leys are designed to be the most palatable grass mixtures in farming.

Ask your Nickerson's representative or, better still, look at your neighbours' cows – they're probably enjoying some already.

THE CIRCLE LEYS

NICKERSONS KNOW ABOUT GRASS

NICKERSONS

SEED SPECIALISTS LIMITED

25 Westgate
North Berwick
East Lothian
Tel. North Berwick 3821

Yellow turnips Yields ranged from 22 - 55 t/ha of roots (2.3 - 4.7 t/ha DM). Invincible Yellow and Bruce were the top yielders (55 and 42t/ha respectively).

Stubble turnips A date of sowing trial gave the following dry matter yields: 21 June 6 - 7t/ha, 16 July 3.5 - 5t/ha and 21 August 1 - 1.5t/ha, so the advantage of timely sowing is clearly illustrated. Good yields will not be obtained if sown after a grain harvest. There was little to choose among the 11 varieties tested. Civasto, Debra and the Dutch types in general show good resistance to club root.

A grazing trial has been conducted over the past two winters (1975, 1976) to study the utilisation of rape and stubble turnips by lambs. The trial has also been used to test techniques for evaluating the yield and productivity from grazed forage crops. Lambs (Blackface wethers) were stocked at three rates to give a daily dry matter allowance of 8, 6½ and 4½ per cent of lamb liveweight. The net carcase gains in kilogrammes per tonne of crop dry matter on offer were 30.6, 35.2 and 41.4 for the three stocking rates respectively on rape and 31.9, 31.0 and 31.6 on stubble turnips. It would appear therefore that rape is better for finishing lambs than stubble turnips particularly at high stocking rates.

Discussion

Kale The efficiency of use of kale prompted considerable discussion. The speaker estimates about 90% utilisation provided that the fence holds. Break-outs lead to increased wastage. The fence is moved daily and sometimes twice per day. Three shifts a day tended to give more waste because the cows don't graze all the kale and they will not eat what is left next morning. It is important therefore to have a clean start every day.

Nutritional problems are only likely if the kale is a substantial proportion of the diet. A guide would be to exercise care if the kale exceeds one-third of the daily dry matter intake. The symptoms of kale poisoning are red pigment in the urine and an apparent dosiness in the stock.

Kale is a useful supplement to autumn grass and the suggestion was made that kale grazing should start earlier to make up for the short falls in grass from September onwards rather than switching from all grass to all kale grazing in October.

The problem of missed strips at spraying can be overcome by applying 3 pints/acre then wait a few days and go over with a further 2pts/acre.

Maize Time for sowing maize depended on soil temperature. Ideally this should be around 50°F (10°C) and this is usually reached in late April and early May. Maize can be ensiled successfully in a clamp but it should be narrow and deep. Avoid exposing a large face area. Silage from a tower can heat up between feeding times and the same will happen in clamps.

The same forage harvester for cutting grass is used for maize but the row harvesting mechanism is required. A similar setting and knives are also used

but the back plate is replaced with a rasper. The varieties at present available are harvested in October but the ideal would be an earlier maturing crop for cutting in September.

Forage Crops The critical soil pH levels for brassica crops was raised especially where used as pioneer crops. pH 6 is the ideal for most crops and swedes are better at this level. Turnips will probably grow quite well at pH 5.5 as will the rapes. Kale would be better at 5.7 - 6.0. But warning was given about applying too much lime as this could lead to raan in turnips and swedes.

Aerial seeding of Dutch white turnips (stubble turnips) was discussed. In 1976 Kirkland tried 20 acres at a cost of £9/acre for seed, slug pellets and sowing charge. Cost of fertiliser would be an extra. Last year lack of moisture upset the exercise and once the rain did come germination was very varied. It has been decided to repeat the exercise again this year. Late July to mid August would appear to be the most appropriate seeding time.

DO YOU NEED A SILAGE ADDITIVE?

The test chart below has been produced by PBI Ltd. as a guide to the need for silage additives. It takes into account type of crop, stage of growth, weather at cutting, length of wilt and system of harvesting. The chart applies to any type of silage additive.

	Points if answer yes	Your Points
What is the predominant constituent?		
Lucerne, clover, kale, sugar beet tops	5	
or Timothy, meadow fescue	4	
or Perennial ryegrass	3	
or Italian ryegrass	2	
or Maize, pea haulm, cereals	1	
What is the crop's growth stage?		
Leafy	3	
or Stemmy	1	
How much nitrogen fertiliser was applied?		
Over 100 units (heavy)	3	
or 30-100 units (average)	2	
or Under 30 units (light)	1	
What is the weather at the time of cutting?		
Dull and wet	3	
or Clear and dry	2	
or Brilliant sunny	1	
Has the crop been wilted?		
Not at all	4	
or Slightly	3	
or Moderately	2	
or Heavily	1	
How is the crop being harvested?		
Forage Wagon	4	
or Single chop	3	
or Double chop	2	
or Precision chop	1	
Is some soil being harvested with the crop? (e.g. molehills, dust or mud)	4	

Score			
1	-	6	no additive required
7	-	10	additive not essential but a wise insurance
11	-	12	additive required at lower rate
13	&	over	additive required at higher rate

GREEN GOLD - ITS USE AND MISUSE

Dr. J. Frame

West College, Auchincruive

A meeting of the CSGS at the Silver Bell Hotel, Lanark, on 3 March, 1977.

Much is heard about black gold (oil) but green gold (grass) is just as important a national resource, bearing in mind that about three-quarters of the U.K. is under grass.

The national "average" picture is depressing - many swards are dominated by bentgrass and are therefore substandard; the level of fertilizer N use is low (less than 100 units/acre); there is excessive concentrate feeding at summer grazing; stocking rates are low (about 1 acre of grazing per adult cow). The upshot is low animal production per acre, whether expressed as milk or meat.

Advantage from good grass varieties

The use of recommended grass varieties in seeds mixtures confers a potential grass yield and stocking rate advantage. To illustrate this, yield superiority of 2000lb dry matter per acre has been obtained from a good compared with a poor grass variety. This superiority is equivalent to 66 cow grazing days (CGD); if 50 acres grassland are sown to a top variety, it would carry 3300 CGD extra in total. Put another way, an additional 20 cows could be kept on the 50 acres for the whole grazing season. Alternatively, the 2000lb yield advantage could make 180 tons silage at 25 per cent DM and this could keep 20 to 30 cows for the winter period. Trying to obtain 2000lb dry matter by additional fertilizer rather than by the use of an inherently superior variety could cost £10 per acre!

Importance of nitrogen

Nitrogen (N) supply is the major determinant of grass yield. A high proportion of grassland receives no fertilizer N nor does it contain a satisfactory proportion of N-supplying white clover. Inevitably grass yield per acre must be low. Even if efficiently used, animal output per acre cannot be high.

Sources The main sources of N are the soil, which supplies 30-150 units per acre, white clover, which can supply 0-150 units per acre depending upon the proportion of clover in the sward; urine/dung from the grazing animal which can supply 30-120 units N per acre depending upon stocking rate, and nitrogenous or compound fertilizers, which can supply 0-350 units depending upon the management intensity desired.

Prudent use of N Fertilizer N should be applied periodically throughout the season and not in few massive doses. The less frequent the defoliation (grazing or cutting), the greater response there is of grass yield to applied N. However, if the interval between defoliations is excessive, the herbage may be

too low in quality.

Effect of growth interval (24-week period)

Growth interval	Grass yield per defoliation (lb)	Annual yield (lb)	Relative yield
8 x 3 weeks	1250	10,000	100
6 x 4 weeks	1833	11,000	110
4 x 6 weeks	3125	12,500	125

Fertilizer N should be applied promptly after grazing (in rotational grazing situations) or cutting to ensure speedy yield response and to allow sufficient growth time before the next defoliation for yield response to develop. If the time for growth (rest interval) between applying N and defoliation is short, or if excessive N is given relative to the rest interval, the sward cannot use the N effectively to increase yields.

Yield response to N The average annual yield response to fertilizer N for grazed swards with rest intervals for growth of three to four weeks is 20 to 30 lb dry matter per unit N applied. The greatest response occurs when seasonal growth is at its more vigorous, that is, May-June, when moisture, sunshine and temperature are not limiting. The least response takes place when daylight is short, temperatures are low, or if the weather is very dry. Based on a recent Auchincruive experiment, where the grass was harvested every 24 days, average responses shown below were obtained. Had the growth time allowed been 28 to 30 days, yield response would have increased by about 10 per cent.

Month	Yield response lb dry matter per unit N
April	5 to 15
May	15 to 25
June	30 to 40
July	20 to 30
August	15 to 25
September	10 to 20
October	5 to 15

Average annual grass yield at various fertilizer N levels

Sward (units N per acre)	Grass dry matter (lb per acre)	Acres per cow
Grass (No N)	3000	1.8
Grass (100 N)	5500	1.0
Grass/clover (No N)	6000 to 7000	0.9 to 0.8
Grass (200 N)	8000	0.7
Grass (300 N)	10500	0.5

To illustrate the influence of fertilizer N, a hypothetical situation could be:

70 dairy cows kept on 84 acres given fertilizer units of 63N, 20 P_2O_5 and 20 K_2O; fertilizer cost is £865 (£10.30 per acre)

70 dairy cows kept on 35 acres given fertilizer units of 300N, 40 P_2O_5 and 40 K_2O; fertilizer cost is £1330 (£38/acre)

49 acres have been released at an extra cost of £465 (£9.50 per acre!)

The area released at this cheap "rent" can be used to carry more stock or to grow barley for example, with the not too difficult likelihood of profitable returns.

At current costs, the fertilizer N is a good buy provided the extra grass grown is used effectively by stock. It is not economic to produce more grass than there is stock to handle it.

A guide to current costs is: N, 10p per unit; P_2O_5, 14p per unit; K_2O, 6p per unit.

Sufficient P_2O_5 and K_2O should be applied but no more than absolutely necessary. The high cost of P_2O_5 should be noted.

Phosphate

P_2O_5 is important for root growth, particularly at establishment. Some of the P_2O_5 applied then should be water soluble type e.g. superphosphate. Established grass with its dense root system can make use of the less soluble types e.g. basic slag. Heavy clay-type soils require more P_2O_5 than light sandy soils since P_2O_5 is locked up more readily. A 10-ton silage crop removes around 40 units P_2O_5 while a 2-ton hay crop removes around 25 units P_2O_5.

Potash

A lack of K_2O in the soil limits yield response of a sward to applied N. When conservation crops are cut and removed, soil K_2O reserves are quickly depleted unless compensatory K_2O is applied via compound fertilizer or slurry, for example. Light soils have less reserves than heavy soils. K_2O is best applied in increments for the crops taken, not in massive doses which leads to 'luxury' and unnecessary uptake. In a 3-year trial given 300 units N/acre per annum and cut for silage, yield of the sward given no K_2O fell by the third year to only 61 per cent of the yield where adequate K_2O was applied. A 10-ton silage crop removes around 80 units of K_2O while a 2-ton crop of hay removes around 70 units K_2O.

As a rule of thumb, ½ unit of K_2O per unit N is required in conservation systems (as opposed to ¼ unit P_2O_5) but the K_2O requires upgrading to ¾ unit per unit N on light sandy soils. In grazing situations, only 30-40 units P_2O_5 and 30-40 units K_2O are required per annum. Periodic soil analyses

provide a good guide to manuring requirements.

Slurry

The rational use of slurry in a farm fertilizer programme can lead to major savings in the cost of bought fertilizers. Estimates of contents of N, P_2O_5 and K_2O in undiluted animal excreta vary but generally acceptable conservative analyses of plant foot units immediately available per 1000 gallons, assuming urine is collected as well as faeces, is:

	N	P_2O_5	K_2O
Cow slurry	22	6	40
Pig slurry	36	8	14

For farmyard and poultry manure the figures per 10 ton are:

	N	P_2O_5	K_2O
FYM	22	16	70
Hen manure	140	60	80

The plant food unit value of slurry largely depends upon the extent of dilution with added water. For example, if an equal volume of water is added to excreta, the plant food value per 1000 gallons cow slurry becomes 11N, 3 P_2O_5 and 20 K_2O.

Lime

Concerning lime, the effects of calcium, which is contained in lime, are: improves soil chemical environment by neutralizing acidity; improves soil physical environment; increases calcium content of herbage; improves acceptability of the herbage and assists development of better herbage species; speeds up decomposition of undecayed herbage mat in swards which have developed under acid soil conditions.

Application rates should be determined by soil analyses but will not normally exceed 2-3 tons ground limestone per acre at a single dressing. Magnesium limestone can be used if magnesium deficiency is likely. It should be noted that many of the highly concentrated modern compound and nitrogenous fertilizers contain ammonium nitrate. This has an acidifying effect on the soil over and above that of leaching via drain water, removal in crops and possible air pollution in industrial areas. As a guide, nearly four cwt ground limestone per acre is required to neutralize 100 units of N of the ammonium nitrate type. It can be readily seen that under intensive N manuring soil acidity can build up quite rapidly in comparison with the past when less concentrated forms of N fertilizer had built-in calcium.

Renovation of existing grassland

Much existing grassland, mainly of a permanent pasture type, is of low productivity. This may be due to several reasons, e.g. little fertilizer given, a sward composed of inferior grass species or a sward riddled with weed species such as buttercups, docks or even rushes. The value of the grass species present depends upon location; for example, the fine-leaved bent grass type is acceptable, indeed desirable, in hill land situations but in lowland situations, it should be replaced by the more productive ryegrasses.

Improving value of existing sward The options are soil treatments, sward treatments or a combination of both; within these, several individual treatments are possible.

Soil treatments			Sward treatments		
Calcium (liming)	Phosphate Potash Nitrogen	Drainage	Burning Cutting Grazing	Herbicides	Fencing

The treatments are largely self-explanatory. Burning, cutting or hard grazing are simply ways of reducing accumulated growth, which can build up in undergrazed situations e.g. hill land. These treatments give the opportunity for young nutritive growth to emerge. Grazing allows recycling of plant food locked up in the accumulated growth, via animal return of dung and urine to the sward.

Introduction of improved grass and clover species Appropriate treatments may be selected from those outlined above, but in addition adding a soil/sward option:

Soil/sward treatments

Ploughing	"Chemical" ploughing	Sod seeding
Rotovation		
Discing/harrowing		
Surface seeding		

These represent sudden to gradual means of preparing the ground to introduce improved grass and clover species. In the case of "chemical" ploughing, due regard must be made to timing of the grass-killing herbicide in relation to stage of growth of the grasses being sprayed. Some of this work is still in a "developmental" stage rather than a proven technique. The same conclusion applies to sod seeding which is a possible quick means of introducing improved species into the existing sward by partial cultivation, that is, gouging out spaced slits.

Animal effects

Grazing animals trample the sward, selectively defoliate plants or parts of plants and return 70 to 90 per cent of ingested nutrients as urine and dung. Grass species are structurally adapted to varying degrees of trampling and defoliation. Only when their tolerance levels are overrun is damage severe or irreparable.

YOUR FARMELECTRIC MAN

BILL GODLEY
located at S.S.E.B.,
154 Montrose Cres.,
Hamilton ML3 6LL
Tel: Hamilton 21144
Responsible for
Central & South
West Scotland Area.

MALCOLM FRASER
located at S.S.E.B.,
Dellingburn Street,
Greenock PA15 4TJ
Tel: Greenock 25386
Responsible for Glasgow/
Clyde Area.

These are your FARMELECTRIC men. They are your contacts with electricity's farming advisory and sales service. This service is the logical development of electricity's expanding role in agriculture and it's at your disposal NOW. It's the source of information and guidance on how best electricity can meet your particular requirements in the drive for increased productivity and efficiency on the farm.

USE ELECTRICITY WISELY

South of Scotland Electricity Board

PROGRESS MIXTURE

* The Top Selling Medium-Term Lay Mixture

* For Maximum Live Weight Gain, and

* High Milk Yields

* Contains the most up-to-date Winter Hardy and Persistent Varieties

For Intensive

Grazing

and Cutting

sinclair, mcgill

THE GRASS SEED SPECIALISTS

AYR 63271 KELSO 2121 HADDINGTON 3304

Trampling can bruise or destroy growing points, leaves, stems and roots so grass yield is reduced. Changes in sward composition may be induced since species differ in tolerance. Perennial ryegrass is the most tolerant. Trampling can also damage top layers of the soil, main symptoms being low water infiltration and poaching.

Examples of extent of trampling

Attribute	Cow	Sheep
Total hoof area (in^2)	52	13
Grazing season (days)	200	200
Stocking rate/acre	2	8
Walking distance/day (yd)	3520	3520
Step length (yd)	0.5	0.2
Mean times trampled/acre	12	29

To minimise the damaging effects of trampling, management should include such practices as:

(a) improving soil drainage where necessary;
(b) achieving high soil fertility so that vigorous swards develop;
(c) establishing tolerant species and varieties;
(d) concentrating, if possible, on long term swards;
(e) using selected 'sacrifice' areas or fields, that are due for ploughing, to bear the brunt of damage at critical times;
(f) reducing the amount of walking by stock as far as is practicable by good field layout, the use of tracks and the provision of a plentiful supply of grass.

Intake of grass by stock is determined by the quantity of herbage available, its acceptability and its overall quality or digestibility. Stock usually select grass of higher quality than the average quality of the grass available to them. In intensive grazing systems where grazing pressure is high the opportunity for selective grazing is minimized and the majority of grass species may be equally grazed. It is therefore incumbent upon the operator to present good grass at all times.

A large proportion of the grass nutrients ingested is excreted, but subsequently, up to a half may be lost by leaching, volatilization or fixation in the soil. Urine is the richest source of N and K_2O. Dung is rich in lime and P_2O_5 but requires microbial action before the P_2O_5 becomes available.

Grazing systems

Grazing systems are attempts to:

a) overcome the problems caused by variable grass growth rate, potential variation in grass quality and the trampling/selective grazing/excretal return effects of grazing stock.
b) aid the stability and continued productivity of pastures.

c) utilize the grown grass with a minimum of waste and still attain maximum intake by the grazing stock.

d) achieve high animal output per acre.

Grazing system is one link in the chain of grass management. However efficient, it will not compensate for other weak links such as low grass yield or low stocking density. At similar fertilizer N levels, intensive rotational grazing systems can give greater grass yield than less intensive systems. Animal output per acre is therefore higher, provided stocking rate is increased to utilize the extra grass. STOCKING RATE, that is, animals per acre per season is the key factor in grassland utilization.

Influence of stocking rate (Gordon)
(Milk production (gals/acre), 3-year average)

N level Units N/acre	Stocking rate 2 cows/acre	3 cows/acre
310	1074	1392
560	1070	1503

Flexible management is necessary if intensive grazing systems are to be fully effective. The cost of the system must not exceed the value of the extra product obtained.

Farmers are not all motivated towards the goal of obtaining every iota of output. Also, farm labour is becoming scarce and older. Hence there is interest in the potential of simple, rigid rotational systems and more recently, set stocking even although they may be less productive. The change of attitude from before is that simple systems need not be associated with low overall intensity of grassland management.

Set stocking The main advantages are easy, simple installation and operation. The main disadvantage is achieving the correct grazing pressures over the season, since growth rates of grass vary seasonally.

Rotational grazing There are many variants of what is essentially "on-off" grazing in which periods of grazing alternate with periods of rest. Period lengths vary with the systems. Built into rotational systems is the possibility of closing off some fields for conservation at times of surplus grass growth and bringing them back into grazing when grass growth slows down.

In rotational systems, there is also the choice of the 2-block system of separate grazing and conservation blocks, the 3-block system of grazing, cutting and grazing with cutting or the 1-block system of integrated grazing with cutting.

Rigid grazing systems Several rigid rotational systems have been developed for block systems where grazing and cutting are separate. They usually require modification in late season when grass growth slows down, for example,

by increasing the size of the grazing area, or reducing the stocking density.

Influence of rotational grazing (McMeekan and Walshe)
(Relative milk production (gals/acre), 4-year average)

Stocking rate per acre	Grazing system	
	Set stocking	Paddocks
0.9 to 1.0	100	110
1.1 to 1.2	110	125

Influence of rotational grazing (Conway)
(Liveweight gain per acre (lb). 3-year average)

Stocking rate per acre	Grazing system	
	Set stocking	Paddocks
1	450	410
1.75	610	640
2.5	500	770

Subdivision x liveweight gain per acre (lb). (MLC)

	Average	Top third
Set stocking	427	569
2 fields	555	687
Up to 4 paddocks	560	720
Over 5 paddocks	624	844

Herbage quality

Grass well-managed to give a succession of 3 to 5 week leafy regrowths forms an almost complete feed for grazing animals. The main principle is to produce a quality matched to the needs of the particular stock to be fed.

In early spring, it is often low yield and not low quality which reduce intake. A cow has to harvest around 30lb DM per day. This represents 145 sq yd at a field of 10001b DM per acre but only 48 sq yd at a field of 30001b DM per acre. Since cows belong to a "trade union" they will not work at harvesting beyond 8 to 10 hours or so per day. Thus if insufficient yield of grass is available, their grass intake will be unsatisfactory. In turn, their production suffers.

In late season, the quality of grass selected by grazing stock may be reasonably satisfactory, although possibly high in moisture. There may however be a low yield of acceptable grass, due to soiling of the herbage in wet weather, build-up of diseased or decaying grass at the base of the sward and proximity to old dung pats. Grazing pressure, that is the relationship between number of stock and amount of grass present may seem satisfactory. It

may however be excessively high because a proportion of the grass is actually unacceptable to stock.

As a generalization, supplementary feeding is not necessary, even for highly productive animals, for a large part of the grazing season, provided a succession of high quality regrowths is available. If fed in this situation, the concentrates simply replace grass and substitute a dear feed for a cheap one.

The pros and cons of the various grazing systems are summarised as follows:

	Merit points out of 4			
	Strip	Paddock	Rotational	Set
Simplicity of management	1	2	3	4
Labour	1	2	3	4
Cost	3	1	2	4
Flexibility	4	3	2	1
Grass production	4	3	2	1
Efficiency of utilization	4	3	2	1
Poaching	1	2	3	4

Silage Improvement in silage making and silage utilization have been intensively featured in recent years, so it is only necessary to draw attention to the various West College advisory leaflets available and to re-state the 'golden rules'. These are:

1. Sow quality - predictable ryegrass swards
2. Apply correct fertilizers
3. Cut at the correct time, making use of College forecasts published in the farming press and given out on the BBC
4. Wilt, if possible, and for no longer than 24 hours
5. Chop the grass to 1 to 3 inches
6. Keep the grass clean
7. Use an effective additive
8. Fill the silo quickly and limit the exposed surface
9. Sheet the silo nightly during making
10. Seal the silo effectively

Several surveys have shown that silage quality in the west of Scotland apparently has been improving over recent years. However in 1976 the weather had a dominant influence. Many of the best silage makers were only able to apply 6 or 7 of the golden rules and quality suffered accordingly. For example, cutting had to be delayed due to wet weather; thus D values were lower than desirable. It was not always possible to wilt, so there were fermentation problems. It was sometimes difficult to avoid some soil contamination in the silage, so fermentation and D values were affected adversely.

A suggested quality target to aim for is 68D, 9ME and 13 CP. Clearly to check

on the quality which is obtained, it is wise to have the silage analysed and plan winter rations accordingly. The feeding of a quality silage as opposed to a poor silage in the ration can lead to a saving on the cost of the ration of 30 pence per cow per day or about £60 per cow over the winter feeding period.

The value of sealing, which often seems a chore is highlighted when it is realized that a 6-inch layer of wastage top and sides in a 100 feet x 50 feet silo constitutes 70 to 80 tons!, or put another way the produce of 6 to 7 acres! Compare this loss against what is a modest cost of about £50 for a plastic sheet.

Hay The importance of hay as a feedstuff must not be underestimated; the figures previously shown of acres cut speak for themselves. In terms of quantity of dry matter, there is about twice as much hay dry matter as silage. A recent Scottish Milk Marketing Board Survey showed that just over two-thirds of all milk producers in Scotland used hay for all or some bulk feeding as opposed to just over 40 per cent for silage.

Experience has shown that the weather in west Scotland is not ideal for hay-making; studies of the weather records confirm that there is a less than 25 per cent chance of obtaining 4-day dry spells during most weeks in June and July. It is obvious that there should be more artificial drying systems installed to reduce the time hay is exposed to the vagaries of weather in the field. The use of hay additives is still largely in the development stage.

As with silage, there are several key points to observe if quality hay is the target:

1. Use good grass varieties
2. Apply correct fertilizers
3. Cut at correct time
4. Speed up wilting process
5. Reduce field losses
6. Reduce storage losses

Analysis of the hay will give a good baseline to formulate its use in rations. The average analysis over several years is shown below, together with a suggested analysis.

	D value	ME	CP%
Average	52	7.7	7
Target	60	9.0	10

Stage of growth at cutting has the major influence on D value, which in turn controls intake of feed; the majority of hay in Scotland is cut around 10 to 14 days too late usually to obtain top quality material. The figures below show how the D values are affected by grass maturity type and date.

Probable D value of hay

	Cutting date in June			
Perennial ryegrass	Week 1	Week 2	Week 3	Week 4
Early	63	60	56	54
Intermediate	66	64	62	58
Late	67	65	63	59

The second half of June is too late to make quality hay from early perennial ryegrass varieties, but not from late perennial ryegrasses. Clearly sward type and management practice must be meshed together for best results. High D value enables a high intake of digestible nutrients; this in turn leads to a saving of supplementary concentrates (as was the case with high quality silage).

Conclusions

We are confronted by a great challenge. We know the potential of grass. We know there is a great gulf between this potential and what is being achieved in practice. We can narrow the gulf by the wider application of the principles I have outlined.

I leave you with the quotation from Gulliver's Travels by Jonathan Swift "And he gave it for his opinion that whoever could make two ears of corn or two blades of grass to grow upon a spot of ground where only one grew before, would deserve more of mankind and do more essential service to his country than the whole race of politicians put together" to which I would like to add "And utilize two blades of grass where only one was utilized before".

DAY VISIT TO DUMFRIESSHIRE

A day outing of the SWSGS to Spango and Townfoot Farms on 20 January, 1977.

Heavy snowfalls the previous week had cast doubts on the Societies day outing to Dumfriesshire. However, roads cleared and the sky brightened to give an enjoyable day out for a party of 80 members and friends.

The first visit was to Spango, Sanquhar where Messrs. Dickie farm some 2700 acres at about 1000 ft above sea level. 110 suckler cows, Blue-grey or Hereford x Friesian are wintered indoors on slats, 65 score ewes run on the hill and of these, 14 score are tupped by a Leicester.

On the cropping side 25-30 acres of hay and 30-35 acres of barley are grown. Barley yields are good at 1½-2 tons per acre despite the altitude. Barley is cropped for three years then undersown. Golden Promise is used and never sown before 28 March. The grain is stored in polythene bags. Grass receives slag in the back-end and fertiliser goes on around 1 May. Hay ground gets 60 units N in a compound when the stock come off on the 15 May.

Of particular interest was the 90ft x 60ft slatted shed with an adjoining 45ft x 60ft hay shed. To aid ventilation, washers were placed between the roofing sheets and no condensation problems are encountered. Electric tape runs along the water pipes underneath the lagging to prevent freezing. Slats have a 9ft clearance and a tractor and three spreaders clear a winter's dung in three days.

The daily rationing of the calved cows is 4lb cake, 3½lb beet pulp, hay and straw. Calves are allowed to 'creep' for hay and cake. Cows which are not calved receive 2½lb cake, 2½lb beet pulp and straw.

An interesting question time followed. Pens and slats were chosen in preference to cubicles and slats because cleaning was easier in pens, and the bull chasing cows in the cubicles could be a problem! All cows are pregnancy tested. 30-40 cows calve in September/October, the remainder being later in November and onwards. Cows calving in December onwards are on the hill and not fed till housing which is around mid December.

Because sheep are on inbye fields till 15 May, hay is the most suitable crop to take and is made from 15 July onwards. High quality is not wanted lest it stimulates too much milk and exposes the calves to scour. Rainfall is around 60 inches per year but usually a break in the weather enables suitable hay to be made.

The second visit of the day was to Mr. R.W. Weir, Townfoot, Thornhill. In contrast to the first farm, Townfoot has cattle fed on silage and housed in cubicles as well as on slats. Farm elevation is around 700ft on what was described as middling to poor land. 500 suckler cows and a total headage of 1400 cattle plus 4000 ewes says enough to illustrate the size and complexity of this farming enterprise.

Grazing was mainly set stocked at 1½ beasts plus 2 ewes and twins per acre. Silage was cut by contractor because silage and clipping tend to clash. In addition to silage some hay is made and 60-70 acres rape are grown for the lambs. 70-80 acres of cereals are also grown.

Winter rations for the cattle are based on silage and hay with 10-12lb concentrates for fattening cattle and 4lb for stores. Cattle are fed once per day but on Sundays receive only concentrates. Two men feed the cattle. Finished cattle are sold on the hoof or the hook depending on the market. Mr. Weir stressed the need for adequate trough space, 18 inches for the younger cattle rising to 24 inches.

In reply to a question on the management of calving and lambing such large numbers of stock Mr. Weir said that good men are the key to success. Concerning the general management of the cows, these are run in groups of 60-70. Mineralised cobs are fed as a precaution. Watch is also kept for cobalt deficiency in sheep.

The Society is most grateful to these two farmers for their helpful co-operation and for providing such an interesting day out.

RESEARCH REVIEWS

171 Collection of labour data in milk production: grazing systems (DH.H 17)

E. J. Noakes, Reading ADAS.

This survey was undertaken to study the time to collect and move dairy cows in paddocks or set stocked systems. To gather cattle from a paddock system took 0.6 minutes per acre whereas set stocking took 1.5 minutes per acre being grazed. The time to walk 100 yards was 1.6, 1.7, 1.8 and 1.9 minutes for herd sizes 40, 70, 100 and 130 respectively.

So to gather 100 cows and move them 400 yards took 14.2 minutes in a paddock system and 41.2 minutes in a set stocked system in the example given. (This is for one milking only).

To shift an electric fence took 6½ minutes plus 3 minutes per 100 yards of fence. Operator travel time was 1 minute per 100 yards.