GRASS AND FORAGE

JOURNAL OF THE SOUTH-WEST AND CENTRAL SCOTLAND GRASSLAND SOCIETIES

CSGS

SILVER JUBILEE

1963 - 1988

No. 31

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CONTENTS

FOREWORD

For the second year in succession *Greensward* has an anniversary number, this one celebrating the Silver Jubilee of the Central Scotland Grassland Society. Best wishes to the Society on completion of its first 25 years and for the future. The anniversary is marked by two special articles, one on the history of the CSGS and the other on changes in the structure of farming in central Scotland over the last 25 years.

The South West Scotland Grassland Society celebrated its Silver Jubilee in 1987, ending with the crowning occasion of a dinner-dance at the Hetland Hall Hotel, Carrutherstown, Dumfries in October. Patrick Gordon-Duff-Pennington, MBE and Cyril Davies, President of the British Grassland Society were the principal guests. Former Editor of *Greensward*, Ron Harkess, and past Chairman, Michael Milligan, were made Honorary Vice-Presidents of the SWSGS during the evening.

As your new Editor I foresee the Journal running along much the same lines as before. The greater part of each issue will continue to be devoted to reports of meetings and visits of the two Societies. These provide a valuable record of the proceedings for members who attended the meeting or visit. They also inform those who do not attend regularly, and hopefully stimulate them to come along more often in the future. A change I would welcome is for more articles to be contributed by individual members. Most of this number was written by Gordon Tiley, Iain Fraser and myself. A wider view of the meetings would be obtained if others volunteered to record the proceedings, and original articles would also be gladly received.

Apart from the anniversary articles members should find much stimulating material in this issue. Topics discussed range from organic farming to silage additives. Reports are also included of the excellent farm visits of the SWSGS in its Jubilee Year.

I thank Dr Ron Harkess for his help during the transfer of editorial responsibilities. Thanks are also due to Dr Gordon Tiley for his assistance in preparing this issue. Finally, the Societies are once again indebted to Mrs Kathleen Jones, Crop Production Department, for typing the manuscript.

David Reid - Editor

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SOUTH WEST SCOTLAND GRASSLAND SOCIETY

EXECUTIVE COMMITTEE, 1987-88

Chairman	J N Watson, Hannah Research Institute, Kirkhill, Ayr.
Vice-Chairman	R I R Evans, Penkiln, Garlieston, Newton Stewart, DG8 8AB.
Past Chairman	J M L Milligan, Culvennan, Castle Douglas, Kirkcudbrightshire, DG7 2LJ.
Secretary	Dr G E D Tiley, The West of Scotland College, Auchincruive, Ayr.
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Journal Editor	Dr D Reid, 10 Woodend Road, Alloway, Ayr.
Ayrshire Members	W H Rowney, Burnton Farm, Crosshill, Maybole, KA18 7SQ. D C Hogarth, Sorbie Farm, Ardrossan. N Day, Scottish Agricultural Colleges, 20 Miller Road, Ayr.
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Co-opted Member	I R Fraser, Central Scotland Grassland Society, Scottish Metropolitan Alpha Centre, Stirling University, Innovation Park, Stirling, FK9 4NF.

CENTRAL SCOTLAND GRASSLAND SOCIETY

EXECUTIVE COMMITTEE, 1987-88

Chairman	W Lawson, Parklea Farm, Carmunock, Glasgow.
Vice-Chairman	G Hamilton, High Garrion, Larkhall.
Past Chairman	A Bankier, Fernieshaw, Cleland, Motherwell.
Secretary	I R Fraser, Scottish Agricultural Colleges, Alpha Centre, Stirling University Innovation Park, Stirling.
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Retire AGM 1989	A Barr, Hill of Westerhouse, Carluke. J Boyd, Dechmont Farm, Cambusland. R Reid, Glen Farm, Falkirk.
Retire AGM 1990	W Andrew Jnr, Crossflat, Kilbarchan. W Black, Orchard Farm, Bellshill. J Hunter, Luchenburn Farm, Falkirk.
College	D Scrimgeour, Scottish Agricultural Colleges, Abbotsinch House, Inchinnan Road, Paisley.
Co-opted Members	G Blackhall, Hill of Westerhouse, Carluke. J M Milne, Wellhall Farm, Dollar. Dr G E D Tiley, The West of Scotland College, Auchincruive, Ayr. C C Watson, 73 Craighlaw Drive, Eaglesham, Renfrewshire.

THE CENTRAL SCOTLAND GRASSLAND SOCIETY

1963-1988

A MESSAGE FROM THE CHAIRMAN

Mr W Lawson, Parklea Farm, Carmunock, Glasgow

I am very pleased to write a few words of introduction to this issue of the Journal in our Silver Jubilee Year.

Twenty five years ago the Central Scotland Grassland Society was formed with the idea of helping farmers with the production and utilisation of grass. Also to provide opportunities for its members to talk of their experiences and to learn from each other.

Over the years, farm outings to different areas of the country and evening meetings with knowledgeable (well informed) speakers on a wide range of topics have helped to promote this aim.

The Silage Competition each year has created great interest and has gone a long way to improve the quality and use of silage. Many changes in methods and mechanisation have been seen and great progress made and I feel that the Society can take some credit for it.

We have always had a good relationship with staff from The West of Scotland Agricultural College who have been our major support. We have benefited too from meetings with members from trade and industry. Many personal friendships have been made.

As profit margins fall in farming, it is of the utmost importance that we keep up with the latest developments and keep our members informed.

The next 25 years will be a challenge and I hope that we can encourage young farmers to join us and enable the Society to continue with the help and advice as the Society originally set out to do.

A Jubilee Dinner has been arranged for Friday, 28 November 1988, in the Stuart Hotel, East Kilbride, when I hope to welcome all members and their wives.

A BRIEF HISTORY OF THE

THE CENTRAL SCOTLAND GRASSLAND SOCIETY

Mr G B Blackhall, Hill of Westerhouse, Yieldshields, Carluke

The stimulus provided by the formation of the North of Scotland and South West Scotland Grassland Societies, had its effect in the Central belt of Scotland in 1963 when the establishment of a Grassland Society for that area was suggested. The Colleges were playing a major role in Grassland Societies and the area to be involved was that covered by the West College, namely Clackmannanshire, W. Perthshire, Lanarkshire, Dumbartonshire, Renfrewshire, Stirlingshire, Argyll and Bute. Principal D S Hendrie of the West College had already been deeply involved with setting up the South West Society in 1962 and along with College personnel, particularly Graham Berrie and John Waddell, was of great assistance in the initial preliminaries required. The experience of the previous year relating to constitution and general guidelines undoubtedly simplified the approach work and much of the detail which was necessary in setting up the Central Society.

It was obviously anticipated that there would be considerable interest in the proposal for a Society specifically related to grassland farming, since these were the days of great anticipation and expansion; and grassland, especially in an area well suited to growing grass, would figure prominently in many farmers plans and objectives.

An inaugural meeting was planned for the 29 July 1963 at the Burn Farm, Chapelton, near Strathaven, farmed by Robert Yuill, where 45 dairy cows were kept on a similar number of acres. The meeting was well attended and chaired by Principal Hendrie. After a farm walk and discussion the objective of setting up the Society was completed. Mr George Gilmour was elected Chairman and Minto Argo as his Vice-Chairman. The posts of Secretary and Treasurer were in the very capable hands of Graham Berrie and John Waddell. The Committee comprised: Mr A P Anderson, Mr W Elder, Mr R Howie, Mr A Malcolm, Mr J Minto, Mr A Paterson, Mr A Robertson, Mr R Yuill, Major R Tullis, Principal D S Hendrie, Mr I V Hunt, Mr A Parkinson, Mr C Watson.

The subscription was set at £1/head and after the initial committee meeting and the awareness of the existence of the new Society, the membership was 172.

So Central Scotland now had a viable agency with the responsibility of promoting grassland farming in the realms of techniques, production and profit. It is interesting to note how these aims have been targeted in many differing approaches. There have been eight different lines of attack in the attempt to vary and stimulate interest so that the programme and activities did not settle into a rigid pattern in the hope that all members would find interest and help in the programme of events over the years.

Winter meetings have consisted of speakers in various roles and four groups of speakers have been used. Firstly there has been what may be termed the 'Professionals' - people who are associated with farming and grass, but not actually farming, then the everyday farmer who has some special skills with grass, thirdly a combination of these two, where a 'Professional' is actually involved with farm animals in his work (e.g. Crichton, Hannah, Hillsborough etc.) and fourthly a panel night of three farmers involved in a 'My Farm' type of meeting. It is surprising to find that from the inception in 1963 up to February 1969 not one farmer spoke to the Society as sole speaker, though there was a panel night when three farmers formed the panel. In the period up to February 1969 there were eleven 'Professionals' and one 'Professional'/Farmer who addressed the Society.

The first farmer to hold the stage by himself was N McCall Smith from Crieff and this seemed to set a change in pattern for the ensuing years. Since then there have been twenty-four farmer speakers, four nights with panels of three farmers, ten 'Professional'/Farmers and fifteen 'Professionals' as speakers.

The fifth avenue of approach is the visits made by the Society which have usually numbered three per year, in May, August and prior to the AGM in November. It is natural that these visits are predominantly to farms within reach for a 1 day visit. The scope of the visits have been wide and varied, both as to distance and type of farm - Bute to Stonehaven, Fife to Stranraer, as well as two visits to grass seed units, the SMMB Centre (AI), a meat processing unit and a forage machinery demonstration.

The sixth line of attack has been extended tours of more than 1 day's duration. This is not an approach that has apparently attracted a lot of interest within the Society as numbers have been difficult to find, but the Central Society combine with the South West in the visits to Northern Ireland in 1965 and to Eire in 1967. In 1973 and 1979 the Central Society had their own outings to Cumberland and Berwick which were enjoyed by those participating.

The seventh item is relatively recent, with the introduction of the Silage Competition in 1979. This has attracted a good response with 40-60 entries per annum and a modification was introduced in 1985 when a beef and sheep section was started. We are indebted to SAI for the main sponsorship and Reco for presenting a trophy for the new beef and sheep section, along with Messrs Hamilton of Larkhall. The competition in the 9 years has only had three winners with Jim Clark of Dunrod and Sandy Bankier of Fernieshaw having four wins each and Messrs R M Young of St Johns Kirk winning once. Jim Clark went on to win the Scottish regional competition in 1982 and 1986 and in the latter year was third in the British National Competition. The beef and sheep section has had three different winners in its 3 year existence with Lord Maclay of Milton being the first winner followed by Messr R M Young and Messrs Lyon of Drumachloy.

Finally we have had the good fortune of being able to muscle in on the South West Journal and benefit from all the advantages of having *Greensward* as part of the service to members.

Within the National framework we have acted as joint hosts to two BGS tours in 1969 and 1987 when the British Grassland Society Summer Visit encompassed the Central area. These are very worthwhile occasions not only for the farm visits and the official social events, but also for the contacts and friendships evolving from the visits. Likewise we have sponsored members to go to BGS visits in the South and keep us informed of trends and patterns arising at these visits.

There is, of course, a tremendous indebtedness to all office bearers, sponsors and helpers, who have worked so diligently in its efforts. Our thanks go to everybody who has played a part in the functioning of the Society, but especially to the West College who provided all the Secretaries from Graham Berrie at the start through Ian Mitchell, Tony Hope, Ray Allbrooke, Brian Simpson to Iain Fraser at the present time.

These Secretaries had able colleagues as Treasurers in John Waddell, Gordon Berry, David Marshall, Ian Taylor and Ken Phillips.

Outwith the Society, major contributions have come from all the farmers and their wives who have hosted the farm visits and provided excellent venues for lively and profitable meetings, allied to the very kind hospitality which they provided.

The commercial firms associated with farming have contributed very generously to the Society. In addition to the Silage Competition sponsors, we must thank all the firms who advertise in *Greensward* and SAI who sponsored the BGS Meeting in 1986 in a manner which allowed the Society great scope in ensuring a successful week not only for their own members, but also the visitors from overseas and the Grassland Societies throughout Britain. The success of this week was due in no small way to the hard work of the 'tour' committee under the chairmanship of Professor Ian Cunningham to organise the programme and especially to David Marshall who carried the responsibility for the exacting travel, timing and infinite number of details which such a visit entails. This aspect of the Society embracing all sections of the Agricultural Industry reflects a major and useful change from early days, since at the inaugural meeting it was stated that members of commercial firms were not eligible to hold any office in the Society.

So there has been a prolificacy of change influencing the Society over its life span, but whatever happens in the run up to the next century in farming there is no doubt that grass will be of prime importance and perhaps it is worth wondering that while we have a viable and very useful Grassland Society in the Central area, why it is in terms of percentages that relatively few farmers partake of the facilities available - the present membership is 155. Each one of us could no doubt encourage even one or two of our associates or neighbours to join the Society to everybody's benefit. However whether there is an expansion in numbers or not it is to be hoped that the camaraderie and friendship which exists today will remain strong and that the improvement in our grass knowledge will be continued in the atmosphere that has prevailed for the past 25 years.

MEET THE CHAIRMAN

CSGS: Willie Lawson, Parklea Farm, Carmunock, Glasgow

Willie followed his father and grandfather in farming at Parklea. He was educated at Allan Glen's School in Glasgow and then took a short Farmers Course at the West College. For the last 32 years he has farmed in partnership with his twin brother, George, who looks after the dairy enterprise while Willie runs the beef enterprise.

Parklea is on the edge of a conservation village in the decreasing green-belt between Glasgow and East Kilbride, which brings problems with vandalism. For many years Willie was responsible for the retail milk business, but with increasing pressure on time, greater competition and compulsory pasteurisation, this was sold in the late 1970s.

Half of the dairy herd of 80 Friesian cows is crossed to a Simmental bull. All the calves are retained either as dairy heifers or for finishing. Each winter about 120 bullocks and heifers are fattened in slatted sheds and sold as prime beef.

About 12 ha of hay is made, mostly for sale off the farm, and 30 ha of barley is grown for feeding at home. 40 ha of grass is cut twice for silage, aiming for top quality both for the dairy cows and for the finishing cattle.

There is no hired labour on the farm and the family have to "muck in" at busy times. Willie's wife, Elma, is kept busy on the farm. They have a teenage son and daughter, which Willie says at least keeps him feeling young! David is serving his time as a mechanic, but will probably return to the farm to follow in his father's footsteps. Maureen is in a chartered accountant's office in Glasgow, and has just finished a stint as secretary of East Kilbride Young Farmers' Club.

Among his other interests Willie is a Proficiency Test Examiner with the West Area Young Farmers' Clubs, and a committee member of the local branch of the NFU. He is an elder in the local parish church and a member of the village drama club.

As a founder member of the Society, it is particularly appropriate that Willie should be its chairman in the Silver Jubilee Year. He has been an extremely enthusiastic member of the Society and carries his enthusiasm into his term as Chairman. The Society will greatly benefit from his leadership and this should see it set course for another 25 successful years.

I R Fraser

OFFICE BEARERS OF CSGS 1963-1988

Chairmen

1963-65	George Gilmour, West Crosshill, East Kilbride.
1965-67	Minto Argo, Newton Farm, Cambusland.
1967-69	Robert Howie, Drumfork, Helensburgh.
1969-71	Bill Elder, Mid Glen, Langbank.
1971-73	Lex Smith, Hazeldean, Stonehouse.
1973-75	Jim Brown, Gaindykehead, Airdrie.
1975-77	Robert Yuill, Walston Mansions, Dunsyre.
1977-79	Robert Simpson, Duchlage, Crieff.
1979-81	Basil Baird, Windhill, Eaglesham.
1981-83	George Blackhall, Hill of Westerhouse, Carluke.
1983-85	Michael Milne, Wellhall, Dollar.
1985-87	Sandy Bankier, Fernieshaw, Cleland.
1987-	Willie Lawson, Parklea Farm, Carmunock.

Secretaries

1963-69	Graham M Berrie, WSAC, Glasgow.
1969-73	Ian Mitchell, WSAC, Stirling.
1973-77	Tony Hope, WSAC, Stirling.
1977-79	Ray Allbrooke, WSAC, Stirling.
1979-81	Brian Simpson, WSAC, Stirling.
1981-88	Iain Fraser, SAC, Stirling.

Treasurers

1963-73	John Waddell, WSAC, Lanark.
1973-78	Gordon Berry, WSAC, Lanark.
1978-81	David Marshall, WSAC, Lanark.
1981-84	Ian W Taylor, WSAC, Lanark.
1984-88	Ken Phillips, SAC, Lanark.

NEW HONORARY VICE PRESIDENTS OF THE SWSGS

A rare ceremony took place at the Silver Jubilee Dinner of the South West Scotland Grassland Society on 30 October 1987. With the enthusiatic approval of everyone present Cyril Davies, President of the British Grassland Society, presented certificates conferring the title of Honorary Vice President on Dr Ron Harkess and Mr Michael Milligan, two long-standing members of the Society. This honour has been previously conferred on only two other members of the Society, namely Dr Malcolm Castle and the late Mr Idris Hunt, who received their certificates at the Silage Competition meeting in January 1982. The citations for the two new Honorary Vice Presidents, as read by Cyril Davies at the Dinner, are given in full below.

DR RON HARKESS

Ron Harkess joined the South West Scotland Grassland Society as a founder member (number 008) in 1962. During the whole 25 years Ron has been an enthusiastic and dedicated member of the Society. He was Editor of its Journal *Greensward* from 1975 until this year. He was the principal organiser of the South West's Silage Competition, and personally accompanied the silage judge in every competition for 12 years.

As a specialist adviser on silage in the Agronomy Department of the West of Scotland Agricultural College, Ron has made a major contribution to the high standards of silage making in Scotland. He has now moved on to the post of Technical Secretary in the Scottish Agricultural Colleges HQ in Perth.

It is fitting that after so many years of dedicated service to the Society, Ron should receive the honour of Honorary Life Member and Vice President of the South West Scotland Grassland Society.

MR MICHAEL MILLIGAN

Also a founder member (number 027) of the South West Scotland Grassland Society, Michael Milligan has always been one of its keenest supporters. He has served many years on the Executive Committee and for the last 2 years has been Chairman.

Michael's tremendous enthusiasm for grassland and his perfectionism in silage making has earned him national, indeed international, acclaim. He was winner of the local Society's first Silage Competition in 1973 and champion no less than six times since. He has also won the all-Scotland Regional Competition three times, and is now much sought after as a silage judge. Few farmers have done so much to promote the high standards of silage making in this part of Britain.

For his long and outstanding contribution to grassland the South West Scotland Grassland Society wishes to confer on Michael the honour of Honorary Life Member and Vice President.

BGS AWARD 1987

The South West Society congratulates Dr John Frame who was presented with the BGS Award at the Winter Meeting of the Society in December 1987. This award is given for an outstanding contribution to the understanding or application of grassland and forage crop husbandry and technology, and it was the unanimous opinion of the three judges that it should be made to John.

The President of the BGS, Mr Cyril Davies, said that John had worked tirelessly for British grassland over more than 30 years in regard to research, development and extension activities. He had also carried the UK grassland banner to many countries and was well respected internationally.

John joined the BGS in 1959 and has served twice as a member of the Executive Council. He is an Associate Editor of *Grass and Forage Science*, and the Editor of three of the Society's Occasional Symposium publications. He has also been the author of over 250 other scientific papers and advisory articles.

Since the South West Society was founded in 1962 John has been an enthusiastic member supporting all of its activities, and he served as Secretary from 1975 to 1979. He was a driving force behind our Society following I V Hunt's retiral from active grassland work. As Head of the Crop Production Department of The West of Scotland College, he has been instrumental in providing past secretarial, technical and editorial services without which the Society could not have functioned. The Society is much indebted to John and consider that this award is very well deserved.

CHANGES AT THE WEST OF SCOTLAND AGRICULTURAL COLLEGE

In the spring of 1988 The West of Scotland Agricultural College was officially renamed 'The West of Scotland College'. On College publications the new name appears with the SAC (Scottish Agricultural Colleges) logo and the College crest and with the associated words 'For Agricultural, Horticultural and Food Studies'. The change reflects the College's link with the SAC and more fully expresses the range and diversity of its activities.

In addition to a new name, the College has also been given a new organisation, involving firstly some regrouping and renaming of existing departments. The departments have been organised into four Divisions according to their subject specialisation, educational responsibilities and research and advisory duties. All departments within a Division have a multi-functional role including education, advisory and R & D activities.

The Agricultural Division consists of five Departments - Agriculture, Animal Production, Crop Production, Engineering & Mechanisation and Buildings. Next is the Plant and Environmental Sciences Division with three Departments - Plant Sciences, Environmental Sciences and Horticulture & Beekeeping. The third Division is Animal and Food Sciences, in which the Departments are Nutrition & Microbiology, Poultry Science and Food Technology. Finally, there is the Economics and Marketing Division with two Departments - Agricultural Economics & Marketing and Computing & Information Technology.

A detail of particular interest to members of the local grassland Societies is that the Chairman of the new Agricultural Division is Dr John Frame. He is, of course, a founder member of the South West Society and recently recipient of the BGS Award.

With the establishment of the Scottish Agricultural Colleges in the spring of 1987 and the appointment of a new Principal at the West College, changes were inevitable, and the members of the two local grassland Societies will wish Professor Thomas and his staff all success in continuing to improve on the services provided to the farmers of the west of Scotland and to the students.

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HYDRO FERTILIZERS

ORGANIC GRASSLAND FARMING

Patrick Holden

Bwlchwernian Fawr Farm, Lampeter, Dyfed, Wales

Meetings of the CSGS at the Black Bull Hotel, Killearn, on 25 November 1987 and of the SWSGS at the Galloway Arms Hotel, Newton Stewart on 26 November 1987

The speaker at those two meetings on succeeding evenings was Patrick Holden who has been dairy farming on the organic system in west Wales for 14 years, and has been growing organic vegetables for 8 years. He is also Director of British Organic Farmers, and an active member of the Organic Standards delegation to the EEC.

Mr Holden claimed that his views were not so politically radical as those of Jonathan Porritt and Friends of the Earth, but were more sympathetic to the needs of the farmer. He was not optimistic about the speed of development of organic farming, and claimed that there was widespread ignorance of the contributions that the system could make to a better environment and to improved health. He considered organic farming a more sustainable agriculture.

Three factors determined whether or not an interest in organic livestock farming would actually lead to active participation. The first of these was a market for the organic produce - livestock or vegetable. The second was the political climate determining the potential profitability of organic farming. The final factor was the personal commitment of the farmer to this type of farming.

The speaker then listed the problems of the current agricultural policy:-

(1) Overproduction arising from EEC policy, guaranteed prices, etc.

(2) Damage to the environment, e.g. contamination of water by nitrates.

(3) Economic and social cost of disposal of butter mountains and other surpluses, and storage costs for these surpluses.

(4) Deterioration of food quality and health.

(5) Economic cost to the farmer.

(6) Depletion of non-renewable resources.

Discussing possible solutions to these problems, the speaker held that price restraint alone could not achieve many of the goals. Quotas cost little, but were bad for the farmer and had a negative effect on food and health. Taxation of agricultural output was also of questionable value. He believed that "setaside" was a bad policy, and would be a social disaster on the poorer land. Forcing 20% of land out of production would simply lead to intensification on the remaining 80%. Another bad policy was "extended ESA's" (Environmentally-Sensitive Areas), which would pay farmers not to farm or to farm less intensively. The final solution was organic farming, which would, like the previous solution, reduce intensification. The choice depended on government policy. A subsidy would be required to assist the farmer through the first few years when changing over to organic farming. The government considered organic farming as a growth area in the market place, and was not interested in its other aspects. They should realise that it was much more than a growth area, and should create conditions to persuade farmers to change and to help them make the conversion.

The attitude of consumers to food has altered much in the last few years. What the food processing industry did to food has been of interest for some years, but not what happened before processing. The current concept of healthy eating is a big problem, following the anti meat and anti milk produce conclusions in the COMA report. Organic cereals such as oats and wheat can now be sold at a premium. Sales of organic vegetables are also growing rapidly, and prepacked organic vegetables are being introduced. This development is being encouraged by the multiple-store outlets, but they demand quality and continuity of supply. However, 60% of organic vegetables are imported.

To be successful organic farming must be mixed or entirely livestock farming, but the question is whether there is a consumer interest in organically-produced milk and meat for which there is a big potential market. Unfortunately, the consumer demand for all dairy and meat products is falling because of the public perception of animal products as unhealthy. It is essential that the market for these products

should be developed, and organic farming could be the salvation of the dairy and livestock industries. The opportunity now for organic farming is enormous, but marketing and practical advice and costings are required.

The organic standards of the EEC may come into law in 3-5 years, when it will be illegal to sell organic branded produce unless marked with the EEC symbol. The UK government recognizing a demand for organic products has introduced a board to set up standards. Persuasion and education may influence the government to further action.

The Soil Association produced a standard production system banning entirely the use of compound fertilizers, pesticides, herbicides, growth regulators, etc. The system relies on crop rotations, crop residues, legumes, grass and animal residues. Its goals are:-

(1) To work within an enclosed system, and to draw upon local resources.

(2) To maintain the long-term fertility of soils.

(3) To avoid pollution.

(4) To produce high nutritional quality foods.

(5) To reduce fossil energy use.

(6) To give livestock living conditions that conform to their physiological needs and to humanitarian principles. Animal welfare has a high priority among the public.

(7) To make it possible for farmers to earn a satisfactory living.

The Soil Association standards for the organic production of grass call for no soluble fertilizer input for at least 2 years. Nitrogen fertilizers and superphosphate are banned, but potash fertilizers are allowed under licence, e.g. Highland potash. Rock phosphate is also allowed. Drainage is essential, as is an adequate pH (around 6). Lime or calcified seaweed can be used to adjust pH. Other essentials are a good earthworm population to incorporate the applied organic matter into the soil, and also a high clover content. A good soil structure is required to allow

root penetration. Mr Holden applies 628 kg Gafsa phosphate per ha and farmyard manure, and his grass yields appear to be increasing.

A typical seeds mixture of the Clifton Park type was shown. This contained perennial ryegrass, cocksfoot, timothy, white clover, red clover and a number of herbs. Most of the herbs do not persist long, but the best are chicory and sheep's parsley. A relatively high seed rate of clover is essential, and a high proportion of this should be wild white clover. There is a growing preference for a Cockle Park type seeds mixture with less cocksfoot and more ryegrass than in the Clifton Park mixture.

Mr Holden farms 55 ha in the uplands of west Wales where the rainfall is 1470 mm. Under these conditions he has achieved a stocking rate of 1.7 cattle units per ha with no nitrogen fertilizer input. Reseeding is done in the spring, and the young seedlings are topped to control annual weeds - no herbicides are used. There is no problem with docks since neither slurry nor nitrogen fertilizers are applied, and consequently soil compaction is reduced. The pastures are rotationally grazed and topped as necessary. When possible cutting and grazing are alternated. The critical problem in organic livestock farming is the maintenance of a clover content of at least 30% in the pastures. Mr Holden claimed that when no nitrogen fertilizer is applied it is easy to maintain this level, and he described nitrogen as "the killer of clover". In addition, he grows about 8 ha of carrots on ridges, and also wheat which yields about 3 tonnes per ha.

The dairy herd consists of 55 Ayrshires, which Mr Holden described as "the breed of the future", since the cows are more efficient converters and thinner than those of other breeds. The average yield is about 5000 l per cow, which until recently went to the MMB. The Welsh Department of Agriculture helped to set up a small cooperative creamery, which makes high quality cheese from organically produced milk. Cardigan hard cheese is now marketed nationally from this creamery, also a soft cheese, both under the Soil Association label. A small packing plant for organic vegetables has also been established.

The grazing season is 5 months long, when the cows are rotationally grazed in small fields. 2-3 cuts of silage are usually taken using a flail-type forage

harvester, the first cut being in June and the second in early August. The silage is removed from the silo with a block cutter and fed in the feeding passage of the cubicle house. The Soil Association feeding standards for livestock lay down that 80% of the concentrate portion of the diet must be from an organic source. The remainder can be non-organic because of the scarcity of organically grown feeds, particularly protein feeds. The veterinary standards ban the routine use of drugs, particularly antibiotics. On a nearby farm a herd of Guernsey cows has produced milk for 40 years without the use of udder antibiotics. Routine blanket vaccination of sheep is also not allowed.

The speaker closed his talk with the presentation of slides taken on his farm and in the cooperative creamery. Particularly notable among these were views of his grassland showing the high clover content of the sward. The high quality of his Ayrshire herd was also evident.

Discussion

The discussion at the SWSGS meeting was opened by **Mr J Scott-Park, Portnellan, Gartocharn, Dumbartonshire,** who outlined his experience in converting to an organic system after many years of conventional farming. His conversion resulted from the occurrence of severe mineral deficiency symptoms in his livestock, and from the firm conviction that organic farming was necessary for human and animal health. During the conversion period he used calcium nitrate fertilizer (15.5% N), but now uses only slurry and calcified seaweed. The animals are healthy, though he still feeds a mineral supplement on occasions. Despite the reduction in intensity arising from the conversion to organic farming the farm of 101 ha (73 ha in grassland) supports three families against one before.

The first questioner asked for further details regarding the Guernsey herd on which no antibiotics had been used over a period of 40 years. Only one treatment is employed, namely cold-water soaking of the affected quarter. After stripping out the quarter is soaked for 5 to 10 minutes. If this does not work, the quarter is dried off, and in most cases comes right in the next lactation.

On the question of homeopathy, Mr Holden quoted a homeopathic veterinary surgeon (Chris Day, President of the Homeopathic Association) who believed that there was no animal health condition that could not be so treated. However, the fees are high as the necessary skills are in short supply.

In answering another question Mr Holden said that he had no resident sheep flock on his farm, but did take winterers. The difficulty with sheep is that there is no organic solution to the problem of fly strike, as organo-phosphorous insecticides are not approved. The only cure at present is dagging and good sheep herding. Pyrethrum is allowed for the treatment of scab.

Mr Holden was asked if there was any way to stimulate a greater consumer/producer involvement in organic agriculture. The organic movement has not involved food processors nor government. A larger and more informed consumer understanding is the most important requirement, but the participation of more farmers is also important.

Doubts were expressed as to how organic farming could make any headway at a time when government was cutting back on research funding and seeking more financial support from industry. Mr Holden said that it was very short-sighted to withdraw funds for research and development in organic farming. There are no vested interests except the multiple retailers who have not so far appreciated the need for research, so it is difficult to see where the money could come from except government.

It was commented that the speaker had made many statements as though they were absolute fact, but there was no supporting evidence, for example, that organic food is healthier. Most farmers are not going into organic farming unless they have an economic motivation. Mr Holden replied that the virtues of organic agriculture were not necessarily proven but many members of the public were thinking healthier eating and not waiting for scientific proof. Further comments at this time drew attention to the high level of pesticide usage in Third World countries from which food was imported into the UK.

More details were requested on Mr Holden's methods of organic farming. The farmyard manure from the cattle is collected in an earth-bank slurry compound with no

cover. It is spread in the spring at a rate of 10+ tonnes per ha on the silage land and on the vegetable fields (not carrots). The high earthworm population incorporates the dung into the soil quickly, and the high straw content is no problem during silage making. Mr Holden does not use compost, nor any other fertilizers except lime although the soil has a low phosphate analysis. **D Reid & G E D Tiley.**

PRINCIPAL - THE WEST OF SCOTLAND COLLEGE

The "new" Principal of the "newly" named College is Professor P C Thomas, a Welshman born and brought up in Abersychan, Gwent, South Wales. He comes to the College in difficult and challenging times, well qualified to meet these new problems.

His higher education started with an Honours degree in Chemistry and Biochemistry, graduating in 1963 from University College of North Wales, Bangor. He was then in receipt of a MAFF scholarship and stayed at Bangor to obtain a PhD.

In 1966 Professor Thomas joined the staff of the University of Leeds as a lecturer in Agricultural Chemistry. It was during this period that he started research into ruminant digestion and the lactation process in the dairy cow.

In 1971 he moved to the Hannah Research Institute working on ruminant nutrition, eventually becoming the Head of the Department of Animal Nutrition and Production. During this period he lectured widely to scientific societies and farmers' groups all over the United Kingdom.

In 1987 he became Principal of the West College and Professor of Agriculture at the University of Glasgow.

J N Watson

MEET THE CHAIRMAN

SWSGS: John N Watson, Hannah Research Institute, Ayr

At a recent meeting of the South-West Scotland Grassland Society the new Chairman stated that he was the first non-farmer member to hold this office. This is correct, but nonetheless John has had a lifetime's experience of farming, particularly grassland management, as Farm Manager at the Hannah Research Institute, Ayr.

John was born in Carlisle, and his agricultural education was on farms in Cumberland, at the Durham Farm Institute, and ultimately at the Agricultural College, Aberystwyth. In March 1952 he joined the Grass and Dairy Husbandry Department at the Hannah and became Farm Manager in 1956.

Since then, John has been responsible for the intensively-managed grassland farm with its herd of 120 experimental cows. In addition to the normal day-to-day duties of farm manager he has always been involved deeply with the numerous grassland and feeding experiments. These have included plot trials, grazing experiments and detailed work on silage making and feeding. In many winters virtually every calved cow has been on an experiment with a dozen different rations on offer to the various cows which are all rationed individually.

The task of managing the land, the cows and youngstock, and the large staff is thus complex and difficult, but in return, full of interest and extremely challenging. John has tackled this work in a business-like and methodical way, and worked closely with the scientific staff. Because of this happy partnership with other people, John is the co-author of a large number of scientific publications. He is also a popular and gifted speaker with a dry wit and humorous asides.

John was a founder member of the Society, and has been a regular supporter at its meetings and visits. His wife, Ruth, hails from a farm in Cumbria and is involved in the WRI and curling. Their sons, Richard and David, are doctor and farm manager respectively, so John should be well looked after in the years to come! The Society is indeed fortunate to have John as Chairman, and the best wishes of all members go to him in his period of office. **M E Castle.**

SWSGS SILAGE COMPETITION 1987-88

A meeting of the SWSGS at the Loudon Arms Hotel, Mauchline, 14 January 1988.

Judge: John Huyton, Grenaby, Bride, Isle of Man

Mr Huyton began by remarking that he had found judging the silage competition an onerous task because of the high standard of all the entrants who had reached the short list. However, he had enjoyed travelling round the countryside and visiting the farms, particularly as this was his first visit to the area. He was only sad that some tremendous silage makers would not be mentioned although in many years they would have won.

On all the farms he had visited the attention to detail, stockmanship and enthusiasm was tremendous, and just had to be the best nationally, but he had some small criticisms. Firstly, one or two competitors had not used side sheeting in the silo, and the Judge firmly believed that this was necessary to eliminate waste. He was particularly critical of two farmers who had been prepared to accept the resulting waste, and feed the poorer quality material to suckler cows. Generally, however, there was virtually no waste in the silos inspected. A second minor criticism was aimed at the somewhat rough and ready methods employed on certain farms to get the silage out of the clamp. These resulted in untidy and uneven faces, which could result in waste and mould development. Mr Huyton had recently invested in a 'Sheergrab', which left a marvellous face. In general the methods of dealing with effluent were excellent. Inspection marks were all to perfection in this class of silage.

Tables 1 and 2 show the marks awarded in the competition. First prize in the Open Class went to Michael Milligan, Culvenan, Castle Douglas, with a very high standard of perfection. Michael was also the overall winner and Silver Rosebowl champion, and has been the winner in six previous Society competitions. The second prize in the Open class was awarded to brothers John and Willie Carson, Conchieton, Twynholm, who had the highest analyses marks this year and won the BGS National Silage Competition in 1986. Only a hairs-breadth behind came the third prize winner in the Open class - Alex Irving, Largs, Twynholm.

Table 1. 1987-88 Silage Competition - Analyses and Marks

B = Big Bale T = Tower

OPEN ENTRIES

Rank		Code	% DM	% CP	D Value	Ammonia N % Total N	ME	Marks /35
1		KS 3	24.7	18.0	73.6	6.8	11.8	33.49
2	B	WS 3	32.9	16.3	70.2	2.1	11.2	33.30
3		AS 2	22.2	16.9	74.6	5.4	11.9	32.88
4		KS17	18.7	19.6	75.4	5.0	12.1	32.85
5		WS 1	22.8	17.9	72.7	7.0	11.6	32.75
6		AS 3	20.6	17.2	71.5	6.8	11.4	31.56
7		KS 7	22.6	15.4	73.1	6.1	11.7	30.92
8		AS 1	23.0	15.5	71.6	6.5	11.5	30.80
9		KS 4	20.1	15.2	76.6	3.2	12.3	30.75
10		KS21	20.4	17.1	68.9	6.3	11.0	30.66
11		AS 4	28.8	14.4	73.6	6.0	11.5	30.60
12		DS12	22.1	17.9	72.5	9.5	11.6	30.57
13		AS 5	18.7	17.4	73.5	7.2	11.8	30.49
15		KS14	20.6	14.8	70.8	6.5	11.3	29.40
16		KS20	20.2	16.3	68.4	7.0	10.9	28.70
17		WS 4	20.7	14.8	70.8	7.4	11.3	28.68
19		DS 1	17.9	15.8	69.3	6.2	11.1	28.54
20		KS18	20.6	17.2	73.4	10.6	11.7	28.45
21		AS 9	18.5	17.0	69.8	9.1	11.2	28.27
22	B	AS22	48.8	18.3	64.9	7.8	10.4	27.66
24		AS16	17.1	16.8	70.4	9.1	11.3	27.59
25		AS 8	17.8	16.6	67.9	6.8	10.9	27.46
26		AS17	23.8	16.7	72.5	12.9	11.6	27.08
27		DS 8	22.3	13.6	71.2	9.7	11.4	26.16
28		KS 6	21.6	13.1	67.1	5.3	10.7	26.13
29		DS 9	19.3	12.4	69.2	5.8	11.1	26.11
30		DS 3	21.9	13.6	68.0	7.2	10.9	26.04
33		AS19	17.8	18.1	70.8	14.4	11.3	24.86
34		DS 4	20.0	13.9	67.0	6.9	10.7	24.85
35		AS13	20.6	16.4	65.1	8.1	10.4	24.80
37		DS 2	19.1	17.8	67.5	13.8	10.8	23.31
38		KS 5	17.9	13.4	66.4	6.6	10.6	23.02
39		AS20	23.0	12.8	64.4	5.9	10.3	22.98
40		KS 2	18.1	16.7	64.8	10.3	10.4	21.81
42		WS 2	25.7	16.4	70.7	26.5	11.3	21.40
43		AS18	17.3	15.4	68.7	13.6	11.0	21.37
48		WS 6	19.6	16.6	63.5	11.5	10.2	20.20
49		AS21	21.8	13.9	64.3	10.7	10.3	19.84
51		WS 5	17.2	12.5	61.8	5.0	9.9	18.40
54		AS14	20.7	12.7	59.7	6.6	9.6	16.97
55		KS 1	17.5	12.3	63.4	9.1	10.1	16.67
56	B	AS 6	25.9	13.0	63.1	13.3	10.1	16.46
63	T	DS13	34.9	14.2	62.9	24.3	10.1	12.10
64	B	AS 7	21.6	15.1	59.9	23.3	9.6	9.15

BEEF/SHEEP ENTRIES listed on next page

BEEF/SHEEP ENTRIES*

Rank		Code	% DM	% CP	D Value	Ammonia N % Total N	ME	Marks /35
14		*DS14	21.9	17.2	72.0	8.9	11.5	30.31
18		*DS15	30.2	14.8	68.4	6.9	10.9	28.65
23		*AS11	25.4	14.4	67.3	6.3	10.8	27.65
31		*DS11	20.2	16.0	68.6	10.6	11.0	25.72
32		*KS19	24.0	15.5	63.5	5.5	10.2	25.35
36		*DS10	21.1	12.0	67.8	6.5	10.8	24.66
41		*AS10	19.7	11.7	65.7	6.8	10.5	21.61
44		*KS 9	19.5	13.7	65.0	8.3	10.4	21.35
45		*DS 7	19.7	10.7	63.7	5.1	10.2	20.97
46		*DS 5	26.2	10.2	62.3	5.5	10.0	20.90
47		*KS12	19.8	13.5	64.0	8.2	10.2	20.34
50	B	*KS16	29.6	7.7	59.5	4.3	9.5	18.50
52		*KS15	17.6	14.3	62.2	9.1	10.0	17.52
53		*DS 6	17.9	11.4	61.2	5.2	9.8	17.47
57		*AS12	24.3	9.3	63.0	12.4	10.1	15.91
58		*AS15	39.3	8.8	53.7	3.4	8.6	15.00
59	B	*KS13	33.5	14.1	64.6	18.9	10.3	14.58
60		*KS10	19.4	12.8	59.1	8.7	9.5	14.14
61		*KS 8	20.3	13.9	61.6	14.5	9.9	13.55
62		*KS11	19.6	11.5	59.7	11.1	9.6	12.12

In the Beef/Sheep Class the first prize winner was W T McCombe, Trohoughton, Dumfries, who also received the BP Nutrition Trophy. The second prize in this class went to Robert Dalrymple, Crailoch, Ballantrae. The best Big Bale entry came from R D Clark, Fineview, Glenluce with the second highest analyses marks in the competition.

The Michael Milligan Prize was awarded to David Yates, East Logan, Castle Douglas, as the best placed entrant who had not previously won a prize. Allen Ford, Monktonhill, Prestwick won the best new entrant prize.

The Judge said that the first four farmers were extremely close in marking with silage of total excellence. He could not imagine any better silage, and it was a shame to split them. The unlucky fourth was Robert Lindsay. Overlochridge, Stewarton, who had the distinction of having all three of his silage entries in the top analyses short list.

Table 2. Short list for Judge's visit (in order of analyses).

Open Entries		Marks Analyses (35)	Inspection (65)	Total
2nd	J & W Carson, Conchieton, Twynholm.	33.49	59.5	92.99
	R Lindsay, Overlochridge, Stewarton.	32.88	58.5	91.38
Milligan Prize	D Yates & Sons, East Logan, Castle Douglas.	32.85	55.0	87.85
	R I R Evans, Penkiln, Garlieston.	32.75	53.0	85.75
	W A Campbell, Slagnaw, Castle Douglas.	30.92	56.0	86.92
	J McFadzean, Towerhill, Kilmaurs.	30.80	53.5	84.30
1st and Silver Rosebowl	J M L Milligan, Culvennan, Castle Douglas.	30.75	62.5	93.25
3rd	A & I Irving, Largs, Twynholm.	30.66	61.5	92.16
Best New Entrant	A Ford, Monktonhill, Prestwick.	30.60	57.0	87.60
	W Sloan, Ryemuir, Lochmaben.	30.57	53.0	83.57
Beef/Sheep Entries				
	D F Grant, Burrance of Courrance, Lockerbie.	30.31	43.0	73.31
2nd	R Dalrymple, Crailoch, Ballantrae.	27.66	48.0	75.66
1st and BP Trophy	W T McCombe, Trohoughton, Dumfries.	25.72	56.0	81.72
Best Big Bale Entry				
	R D Clark, Fineview, Glenluce.	33.30	N/A	N/A

N. Day: Clamp Silage Quality, 1983-87

A summary of the quality of clamp silages over the last five annual competitions is given in Table 3. This shows a distinct improvement in D-value and a reduction in ammonia-nitrogen in comparison with 1985 and 1986. Quality was, in fact, up to the standard of 1984. However, the results were possibly biased by the new analytical methods introduced this year. This could be particularly the case with the new ammonia-nitrogen method, which measures only ammonia and not the other volatile nitrogen compounds included by the old method.

Table 3. Silage Quality 1983-87

		% of total in each group				
Quality	D-Value	1983	1984	1985	1986	1987
Very good	> 70	0	17	0	7	33
Good	65-70	16	63	48	42	31
Medium	57-64	71	20	45	51	34
Poor	< 57	13	0	7	0	2
Mean DM%		23	24	20	22	22
Mean ammonia N (% of total N)		12	10	13	11	9
No. of entries		69	77	56	57	64

N Day: Additive Use, 1987

Table 4 shows the range of additives used on the 64 silages entered in the 1987 competition. As in 1986 all but 18% of the silages in the Open Class had been treated with an additive but only 50% of those in the Beef/Sheep Class had been treated. As in previous years the acid and acid-formalin additives remained the most popular. However, there was no further change in the popularity of the inoculant types following the marked increase noted last year. These additives were used on about 20% of the silages in both years.

Prize Winners' Comments

The first prize winner in the Beef/Sheep class - W T McCombe - believed that one of the most important factors in good silage making was to fill the pit as quickly as possible. 1987 was the first year that he had used a side sheet, but found that this had eliminated waste. He also considered it essential to cover the pit at night, and to cover quickly when the

Table 4. Additive Use 1987.

Type	Additive	Open Class (44 entries)	Beef/Sheep Class (20 entries)
Acid (20)	Add-F	7	1
	Sulphuric	2	2
	Add-Safe	8	-
Acid/Formalin (12)	Farmline	5	-
	Sylade	4	-
	F100	2	-
	Siloform	-	1
Enzyme (1)	Clampzyme	1	-
Inoculant (12)	Silo King	-	1
	Ecosyl	4	2
	Safe-Sile	-	1
	Super-Sile	2	-
	Brewery Inoculant	-	2
Other (1)	Molasses	1	-
None (18)		8	10

pit was full. Alex Irving, the third prize winner in the Open Class, also stressed the importance of quick filling, and proper sealing. He used sand bags round the sides as well as tyres over the top of the pit to eliminate any air movement. The Carson brothers, on the other hand, sealed their pits with dung. They believed that this followed the contours and so gave a better seal and eliminated waste. The importance of cutting at the proper stage was also stressed by the Carsons.

This year's champion in the Open Class - Michael Milligan - was a great believer in silage effluent, which he collected, stored and fed back to his cattle. Michael's message to the members was not only to make high quality silage, but to allow that silage to express itself in the production of milk or meat and to produce it a lot cheaper than with any other feed.

David Yates, the winner of the Michael Milligan Prize, described his innovative silo. This was dug sideways into the side of a hill, the inner side being a jagged rock face and the outer an earth bank retained by sleepers. The winner of the New Entrants prize - Allen Ford - agreed with the necessity to make silage as quickly as possible and covering immediately the pit was full. Because of shortage of labour he did not sheet the pit each night. However, he did use a side sheet and when the pit was full put a double sheet on top. As a result he had no waste. R Clark -

the winner of the Big Bale Class - had made round bales for about 6 years, but he also made some pit silage. He used a contractor for making bales and filling the pit, and claimed that both methods cost the same. Bags were used for 2-3 years, new bags being put on the top and sides of the heap and the old ones inside. Mr Clark tried to wilt the grass so as to reduce the number of bales and the expense.

Discussion

Before the discussion the Judge briefly described his farm in the north west of the Isle of Man. This is a dry area (635 mm rainfall) mostly with a sandy loam soil over gravel, but with some clay land. The farm of 119 ha carried a flock of 270 breeding ewes, virtually all Charollais x Mules, which were lambed indoors in March. About 100 cattle were bought in as suckler calves, and fed over their first winter on silage plus 0.9 kg of barley and protein. The aim was to get about 2 kg gain per day, and sell in 13-14 months just before Christmas when the price was at the top. Another batch of about 100 cattle were bought in as stores. Feeding barley to fattening cattle was not so profitable now that implantation was banned, so the number of cattle bought depended on the quality of silage available.

Grazing land received 100-113 kg nitrogen/ha before the stock went on, and little and often thereafter, but none in dry weather. Silage land got 150 kg nitrogen/ha and plenty of potash. No slurry was applied on grassland, but yard scrapings went on to sacrifice fields as it caused sward damage. The D-value aimed for in the silage was 67, and it was not planned to improve on this. No importance was attached to the dry matter content. In the conditions prevailing wilting was difficult and usually a waste of time. 54 ha of cereals were grown - mostly wheat and winter barley - and all but 20 tons were sold, mainly for seed.

The meeting concluded with a short discussion which concentrated on the rules and regulations of the silage competition. One member suggested that since the making of big bale silage was on the increase and the winner of this class in 1987 had the second highest analyses marks, big bales should be included in the Open Class. It was thought that this would give the judge a difficult task. However, the Secretary said that Mr Clark's farm was not visited

because there was no silage left to judge. He also indicated that a big bale winner would not be eligible for the Regional and UK competitions.

Another member wanted to know if any comparisons were available between College analyses of silage and independent or commercial analyses. From their analyses BP have concluded that silage quality was down in 1987 but the College results do not show this, and the production from silage feeding seems to be good this winter.

Regarding the marking system used in the silage competition it was suggested that the dry-matter score should be discontinued because of the lack of a firm relationship between this and feeding value. The Secretary said that this had already been done by the BGS for the National Competition, and that this would be considered by the Society's Competition sub-committee. Crude protein scoring was also discussed.

A suggested addition to the scoring was some allowance for the stocking rate achieved on the farm, but the results from an MMB survey were quoted to show that this was much less important than was once thought. In fact, the highest stocking rate was not always the most profitable. What was important was the stocking rate achieved on the grass itself. The introduction of quotas also meant that the most efficient farms were not necessarily those with the highest stocking rate.

Dr Malcolm Castle proposed the vote of thanks to the Judge, to the competitors and to all those who had helped to make this such a successful competition.

D Reid & G E D Tiley.

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RECENT DEVELOPMENTS IN SILAGE ADDITIVES

Dr D Chamberlain, Hannah Research Institute, Ayr

A meeting of CSGS at the Stuart Hotel, East Kilbride on 14 January 1988

Dr Chamberlain began his talk with a summary of the aims of the silage making process. Bacteria which occur naturally on grass convert the available sugars into organic acids by fermentation. In order of desirability, these acids are mainly lactic acid, acetic acid, ethanol and butyric acid. The quantities of each produced is partly determined by the bacteria present. The aim of inoculant additives is to introduce the most desirable bacteria. Acid additives aim to increase the acidity in the grass and to discourage undesirable bacteria from producing poor fermentation products. Molasses has long been used as an additive, providing a readily available source of soluble sugars to augment the grass's own sugars for the bacteria to ferment. The more recently introduced enzyme additives act on the cellulose in the grass, breaking it down to release sugars.

Recent developments have been in the area of biological additives, rather than the acid additives or preservatives such as formaldehyde. The biological additives can be grouped as follows:

1. Added Substrate: e.g. Molasses

2. Inoculants: e.g. *Lactobacilli; Predococci; Streptococci*

3. Enzymes: Cellulases; Hemicellulases

Recent investigations at the Hannah Research Institute have concentrated on the enzyme additives. If fibre can be broken down in the silo this is equivalent to predigestion of the fibre, and could influence the D value of the silage and its nutritive value. Many enzymes will break down cellulose and the first job was to establish which were effective on grass cellulose. A comparison was made of the enzyme ESI, which is the main constituent of Clampsyme, and a commercially available enzyme sigma cellulase. ESI reduced the fibre content as rate of application was increased, but sigma cellulase did not. Thus ESI will break down grass cellulose.

The next step was to look at the effect of enzymes on fermentation, but the experimental results were inconclusive. It is recognised, however, that enzyme additives do have the potential to help fermentation. A comparison of the intakes of silage treated with enzymes and control silage also produced inconclusive results.

A trial was conducted to compare silages made with three types of additive together with a control. The types were an enzyme - ESI, an inoculant - Ecosyl, and formic acid - AddF (at 2.3 litres per tonne). The comparisons were made on silages of two different D-values - 72% and 65%. The silage analyses are given in Table 1.

Table 1

	Control	Formic Acid	Inoculant	Enzyme
72 D Silage				
Dry Matter (g/kg)	180	206	208	197
pH	4.3	4.0	3.9	4.0
Crude Protein (g/kg)	173	172	166	176
Ammonia Nitrogen (g/kg)	180	120	130	160
Lactic Acid	77	65	99	117
Acetic Acid	70	52	44	89
Butyric Acid	5	0	3	4
Ethanol	17	26	15	19
Water Soluble Carbohydrate	8	14	17	12
NDF	519	464	492	479
ADF	317	278	309	286
65 D Silage				
Dry Matter (g/kg)	257	267	248	256
pH	3.8	3.8	3.8	3.6
Crude Protein (g/kg)	106	106	111	108
Ammonia Nitrogen (g/kg)	125	115	76	124
Lactic Acid	84	63	83	118
Acetic Acid	15	9	6	10
Butyric Acid	2	0	0	1
Ethanol	33	45	48	37
Water Soluble Carbohydrate	26	64	13	18
NDF	582	553	581	527
ADF	355	332	361	351

These results show that the effects of the additives on the analyses vary with the D-value of the silage.

For example, the ammonia nitrogen level was considerably reduced by the formic acid and the inoculant treatments in 72D silage, but only by the inoculant in 65D silage. Water soluble carbohydrate was increased by all the additives at 72D, but only by formic acid at 65D.

The most useful comparisons of silage involve the measurement of intakes and milk production, and this was done with the high and low D-value silages at two different levels of concentrate supplementation. The concentrate was an 18% CP mix of barley and soya bean meal. The intake results are given in Table 2.

Table 2. Total Daily Dry Matter Intakes of Various Treatments (kg DM)

	Control	Formic Acid	Inoculant	Enzyme
72 D Silage				
LOW CONCENTRATE				
Silage	10.5	11.0	10.5	10.1
Concentrate	3.7	3.7	3.7	3.7
Total	14.2	14.9	14.2	13.8
HIGH CONCENTRATE				
Silage	8.9	9.8	9.1	8.5
Concentrate	7.5	7.5	7.5	7.5
Total	16.4	17.3	16.6	16.0
65 D Silage				
LOW CONCENTRATE				
Silage	9.4	10.0	9.5	9.6
Concentrate	3.7	3.7	3.7	3.7
Total	13.1	13.7	13.2	13.3
HIGH CONCENTRATE				
Silage	8.2	8.7	8.2	8.3
Concentrate	7.5	7.5	7.5	7.5
Total	15.7	16.2	15.7	15.8

On all treatments the formic acid treated silage gave the highest intakes. With the 72D silage the enzyme treatment gave the lowest intakes, but with the 65D silage the intakes were not reduced by this treatment.

Intakes were greatest on all treatments with the 72D silage. The high concentrate regime gave a substitution rate of 0.3 kg dry matter of concentrates for each kg of silage dry matter.

Milk yield on the 72D silage was about 5% higher with the enzyme treatment but the other treatments did not differ from the control silage. This was noted at both levels of concentrate feeding. Milk composition was not affected by any of the treatments.

On the 65D silage there were no differences in milk yield between any of the additive treatments, and again this was noted at both levels of concentrates fed. The higher rate of concentrate feeding gave an additional 2.5 kg milk per day on all treatments compared to the low concentrate input.

Most other trials have compared formic acid treated silages with inoculant treatments. In a trial at Edinburgh untreated, inoculant treated and formic acid treated (5 litres/ tonne) silages were fed to lambs. The inoculant treated silage increased both intakes and lamb growth, but this was exceeded by the formic acid treated silage.

At Greenmount College in Northern Ireland untreated silage was compared with formic acid (2 litres/tonne) treated silage and an enzyme treated silage. No differences in intake or growth rates were observed in beef cattle. The trial was repeated using formic acid at 4 litres/tonne and this treatment increased performance and growth rates.

At Hurley untreated silage was compared with formic acid treated silage (3 litres/tonne) and the resulting silages showed no differences.

Summary

Both inoculants and enzymes will produce well fermented and well preserved silages. However, comparisons are difficult because under experimental conditions the control silages are generally also well preserved. Limited evidence shows that inoculants can improve the nutritional value of silages, and that this is translated into improvements in livestock performance. Enzymes have produced less consistent results than inoculants, although there have been fewer trials carried out.

Formic acid when applied at higher rates has tended to produce consistently better results. The application rates have to be over 6 litres per tonne which severely restricts fermentation and preserves the grass by the action of the additive rather than by fermentation of the grass sugars. There is some evidence that lower rates of formic acid (2 litres/

tonne) also produce satisfactory silages with increased performance. This is because less of the desirable types of bacteria are killed off at this application rate and the silage fermentation is more satisfactory. Some rather unsatisfactory silages have been produced from formic acid applied at 4 litres/ tonne.

Discussion

The speaker was asked about the use of formaldehyde as a silage additive. Additives containing formaldehyde were likely to be withdrawn from the market in several years time, but they had generally given satisfactory results in trials.

The point was made that there were many additives on the market, and the effectiveness varied little within particular groups. The speaker believed that the inoculant type additives had improved in recent years, and satisfactory numbers of bacteria could now be applied in relatively low volumes of water. This was not possible with earlier inoculants.

On the question of application rates, inoculants had to be applied at recommended rates to give the optimum number of bacteria per tonne of grass. There was, therefore, no scope for reduced rates. Present evidence also indicated that enzyme additives would have to be applied at full rate to achieve their function. Formic acid applied at 2 litres per tonne appeared to act as a fermentation inhibitor, but at 4 litres per tonne fermentation could be poor, giving high ammonia nitrogen levels. This was because formic acid inhibited the development of lactic acid bacteria. At 4 litres per tonne the pH reduction was not sufficient to give a stable silage and the pH finished up at 4.4 to 4.5, which was not satisfactory.

Sulphuric acid was not as effective an additive as formic acid unless applied at twice the rate. A low pH was purely dependent on applying sufficient acid.

The speaker indicated that on available results it was difficult to justify the cost of using an additive. However, experimental comparisons tended to be made between good silages. Greater justification might arise if some of the poorer silages which seem to be made in the farming situation were treated with an additive. This could imply using an additive as an insurance, such as in unsettled weather.

I.R. Fraser

CSGS SILAGE COMPETITION 1987-88

A meeting of the CSGS at the Stewart Hotel, East Kilbride, 14 January 1988

Judge: **Mr T W Brown, Muirhouse Farm, Libberton, Carnwath**

In his opening remarks the Judge said that he had been most impressed with the standard of silage he had seen during the 2 days of his visits. For the first time the Judge's itinerary had included the Island of Bute, and it was most encouraging to have three farms on the island reach the short leet.

Great attention had been paid to detail both in making and feeding the silage, and this was reflected in the analyses marks. Only decimal points separated some of the first ten silages. Much more attention was being paid to effluent control, and this was satisfactory on all the farms visited. One farm even had a fish farm situated on the burn below, which ensured the effective control of all effluent.

The over-riding impression of the 2 days of visits was the enthusiasm of all competitors to make good silage. The determination often came from the younger members of the farming families, and it was gratifying to see so many farmer and son teams on the short leet. The units visited were all very functional with thought being given to the planning of the feeding of the silage.

More faith was being put in quality silage to produce milk with a consequent reduction in concentrate usage. Originally this was a response to milk quotas, but now it was being realised that silage could produce more milk than many farmers supposed. The replacement of concentrates with silage had its problems in that more silage was required, and in some cases raised doubts whether it was going to last through the winter. Careful planning would be required in the future to allow a sufficiently large area to be cut for silage.

In the event the winner of the competition was clear cut but the remaining places were closely contested. Those on the short leet who did not get a prize should not be discouraged. Their turn would come, and given

Table 1. 1987-88 Silage Competition - Analyses and Marks

Rank	Code	DM (g/kg)	CP (g/kg)	D Value	Ammonia N % Total N	Marks /35
1	CL18	248.8	147.0	73.0	62	31.54
2	CL11	211.7	149.8	68.1	65	28.68
3	CL12	211.0	145.9	68.3	66	28.49
4	CL13	193.9	165.9	71.9	103	27.90
5	CP23	209.2	129.7	67.6	53	27.55
6	CP24*	183.5	170.6	71.0	113	26.93
7	CL 6	196.7	132.6	69.6	85	26.58
8	CP 9	215.9	132.4	65.6	50	26.18
9	CP 2	234.2	141.8	64.7	55	26.04
10	CL10	188.2	154.6	69.0	100	26.01
11	CP17	244.9	110.9	67.5	66	25.91
12	CP20	185.7	156.9	64.1	45	25.15
13	CS28	210.2	145.9	67.0	93	25.01
14	CL19	204.8	143.1	65.5	85	23.67
15	CP27	204.2	124.3	64.8	72	22.57
16	CP 4	240.8	120.6	64.2	75	22.52
17	CS 3	217.5	102.0	64.1	39	22.44
18	CP14	214.3	118.1	65.1	86	21.69
19	CP 1	206.5	105.1	63.2	47	21.41
20	CP26*	202.5	103.9	62.4	62	19.36
21	CP15*	199.8	109.4	63.4	89	18.48
22	CS 5	181.5	123.4	64.2	101	18.45
23	CL16*	252.0	116.8	61.3	95	17.96
24	CL 7	214.5	157.0	61.5	137	16.93
25	CL25*	203.5	110.8	58.4	68	15.45
26	CL21*	218.8	167.2	62.0	231	13.26
27	CL 8*	403.2	99.0	58.4	105	13.00
28	CL22	204.4	142.8	59.0	180	10.33

* Denotes entry in beef and sheep class

the enthusiasm that existed some of the more seasoned competitors would have to work hard to maintain their position at the top. The Judge thanked all members who had entered the competition, particularly those who had so willingly allowed their farms to be visited for the silage inspection during the previous 2 days.

The marks awarded in the competition are shown in Tables 1 and 2. Winner of the first prize and the SAI Cup was Sandy Bankier, Fernieshaw Farm, Cleland. Runner up was Messrs J Kerr & Sons, Kirklands Farm,

Table 2. Short list for Judge's visit

Open Entries		**Analyses (35)**	**Inspection (65)**	**Total (100)**
1st and SAI Cup	Messrs A Bankier & Co, Fernieshaw, Cleland.	31.54	62.5	94.04
2nd	Messrs J Kerr & Son, Kirklands, Dunsyre.	28.68	60.5	88.18
3rd	Messrs W S Millar, Newlands, Uddingston.	26.58	61.0	87.58
4th	Messrs W K Carruthers, Nethertown, Auchenheath.	27.90	58.5	86.40
	Messrs A H Lyon, Drumachloy, Rothesay.	27.55	57.0	84.55
	Mr C Telfer, High Branchal, Bridge of Weir.	26.04	58.0	84.04
	Messrs W M Andrew & Son, Crossflat, Kilbarchan.	26.18	56.15	82.68
	Mr A Park, Patterton, Newton Mearns.	25.15	57.5	82.65
Best New Entrant	Mr W McMillan, Cranslagvourity, Rothesay.	25.91	55.0	80.91
Most Improved Silage	Mr C Murray, Inchbelle, Kirkintilloch.	25.01	55.0	80.01
Beef/Sheep Entries				
1st and Hamilton Reco Salver	Messrs A H Lyon, Kidavannan, Rothesay	26.93	57.0	83.93
	Mr A Campbell, Milton, Kilmacolm.	19.36	52.0	71.36

Dunsyre. The third prize went to Messrs W S Millar, Newlands Farm, Uddingson and the fourth prize to Messrs W K Carruthers, Nethertown, Auchenheath.

Messrs A H Lyon, Kidavannan Farm, Rothesay, won the first prize in the Beef and Sheep Class, and also received the Hamilton Reco Salver. The runner up in this class was Mr A Campbell, Milton Farm, Kilmacolm.

Mr W McMillan, Cranslagvourity Farm, Rothesay, won the best new entrant prize, and the prize for the most improved silage was awarded to Mr Colin Murray, Inchbelle Farm, Kirkintilloch.

I R Fraser - Silage Quality 1979-87

A summary of the mean silage analyses for the last nine annual silage competitions is given in Table 3. Total entries in the competition were the lowest ever and it was difficult to see the reason for this. However, this did not detract from the quality of silage made. In terms of D value there was a distinct improvement over 1986, and the average has only been bettered in 1984. Ammonia nitrogen levels fell to their lowest ever and averaged out at just under 9%. This indicates the much better fermentation quality that is now being achieved.

Dry matter levels were much the same as in 1986 and probably indicated less emphasis on wilting. As long as effluent is effectively controlled this lowering of the dry matter should cause no problems. Crude protein levels fell from the previous year and were the lowest ever recorded in the competition. This was general in many parts of the country and reflected growth conditions particularly for first cut silages.

Table 3. Mean Silage Analyses for Silage Competition 1979-87

Year	Numbers Entered	% Dry Matter	% Crude Protein	D Value	Ammonia N % Total N
1979	33	20.8	17.0	61.8	18.9
1980	37	21.6	15.7	61.3	16.3
1981	53	22.6	13.8	60.1	14.0
1982	59	26.6	14.6	63.6	13.6
1983	53	24.0	14.6	61.5	11.3
1984	40	23.5	15.7	66.3	11.6
1985	49	20.4	15.9	64.3	12.9
1986	43	21.6	14.8	64.4	11.8
1987	28	21.8	13.3	65.2	8.7

SOUTH WEST SCOTLAND GRASSLAND SOCIETY

COMPETITIONS 1988-89

16TH ANNUAL SILAGE COMPETITION

The 16th Annual Silage Competition of the South West Society will be run again this year though with a number of changes in the marking and judging system. These changes follow current thinking on silage quality and include dropping the marks for DM content, reducing those for crude protein and increasing the digestibility marks. The scoring for ammonia content has also been revised, and fewer total marks will be awarded for analyses to make more available for on-farm judging. Emphasis in judging will continue to be on feeding efficiency and the control of effluent. Full details of the new system will be circulated with the entry forms and rules for the competition.

The prize for the best big-bale silage (based on analysis only) is a cash token kindly donated by Plasti-Covers Ltd (Irvine).

The competition entry fee does not include the charge for laboratory analysis which is now made directly by SAC.

GRASSLAND IDEAS COMPETITION

This competition seeks original ideas or innovations developed by individuals on their own farms. These can be gadgets or home-designed modifications to machines, gates or could be ideas on systems of crop or stock management which have been used to improve efficiency.

Entry is free and forms will be circulated with the silage competition forms.

The prize for the winner of this competition is a tankard donated by UKF Fertilizers. Each local Society winner may go forward to the BGS National Ideas Competition if this competition is run in 1989.

GRASSLAND FOR THE '90s

The 1987 Winter Meeting of the British Grassland Society held at the Purcell Rooms, South Bank, London on 9 December 1987

Several members of SWSGS and The West of Scotland College attended this meeting. Poster papers were presented by staff from Auchincruive and Crichton Royal Farm on compaction/drainage and grass-clover swards respectively.

The theme of the meeting was 'Establishment, maintenance and improvement of swards to meet changing economic and environmental pressures'. Invited papers were presented on the need for reseeding, grassland management, dependable white clover, and future herbage varieties. There were shorter papers on efficient slurry application, slurry seeding, pest control during grass establishment, and breeding varieties in New Zealand. Posters were given on agroforestry, grass pests, surface seeding of clover as well as on drainage compaction and grass-clover mentioned above.

The meeting attempted to present an update of new practical findings and an overview within the topics covered. The need for reseeding, how to get the best from white clover, poaching, slurry and grass heights stimulated the most discussion. The message coming through was that a more positive and precise application of new knowledge was necessary in grassland management in order to cope with the increasing constraints imposed by economics, environment and public requirements.

A number of West College staff have details of the items discussed and could be consulted on particular points.

The Winter Meetings of the BGS bring together farmers, advisers and research workers and provide a valuable forum for discussion of well-chosen themes in the winter ready for planning the coming year.

This particular meeting was well-sponsored by seeds and chemical firms, including Sinclair McGill plc and Monsanto plc. The venue of the Purcell Rooms provides excellent facilities in the centre of London (near Waterloo Station).

G.E.D. Tiley

1987 GRASSLAND IDEAS COMPETITION

South West Scotland Grassland Society

Winner 1987: B Walker, Rogermoor, Moffat

Mobile concentrate feeder

Brian Walker's winning Grassland Idea was a mobile concentrate feeder, converted from an old 15 feet bale trailer. Wooden feed troughs are hinged at trailer-bed height. The free end is supported in the feeding position by a stand which is lowered and clamped to take the trough weight. Two troughs at each side of the trailer give a total feed trough length of 60 feet, sufficient for 55 cattle.

The mobile trailer can be towed around different cattle groups. Poaching of a single feeding spot can thus be prevented and the need for large numbers of static troughs avoided. There is flexibility to take hay or straw out with the concentrates and the operator can look over the animals each day while waiting for them to finish feeding.

This idea was seen on the Dumfries Summer Farm Walk to Rogermoor. The Society members were greatly impressed by the simplicity, ruggedness and practicality of the mobile feed trailer.

Further elaboration of the idea would be possible by hydraulic operation of the feed troughs or by hydraulically lowering the trailer bed to allow for feeding sheep.

The UKF Grassland Ideas tankard was presented to Brian for this winning idea at the Competition Evening in Mauchline.

Other ideas submitted this year included use of straw base to absorb effluent and prevent soil contamination of silage in an outside field clamp; the possible alleviation of trace element problems through better drainage; quick repair cubicle legs made from hollow iron sections.

The Grassland Ideas Competition will be continued in 1988-89.

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FARMING IN CENTRAL SCOTLAND 1963-1988

Mr A Bankier, Fernieshaw Farm, Cleland, Motherwell

In the 25 years since the Central Scotland Grassland Society was founded tremendous changes have occurred in the pattern of farming in this area of Scotland, an area almost totally classed as 'less favoured area' by EEC directive. Particularly noticeable have been the changes which have taken place on the dairy farms, but beef and sheep farms have not been immune to change either.

In the early 1960's the herd size on the average dairy farm was considerably smaller than today, varying from 35 to 55 cows. The main limitation on herd size then was that the cows were tied up in byres; hay and turnip feeding systems were the vogue and these were labour intensive as was the handling of farmyard manure. It was only with the spread of cubicle housing that herd size began to expand, so that herds of 100 to 150 cows are not unusual now. Self feed, easy feed and complete diet feed systems evolved depending upon the farmer's preference.

Another marked change has been the trend to larger cows. In the early years of the Society the predominant dairy breed in the area was the Ayrshire supplemented by some Ayrshire x Friesians. Today the predominant dairy breed is the Friesian with a contribution from the larger Holstein. Friesian bull calves had higher market value than Ayrshires. Over the years continental beef bulls have been increasingly used on the lower yielding dairy cows. Artificial insemination has become increasingly important as a means of improving the genetic potential of dairy cows.

Over the 25 years grass has been of prime importance on farms but the main method of conserving the cut herbage for winter feeding has altered. Traditionally hay was made and fed to stock, but this has been gradually phased out especially on dairy farms where most of the conserved feed is now in the form of silage. High and frequent rainfall and high humidity makes hay making a high risk venture. The long period of winter housing necessitated adequate stocks of home grown forage and silage fitted the bill. The western third of Scotland is now the primary silage making area producing half of Scotland's 5 million tonnes.

Silage making is more flexible than hay making and integrates more easily with grazing. It is less weather dependent, regrowth is quicker after cutting and it allows higher use of fertilizer nitrogen if intensification is the objective. There is also opportunity to achieve consistently better feeding value than hay. A significant recent development has been big bale silage whether bagged or wrapped. It can be used for surplus grass in late season or on small units and on hill and upland suckler units it has avoided high capital expenditure on silos. A continuing flow of improved grass varieties, knowledge of the relationship between grass maturity and feeding value, effective additive use, more precision in the use of fertilizers and observing the rules of good silage making aided the tremendous expansion of better quality silage and ensured its major role now in winter feeding and a role for it in summer buffer feeding. Effective sealing and weighting down of plastic sheeting were key rules which emerged. Society members became more and more familiar with the golden rules as the silage competition went from strength to strength.

To cope with the increased output of silage new types of machines were developed during the 1970's. These machines required more power, and larger tractors had to be purchased. On some soil types soil compaction problems have resulted. Increased mechanization had two profound effects on the dairy farm. The first of these was that a big reduction took place in the labour force. However, although there were fewer workers, the labour bill was higher not only because of increased wages but also because of the greater cost of conditions of work and safety regulations. The second effect of increased mechanization was to change the traditional family farm to a farming business and this created many pitfalls such as bank borrowing, accountancy fees, etc. Despite these draw-backs dairy farms enjoyed good profits in the 1970's due to better silage, better cows and better machines. In addition, incentives were given by the Government to go forward and produce more milk.

Associated with the change in stock feeding systems came slurry and its attendant problems of storage and distribution. However, there is now realization that it is a valuable source of nutrients which should be used sensibly to complement bought fertilizers rather than regard it as a waste product. Over the winter period a dairy herd of 100 cows produces about £1,600 worth of plant food. Environmental pressures to avoid aerial or water pollution have steadily increased (as they have for silage effluent disposal too).

Grazing has always been the cheapest way of using grass. Over the 25-year period emphasis and arguments on grazing systems gave way to acknowledging that stocking rate was the key to efficient use. Tight control of spring grazing to maximise the area cut for silage is now recognized. Where the land can carry stock, early and late grazing are still common but on land susceptible to poaching, a major problem in the area, more silage feeding has become the recognised answer. Buffer grazing which allows silage land to be grazed if necessary or surplus grazed land to be shut up for silage has become commonplace and there are now recognised sward surface height rules to aid efficient grazing. Thinking of beef and sheep, clean grazing systems have evolved while on hill sheep units, the two pasture system (improved grass to complement rough grazing at key times in the ewe's nutritional cycle) has been increasingly adopted.

After following the high production route, the crunch came in the early 1980's, even before the introduction of milk quotas. Increasing prices of fertilizers, machinery and dairy equipment, high interest rates and many other items overtook the modest increase in the price of milk at the farm gate. It was a case of cutting costs and tightening belts. At the same time serious concern developed on the EEC over the level of surpluses, especially dairy. The continuing expansion of the EEC dairy herd and high cost to CAP of storage and disposal led to the imposition of quotas in 1984. Milk quotas have made the economic situation even more critical, and many dairy farmers are now seeking alternative enterprises to maintain farm profits. However, viable alternatives in the central Scotland area are not easy to find. The soils and climate are responsible for the low amount of land (6% or so) which is arable cropped.

Not so many years ago a cow giving 23 litres of milk per day or 4,500 litres in a lactation was considered good. Nowadays the farmer would be looking for a lactation yield of 6,000 litres and more. Yield per cow has steadily increased; herd size has also increased while the number of producers has declined. With the onset of quotas, farmers have two main options: maintain herd size but produce lower yields per cow and more calves for the beef industry; alternatively reduce herd size and increase milk yields plus find alternatives. High quality forage has a continuing and increasing role to play in meeting the challenge of today - lower unit costs of production.

Turning to cereals, a yield of 3.5 to 4 tonnes of oats per hectare seemed adequate in the 1960's. Cutting with a binder, stooking and threshing in the 'big mill' were common. Today, following the trend to barley, and given the fact that grain yields have increased at 2% per year in recent years, a good crop of barley cut and threshed through a combine harvester would be expected to yield 6 to 7 tonnes per hectare. The yield increase can be attributed to a host of husbandry factors including varieties, fertilizing, weed, pest and disease control. Again overproduction has ensued and alternatives, including land set-aside schemes, need to be considered.

It is a moot point if the pattern of farming in this area will change as much in the next 25 years as it has done since 1963. Yet we must not overlook the potential dramatic changes which could come from biotechnological advances. Nevertheless, the changes which have occurred demonstrate the capabilities of the farming industry to adapt. Hopefully the same efforts directed towards new developments in dairying and other traditional stock enterprises or towards some alternative enterprises will be equally successful in the future. They will need to be if the industry is to survive and thrive.

CENTRAL SCOTLAND GRASSLAND SOCIETY

COMPETITIONS 1988-89

10TH ANNUAL SILAGE COMPETITION

The CSGS 10th Silage Competition will again be run in 1988-89. A good entry will be anticipated in the Society's Jubilee year.

The prizes will be the same as last year though there will be some changes in the marking system. Full details of these will be circulated to all members with the rules and entry forms.

SULPHUR FOR SILAGE

Keith Chaney

Senior Agronomist, Norsk Hydro Fertilizers Ltd.

Is your silage aftermath growing to its full potential? Recent trials showed an average yield increase of 9-10% from sulphur fertilizer applied on second cut silage - the extra grass being worth £30-35/ha. Symptoms of sulphur deficiency are similar to those of nitrogen deficiency. Pale green grass which fails to grow following nitrogen application could indicate a lack of sulphur.

Introduction

Sulphur is taken up by plants in the form of sulphate of which sulphur-demanding crops such as conserved grass, swedes and oilseed rape remove 30-40 kg sulphur/ha. This is obtained from the breakdown of soil organic matter and rocks, and from the atmosphere. In the past these sources have been supplemented by the addition of fertilizers which contained sulphur, e.g. ammonium sulphate or single superphosphate. However, these fertilizers have been replaced by ammonium nitrate and triple superphosphate which contain little or no sulphur. Also the deposition of sulphur from the atmosphere is generally decreasing.

English Trials

Field trials have been carried out by Norsk Hydro at twelve sites in England in the past 3 years, applying sulphur fertilizers to grass for silage production. There was no yield response to applied sulphur on first-cut silage.

In 1985 50 kg sulphur/ha was applied in the form of gypsum in mid March, and in 1986 and 1987 15 kg sulphur/ha was applied as ammonium sulphate immediately after the first cut had been taken. In each year the second cut received 120 kg nitrogen, 20 kg phosphate and 75 kg potash per hectare.

At the second cut a 9% yield increase was obtained when averaging all sites. The additional 0.36 t grass dry matter/ha grown was worth almost £30 per hectare, valuing the grass dry matter at £80/t. However, at the four responsive sites there was an 18% increase worth £69 per hectare.

Scottish Trials

Trials conducted by the West of Scotland Agricultural College in 1984 and 1985 at Dumfries on potentially sulphur-deficient soils gave significant yield increases to sulphur fertilizer. Again there was no sulphur response in the first cut, but sulphur plots produced 17-27% and 12-26% more grass dry matter at the second and third cuts respectively.

Further trials in 1985 at Campbeltown and Thankerton on light soils gave yield responses of 52% and 11% respectively for the second cut. Similar responses have been obtained in north-east Scotland at Laurencekirk and Boyndie at second and third cuts.

How Much?

The trials on sulphur-responsive soils have shown that an application of 15-30 kg sulphur/ha will ensure a full yield of second cut silage. If a third cut of silage is to be taken a further sulphur application may be required. However, the Scottish trials showed that a single dressing of 24-48 kg sulphur/ha in spring lasted until the third cut.

The different sources of sulphur used, e.g. gypsum, elemental sulphur or forms of sulphate, have given similar responses. The important point is that sulphate is readily leached from the soil over the winter period, and sulphur must, therefore, be applied each year according to crop needs.

Light Soils Responsive

Thus, trials have shown that on sulphur-responsive soils sulphur fertilizers can be beneficial for second and third cut silage especially on light soils where fields have a history of cutting, but not on heavy soils high in organic matter. Responses are unlikely where heavy dressings of farmyard manure or slurry have been applied. ADAS have reported a response to sulphur following a light slurry application.

Soil analysis measuring the available sulphate content can be used as a guide to indicate low sulphur status. However, there is a large 'grey' area where sulphur may or may not be required. Grass herbage analysis measuring the nitrogen : sulphur ratio gives the best indicator of the sulphur status of the crop. If the ratio is greater than 16:1 the grass sward is likely to be responsive.

Recommendations

Fertilizers with added sulphur are now available on the market. For example, SulphurCut (22:4:14 + 3% sulphur) from Norsk Hydro supplies sufficient sulphur for full silage yields, as well as providing the correct balance of nitrogen, phosphate and potash.

The recommended rate of application of SulphurCut for a second cut is 500 kg/ha, which supplies 15 kg sulphur, 110 kg nitrogen, 20 kg phosphate and 70 kg potash per hectare. The recommended dressing for a third cut is 375 kg/ha supplying 11 kg sulphur, 83 kg nitrogen, 15 kg phosphate and 53 kg potash per hectare.

BGS NATIONAL SILAGE COMPETITION 1988

It is a great pleasure to record that Michael Milligan, who won the first prize in the South West Society's Silage Competition for 1987-88, went on to win the Scottish Regional Competition for the fourth time. He then achieved his great ambition by winning the BGS National Silage competition with full marks for analysis and a total score of 96.1 marks out of a possible 100. All members will wish to congratulate Michael on this outstanding achievement, which will be marked by a National Open Day at Culvennan on 4 October 1988.

The South West Society is building a tremendous reputation for outstanding silage making with Michael's award coming only 2 years after John and Willie Carson won the same supreme trophy. There is no doubt that other SWSGS and CSGS members are fully capable of achieving the same success in the future, given the right circumstances.

ISLE OF MAN HIGHLIGHTS

J Harris
Secretary of the Manx Grassland Society

Adapted from the Manx Grassland Newsletter No.10, 1988

Manx Grassland Establishment Survey 1987

When the 245 fields submitted for grassland improvement grant in 1987 were inspected, the quality of grassland established in the different situations and by different methods was assessed. 1987 was a poor year for grass establishment, with dry conditions in May and heavy cereal crops harvested rather late. However, conditions were excellent for autumn reseeding. The May drought had little effect, and undersown grasses on dry soils in the north of the island were no worse on average than those on the moister soils in the south.

Direct sowing was the best method of establishing good grassland, whichever month between May and September it was done. Nearly 70% of direct sowings were very satisfactory.

Undersowing was a poor second best, with an average of 35% of undersown crops giving a very satisfactory take. The take was particularly bad where 247-370 kg/ha of 20:10:10 was the only fertilizer applied for the cereal crop, with as little as 20% showing a very satisfactory take. However, 50% was very satisfactory where the grass was undersown with adequate phosphate and potash applied.

Economics altered the picture because undersowing cereals meant a net return of about £300 per hectare in the seeding year. Given a 6-year life of the sown ley, the farmer who sowed direct in the spring would have to produce livestock products with an additional annual value of £50 per hectare compared with an inferior undersown sward.

Organic husbandry and the grassland farmer

One of the growth areas in agriculture is the production of 'organic' produce for what seems to be a rapidly increasing market. The Isle of Man is slowly

building a reputation for organic oats, because there are no areas in the UK where traditional mixed farming allied to moderate fertilizer use is conducted on the same scale. Unfortunately it does not seem possible to market the meat and cheese as organically produced.

However, a further increase in the quantity of organic oats exported is possible, and this will come from mainly livestock farms rather than mainly arable units. A good market exists for truly organic oats on the mainland and on the continent.

Manx Grassland Society Tour of Yorkshire 1987

Bishop Burton College Farm

The dairy unit here had 125 Friesians, calving from August to January, with an average yield of 5900 litres and a margin over concentrates of £660. The new unit incorporated an observation platform for visitors, and consisted of four rows of cubicles - two each side of a central feed trough. The cows were fed second-cut silage plus maize gluten for maintenance + 15 litres. Heifers joined the herd at 2 years. Due to poaching problems in October and April, the indoor feeding period was 7 months long.

The sheep unit specialised in January lambing with singles weaned at 6 weeks, and twins at 8 weeks. They were kept inside, and fed 0.7-1.4 kg of a concentrate containing barley, soya and groundnut. The ewes were fed 0.7 kg after lambing, reducing to nothing before weaning. Feed conversion was about 3½:1, with lambs going at 18 kg.

Three beef cattle systems were in operation using calves from the dairy herd, namely - 10-11 month bull beef from barley (Friesians); 15 month silage beef (Limousin x Friesian); and 2 year grass/cereal beef (black Hereford crosses).

Mr J Dunning, Cold Harbour Farm, Bishop Burton

This was a mixed farm of about 263 ha, with 200 ha in wheat and vining peas, and a breeding herd of 100 sows. The dairy herd consisted of 103 Holsteins and followers utilizing 63 ha of grass of which 40 ha was in the arable rotation. The herd was autumn calving and self-fed on silage plus a 7 kg per head of a home-mixed ration. Housing was on a straw-yard system, and from turnout to calving no concentrate was fed.

The yield per cow was 5831 litres, of which 3100 litres was from forage. 1.4 tonne of the home-mixed ration was fed with about 10 tonne of silage per cow. Stocking rate was 0.44 ha per cow. The leys were down for either 1 or 3 years and predominantly Italian ryegrass. Permanent pasture and long leys contained perennial ryegrass and little clover. Nitrogen application rate was 250 kg/ha and the rainfall averaged 635 mm annually.

Mr I Rigby, High Mowthorpe E.H.F.

Suckler cow management and feeding

In the suckler cow enterprise at High Mowthorpe the replacement heifers (Hereford x Friesian) were home reared and calved at about 26 months when about 450 kg. Heifers were mated to easier-calving bulls such as Limousin or Blonde d'Aquitaine. The cows calved outside in April and May, and grazed the permanent dale grassland.

After bulling, cows and calves stayed outside until housed at the end of October, when the calves were weaned and the mature cows went onto cheap wintering rations based on straw. Straw dry-matter intakes of 9 kg/day allowed supplementary feed to be saved, especially when the straw was ammonia treated. Mature cows were wintered on treated straw alone with no detrimental effects. The suckler enterprise was efficient and quite profitable although using the least productive land.

Finished suckler calves

At weaning the calves were housed, and finished indoors during their first winter. The heifer calves were finished on silage-based rations with a supplement of only 3 or 4 kg per day, according to silage quality. Silage was not used elsewhere in the enterprise, so straw-based rations were being investigated.

Male calves were left entire and finished as bulls, giving the benefit of better growth rates and feed conversion. The animals could also be taken to heavier weights without becoming over fat, and superior carcase conformation was obtained.

Store lamb finishing

Since 1983 work has concentrated on producing standard carcases (18 kg in fat classes 2 or 3L) regularly between January and May. The lambs were held either on grass after the cows were brought in or on swedes, and finished indoors.

Scottish Blackface and Swaledale lambs produced carcases about the target weight and condition, but Mule wethers were too late maturing. Systems of holding lambs on straw-based rations were being investigated as alternatives to growing swedes.

J S R Farms, Givendale Farms

This farm of 402 ha was acquired in 1974 and, after intensive improvement over the first 5 years, it was split into 271 ha of arable land and 131 ha of permanent grass and steep dale. By 1987 the permanent grass in conjunction with 61 ha (mainly silage and sheep grazing) of 2-year leys carried nearly 200 cattle plus 650 Mule ewes and 220 Mule gimmers.

The grazing land was divided into 12 ha enclosures for a controlled "clean grazing" system. Sheep were stocked at 17 per ha on the leys and 12 per ha on the permanent grass. The arable land was cropped with cereals, oil seed rape and 2-year leys (61 ha). A suckler enterprise continually produced a high level of performance recognised in 1983 by the award of the "MLC/BGS Yorks/Lancs Grass to Meat Award".

An intensive campaign of gassing, night shooting and the use of rabbit netting on the perimeter dramatically reduced the serious damage caused by rabbits in the immediate vicinity, and contributed to improved productivity.

C W Marwood & Partners, Foultrice, Whenby, York

This 53 ha arable farm on heavy land had 26 ha of cereals consisting of winter wheat for 3-4 years, followed by barley, and 23 ha of which was undersown with grass. The leys were usually down for 3 years to help establish a good soil structure and plenty of humus. The remaining 4 ha were roads, buildings and uncultivated land.

The grass seeds mixtures used were predominantly perennial ryegrass with some Alsike and white clover. The fertilizer rates were 244 kg nitrogen, 41 kg phosphate and 84 kg potash per ha. 250 tonnes of silage were made in 1986.

The commercial sheep flock of 200 ewes was housed at the end of November and lambs were finished indoors on home-mixed concentrates to avoid poaching on the heavy land. It consisted of Suffolk x Scottish half breds, Scottish half breds and Charollais x Scottish half breds. The majority were lambed in January and February. The lambs were weaned at 7 weeks of age, finished on concentrates fed indoors and sold from the end of March onwards.

There was also an MV Accredited flock of 44 pedigree Charollais ewes and ewe lambs, producing shearlings and ram lambs for sale. The Charollais sheep were used in the early lambing flock to produce lambs at 18-20 kg with good quality carcases.

Mr A Hewetson, Pasture House, Broughton, Skipton

This 111 ha sheep farm on heavy clay at 150 m carried 1000 breeding ewes and 150 summer agisted cattle to use surplus grass. The ewes were mainly Mules, but Suffolk x Mules were being substituted to reduce replacement costs.

All of the grassland was permanent and of high quality. Various methods of oversowing with ryegrass and clover were pioneered. The most effective was to "black" the grass completely with up to 500 weaned ewes, chain harrow twice, broadcast the seed at about 17 kg/ha and roll.

Ewes were in two groups - April and January lambers. The April lambers were 200 hoggs and 500 ewes (Mules and Suffolk crosses). The January lambers were 300 ewes (Suffolk crosses) bought in in October, and with lambs finished in April without going out to grass. The lambs in this group were weaned at 7-8 weeks, and were eating 1 kg of concentrate via the creep 4 weeks after birth.

Silage had been fed to sheep for 30 years. Nitrogen was applied to grass every 6 weeks with the first application of 88 kg/ha in the second week of March.

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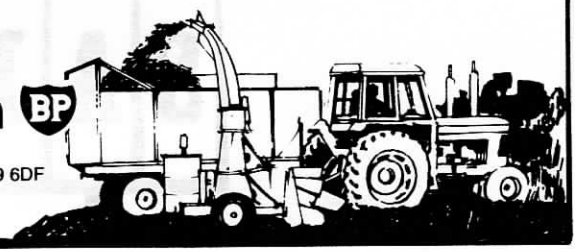


Manx Grassland Society Visit to Northern Ireland 1987

Greenmount College, Antrim

In the Teaching Unit three beef systems were being compared. These were:

(i) 15-month beef with November born Hereford x Friesian bulls, grazed on a 2-3 paddock system, and brought in on 5 September. They were given 3 kg of cereal per day and weighed 400 kg by 14 October - an increase of 1.6 kg/day. Friesians on a similar system gave 1.5 kg/day.

(ii) 18-month beef, which was being abandoned because of poor margins.

(iii) 24-month beef with January calves, turned out to grass in May when they weighed 120 kg. 1 kg meal was fed per day throughout the grazing season. The calves were housed in October at 250 kg (0.8-0.9 kg increase per day) and wintered on good silage plus about 1 kg meal to grow at a rate of 0.6 kg/day. They were finished on 2-3 kg meal to weights of 580-600 kg in the December-February period.

The gross margin per hectare was about the same for all systems. However, the system to be used depended on a number of factors. For example, heifers and early maturing steers would normally be finished at 15-18 months, whereas Continental steers were best finished at up to 24 months. Autumn-born calves were suited to the 18-month system, as were spring-born heifers. Spring-born steers were best finished at 2 years. The 15-month system demanded a superior management with full use of high quality grass and silage, and with high costs and low beef prices would only be attractive with bulls.

The grass, hay and silage for the beef enterprise was produced on 35 ha, half of which was cut for silage and the rest grazed. A small area of permanent grass was retained. The remainder was regularly reseeded with midseason perennial ryegrasses.

The grazing system was based on groups of 20-30 cattle, each group grazing 2-4 paddocks. In early summer the cattle were tightly stocked and surplus paddocks were cut for silage. Some of the cutting area could be used for grazing following the first or

second cut. The grazing area received 270 kg nitrogen per ha - 75 kg in early spring and 50-60 kg after each subsequent grazing at 3-4 week intervals.

The first silage cut was taken at the end of May, and the remainder at 6-7 week intervals. Most of the area was cut three times unless required for grazing, and all of it received slurry in winter or early spring. Fertilizer rates were 125 kg nitrogen per ha as urea for the first cut. The second and third cuts received 125 and 95 kg respectively as Nitrochalk or a compound.

In the Experimental Unit the facilities for silage feeding trials were excellent, thirty different silos being available. The staff of thirty supervised computer controlled silage feeding with a minimum input of cereals (1 kg). Each animal was fitted with a transponder to open its own silage bin. Gains per day varied from 0.1 to 0.9 kg depending on which additive (if any) was used. In addition, individual cattle on one lot of silage plus 1 kg of barley showed liveweight changes varying from -0.2 to +1.9 kg per day, although they were evenly matched to start with.

S and D Carlisle, Westgrove, Templepatrick, Co. Antrim

This farm was 142 ha (20 ha in barley) of heavy land at about 90 m. The herd of 110 suckler cows was previously Aberdeen Angus x Friesian, but was being changed over to Limousin x Friesian, with 40 calving in the autumn and 70 in May. There were also 250 ewes, - Mules and Suffolk x Cheviots all put to Suffolk tups. Fifty of the Suffolk x Cheviots lambed in early January and the rest in March.

The grazing system gave the sheep preferential treatment with the cows following round eating the rougher grasses. Stocking rate was 2.5 cow equivalents per ha. The heifers were finished at 460 kg when 15-16 months, and the steers at 600 kg when 24 months.

40 ha of the grassland was cut twice for silage, and 6 ha for hay. The first cut (3rd week in May) was used for young stock and the second cut (mid July) was self fed to the cows. Cows getting fat before calving were taken off silage and put on straw, and all cows were fed nothing but straw in the last 3 weeks in the cow shed. No concentrates were fed. Autumn-born steers were fed silage plus 0.9-1.4 kg of barley, and all summer calves got 0.9-1.4 kg of a 16% protein mix.

My Farming System - Dr S Jamieson, Kirkland, Dumfries

Dr Jamieson, who was the Silage Judge for the Manx Grassland Society in 1987/88, described his farming system to the Society. The farm was 142 ha of good free-draining soil in the Nith Valley, and was 46-76 m above sea level. The two dairy herds - 116 cows at Kirkland, and 140 cows at Rosehill - were housed in cubicle buildings. All silage was fed from one large silo at Rosehill by means of a forage box.

On the grassland a set stocking system was used, keeping the grass short. Silage was made by a chopper with three trailers. Grass was pre-cut with a mower conditioner, which left a perfect swathe for picking up. The biggest advantage of the mower conditioner was an increased chopper output rather than wilting. All cut grass received a formic acid additive.

The average milk yield from the two herds was 5924 litres. Concentrates were fed at 0.27 kg per litre with a total of 1.60 tonnes per cow. The calving index was 370 days. Only well proven Holstein bulls were used. Cows were calved all the year round except in August and September. **D Reid.**

SCHERING AGRICULTURE GREEN SCIENCE GRASSLAND CHALLENGE 1988

The winners of the above competition were announced by Schering Agriculture in May 1988, and the successful man in the South West Society was David Hogarth of Sorbie Farm, Ardrossan. The congratulations of the Society go to David on his win.

Each prize winner in this competition is offered a place on the BGS summer tour of Lancashire in July with Schering Agriculture covering the fees for the tour plus full board and accommodation. Apart from the opportunity to be able to join in these well-organised BGS Summer visits, the value of the prize is quite considerable. We hope that David will be able to accept the offer, and we are sure that he will thoroughly enjoy the experience.

THE BRITISH GRASSLAND SOCIETY

SUMMER VISIT TO ROYAL BERKSHIRE, 1987

Malcolm E Castle, Tobergill, Low Coylton, Ayrshire
Jim Watson, Creoch, Ochiltree, Cumnock, Ayrshire

The theme of the 1987 Summer Meeting was "Research into Grass : Grass into Profit", and Berkshire was the ideal county in which to show these two vital links. The Royal county contains many well-known research stations conducting work on grassland, and there are also many progressive farmers testing new ideas. This hopefully leads to greater grassland efficiency, both technically and financially. Berkshire is only a small county, 8-16 miles from north to south and 45 miles east to west but the area pulsates with a thriving economy, an increasing population and low unemployment. Grassland farming is part of this scene, and the Berkshire Grassland Society staged a first-rate summer meeting packed with interest.

Research Visits

Appropriately the first visit was to the Institute for Grassland and Animal Production at Hurley which studies all aspects of grassland production, management and utilization. The staff number of about 700 indicates the importance attached to this type of work. Three aspects of the research work were seen briefly; the control of diseases and pests in newly-sown grassland, methods of improving grazing management, and slurry and the environment. Diseases such as *Fusarium* which attack seedlings can be treated effectively and cheaply, and the frit-fly pest may be controlled by biological programmes which use reduced amounts of agro-chemicals.

The simple guidelines for sheep production indicated that sward height should be 4-6 cm for optimum performance from ewes and lambs in a continuous stocking system. At this height the intake per hectare was also close to the maximum. For cattle, a grass height of 7 cm is ideal for set stocking systems.

An important aspect of the slurry work was the emphasis on reducing air and water pollution. This is important in a densely populated area, but from an agricultural viewpoint it means a reduced loss of valuable nutrients.

Jealotts Hill

The effect of nitrogen fertilizer on the environment was discussed also at Jealotts Hill Research Station which is the centre of agricultural research for ICI. This station covers 243 ha and employs a staff of 850 people. The target yield of grass, 10-11 tonnes dry matter/ha, was achieved with an application rate of 370 kg nitrogen/ha but on the farm rates of up to 450 kg/ha were used. The effect of fertilizers on nitrate accumulation in the soil, and its disposal through leaching and denitrification were being studied. At the present time this is a most important topic for both the grassland farmer and the public.

The experiments with dairy cows at Jealotts Hill were aimed at reducing the costs of milk production by using large amounts of high-quality silage. Recent work to reduce costs per litre of milk have shown the value of low inputs of a high-protein concentrate. The results fully confirmed the original studies conducted at the Hannah Research Institute which showed that a high-protein concentrate increased the intake of grass silage. Cows offered soya bean meal and fish meal at rates as low as 1.6-1.8 kg/day produced similar yields of milk as animals given much larger amount of a standard concentrate containing 18% crude protein. This idea of a high-protein supplement demands *ad lib* access to silage of high quality but gives increased margins per litre.

Farm Visits

David Stevens and John Holmes at Kintbury Holt farm, near Newbury, aim to produce milk with minimum concentrate use. Originally tenant and manager respectively, they are now partners with 555 ha, two dairy herds and 356 dairy cows. Milk yields were 5,000 litres/cow in 1987 with a concentrate use of only 0.18 kg/litre. Wheat, barley and maize are grown, and 49 ha of woodland is managed with conservation in mind.

At Faccombe Estates Ltd., Andover, the theme for the manager, David Harbottle, was intensive sheep on 2-year grazing leys. David is the sheep farmer correspondent for "Livestock Farming" and acts as a consultant on farms in Scotland. His farm of 1000 ha is high (280 m) and exposed for the south of England. Springs are late but his 3,000 sheep stock make maximum use of grass. Mule ewes were mated with Dorset Down and Hampshire tups but Suffolks are used

increasingly. Bleu de Maine tups are also used to produce homebred ewes as replacements and for sale. Cereals are grown but the sheep flock used as a break crop showed substantial advantages over continuous grain production.

Jersey Beef

Donald Dawes at Remenham was a real personality and could have out done Bob Hope as a comedian. However his farming was no joke, and he is the man who has turned the Jersey Cattle Society towards a very bright future. Indeed it was an eye opener to see Channel Island milk production at low cost from grass with quality beef from a Jersey herd. The sires used were Charollais, Limousin and Belgian Blues. Llamas, the property of Mrs Dawes, were another enterprise, and the description of their mating habits had the entire membership roaring with laughter. The farm extends to 209 ha with 450 cows and heifers making good use of both 1-year Sabalan Italian ryegrass and long leys of perennial ryegrass. A flock of 200 ewes is kept also.

The farm of Sam and Giles Philp at Bisham was a typical Thames Valley dairy unit meeting the challenge of a reducing milk quota. The 104 ha supports 120 dairy cows plus 100 other cattle. Milk yields were 6,180 litres/cow in 1987 using 0.25 kg concentrates/litre. High production was obtained from continuous grazing at the correct sward height. A layer of maize in the middle of the grass silage pit was an idea which seemed to work well. The grazing area was sown with Melle/Meltra perennial ryegrass leys without clover, which was given 62 kg nitrogen/ha each month in the grazing season. Future strategy is to minimise production costs by maximum reliance on high-quality forage and to maintain milk production by purchasing additional quota.

Diversification

David and Joanna Castle, who farm near Wantage, produce semi-intensive beef and work in close contact with the research staff at Hurley. Joanna was clearly an expert calf rearer and public speaker and was already into diversification. Sanfoin is dried in a barn, ponies are stabled in a calf building, and there are commercial ventures in the farm workshop. Although cereals and grassland are the main crops on the farm, many other projects were being implemented.

The Host-Vice President, John Gerring farms in partnership with his father and brother at Buckland on light land and have a low input, high margin system of milk production. They have 186 cows and a large bull-beef unit. Milk yields averaged 5,870 litres/cow with concentrates given at 0.20 kg/litre. To illustrate the value of property, the landlord had just sold a cottage on the farm with no power, water or road for £120,000! Swards are maintained by overseeding late perennial ryegrass directly into older leys with a Moore drill.

The final visit was to the farm of Arnold Christensen, a former President of the BGS, and his son, Poul, at Kingston Bagpuize. The dairy herd has now 404 cows plus 199 replacements, with a production of 5,230 litres/cow and a concentrate use of 0.22 kg/litre in 1987. All the grassland is either permanent pasture or long-term ryegrass leys, and up to 400 kg nitrogen/ha is applied. Maximum use is made of grassland, plus aiming to improve the asset value of the livestock. Arnold, who came originally from Denmark, is known affectionately as the "Great Dane of English Farming" and we shall long remember the visit to his superb farm.

Wildlife Conservation

Throughout the visits to both the farms and research stations attention was directed towards many aspects of wildlife conservation. Berkshire FFWAG have a full-time conservation adviser, and the farmers and the research workers were clearly aware of the importance of reconciling intensive grassland farming and wildlife conservation. This was perfectly illustrated on the farm of Arnold and Poul Christensen who have a large and profitable dairy herd, a grassland output of 104 GJ/ha and yet make every effort to conserve wildlife and the historical features of the farm. Conservation objectives were considered to be just as important and necessary as grassland farming objectives. For example, no fertilizer, spray or slurry was applied to any field margins. At times an element of "enlightened untidyness" was present but one reward was that 65 species of birds nested on the farm.

The Berkshire Grassland Society must be congratulated for bringing wildlife conservation into their excellent Summer Meeting. It was indeed a memorable meeting which truly illustrated that if research findings are sensibly incorporated into a grassland farming system it is still possible to convert grass into profit.

SILAGE ADDITIVES

Dr A G Beardsmore
ICI Ltd, Billingham

Meeting of the SWSGS at the Ernespie House Hotel, Castle Douglas on 18 February 1988

The speaker at this meeting on silage additives was Dr Andy Beardsmore, who is Business Manager of the Biotechnology Division of ICI Ltd. at Billingham.

Dr Beardsmore began by listing the important points in the silage-making process. First, the cutting date should be selected, and the herbage mown and conditioned. Wilting should never be longer than 24 hours, because losses due to rotting in the swath can be as great as 25% in the first 4 days. When the herbage is picked up it should be chopped since this releases sugars to aid the fermentation process. An additive will improve the process but will not make up for mistakes at other stages in the operation. Contamination with soil should be avoided as this reduces quality. The pit should be filled quickly, rolled to consolidate, and sheeted every night. When filling is completed the pit should be sealed carefully and the sheet weighted down.

Why use a silage additive?

Good quality silage is an essential element of economical livestock feeding, and increasing the quality of silage leads to less reliance on bought-in feed. To get the maximum benefit from silage it must have a high digestibility, a high ME, a low fibre content and a good fermentation. This means cutting early. In the USA with temperatures over 70°F at silage time, dry matters of 35-70% can be achieved, but the usual weather at silage time in this country results in wet grass with a low sugar content. The average silage DM contents have been decreasing over the last 10 years. Something is needed to aid fermentation under such conditions.

In the silage clamp the pH falls from 6.5 to 4 over the first 6 or more days depending on the sugar content of the grass. Three organisms start working as soon as the clamp is sealed. These are *Escherichia coli*, *Klebsiella* and *Bacillus*. but these produce no acid. Another organism - *Pediococcus* - produces

lactic acid from pH 6.5 down to 4.2, but cannot by itself produce a stable silage. *Clostridia* is also active over the same pH range. *Leuconostoc* and *Streptococcus* produce some lactic acid, but are wasteful organisms since they also produce acetic acid and carbon dioxide. The key organism in the clamp is *Lactobacillus plantarum*, which only works from pH 5 downwards and which produces lactic acid and a stable silage. It is essential to reduce the pH as quickly as possible to obtain this fermentation with *Lactobacillus* and produce a stable and nutritious silage. A quick reduction in pH also reduces ammonia production.

Cored samples from clamps have shown that untreated silage can take up to 7 days to reduce the pH to 4 compared to 2 days with silage treated with the inoculant Ecosyl. The pH of the treated silage remained below pH 4 for up to 90 days, but that of the untreated silage tended to rise slightly. Over the same period the ammonia content as a percentage of total nitrogen increased from 5.5 to 12 in the untreated silage, but only to about 6 in the treated silage. This was due to the quick reduction in pH in the latter. It is particularly important to use an additive to aid fermentation in wet silages with low sugar contents.

What is an effective additive?

In 1986-87 there were 104 silage additives on the market. Basically these can be classified into three categories:

(1) The direct acidifiers are additives containing one of the following :-

a) Formic acid - an excellent biocide at an application rate of 2.2-4.5 l per tonne. It works by reducing the pH to about 4.5, and kills most bacteria leaving *Lactobacillus* to finish the fermentation. Formic acid does not kill yeasts, thus leading to a higher ethanol content. It has been thoroughly researched.

b) Sulphuric acid - relies on acid to reduce the pH. However, this acid does not kill bacteria as does formic acid. At an application rate of 2-4 l per tonne it is very cheap and compares favourably with formic acid. It has been researched in Eire.

c) Acid salts (mixtures of the salts of propionic and formic acid) - work by producing acid in the clamp when they are mixed with water at an application rate of 3-5 l per tonne. No research has so far been done to show the benefit of the acid salts, but they are safe to use.

(2) The fermentation inhibitors contain formaldehyde and an acid. These are applied at a rate of 2.5-5 l per tonne, and stop all fermentation. They protect protein, and have been thoroughly researched.

The problems with the additives in the above two categories are that they are corrosive, difficult to handle, they fume and are dangerous to handle in bulk. Is there then a safe alternative?

(3) The fermentation stimulants fall into three groups, namely:-

a) Molasses, which adds sugar to aid fermentation. However, large amounts are required and the sugars could be feeding the wrong organisms, resulting in a worse silage. Molasses does not kill any bacteria, and is intended to allow *Lactobacillus* to dominate. Its big advantage is that it is safe. Some research has been done on molasses.

b) The bacterial inoculants. which use the sugar in the herbage to reduce the pH. They have to be applied in large enough numbers to dominate the naturally occurring organisms. Application can be in the dry form, but the liquid form is generally preferable to give an even cover. Only one or two of the 45 inoculants have been proved effective. Ecosyl consists of a special strain of *Lactobacillus* which works over the whole pH range of silage, and has been shown to take the pH to below 4 quicker than any other additive. The application rate for the bacterial inoculants must supply a million bacteria per gram of silage if the additive is to dominate the fermentation. Only seven of the 45 products on the inoculant list give this rate. They are Biomax, Clampdown, Forager, Microsile, Silo Action, Siron and Ecosyl.

c) The enzyme additives, which aid fermentation and reduce the pH quickly by breaking down the

cellulose in the grass to soluble sugars. At a price per tonne comparable to that of the acid additives the application rate would be insuffucient to give a satisfactory fermentation. None of these additives has so far been proven effective.

Conditions in which silage additives fail

Silage additives can be ineffective where other management factors are poor, or where soil or slurry contamination has occurred. High buffering in the grass can also cause additive failure. This arises where nitrogen fertilizer has been applied too late (less than 6 weeks before cutting) resulting in a high uptake of nitrogen with a poor conversion to protein. A common cause of additive failure is low sugar content in the grass.

Results from a silage fermentation trial in West Germany clearly showed the effects of soil contamination and low sugar content. Here the fermentation became dominated by the wrong organism - *Enterobacteria* - and the silage had a low water soluble carbohydrate content, a high ash content and a poor fermentation. In another fermentation trial the control silage, which received no additive, had an ammonia-nitrogen content of 45% of the total nitrogen and a high butyric acid content. With a formic-acid additive the fermentation was still not fully controlled, having an ammomia-nitrogen content of 15%, but a very low butyric acid content. Ecosyl gave very similar results with a 15.6% ammonia-nitrogen content. Additives cannot fully control fermentation where disastrous problems arise such as high soil contamination or high ammonia-nitrogen content caused by applying nitrogen fertilizer too late.

Price of additives

The present price of acid additives range from £0.5 to £2.0 per tonne, the "battery" acids being the cheapest. The price range of the acid/formalin additives is £1.5-2.5 and of the acid salts £1.0-2.0. Because of the higher application rates required, molasses is more expensive at £1.8-3.0 per tonne. The bacterial additives vary in price from £0.7-1.9, and the enzymes from £2.5-3.5 per tonne.

ADAS figures suggest that an increase of 0.5 kg of milk per head or 0.1 kg of liveweight gain per head per day is required to pay for the additive. Results from a dairy cow trial by Dr Fred Gordon at Hillsborough showed that even when silages do not differ in analyses animal performance can be improved. Three silages treated with no additive, formic acid and Ecosyl had almost identical analyses. However, the Ecosyl silage gave a milk yield of 24.2 kg per head per day compared with 22.1 kg from the control silage and 21.9 kg from the formic acid silage.

Dr Beardsmore concluded by reminding members that there were 100+ additives available on the market. Whatever is purchased, a farmer needs to be able to satisfy himself that the product has been tested and proven by some independent body.

Discussion

Professor Phil Thomas, Principal of the West of Scotland Agricultural College opened the discussion by listing what a farmer wanted from a silage additive, namely:

(1) A good preservation.

(2) Reduced losses.

(3) A high intake potential.

Information on losses was scarce but important, and Dr Beardsmore had given little attention to this point. A good fermentation does not always give a good intake. Animals may perform better or worse than the analysis of the silage would suggest.

Regarding the choice of an additive, Professor Thomas listed the following questions which should be asked:

(1) Is it going to work? The additive should not be used if it lacks technical support.

(2) Does the product work all the time or are there areas where it is not going to work?

(3) What is its economic value to a particular farmer? Scope for improvement may be small if the farmer is already making high quality silage.

Of the additives on the market the most thoroughly researched in terms of numbers of experiments was formic acid. Experiments conducted between 1960 and 1970 on formic acid showed an average response of 0.5 kg milk per head per day. Later experiments showed smaller responses, and some showed no benefit at all. This was because silage fermentation methods had improved making it difficult to justify the use of formic acid. A high ammonia content was sometimes got in an otherwise well preserved silage because the lactic acid bacteria had been inhibited allowing the *Coliform* to increase. This occurred with an application rate of 3-4 l per tonne, but not at the lower rate of 2-2.5 l per tonne.

No tests have been done on the acid salts additives, and the companies marketing these should be taken to task. The recommended application rate for the acid/formalin additives was wrong for protein protection in the animal. Molasses had benefits but was difficult to handle.

A few of the bacterial additives were better than the rest, and one of these was Ecosyl. However, the correct application rate for these was not a million organisms but a million viable organisms. In general the bacterial additives worked with a wide range of grasses, but evidence was sparse on their success when the sugar content was low.

Most of the enzyme additives contained too little enzyme to be effective. Some had a high content of effective enzyme, but were they proven? Considerable data have been collected on the Finn Sugar products, but the responses have varied considerably. Both the bacterial and the enzyme additives have much improved over the last 5 years, and continue to improve.

Professor Thomas concluded that it was important to consider whether there was scope to improve animal production. If a farmer was technically sound then the need to use an additive was questionable.

The first topic raised in the open discussion was secondary fermentation. No additive could be suggested to cope with this. If the sugar content of the herbage was high some sugar would be left after the fermentation was completed, and this could give rise to secondary fermentation or aerobic spoilage. It was mainly due to the conditions in which the herbage had been cut. The enzyme additives have shown a tendency to give a more stable silage and less secondary fermentation.

Regarding the ideal sugar level in the herbage, if it was too low conditions were unsuitable for the inoculants, and if it was too high secondary fermentation occurred. The optimum sugar level was estimated at 3% of the fresh weight, but this depended to some extent on the dry-matter content, the buffering capacity and other factors, such as the additive being used. With formic acid additives a high sugar content could lead to an unsuitable yeast fermentation.

A member commented that if milk was to be produced from the silage the the intake necessary to maximize yield could only be obtained if an additive was used. The cost of the additive could be fully recovered by using less supplementary feed, and allowing the silage to express itself by increasing intake.

The speakers explained the names given to the two different type of fermentation. "Homolactic" fermentation gave lactic acid only, whereas "heterolactic" fermentation gave lactic and other acids. The former was the most effective but this was not always reflected in increased animal production.

The next question was why a silage given no additive and with a pH going down to 3.6 should give problems with animals. Some silages made in 1987 had pH's down to 3.3, which could be explained by the presence of yeasts. The addition of bicarbonate might be necessary before feeding such highly acidic silage, but this could suppress intake. A period of 7 to 10 days would elapse before intake level was restored.

The key to good silage was having enough *Lactobacillus* present and having a sufficiently high acidity. Generally where the dry-matter content was high no additive was required. This was because under good wilting conditions the sugar content would be high. However, under most conditions in the UK an additive should be used.

On the important topic of losses it was suggested that these tended to be related to the temperature in the silo. Formic acid had been shown to give lower temperatures than bacterial additives in an experiment at Greenmount. The inoculant stimulated fermentation and thus gave higher temperatures. However, the increase was rapid and the subsequent decrease was equally rapid. As a result the losses were the same with both types of additive.

Inoculants have been shown to give smaller effluent loss than acid additives. Absorbents such as sugar-beet pulp could reduce losses, but the problem was to get enough in to absorb all the effluent. The quantities required might not be economically attractive. In recent work at the West College, putting straw bales under the silage was found to actually increase effluent loss.

The speakers were questioned on the use of bacteriophage as a silage additive. Several companies have produced such additives. These organisms were supposed eliminate *Clostridium*, but the effect varied with the strain of this organism, some being killed and others not affected. A patent has been applied for by one company, and supporting evidence should be available in a year.

The next question was how many years should an additive be tested before it is put on the market? Dr Beardsmore suggested that if the producer could not supply a list of institutes where the additive had been tested it should not be allowed on the market. Ecosyl was tested on three farms in 1984, and four farms in 1985. These farms were scattered over the UK to demonstrate its effectiveness over a wide range of environments. Professor Thomas believed that fifteen or sixteen trials were required to prove an additive effective. Since each of these trial would cost £20-30,000 this would cut down the number of additives offered to farmers.

Finally, regarding legislation on additives, work began on this in 1982, but would not be completed until Christmas 1988 at the earliest. At present a voluntary code of conduct covered misleading representation in additive advertising.

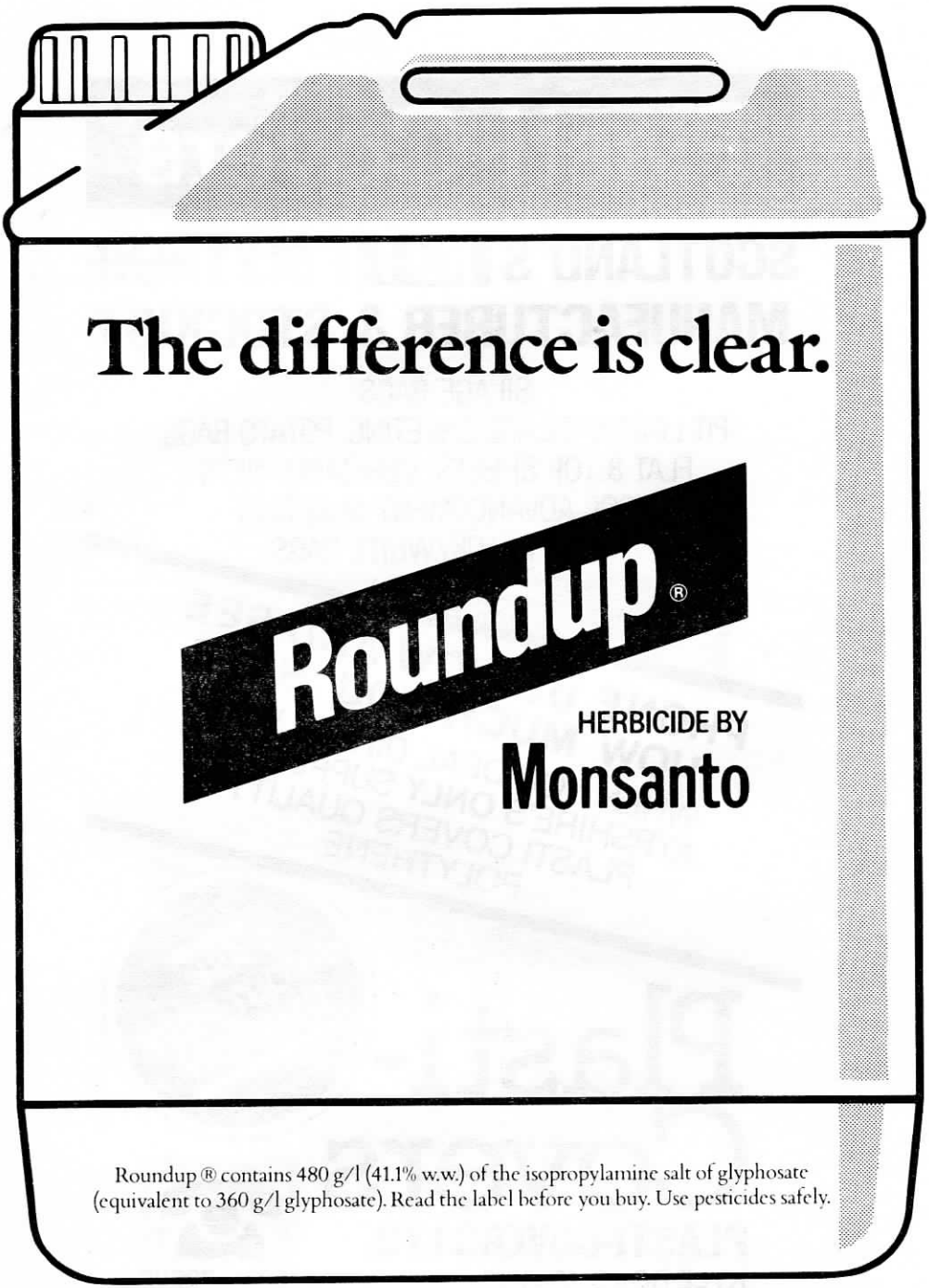
Mr Michael Milligan proposed the vote of thanks to the speakers.

D Reid & G E D Tiley.

ALLAN A BUCHAN

It is with very great regret that the South West Society learned of the death of Allan Buchan, factor of Ladykirk Estates, Prestwick.

Allan was Chairman of SWSGS from 1970-72 and a long-standing member. Allan's support and contribution to the Society is greatly acknowledged.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Bargany Mains

An equally interesting and well-run beef/sheep enterprise at Bargany Mains, Dailly, was visited in the afternoon by invitation from Captain N Dalrymple-Hamilton. The Dalrymple-Hamilton family have occupied the estate since the 16th century, though the house has now been sold to a citizen of the USA.

Two farm units are run at Bargany, and these together with a hill-sheep farm at Delampford above Dailly make up 235 ha arable, 20 ha permanent grass and 443 ha hill. There is also a considerable area of forest at various stages of felling and replanting. The estate has, in addition, horticultural, game, amenity and wildlife interests.

Barley is grown on 69 ha, and 39 ha of grass is cut for silage and 4 ha for hay. A suckler herd of 160 cows, some Irish blacks, are wintered and calved in the spring. All calves are finished and additional stores are bought in. Winter quarters are divided between a cubicle shed at Delampford and a hard standing on a former coal pit site. A slatted shed with a wooden centre floor is used for finishing with straw and barley. Silage making is aimed at bulk, and corrosion of the clamp floor is a problem.

On the hill land there are 860 Blackface ewes which are crossed with Leicester tups.

The farms are managed by Angus McKenzie, who succeeded his father at Bargany, and the hill-sheep unit is run by David McCracken.

A tractor and trailer was provided for the convenience of the members and a delightful tour was made through the grounds of the estate and farm. A notable feature was a flower-rich meadow with an abundance of cowslips. This was a most enjoyable and interesting visit, and the Society thanks Captain Dalrymple-Hamilton and his staff for arranging it.

G.E.D. Tiley

WEST OF SCOTLAND COLLEGE SUBJECT DAY

CLOVER FOR DAIRY CATTLE

A well-attended Subject Day, organised by The West of Scotland College and sponsored by Monsanto plc, took place in the new Visitors' Centre at the Crichton Royal Farm, Dumfries, on 5 May 1988. The aim was to demonstrate methods of integrating grass-clover swards into grassland management on the dairy farm. Grass-clover mixtures are sown on about a third of a million hectares annually in the UK using about 1000 t of white clover seed. However, recent surveys suggest that pastures contain too little white clover to influence herbage production. Dairy farmers in Scotland apply an average of 290 kg N/ha giving clover little opportunity to contribute.

Session 1 - Technical Update

The potential of clover - Dr J Frame

Dr John Frame, Head of the Crop Production Department of The West of Scotland College, gave the opening paper in which he indicated that herbage from a grass-clover sward was highly acceptable to dairy cows and to young stock. The herbage increased animal performance by 10 to 20% since it gave better forage intake, and increased the efficiency of feed conversion. Clover had a high crude protein concentration, maintained high digestibility over the grazing season and was rich in minerals.

Estimates of the amount of nitrogen fixed by the *Rhizobium* bacteria associated with white clover varied from 70 to 280 kg/ha in lowland grassland with a 20-40% clover content. The fixed nitrogen became available for grass growth mainly by being returned in the urine of grazing stock.

Grazed grass-clover swards had a smaller potential for pollution than swards heavily fertilized with nitrogen. This was because of reduced losses of nitrogen by leaching and ammonia and increased retention of nitrogen in the soil organic matter.

Production from grass-clover swards was currently about 70% of that from heavily nitrogen-fertilized swards, but was more cheaply produced. The shortfall in feeding value was smaller and could be compensated

more cheaply by using arable products and by-products rather than nitrogen fertilizers. The grass-clover sward was an increasingly attractive method of decreasing land-use intensity to avoid animal production surpluses.

New, improved varieties of white clover were more persistent, and management systems had been devised for grass-clover swards to increase reliability. These swards had been proved to be more tolerant of flexible management than was once believed. The time had come to exploit the £3 million spent annually by British farmers on clover seed.

Integration of clover in dairy production - Mr J Bax

The second paper in this session was given by Mr J Bax, who is Animal Production Specialist at Crichton Royal Farm, and he began by reminding the audience that traditional milk production systems (e.g. the Ramsay system) used in south-west Scotland relied heavily on grass-clover swards. Intensification over the past 20 years has resulted in a great reduction on reliance on clover and a dramatic increase in nitrogen fertilizer usage. However, factors such as milk quotas and environmental concerns have renewed interest in the use of white clover.

Grass-white clover swards without fertilizer nitrogen could give the same dry-matter yield as grass swards receiving 200 kg N/ha. In cutting trials at the Crichton Royal grass-clover swards without fertilizer nitrogen consistently achieved 70% of the yield of grass swards receiving 300 kg N/ha. The clover content in the sward had been maintained under a three-cut system continued over 4 years.

Improved liveweight gain and increased intake have been observed with young stock fed grass-white clover silage at Crichton Royal Farm. Dairy cattle have given increased yields and milk protein contents when grazing white clover swards. A better understanding of the management of white clover made it possible to formulate dairying systems which relied on clover for forage production.

A new project commenced on 1 April 1988 at Acrehead which will compare the profitability of two systems, one based on high nitrogen input, the other on clover without nitrogen. The two units will be managed so as to optimize production from both systems. Each unit

has the same basic structure, similar soil types and the same herdsman will look after both herds. The relative profitability of the two systems will depend on the price of nitrogen fertilizer and silage substitutes. Both herds will be fully costed.

Session 2 - Farm Tour

On this tour a visit was made to the Acrehead Unit to see the grass-clover swards being established for the new grass-clover project described earlier by Mr Bax. These included swards direct sown after pre-cut/pre-graze treatment with Roundup, and by oversowing into established grass swards. Mr S Stell of Monsanto plc commented on establishment techniques using herbicide treatment. Dr G Tiley described the equipment used to oversow clover in established pastures.

Swards managed for 4 years under a three-cut system were visited on the Crichton Royal Farm. A grass sward given heavy nitrogen dressings was compared with a grass-clover sward without nitrogen, and the latter was obviously maintaining its clover content under this management. In addition, a grazing experiment on a clover sward was demonstrated. Details of these two items were given by Dr D Roberts and Dr J Frame.

Session 3 - Practical Implications

Pre-plant weed control - Mr S Stell

The first paper in the afternoon session was given by Mr Simon Stell of Monsanto plc, who stressed the importance of pre-plant weed control for efficient grass-clover production. The elimination of perennial weeds such as couch grass, docks and thistles before reseeding was an essential first step in grass production. Treatment with the herbicide Roundup had been shown to provide long-term control of sward grasses and perennial weeds. It could be applied either to regrowth of herbage and weeds or before cutting or grazing.

If clover was to be relied upon for herbage production it was particularly important to eliminate perennial weeds and sward grasses before reseeding because:

1. it eliminated the competition from couch grass;

2. it made unnecessary the difficult and costly task of controlling docks, thistles, nettles, etc. in the grass-clover reseed;

3. it reduced the need for post-emergence herbicides on the reseed which could check clover establishment.

Clover establishment - Dr G Tiley

Dr Gordon Tiley, Agronomist in the Crop Production Department of the West of Scotland College, discussed the factors ensuring a good initial establishment of white clover.

Soil conditions. A minimum pH of 5.8 was essential, and since clover leaves were rich in calcium and other minerals, high levels of soluble calcium and phosphorous were also important. In contrast, low nitrogen levels were required to prevent nitrogen inhibiting the *Rhizobium* bacteria in the root nodules of the clover and increasing the competition of the grasses on the clover. Nitrogen reserves could be reduced by cropping or by the removal of heavy silage crops and applying no nitrogen fertilizer.

Seeds. Because of the small seed size of white clover the seeds should not be sown deeper than 13 mm. The recommended seed rate was 3-4 kg/ha. Inoculation with one of the newer strains of *Rhizobium* bacteria was worthwhile, especially on peaty soils or on land with little clover previously present. Companion grasses should be species which were not strongly competitive with the clover. Vigorous clover varieties should be used which suit the intended management. Spring or early summer sowings allowed the clover to develop sufficiently to survive the winter and establish well.

Sowing methods. When sowing in mixtures with grass in cultivated seed beds direct sowing was preferred as the cover crop shaded and weakened clover growth. The seed bed should be fine and firm, and given little or no nitrogen fertilizer. Development of the young clover seedlings was stimulated by rotational grazing by young cattle.

Direct drilling or oversowing of clover into an existing grass sward was best done in April or July after restricting grass competition by heavy grazing or cutting. Open swards free of perennial weeds were required, and the seeds could be broadcast and rolled

in or simply broadcast on moist soils. Alternatively, a choice of direct drills was available according to soil and sward conditions. Frequent rotational grazing was required to control the growth of the old sward, commencing 3 weeks after drilling. Dressings of phosphate and potash fertilizers were essential, but not nitrogen.

Practical aspects - Mr D Webster

The Subject Day was closed by Mr Webster, Farm Manager of the Crichton Royal Farm, with a discussion of the practicalities of clover on a dairy farm. The potential problems he mentioned were:

1. the possibility of a later turnout on clover swards in a cold spring, compared with N-fertilised fields;

2. silage crops were lighter and shorter and picking up could be a problem. An extra 0.5 litre of acid was required and additional effluent could be expected due to reduced wilting;

3. earlier sow outs were desirable (July/August) to allow clover to become better established for the winter and to compete with weeds.

4. care was required not to damage the clover by winter sheep grazing;

5. there was a possibility of bloat. As a precaution herds could be fed a buffer of silage or straw when first turned out. A bloat drench should also be available.

The West of Scotland College must be congratulated on this most useful event, and wished every success with later Subject Days on other topics. **D Reid.**

ALTERNATIVES TO GRASS - TOURISM OR CONSERVATION

Miss Gillian McKnight, Farm Conservation Adviser, Fife and Kinross FFWAG
Mr W Weir, Wheatrig, Kilmaurs

A meeting of CSGS held in the King Robert Hotel, Bannockburn on 24 February 1988

Opportunities for Conservation - Gillian McKnight

Wildlife conservation on the farm involves the integration of wildlife into the farming system. The identification of habitats in semi-natural situations is important. Hedgerows provide a good wildlife corridor and refuge from fields where monoculture does not provide a variety of natural feeding areas. Rich and varied wildlife will be found on areas of the farm which have not had fertilizer applied, but these habitats are not common.

The increasing area of winter cereals has led to a decline in partridge and lapwings because of removal of their source of winter feed. Hares have also suffered from a similar change in agricultural practice. In general winter cereal crops do not provide good overwintering habitats. Changes in grassland conservation have also had an adverse affect on wildlife. Silage is cut earlier than hay and this does not give ground nesting birds time to rear their broods.

In the past, wet lands have been drained leading to loss of wildlife habitat, although the maintenance of wetlands is now being encouraged through grant schemes. Pond construction also offers a significant opportunity for wildlife on the farm. Leaving a "buffer zone" around ditches and headland strips without fertilizer encourages indigenous plants to re-colonise and later attracts other types of wildlife. This buffer margin also provides protection against nitrogen movement into waterways and against pesticide drift. In areas where this has been tried hares and partridge have begun to re-establish themselves.

Upland habitats are also under threat from afforestation and many of the natural beechwoods have disappeared. Overgrazing in many wooded areas has prevented natural regeneration. Grants are now available from the Forestry Commission for re-planting

and regeneration of natural woodlands. Shelter belts also provide useful habitats for wildlife and again grant aid is available. A new farm woodlands scheme to be introduced in 1988 may provide for a more integrated farming system with shooting and timber production being possibilities. It is fully recognised that cash income has to be made available in the initial period where no revenue accrues from the woodland and payments under existing grant schemes are not sufficient.

Game birds on the farm are another possiblity and such things as underplanting for pheasants could be undertaken. New hedge planting to establish field boundaries would greatly enhance the value of the countryside both from an aesthetic point of view and from wildlife enhancement. Cropping could be carried out to maintain low shrubby growth and encourage small animal species.

There are many opportunities to encourage wildlife back into the countryside. Only small compromises in farming practice need to be made to relieve much of the criticism of current farming practices by the non-farming lobby.

Farm Tourism - Bill Weir

The farm at Wheatrig, Kilmaurs, is the main centre of operations, with a substantial dairy and milk retail business. In the early 1980's with compulsory pasteurisation and pressures on dairy farming, the turnover and profit of the business was reduced. In order to justify employing twelve men the whole farming business was reviewed and changes were introduced.

One change related to Blackshaw Farm 2 miles from West Kilbride. It was a small hill farm of 122 ha, carrying 250 Texel x Blackface ewes and 60 suckler cows. In the summer an additional 70-80 dairy young stock were carried but the farm was only generating income from 320 lambs and 50 calves. This was not a lot of income even for one man, and the long-term prospects did not look particularly good.

A new enterprise was required, and after analysing the proposals it was decided to open the farm to the public. From the start it was not aimed solely at the tourist trade which was felt to be too small a market. However, the situation of the farm could be exploited, being only ¾ hour from Glasgow, and having a good outlook over the sea with views to Arran. The project was started in 1984 with a view to opening in 1986.

The aim was to promote the idea within a radius of a 1 hour travelling distance, and to attract school children. An education pack was produced which could be utilised by teachers. The farm opened on 5 July 1986 for a trial period of 6 weeks. In that period, 4,000 people visited the farm demonstrating the potential for such a venture.

Following the first season's success, a great deal of work was put into constructing paths, bridges and fences during the winter of 1986/87, and the farm was opened again the following Easter with a projected throughput of 15,000 visitors for the summer. In fact, during 1987 the total number of visitors was 23,000, and the current projection for 1988 is 30,000. About 90% of the visitors came from within the originally envisaged catchment area. The main emphasis has remained on attracting school parties, and a trailer tour of about 1½ hours duration is provided stopping off at various points of interest.

The project has had problems relating to planning permission for building a car park and converting existing buildings into tea rooms and a gift shop. Because of "red tape" no grants have been claimed on the capital investments. To date over £60,000 has been invested in the farm, which will hopefully give a positive cash return before long. The most profitable item is the trailer tour. The tea room makes little profit, but the craft shop shows a good return.

In developing the business it is important to notice what the public enjoy doing, and for this reason a football field was provided. More recently three-wheel motor bikes have been introduced. This is popular with 12-14 year olds and looks like returning a reasonable profit.

Conservation aspects have not been ignored, with the construction of a pond to encourage wildlife and over 7,000 trees have been planted around the farm to add to visual amenity.

A basic aim of the project has been to improve communication between town folk and the farming industry. Many people coming on to the farm for the first time know nothing about farming and it was felt to be particularly important to attract school children. Educating them to understand the countryside may lead to less conflict in the future. For this educational function to be successful it must also be enjoyable.

I.R. Fraser

SWSGS EVENING VISITS TO FARMS IN SUMMER 1987

G E D Tiley
Secretary of the South West Scotland Grassland Society

Mr Robert J R Ramsay, Lodge of Kelton, Castle Douglas 22 July 1987

Lodge of Kelton is a 90 ha all-grass farm rented from the National Trust. It is low-lying and subject to flooding , so that in 1985 part of the farm was under water from May to November. Some of the silage was direct cut under water.

A section of the farm was recently affected by road re-alignment creating problems of farm access, loss of land and soil disturbance. Some reinstatement was done with subsoil and this has been treated with farm-yard manure. Barley growing has been given up. The farm carries 136 Friesian cows, 50 in-calf and bulling heifers and a flock of 24 Suffolk ewes.

Robert's grandfather was one of the earliest silage makers in Scotland. This tradition has been carried on by Robert who is now one of the top silage makers in the south west. He was the SWSGS champion in 1986 with a 72D silage. Silage is cut direct, aiming for three cuts off 40 ha to produce 2,500 tonnes.

A new development which was demonstrated was an attempt to reduce bag nitrogen input and rely more on clover. On one field nitrogen usage was reduced in 1985 and this appeared to boost the clover. Another field was established with only 50 kg nitrogen/ha and little more was to be applied subsequently. Herbaceous plants could be seen in this field which was being used as day grazing for the cows.

Wildlife and conservation figure prominently on Lodge of Kelton. Large numbers of wild geese overwinter on the grass fields, causing considerable losses in grass production. A corner of the farm is incorporated as an SSSI site for otters and mink. A bank has been constructed near the river to encourage wildlife, with hides for observation. Robert has also initiated the rebuilding of a long stone dyke in another field.

To see all these activities together with highly efficient grassland farming made this an extremely interesting and enjoyable visit. The Society is very grateful to the Ramsay family.

Mr Brian Walker, Rogermoor Farm, Moffat
29 July 1987

Rogermoor is an all-grass, beef and sheep farm of 93 ha on the outskirts of Moffat. An additional 15 ha is rented to produce more silage and to provide additional buildings. An area of 36 ha is wet and steep, but much of the land at Rogermoor is difficult being stony or poorly drained. A sandstone substratum leads to the development of springs in many places. Fields are easily poached and cannot be grazed after mid October.

Rushes are treated with glyphosate, rotavated and oversown with grass. Reseeds are established under arable silage (peas, barley, oats and vetches) sown in April and cut in July. Cutting height is set high to avoid stones and encourage grass growth. Farmyard manure and slurry are ploughed in and 250 kg/ha of 20:10:10 applied. A blend of good varieties of perennial ryegrass with timothy and white clover is used and yields of about 38 tonnes grass/ha are obtained.

Cutting is by flexible arrangement with the contractor, and was in progress during the visit. The mower is only stopped when wheel tracking begins. The cut grass is rowed up, wilted for 24 hours, and treated with sulphuric acid. The site of one of the silage clamps is a conveniently tarmacadamed stretch of abandoned road near the steading.

The suckler herd of 55 commercial beef cows is calved to Limousin and Charollais bulls in July, and the calves are finished in 18 months. The cows are calved on barer ground to keep them lean and then put onto non-silage swards. Concentrate is fed at 1 kg/day to the cows in summer, but not in winter if the silage quality is sufficiently high.

A group of 100 stores is purchased in August and finished in January/February. A further 250 suckled calves, purchased in the autumn, are taken through to March/April for sale as stores. A new enterprise is a flock of 160 Greyface ewes crossed to Suffolk. In 1986 270 lambs were reared from this flock.

An idea from Orkney seen in the buildings was a single slope floor with a carborundum skim finish. This was easy to keep clean with a chain scraper. Another idea was the positioning of brushes to allow the cattle to scratch themselves.

Mr Walker demonstrated a folding trough adaptation on an old trailer, which is kept out in the field for feeding concentrate to the cattle. This device was entered for and won the 1987 SWSGS Ideas Competition. A more detailed description of it is given elsewhere in the Journal.

The SWSGS are very grateful to the Walker family for this interesting farm walk and for their kind hospitality.

Mr A Hogarth, Curragh, by Girvan
12 August 1987

On one of the worst evenings that can be remembered for an SWSGS visit a sizeable group of hardy members visited Sandy Hogarth's coastal farm near Girvan where dairy farming and cropping are combined. The wind was so fierce and the rain so heavy and horizontal that our host described his farm verbally in the shelter of the buildings rather than conduct a farm walk.

Curragh has 101 ha of grass, 35 ha of spring barley, and 8 ha of winter wheat grown for the local distillery. In addition, 6 ha is rented out for early potatoes, and this is ploughed and dunged and sown to Optima Italian ryegrass for backend grazing. This land has grown early potatoes for at least 100 years.

There is a dairy herd of 160 spring-calving Friesians, with heifers reared to calve at 2 years, and also 45 beef cattle. Bulls are preferred to AI, two being worked in the morning and two in the afternoon. Cows are turned out about 20 April. Sandy is thinking of starting lamb fattening as a way of offsetting quota problems.

A low input system was started in 1982 in an attempt to reduce concentrate usage. However, problems were encountered in 1985-86 when a wet backend was followed by a late spring. A ratio of 2/3 cake:1/3 homemix is used, but the emphasis is on growing good grass and only using concentrate as an insurance buffer.

Silage is made in a 21-24 m wide pit, which had to be divided to prevent secondary fermentation. Second cut silage is fed in early winter to dry cows leaving the first cut for calved cows after January. A simple low-cost slurry system has been developed. A novel trickle-feed method for feeding molasses was also seen.

A brief walk was managed late in the evening when the rain had stopped. Following this all members were welcomed into the warmth of the kitchen to enjoy an excellent tea prepared by Sandy's wife. The Society is especially grateful to the Hogarth family (and to brother David from Sorbie) for this interesting farm walk.

Mr Hew Chalmers & Son, Craigencrosh, Stoneykirk, Stranraer - 19 August 1987

Though the nights were drawing in the visit to Craigencrosh, farm of a former Chairman of the Society (1969-70), was a very pleasant occasion rounded off with real Wigtown hospitality. The farm walk had been well planned and arrangements made in advance. For instance, plastic bags had been rolled round the barbed wire at every crossing point on the fences. There was also evidence of field, hedge and tree management sympathetic to the landscape and environment, e.g. whin clearance and hedge planting.

Craigencrosh was taken on as a tenancy in 1951 at a rental of £2.47 per ha. Oats were grown and undersown to grass and the herd was Ayrshires. The old buildings were converted to cubicles and an additional 24 ha taken on in 1985 to give the present farm total of 64 ha. The average milk yield has reached 5,800 litres from 100 Holsteins fed cake at 0.2 kg/litre. Margin over concentrate is £800 and the calving interval is 366 days using AI. The cows' feet are treated in a foot-bath with formaledehyde at weekly intervals in the winter and fortnightly in summer. Copper sulphate might be used in alternate years to harden the feet.

Nitrogen usage is 283 kg/ha on grass, which is set stocked and fertilized every 4 weeks. Two cuts are taken (May and July) on 28 ha, producing 1,100 tonnes of 65D silage using AddF. Silage is self fed to all animals except the heifers.

Grass yields are high and pastures long lived, and excellent swards of 9 and 10 years of age were seen, though docks were sometimes a problem. Slot seeding with the Matco direct drill in 1985 successfully boosted damaged swards. The higher fields are very exposed, which can hold back growth at times. The farm is dependent on an early grazing otherwise silage could be short.

The Society thanks the Chalmers family for this excellent visit to an all-grass farm which is simply but very efficiently run. Members were also appreciative of their splendid hospitality.

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