

Greensward

1989

JOURNAL OF THE SOUTH WEST
AND CENTRAL SCOTLAND
GRASSLAND SOCIETIES

No 32



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FOREWORD

Following two anniversary numbers *Greensward* reverts to its normal shorter form. Although there are no special articles in this number, a wide range of topics of current interest is covered. For example, wildlife conservation was the subject of the talk given by Poul Christensen to the South-West Society in November 1988. Kingston Hill near Oxford is farmed by Poul and his father Arnold, and is a prime example of the successful integration of conservation and farming while still maintaining profitability. Since that talk a new Grassland Environmental Competition has been introduced by the Executive Committee of the Society.

A topic of great concern at the present time is pollution arising from silage and other effluents. Two meetings on pollution were held in south-west Scotland early in 1989, one sponsored by BOCM Silcock at the Hannah Research Institute and the other under the auspices of SAC and the Dumfries and Galloway FFWAG in Dumfries. These are reported in an article by Gordon Tiley, and possible solutions to the problem are discussed by Nick Offer in another item.

During 1988-89 two events were held to celebrate the success of members of the South-West Society in nationwide silage competitions. The first of these was the National Farm Open Day at Culvennan in October 1988 marking Michael Milligan's championship in the 1988 UK National Silage Competition. Despite the weather this was a fascinating day for the many members who attended, and a full report can be found in these pages. The Society also visited Conchieton at Twynholm in February 1989 to celebrate the success of John and Finlay Carson. They were first prize winners in the 1989 Scottish Regional Silage Competition, and went on to achieve a very worthy second-equal place in the 1989 UK National Silage Competition.

I must once again thank Dr Gordon Tiley for his assistance in preparing this issue of the Journal. Despite his many other duties on behalf of the South-West Society, Gordon has written the reports of several meetings. I also thank Mr David Arnott of the Computing and Information Department of the West of Scotland College for his help with this issue, which for the first time was completely processed by computer.

David Reid - Journal Editor

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SUMMER EVENING FARM WALK - AYRSHIRE

*A visit of the SWSGS to Towerhill Farm, Kilmaurs,
Ayrshire on 31 August, 1988*

By invitation of Mr James MacFadzean and family the Society visited Towerhill on the outskirts of Kilmaurs. This is a family dairy farm consisting of 36 ha owned, and a further 16 ha seasonally rented. Cereals and hay were formerly grown, but the change to grass/silage has never been regretted. The dairy herd of Ayrshire cows has been reduced from 93 to 70 and now has an average milk yield of 5000 l. Ayrshires are considered to be a lighter breed of animal giving good cast cows. The herd is calved in mid-March, and the bull calves are taken to slaughter at about 1 year old when they no longer grow economically. Part of the herd is crossed to Limousin. Calves are fed on milk followed by a calf-weaner mix. The milk cooler incorporates a heat exchanger for warming water.

Cows are fed silage all year round and the concentrate allocation is less than 1000 kg/cow. A home mix is used consisting of barley, dark grains, maize gluten, micromized soya, fish meal and minerals. Treacle is not included since this would cause the auger to stick. Beet pulp is being considered as a replacement for barley. Grazing is limited for the cows in the spring to give a maximum silage area. In 1988 the first cut of silage was begun on 25 May and the second on 6 July. Big-bale silage was also made, wilting the herbage for 24 hours.

Fields for spring grazing receive 500 kg/ha of 29:5:5 and silage fields 377 kg/ha of 24:4:15. In 1988 this rate of nitrogen application suppressed white clover, some of which had already been damaged by herbicide.

Towerhill is an efficiently managed family farm based on confidence in making good quality silage. The Society is most grateful to the MacFadzean family for this the only summer farm walk in 1988, arranged at short notice.

G E D Tiley

NATIONAL OPEN DAY AT CULVENNAN FARM

Nearly 300 people attended an Open Day at Culvennan Farm, Castle Douglas on 4 October 1988 organized by the South West Scotland Grassland Society and the British Grassland Society. The event marked the award of the Nitram Trophy to Michael Milligan for winning first prize in the 1988 BGS National Silage Competition. Michael had reached the final of this competition four times previously and been runner-up once. On this occasion he clinched the championship with a total score of 96.1 marks out of 100 - the highest since the National Competition began. He had top scores in all sections of the judging and achieved full marks for analysis. The winning silage had a dry matter of 22.4%, a pH of 3.6, 18% crude protein, 5% ammonia-nitrogen in total nitrogen, a D-value of 73 and an ME of 11.7 MJ.

The Milligan family farm five holdings with a total area of 255 ha consisting of 81 ha of cereals and 174 ha of grass, and the morning of the Open Day was taken up with conducted tours of the grassland and of the Dairy and Beef Units. After lunch there was a discussion session followed by an optional visit to a reclaimed area of the farm.

Grassland

There is no set pattern of reseeding the grass swards, which vary in age from 3 to 9 years. Properly treated grass should continue to produce at a maximum for many years and be ploughed only when productivity begins to decline. The mixtures used are mainly late tetraploid perennial ryegrasses. A long-term mixture contains Condesa and Merlinda tetraploids with Goliath timothy and Perma diploid ryegrass. Some Milkanova white clover is also included in this mixture, and a surprising amount of white clover was seen in resulting swards sown despite the application of a total of about 250 kg nitrogen per ha. Also used is a simple short term mixture consisting of Polly and Dalita hybrid ryegrasses.

All swards are cut and grazed alternately as far as possible, and none are kept for silage only. 1988 had one of the best grazing seasons for many years with the cows going to grass on 6 April and still out at night in early October. However, conditions were getting rather wet by the Open Day. Throughout the grazing season the cows have access to silage - last year's in the early part of the season and second cut later. Young stock graze the swards in the autumn after the cows have

been brought in, but there is no sheep grazing. Michael believes that sheep damage the grass growth for cow grazing and for silage by depleting root reserves and so holding back spring growth. He also holds that the utilisation by the cows is better with strip grazing than with paddock grazing.

Dairy Unit

The dairy herd of 106 mixed Ayrshires and Friesians is housed in sheds built in 1959 at a net cost of £3000. Calving is from August onwards and the average milk yield in 1988 was 6026 litres per cow. The Milligan philosophy is that, to be profitable, milk must be produced from grazed grass and silage. Thus, the concentrate input is only 0.08 kg/litre of milk produced and the margin over bought feed is £1050 per cow or 17 p/litre. Silage costs about 3 p/litre giving a margin over all feeds of 14 p/litre.

Grass for silage is cut with a Vicom Olympus mower conditioner and wilted for only 3-4 hours before being picked up with a Claas Jaguar. The pit is filled by the wedge method with a Kramer Industrial loader and receives little consolidation until it is full. Using this system a team of only four men can clear 10-12 ha per day. For many years an acid or acid/formalin additive was used, but for safety reasons an inoculant is now used. Michael claims that the cost of using an additive on all silage irrespective of the conditions is small in relation to the increase in quality obtained. 4000 tonnes of silage are made annually at a total cost of about £18 per tonne.

The silos are covered with side sheets and two top sheets which are held down by bales on the top and sand bags along the sides. As a result waste is virtually eliminated as was seen on a pit of 1988 first-cut silage which had been recently opened. This had a dry matter of 14.7%, a pH of 3.8, 18.6% crude protein, 7.1% ammonia-nitrogen in total nitrogen, a D-value of 74.2 and an ME of 11.9 MJ. Although low in dry-matter there was no effluent coming from the pit because a polymer additive had been mixed with the herbage to retain the moisture. This polymer can absorb ten times its own weight of water. The usual practice at Culvinnan is to collect the effluent in tanks, preserve it by adding 0.5% formalin and feed it to the cows.

Beef Unit

Silage also forms a large part of the diet of the 200 beef cattle fattened each year but here the silage is not self fed. Bullocks are bought in as 280 kg stores after the New Year, and go straight onto slats to be fed third-cut silage. They are put out to grass in mid April, and come back onto slats in mid September. In their second winter the bullocks are fed as much second-cut silage as they will eat at a single feed in the morning. In addition, the Angus and Hereford crosses get 2.7 kg of barley per day and the Charollais and Limousin crosses 5.4 kg fed by bucket twice a day. The aim is to get them all away to market by Christmas when prices are highest.

Beef calves from the dairy herd are also kept on slats. These Simmental cross calves born in February-March are finished at 13-14 months. The males are kept entire.

"Green to Gold"

After lunch a video entitled "Green to Gold" was shown. This was sponsored by Axis Agricultural Ltd., and includes a description of the methods of silage making used at Culvinnan. Next on the programme was a spirited discussion, chaired by Mr John Watson who is Chairman of the South West Scotland Grassland Society, in which the questions came thick and fast. The main topics covered are summarized below.

On the importance of the mower conditioner, Michael replied that it might not appear to be of much use with the low dry matter silage made in 1988. However, the conditioner sets up the wet herbage in the swath and makes it easier for the harvester to pick up.

Organic fertilizers have not been considered because of cost and availability, but liquid fertilizers have been used at Culvinnan since 1971. They have the same effect as conventional fertilizers but are easier to handle and to apply accurately.

The feeding of silage effluent is an important factor in achieving maximum performance from silage. When the cows are grazing they consume the grass juice, so why should it have less value in silage? The problem with effluent is the cost of storage. Collection is by slotted plastic drainage pipes along each side of the silos. These are cheap to replace but storage tanks are expensive. However, there were tanks for liquid fertilizer storage and these are now used for effluent. Not

all effluent is saved, because storage space is usually used up by the second cut.

Michael was strongly against a suggested change over of his mixed herd of Ayrshires and Friesians to Holsteins. It was difficult enough to fatten Friesian crosses but virtually impossible with Holstein crosses. He also believed that Holsteins did not perform well on grass even when given supplementary feed.

Herbage utilization appeared to be poor on the grazed swards which had been visited, and it was suggested that more cows should be kept. Michael explained that the herd had been larger but had been cut back to give a better balance of dairy, beef and cereals. Each enterprise should contribute to the others and increase their profitability. Cows are more profitable than beef and cereals but if cows were the only enterprise they would not be as profitable as they are in the mixed system.

Finally, Michael was asked why having consistently made good silage over many years the 1987 silage was the best. He suggested that the change to an inoculant had some effect. However, the main factor was the tremendous weather in the spring of 1987 with high sunshine figures giving herbage with high sugar content.

Dr John Frame, Head of the Crop Production Department of the West of Scotland College gave the vote of thanks to Michael and all the other members of the Milligan family who had helped make the Open Day such a success. He also thanked the sponsors for their invaluable contributions. The main sponsors were Axis Agricultural Ltd., but valuable assistance was also received from James Gordon (Engineers) Ltd., Scottish Agricultural Industries plc, Sinclair McGill plc, Jim Watson Seeds, Chambers, Claas Jaguar, Vicon and Humberclyde Leasing.

Reclaimed land

A small party of enthusiasts braved the weather in the late afternoon to visit the reclaimed land. About half of the farm is below the level of the River Ken and is protected from flooding by a bank built when the Ken Valley hydro electric scheme started in 1937. Water is pumped from behind the bank by the South of Scotland Electricity Board, and this land has tremendous growing potential although usually too soft to take grazing animals.

D Reid.

SUMMER VISIT TO LANCASHIRE, 1988

David Reid, Journal Editor

In July 1988 Lancashire was the venue of the BGS Summer Meeting the theme of which was "Grass at All Levels". 140 delegates were resident at the Myerscough centre of the Lancashire College of Agriculture and Horticulture conveniently situated just a short distance west of the M6 motorway. More than 40 others attended as day delegates. Hosts for the meeting were three local grassland societies - the Chorley and District Group, Fylde and West Lancashire Society and the East Lancashire Society.

Cyril Davies the President and Alan Spensley the Host Vice-President welcomed the delegates on Sunday evening. Tony Fox the Principal of the College then gave an introductory talk on farming in Lancashire. Agriculturally the county is very diverse ranging from a large area of horticultural crops on the best lowland soils to rough hill vegetation on the poor land at the top of the fells. Much of the grassland is on boulder clay giving drainage problems. Other problems are posed by proximity to the large conurbation of Greater Manchester.

Three Contrasting Dairy Farms

First on the Monday programme was a visit to a lowland dairy farm on clay soils at Ulnes Walton. Jim Deacon's 140 ha Boyes Farm carries 160 dairy cows and 280 Mule ewes. Land purchased in recent years has been drained, reseeded and sheepfenced. Reseeding is only carried out when the swards become unproductive. This is done in August or September with glyphosate spraying preceding the ploughing. 2000 tonnes of silage are made by a contractor in open clamps, and fed twice a day by forage box. The average milk yield in 1987/88 was 5512 litres/cow with an input of 0.29kg/litre of a home-mixed concentrate and stocking rate of 2.4 cows/ha. All lambs from the sheep flock are sold. Winter barley is grown on 24 ha giving a yield of about 5 tonnes/ha.

Problems of farming on the urban fringe were described at New Hey Farm, Castleton near Rochdale by the brothers Adrian and David Drake. This 48 ha farm has a dairy herd of 70 Friesian cows bred up from Ayrshires. Silage is self fed together with a regular diet of waste "Mr

Kipling" cakes. The average yield in 1987/88 was 5300 litres per cow with an input of 1 tonne of purchased feed per cow. 75% of the milk produced is sold in a 6-day-a-week milk round, and the Drake brothers plan to develop the retail side by purchasing another milk round. Excellent grass was seen at New Hey Farm growing on boulder clay at over 120 m and on reclaimed sand quarry land with little top soil.

An upland grassland dairy farm was the final visit on Monday. Broadwood Edge Farm, Holcombe consists of 96 ha of permanent grass between 150 and 350 m above sea level, and has an average rainfall of about 1500 mm. Grazing rights are also held on Holcombe Moor. Keith Wood and his son Gary are producer retailers with a herd of 98 Friesians giving an average milk yield of 5085 litres/cow. The stocking rate is 2.42 cows/ha and the concentrate input 0.28 kg/litre. There is also a sheep flock of 380 Gritstone and Cheviot x Gritstone ewes. Part of this farm was used in the 1960's for a comparison of permanent pasture and reseeds on a farm-unit scale run by Harry Mudd of Great House Experimental Husbandry Farm.

Sward Maintenance by Slot Seeding

Tuesday's tour began with a visit to Cross Hill Farm, Treales, which is run as a partnership between Brian Robinson and his parents, Bill and Lena Robinson. Brian gave an instructive and, at times, hilarious account of his methods of grassland management. This 107 ha intensive Fylde dairy farm has a herd of 160 cows and a sheep flock of 300 Welsh half bred and North Country Mule ewes. All the farm is down to 4-5 year leys which were initially undersown in barley and peas. The silage fields are rejuvenated when necessary by slot seeding. The dairy cows are set stocked with a total nitrogen application of 435 kg/ha on the grazed fields. Sheep grazing is integrated with cow grazing giving dense, highly productive pastures with a good clover content despite the high nitrogen usage. Silage is cut with a mower conditioner, wilted for 12-24 hours, and lifted by a contractor with a self-propelled machine. An inoculant additive is used. Silage fields get heavy fertilizer applications - 500 kg/ha of 29:5:5 for the first cut, 500 kg/ha of 24:0:17 for the second cut, and 375 kg/ha for the third. The average milk yield in 1987/88 was 6183 litres/cow with a concentrate input of 0.24 kg/litre and a stocking rate of 2.6 cows/ha.

Land Reclamation from the Sea

At Sand Villa, the farm of John Barton & Sons, near Cockerham, the theme was reclamation of land from the sea and the establishment of productive grassland on the reclaimed land. The Barton family moved to Sand Villa in 1968. Their first attempt at reclamation was made in 1977, but that wall was destroyed by a flood later the same year. In 1982 the present sea wall was built allowing extensive improvement of the marsh by draining, levelling and reseeding 100 ha. The total area of the farm is now 200 ha and carries a dairy herd of 350 Friesian/Holstein dairy cows and followers and a sheep flock of 500 Mule ewes. Swards of medium-term perennial ryegrass receive large quantities of slurry and sludge from the local sewage works. The soil structure of the reclaimed land has been greatly improved by this treatment. Besides making the farm more productive, the sea wall has improved the sea defences of the village of Cockerham which was regularly flooded in the past.

Lancashire Farmhouse Cheese

Lower Barker Farm, Ingelewhite was the final visit of the day. Here the Butler family make farmhouse cheese and manage a 94 ha intensive grassland farm. Mrs Jean Butler has been making traditional Lancashire cheese for 20 years. The BGS visited the farm in the first week of production in a new more automated cheese dairy, which allows all the milk to be pasteurised before manufacture. Daily throughput is 4500 litres much of which comes from neighbouring farms. Whey butter is also made, and the final whey byproduct is fed to beef cattle. The herd of 138 dairy cows is set stocked except in dry weather when strip grazing is adopted. Silage is fed to the cows throughout the summer. To avoid poaching the heavy land there is no night grazing in spring and autumn. Silage is fed *ad lib* plus 2.5 kg of sugarbeet pulp at midday. Whey from the cheese unit is also fed. The average milk yield in 1987/88 was 6000 litres/cow with 0.29 kg/litre of concentrate fed and a stocking rate of 2.6 cows/ha. In addition to the dairy herd there are 162 followers and beef cattle. Bull calves are fattened at 12 months and fed *ad lib* whey through nipple feeders, *ad lib* silage and beef nuts. Heifers are reared intensively on *ad lib* silage, restricted whey and beef nuts to fatten at 15-18 months. A flock of 100 Mule ewes are also carried on this heavily stocked farm.

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Wednesday's programme began with a rather wet and muddy visit to Hotherstall Hall Farm, Hotherstall. Tom Robinson and his three sons farm 132 ha of flat riverside alluvial land in the Ribble Valley. 12 ha of arable crops are grown to dispose of large amounts of slurry, and 8 ha of this is fodder beet producing a highly digestible feed for the dairy herd. 2500 tonnes of silage are made in three cuts using an acid additive. The dairy herd of 240 Friesians are fed silage, fodder beet and maize gluten via a complete diet feeder. Concentrates are fed at 0.29 kg/litre in the parlour. In 1987/88 the average milk yield was 5346 litres/cow. A flock of 100 Mule ewes are kept on the top land and on rented grazing, and 500-1000 lambs are purchased and finished on fodder beet tops and surplus grass.

Upland Farming

The rain continued for the visit to Dinkling Green Farm, the upland farm of the Lancashire College of Agriculture at Chipping. Here the delegates were welcomed by Mr John Parrett, Head of Agriculture. The farm consists of 90 ha of fell land and 97 ha of inbye, all on steep wet land. The original "country bred" fell flock has been modified since 1975 by the use of Scottish Blackface tups. Part of the 820 ewe flock is put to a Blueface Leicester tup to provide gimmers for the College's lowland flocks, and a small flock of Mules has been established to increase total output. All ewes are housed from mid December to April and most are sheared in early January. The ewes are turned out shortly after lambing. 120 beef stores are grazed on a "payment by liveweight gain" basis for 4 months each summer. Grass swards on shallow peat land have been improved using herbicides and surface cultivation. Selling off the suckler herd in 1980 and the removal of the ewes from the land in the winter has increased grass production. Stocking rate is now 300% greater than in 1975.

Finally the delegates visited Mr John Pickard's Bradley Hall Farm at Great Harwood. This is an upland livestock farm of which 100 ha are owned and 160 ha rented from the North West Water Authority. The rented land is classified as rough grazing and forms the catchment area for a large reservoir, which restricts the farming methods used. Grazing must be by sheep only, application of organic manures and nitrogen fertilizers is forbidden, and no ploughing or other soil disturbance is allowed. However, liming is allowed every 5 years, and phosphates can be applied at half rate. All the owned land is in

permanent grass. There is a suckler herd of 120 Aberdeen Angus x Friesian spring calving cows, which are put to Belgian Blue and Limousin bulls. Calves are finished in straw yards at 13-14 months, and the cows are overwintered in cubicles. A flock of 750 pedigree Lonk and 250 pedigree Gritstone ewes has a lambing percentage of 140. The lambs are sold fat or used as replacements, 600 being taken inside at Christmas and finished on concentrates.

Lancashire College Farm

On Thursday morning there was an optional visit to the Lancashire College's farm at Myerscough. This consists of 175 ha plus 17 ha of the Horticultural Department and sports field and 3 ha of Machinery Demonstration Area. A proportion of Holstein blood has recently been introduced in the dairy herd of 145 pedigree Friesians to improve conformation. The herd is housed in low cost kennel accommodation with an open feeding passage and a herringbone milking parlour. Six "out of parlour" feeders have been installed recently to allow the herd to participate in large scale feeding trials. Summer management is based on 1-day paddocks supplemented with silage aftermaths. In winter the herd is split into two groups according to milk yield and fed a ration consisting of silage, brewers grains and home-mixed concentrate in the trough as a complete diet. The high yielders get top-up rations of dairy nuts in the parlour.

The beef stock are all byproducts of the dairy herd - Friesian steers, Limousin x Friesian and Hereford x Friesian. In winter there are over 200 beef cattle of varying ages on the farm, with about 120 finished each year, mostly between January and May. The intensively managed grassland is a mixture of short, medium and long term leys with a small area of permanent pasture. Swards are usually established by undersowing in arable silage, which is fed to beef cattle and dairy young stock. About 2,000 tonnes of silage are made each year.

50-60 ha of cereal are grown with an increasing proportion of winter wheat and winter barley as opposed to spring barley. All the grain produced is fed to livestock on the farm. 6 ha of potatoes are also grown plus 1 ha of sugar beet for educational purposes. The farm provides an important resource for the Schools Liaison Unit and for this reason a "Farm and Countryside Trail" has been developed. This is used not only by schools but by other interested adult groups and will play an important role in developing public awareness and interest in farming and in the countryside.

SOUTH-WEST SCOTLAND GRASSLAND SOCIETY COMPETITIONS 1989-90

17th ANNUAL SILAGE COMPETITION

The 17th Annual Silage Competition of the South-West Society will be run again this year with only slight changes in the marking and judging. Although the total number of marks will remain unchanged, the limits for D value will be from 60 to 76, and those for ammonia nitrogen (as % of total N) will be 2.5 to 15. As before the judging will concentrate on silage utilisation, feeding efficiency and effluent control.

Two other important changes are being made in 1989-90. First, to keep in line with the regional competitions, up to 10% of absorbent additives (by fresh weight) will be allowed in the silage. Second, big-bale entries will be eligible for judging in the short leet, providing a significant proportion of silage requirement is made in this form. However, big-bale silage is not eligible for the regional competitions. The prize for the best big-bale entry is a cash token donated by Plasti-Covers Ltd, Irvine.

Full details of the rules for the competition will be sent out with the entry forms.

GRASSLAND IDEAS COMPETITION

This competition continues to attract entries and will be repeated in 1989-90. Original ideas or innovations are sought, which should have been developed and used by individuals on their own farms. The winner of this competition receives a tankard donated by Kemira Fertilizers. Local winners may go forward to the BGS National Ideas Competition, which will be held at the Stoneleigh grassland event in May 1990. Entry is free and forms will be circulated with the silage competition forms.

GRASSLAND ENVIRONMENTAL COMPETITION

This is a new competition introduced by the Executive Committee this year. The objective is to encourage an increased sympathy for the environment when carrying out grassland management.

Entrants will be asked to list any existing features on their farm which are beneficial to nature conservation or amenity. Items will not be restricted to grassland but can include such things as pond construction; fencing to improve moorland or woodland; tree planting; hedge or dyke improvement.

A short leet will be selected for final judging by a local FFWAG Chairman. Entry forms will be circulated with the silage competition forms.

SILAGE FOR SHEEP AND BEEF

Malcolm Appleton

Liscombe Experimental Husbandry Farm, Dulverton, Somerset

*Joint meeting of the SWSGS with the National Sheep Association
(South West Scottish Area) at the Creebridge House Hotel,
Newton Stewart on 28 October 1988*

Malcolm Appleton, Deputy Director of the Experimental Husbandry Farm at Liscombe in Somerset was the speaker at this meeting. He has worked for many years on the feeding of silage to sheep and beef cattle on this wet upland, all grass farm in south-west England where the conditions are similar to those in south-west Scotland. Mr Roy MacGregor of the National Sheep Association was chairman for the evening.

Liscombe Farm

Liscombe EHF is an improved upland farm of 200 ha at 240-380 m above sea level on Exmoor. The soil is a free draining silt loam and the rainfall is 1500mm. Stock consist of 120 single-suckler cows, 300 other cattle, 1000 breeding ewes and 1500 lambs. All of the sheep are winter housed. A small area of roots is the only crop other than grass. Bought-in feeds and other purchases are kept to a minimum and the stocking rate is 2.5 livestock units per ha. Fertilizer use is above average for a beef/sheep farm. 75% of the land is accessible to the fertilizer distributor and 50-60% is suitable for silage. Grazing rights are held on the surrounding moorland which consists of heather, bracken and gorse. About 1500 tonnes of silage are made annually as clamps and big bales. With a surplus of grass in 1988 the big bales were particularly useful.

The sheep flock of Welsh Mountain ewes now has a lambing percentage of 140 to 150 due to improved nutrition. A change to the speckle-faced Welsh is being made by using blue-faced Leicester rams to produce Welsh Mules. 500 lambs are taken into the winter and finished on silage, barley and fish meal to sell at the New Year. Others are finished in summer.

70 dairy-bred calves are purchased each autumn for a conventional 18-month beef system. These are mostly Limousin x Friesians and are

fed silage from 12 weeks through to turn out. The suckler herd of North Devon x Friesian cows is put to South Devon bulls. Calves are used for stores and for finishing and, like the cows, are basically silage fed. All calves and most cows are housed through the winter.

Silage

In all the livestock enterprises at Liscombe silage plays a vital part, and the speaker stressed the importance of having a sugar content of 2½-3% in the herbage to give a satisfactory silage fermentation. He mentioned three methods of estimating sugar content - (1) chemical analysis, (2) refractometer, and (3) Liscombe Star System. In the star system the herbage is scored for sugar level which is assessed from the sward type, growth stage of the herbage, nitrogen fertilizer rate, weather conditions, length of wilting period and chop length. Five stars indicates sufficient sugar and four stars to one star an increasing need for the use of an additive.

In the speaker's opinion the best additives to use under low sugar conditions are the acids though they are the most hazardous. Inoculants and enzymes will not work at low sugar levels, but when high all additives will usually give a small benefit. To ensure a good fermentation -

- (1) check sugar level;
- (2) wilt or use an effective additive;
- (3) avoid soil contamination;
- (4) fill silo quickly;
- (5) consolidate;
- (6) seal the silo to exclude air;
- (7) apply surface pressure.

Avoidance of soil contamination is particularly important due to the risk of listeriosis. Soil contamination tends to be higher in big-bale silage where the rules for making are basically the same as for clamp silage. The drier the grass the cheaper it is to bale, but generally big-bale silage is made at about 30% dry matter.

Suckler Herd

Seventy of the North Devon x Friesian suckler cows are calved in March/April and fifty in June/July. The spring calves are weaned at about 7 months in October, and put into a slatted shed where the stores are fed silage only and the finishers silage plus 3 kg of a barley/soya mix. Both steers and heifers are finished at 13 months. The cows

are housed for 1 week after weaning and fed only straw and water to dry them off. They then graze surplus grass until housing in late November/early December. During the winter the cows are subjected to a "controlled winter weight loss" in which they are fed only for maintenance at no more than 60 MJ of ME per day. The cows are housed at about 550 kg and suffer a weight loss of 90-100 kg by turnout in the spring, but fully regain this when at grass. For this system to be successful the following rules must be followed -

- (1) Only fully grown cows should be used.
- (2) Housing conditions should be good.
- (3) A mineral/vitamin supplement should be fed.
- (4) After the winter weight loss summer grazing must be good to give the necessary weight recovery and condition improvement before putting to the bull.

The intake of silage is one of the biggest variables with the suckler cows, and the quality of fermentation has a large effect even in good silages. The gross margin per animal for the spring sucklers are £483 for bulls and £371 for heifers, or on a per ha basis £966 and £742 respectively.

Sheep

From the upland half-bred flock one and a half lambs are sold per ewe as stores or finished. The gross margin is £45 per ewe or £560 per ha. As with the cattle the main feed for the sheep is silage, which is fed to them unrestricted. To be suitable for sheep silage must have a good fermentation and quality. The D-value should be about 68, the ME 10.8 MJ, and the digestible crude protein 10%. The ammonia-nitrogen should be not more than 5-10% of total nitrogen and pH 4-4.5. With single lambs an ME of 8 MJ would be adequate, but for twins 12 would be required. The target dry-matter content should be 20-30%, but the higher end of the scale would be preferable. The herbage should be short chopped. Supplementation should be matched to silage quality, ewe condition and number of lambs.

Summarized below are the mean results over 3 years from an experiment at Liscombe EHF comparing two silages of differing dry matter content fed to housed Welsh half-bred ewes in the last 8 weeks of pregnancy.

	DM content	
	20%	30%
Intake (kg/ewe): fresh	4.3	3.1
dry matter	0.9	1.0
Ewe weight change (kg)	-1.5	-1.3
Condition score change	-0.4	-0.4
Twin lamb: birth weight (kg)	3.8	3.8
growth rate to 6 weeks (g)	260	260

On a fresh weight basis more of the wet silage was eaten, but dry-matter intakes were similar as were ewe weight changes and twin lamb performance.

Results from a recent trial at Liscombe on chop length of silage are shown below.

	Chop length	
	25 mm	75 mm
Intake (kg/ewe): fresh	4.2	4.1
dry matter	0.80	0.77
Ewe weight change (kg)	-2.60	-1.77
Condition score change	-0.4	-0.3
Twin lamb: birth weight (kg)	3.3	3.2
growth rate (g/day)	250	250

Performances were similar at both chop lengths supporting the suggestion that the quality of the fermentation is the most important factor. Short chopping is an expensive operation, and to save money a chop length of about 50 mm is used at Liscombe.

On the question of supplementary feeding Mr Appleton stated that with silages with a D-value greater than 68 no supplement was required or at most a limited energy feed. With silages between 65 and 68 D an energy supplement was needed and perhaps some protein also. From 62 to 65 D both energy and protein supplements were definitely required. Poorer quality silage should not be fed to sheep. Examples of supplementary feeding to ewes carrying twins in condition score 3-3½ or singles in condition score 2½ are as follows :-

	62 D	65 D	68 D
Weeks feeding	8	6	4
Max (kg/day)	0.7	0.7	0.5
Total feed (kg)	28	20	10

These rates are for Welsh half-bred ewes of about 60 kg in mid pregnancy. Thinner ewes would be fed more for a longer period.

The housing at Liscombe allows 200 mm of feed face per ewe for silage (half the number of ewes at one time) and 400 mm per ewe for supplements. Housed shorn ewes will eat about 10-15% more silage than unshorn ewes. Silage is fed morning, afternoon and evening if necessary so that some silage is in front of the ewes in the morning. This gives as nearly as possible *ad libitum* silage feeding. However, it is important to remove uneaten silage in the morning.

Virtually all half-bred ewes in north Devon and Somerset are winter housed, and about half of the other breeds. It would probably be difficult to get shepherds in that area if sheep were kept outdoors particularly at lambing time.

Discussion

In reply to the first question Mr Appleton said that big-bale silage was fed to sheep at Liscombe. A big-bale feeder had been put into the shed, but it reduced the number of ewes which could be housed. Big bales were also fed along the feed barrier by cutting the strings and teasing the silage out. The problem here could be insufficient feed face.

With profit margins higher for cattle than for sheep why were sheep numbers increasing and cattle numbers decreasing? This was mainly a question of fixed costs, the capital input necessary with sheep being smaller than that with cattle. Housing might alter this although cheap housing might not increase the cost much. It is important not to economize on the layout of the shed but costs could be reduced by using a cheap roof. Despite all he had said on housing the speaker admitted that it would be difficult to justify the replacement of existing sheep sheds.

On the question of feeding silage or concentrates to sheep in the critical period during tupping to prevent egg loss Mr Appleton replied that the aim at Liscombe was to avoid anything which would complicate the system. With May lambing supplementary feeding

might help to solve the problem of low prolificacy, but it was important not to use it as a blanket treatment. Silage or concentrates should only be fed where absolutely necessary.

At Liscombe lambs are sheared before tupping and this slightly increases conception rate. They are also sheared before going onto root feeding, which does not increase intake but keeps the lambs cleaner. Heavier lambs, i.e. those of about half mature weight, have a 90% conception rate. The rates are much lower with lighter lambs. One member asked about the possibility of the shorn ewes being chilled when turned out after lambing, but the speaker replied that they are not turned out until March or April and only into well sheltered fields. Shearing might be dangerous where shelter is lacking. The ewes are shorn about a week after housing. The advantages of shearing are that ewes take up less space, they can be scored more easily for body condition, and they are easier to lamb.

It was commented that Mr Appleton aimed for silage with a D-value of 62 to 65 for sheep. What circumstances could justify the use of a poorer quality silage? The speaker replied that if barley prices came down supplementation with barley could be increased and a lower silage quality accepted. Other methods of supplementing poor quality silage were the feeding of byproducts such as sugar-beet pulp, liquid feeds, and maize gluten. Care must be taken with the gluten which should not make up more than 50% of the supplement.

Questioned on the link between soil contamination and listeriosis Mr Appleton replied that turnip feeding could be blamed. The soil ingestion with roots was very high and could cause this disease.

A member asked if any attempt was being made to introduce more clover into the swards at Liscombe, and whether sheep performed better on clover swards than on high-nitrogen swards. In general the nitrogen rates have been reduced over the last 3-4 years giving an increase in the clover content of the swards, but no experimental evidence of increased performance has so far been obtained.

Commenting on "clean grazing systems" Mr Appleton said that such systems were difficult to operate on most farms and impossible on beef/sheep farms because of the balance of sheep to cattle. On an intensive sheep farm the only clean grazing available was on silage aftermaths.

Mr John Watson proposed a hearty vote of thanks to the speaker for travelling from Somerset and giving such an excellent talk.

D Reid

POSTSCRIPT In the spring of 1989 the press reported that the Ministry of Agriculture, Fisheries and Food planned to close down Liscombe EHF.

PLASTI-COVERS POLYTHENE RECYCLING PLANT

At the meeting of the South-West Society on 16 February 1988 two representatives from Plasti-Covers Limited announced that the firm was investing £1 million in a polythene recycling plant at Irvine, Ayrshire. Mr Howard Goldie, Polythene Recycling Manager, and Mr Robert McArdle, Sales Manager, described the new plant which will be the first in the UK to be able to handle contaminated scrap.

Legislation has been introduced in several EC countries preventing the burning or burying of polythene scrap and will probably be brought in in the UK within the next few years. Plasti-Covers believe that for environmental and other reasons this material should be recycled rather than burned. The throughput of the plant will be about 60 tonnes per week when it opens in April 1989, increasing to 100 tonnes later. It will handle silage bags, silo sheets and fertilizer bags, but not stretch wrap.

Scrap will be collected by van, and should be as clean as possible and contain no ties or polypropylene. Plasti-Covers will be offering, for example, about 12p for silage bags and £5 for a silo sheet. The reclaimed polythene will be used for damp-proof course material and refuse sacks, but not for heavy duty use.

WILDLIFE CONSERVATION ON A WORKING FARM

Poul Christensen

Kingston Hill Farm, Kingston Bagpuize, Oxford

Joint meeting of the SWSGS with the Dumfries and Stewartry Farming, Forestry and Wildlife Advisory Group at the Ernespie House Hotel, Castle Douglas on 17 November 1988

At this meeting the speaker was Mr Poul Christensen who farms Kingston Hill Farm, which was visited by the British Grassland Society during the Summer Visit to Berkshire in July 1987. Mr Christensen farms in partnership with his wife and parents Mr and Mrs Arnold Christensen. Arnold is a past President of the British Grassland Society. In the chair for the evening was Mr John Watson, chairman of the SWSGS, who welcomed the FFWAG members.

In his opening remarks Mr Christensen made it clear that Kingston Hill was a working farm. The farming enterprise had to be profitable to allow conservation measures to be applied. Farming and conservation have been combined on the farm since the Christensen family became tenants of St John's College, Oxford in 1968. Kingston Hill is one of ten demonstration farms established in England and Wales by the Countryside Commission to investigate whether it is possible to combine profitable farming and conservation interests. A second aim is to find the most cost effective ways of managing both existing and new landscape features.

The farming enterprise

The farm has a total area of 294 ha of which 278 ha are productive. Forage maize occupies 28 ha, winter wheat 24 ha and the rest is in grass. Half of the farm is on Oxford clay and the rest on greensand. The River Thames forms the northern boundary of the farm, which consists of undulating land with an elevation of up to 30 m. Annual rainfall is 610 mm.

The basis of the low-cost livestock system is the dairy herd, which consists of 415 Friesian cows milked through a very simple parlour with no jars or computers. In winter the cows are loose housed on straw or in kennels and self fed mixed grass and maize silage. Summer grazing is on a set stocking pattern. In the year ending October 1988

the average milk yield was 4864 litres per cow with a concentrate input of 0.18 kg per cow. Margin over feed and fertilizer was £702 per cow and £1708 per ha.

Calving is year round with Friesian AI used on 250 cows and Hereford and Angus bulls on the rest. Limousin bulls were tried but calving difficulties were experienced with this cross. All calves are kept, suckled for the first 3-4 days and then reared off the farm on a separate unit. At any one time there are 80 to 100 calves on milk. At 12 weeks of age Friesian heifers are returned to Kingston Hill. Friesian steers and beef crosses are transferred to a 112 ha beef unit recently taken over about 30 miles away in the Cotswolds.

Most of the beef cross heifers are sold into single suckling units. The steers are sold as stores either from the beef unit in the autumn or transferred back to Kingston Hill to be sold in the spring after overwintering on straw and silage with the dairy heifers. Round bales of straw have made this system easier since they can be rolled out in lines in the field for the cattle to lie on.

Maize is grown on the fields where the cattle have been overwintered and much of the dung and slurry goes on these fields. The crop is cut by a contractor and is put on top of the grass silage in the clamp to give a settled depth of about 1/4 maize to 3/4 grass. One difficulty with this system is that the sheets have to be taken of the silo in the autumn to add the maize.

Conservation

The Christensens have always been interested in wildlife and their approach to conservation has been as simple and low cost as their farming system. Conservation within the farm boundary should be a priority, and it is in the farmer's own interest to ensure that no species are lost. It is just as important to have conservation objectives as farming objectives, and the main one for conservation should be to have as many species of wildlife on the farm at the end of a tenancy as at the beginning.

The greatest drive on Kingston Hill has been to retain all non-farmed areas, i.e. hedges, ditches, woodland, ponds, etc., and keep farming activities out of these. Application of fertilizers, insecticides, herbicides and slurry on the hedges and ditches is avoided by leaving a wide untreated headland round every field. Formerly 2½ % of the 400 kg/ha

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of nitrogen applied annually was estimated to go into the ditches. Farm and conservation management are all part of the same thing and cannot be separated. The combination leads to some untidiness at certain times of the year, but it is an "enlightened" untidiness and does not cost a lot of money. As a result there are now sixty-five bird species on the farm.

Saplings are marked in the hedgerows to grow into trees or bushes at no extra cost. From a wildlife point-of-view the ditch and verge is just as important as the hedge itself. The woodlands at Kingston Hill have been retained by and are the responsibility of the landlord. They had been poorly managed for many years but are now coppiced on a regular basis. The ash trees have been cut out leaving the oaks so that bluebells, primroses, and orchids develop on the woodland floor.

Mr Christensen listed some of the many other conservation measures which have been applied on the farm. For example, fences have been erected 1 m from the edge of all ditches to allow wild species to develop. When the main drainage channel through the north end of the farm was cleared a portion of the existing vegetation was left. This makes the channel fill in more quickly but prevents the loss of species. The willows along the edge of the ditches are pollarded regularly to prevent them getting too big and falling over. When the digger was on the farm to clear the ditches a boggy area was made into a stretch of open water with an island at a cost of only £100. A 90 m length of lane with trees and hedges has been left wild and on this small area sixteen species of birds nest. Hedges are not cut until January or February to give the birds and animals a chance to eat the hedge fruits such as rose hips and sloes.

Not only wildlife is preserved on Kingston Hill. The remains of a Roman villa have been excavated by archaeologists, recorded and then covered over to preserve them. Of more recent vintage, an early 18th-century farmhouse has been completely rebuilt and is now Poul Christensen's family home.

Discussion

Mr John McMyynn chairman of the Dumfries and Stewartry FFWAG opened the discussion with the remark that he was interested to meet a man who could make a profit from farming and at the same time indulge in conservation. He asked if since Kingston Hill was a conservation demonstration farm did not public access to the farm

cause some damage to wildlife ? Mr Christensen replied that unofficial access from boat traffic on the Thames is not much of a problem. The farm is not on the urban fringe so the walkers who come are usually people who are interested in the countryside and cause no damage.

The speaker agreed that more farmers are interested in conservation than is generally credited. However, too much interest usually goes into saving hedgerows and often this is not done correctly. The assumption is that if a hedge looks good it is being properly conserved, but the important point is the number of species in it.

Mr Christensen is not taking the organic road to conservation because the market for organic products does not appear to be sustainable and remains small. Nitrogen fertilizer is still the most cost effective purchase on the farm, and only if a limit is put on its usage will an organic system be considered. Increasing use is being made of clover on the beef unit. The northern boundary of the farm is the river Thames, which provides water for towns all the way to London and the nitrate problem might become a worry in the future, so a change towards clover might be necessary. Most nitrate is released when grassland is ploughed and white clover leys left down longer might reduce the problem.

To reduce the effect of sprays on the hedges and ditches at Kingston Hill weeds in grassland are spot treated with a knapsack sprayer. On cereal fields half a spray width is left all the way round the headland. Application of aphicides has not been required on the farm in the last 4 years. Insecticides kill a lot of insects but the speaker believes that fertilizers have a much greater effect on wildlife.

So far about 6% of the total area of the farm has been set aside for conservation, but this includes areas not usually farmed such as ditches and hedges. Only a small area has actually been taken out of farming. Conservation areas will be extended to parts of the farm which have not been productive.

The vote of thanks to the speaker was proposed by Dr Malcolm Castle, chairman of the Ayrshire FFWAG.

D Reid

GRASSLAND OPTIONS FOR THE FUTURE : COPING WITH RESTRAINTS

*The 1988 Winter Meeting of the British Grassland Society
held at the Purcell Rooms, South Bank, London
on 7 December 1988*

The theme of this successful meeting organized by the British Grassland Society set the speakers the difficult task of looking into future possible uses of grass to cope with the restraints and changes imposed on the agricultural industry. Three research orientated papers were followed by four shorter and more practically based papers. In addition, there were nine posters presenting interim results of research work related to the theme of the meeting.

Outlook for meat and milk

In discussing this topic Professor Colin Spedding said that the use of nitrogen was likely to be controlled with a compensating increase in the use of legumes. Uncertainties in the future of farming would relate to pollution, pests, disease and radioactivity. Apart from preventing overproduction, there could be problems for grassland in a falling demand for meat and milk including a possibility of more vegetarianism. He concluded that extensive grassland offered the best method of combining a given level of production with a higher potential capacity.

Prospects for alternative uses and products from grassland

The second paper was given by Professor T J Maxwell, Director of the Macaulay Land Use Research Institute (MLURI). Returns from traditional livestock industries were not likely to be maintained with less government support. Other land uses were being encouraged and these might eventually be more profitable.

Three quarters of British agricultural land was in grassland and there were few possible alternative animals to utilize it. The first of these was deer, on which there was considerable research and husbandry experience. Viability depended on the future market prices for venison. Horses for recreation were another possibility, particularly in urban areas. However, they posed problems for grazing management. Other animals which might be used were - goats for meat and fibre - cashmere and mohair; sheep for fine wool production - Merino breeds

had a potential in the drier east. Llamas, alpaca, guanaco and vicuna were being investigated. Agroforestry (silvipastoralism) was also being looked at.

Sward management for low input systems

Hamish Munro from Bronydd Mawr, Institute for Grass and Animal Production, indicated guidelines for research into low input systems. He felt that there would be three types of grassland objective in the future. First, there would be intensive production with high fertilizer nitrogen use and this would be mainly on intensive dairy farms. The second system would be based on grass-clover swards, and aimed at moderate output from low resource inputs. Finally, some grassland would be managed only partly for agricultural production, including mixed use of grass and trees with the necessary constraints imposed for wildlife, landscape or amenity considerations. These three objectives could co-exist even on individual farms.

Practical papers

D Griffiths discussed the implications of environmentally sensitive areas. He outlined the background to the agreements which encouraged farming in sympathy with the environment, with reference to the Somerset Levels. The volume and level of payments had removed conflicts and there was a high level of uptake.

The place of organic production of livestock from grass was covered by D R Strickland, who pointed out that organic farms relied heavily on grassland for the build up of organic matter and soil fertility. Providing an early bite in the spring was a problem on these farms since it required the application of Chilean sodium nitrate. This could be banned making it necessary to provide a larger winter feed reserve.

G E Dalton's topic was the economic implications of reducing inputs on grassland farms. More extensive farming would result in lower outputs and a reduced work force especially if cow numbers were reduced. Grassland farmers would need to remain competitive even if they were in an ESA (environmentally sensitive area). There was the possibility of alternative jobs in countryside recreation activities.

S P Hailey, a farmer, discussed changing to less intensive farming. He had been trying this since 1985, and had attempted to be more profitable. Stocking rates were reduced thus reducing forage costs by

mixed cropping (ryegrass, clover and lucerne), minimum reseeding and reduced fertilizers. Labour and interest costs had also been reduced. Milk yield and concentrate input had been decreased but gross margin had increased. Feed costs could be further reduced and greater reliance placed on legumes though retaining some high-nitrogen grassland.

G E D Tiley

SWSGS SILAGE COMPETITION 1988-89

*A meeting of the SWSGS at the Embassy Hotel, Newbridge
Dumfries on 12 January 1989*

Judge: Angus Golightly, Jealott's Hill, Bracknell, Berks

The Competition Night this year was sponsored by the Bank of Scotland (Castle Douglas branch), and chaired by John Watson. The silage judge was Angus Golightly who is Farm Manager for ICI at Jealott's Hill. Angus has had considerable experience of silage judging having judged the 1988 UK National Competition.

He thanked all those who had acted as drivers during his judging visits. Knowing that the analyses marks hardly separated the silages on the short list he had been ruthless in allocating inspection marks. For example, he deducted marks for ragged silo faces which could lead to loss, and also for any surface, shoulder or side waste. He paid particular attention to the net milk yield per cow and to the margin over concentrates and forage on a per cow and per ha basis. Marks were deducted where there was insufficient silage to last through a long winter. However, he was very impressed with all the farms he had visited, and his main disappointment was that some farmers were not assigning a sufficiently high value to their silage. Many silages on the short list were good enough to qualify in the National Competition.

The judge's main criticism was that there was too much waste on the surface, shoulders and sides of some silos. On the other hand most of the farms visited appeared to have sufficient high quality silage available to see them through the winter. However, having made enough silage some were not exploiting it fully by achieving maximum intake. Sometimes this was due the feed face being too short for the number of animals, and here some "away from face" feeding facility should have been provided.

Care should be taken to expose only as much of the surface of the silo as necessary at one time. On some farms visited the sheet had been pulled back too far so that there was danger of waste occurring. Mr Golightly congratulated all the short-listed farmers on their methods of controlling effluent from the silos. On all farms effluent was efficiently collected and on some was even being fed. So long as collection costs can be kept down it is well worth while feeding silage effluent.

The marks awarded in the competition are shown in Tables 1 and 2. In the Open Class the first prize went to father-and-son partners John and Finlay Carson of Conchieton, Twynholm, who were also overall winners and Silver Rosebowl champions. John, previously in partnership with his brother Willie, has won many prizes in this competition before taking second prize on two occasions, and winning the Scottish Region and BGS National Silage Competitions in 1985. Only about one and a half marks separated the first two silages in the Open Class, and the second prize was awarded to A & I Irving, Largs, Twynholm, - third prize winners last year. Third prize this year went to D Yates & Sons, East Logan, Castle Douglas.

The first prize winners in the Beef/Sheep Class and recipients of the BP Nutrition Trophy were J A Houston & Co, Boreland, Kirkcudbright. Once again the best Big Bale entry came from R D Clark, Fineview, Glenluce, this time with the highest analyses marks in the competition.

The Michael Milligan Prize for the best placed entrant who had not previously won a prize, was awarded to J Forrest & Sons, Meinfoot, Ecclefechan. Winners of the best new entrant prize were J & J McColm, Cairngarroch, Drummore.

Prizes for the best silage (on analysis marks only) in each county went to - R Lindsay, Overlochridge, Stewarton for Ayrshire; J Forrest & Son, Meinfoot, Ecclefechan for Dumfries; J & F Carson, Conchieton, Twynholm for Kirkcudbright; and R D Clark, Fineview, Glenluce for Wigtown.

Additional prizes, donated by Plasti-Covers Ltd., Irvine, of new plastic silage sheets were awarded to the 1st and 2nd Open and Beef/Sheep winners, and big bale bags to the Big Bale winner.

Table 1. 1988-89 Silage Competition -Analyses and Marks
 B = Big Bale S = Sausage

Rank	Code	% DM	% CP	D Value	Ammonia N % Total N	ME	Marks /35
OPEN ENTRIES							
1	WS 7 B	22.4	21.4	71.2	2.1	11.4	32.09
2	WS14	21.7	16.3	72.9	3.1	11.7	31.06
3	AS15	22.7	16.5	74.0	5.1	11.8	29.13
4	KS 8	21.0	18.5	73.7	6.4	11.8	28.60
5	DS 5	23.6	16.7	72.1	6.1	11.5	28.23
6	KS12	19.3	16.4	73.1	6.2	11.7	27.98
7	KS16	19.9	15.8	71.4	5.7	11.4	27.62
8	KS 7	18.5	16.7	72.4	7.3	11.6	27.04
9	WS 1	18.3	16.0	71.2	6.6	11.4	26.62
10	AS13	19.7	14.5	70.1	4.8	11.2	26.54
11	WS18	23.1	15.6	73.7	7.4	11.8	26.41
12	DS 4	23.6	15.6	72.8	7.6	11.6	26.19
13	AS 9	19.6	17.1	76.2	8.7	12.2	25.87
14	AS11	25.0	16.2	71.4	7.7	11.4	25.81
15	KS13	17.5	17.9	70.3	7.6	11.2	25.65
17	DS 2	19.9	14.6	71.2	8.0	11.4	24.51
18	WS 2	17.4	12.2	66.6	2.3	10.7	24.41
19	WS 9	20.4	14.1	69.4	6.1	11.1	24.35
20	DS 1	20.9	14.2	71.6	8.4	11.5	24.31
21	KS 6	20.2	16.6	69.8	7.8	11.2	24.29
22	WS17	21.4	13.8	72.2	8.8	11.6	24.11
23	AS18	25.2	17.6	70.2	8.9	11.2	24.08
24	AS 1	21.7	12.9	74.8	8.5	12.0	23.96
25	WS 8	19.4	14.8	67.8	5.5	10.8	23.72
26	AS 6	20.2	15.4	70.6	8.8	11.3	23.50
27	AS10	19.0	13.8	70.1	7.5	11.2	23.49
28	WS13	17.7	17.2	67.0	6.4	10.7	23.18
30	DS 3	17.5	12.9	68.7	6.2	11.0	22.92
31	KS17	20.3	15.1	67.6	6.6	10.8	22.54
32	WS15	21.1	13.7	69.9	8.2	11.2	22.53
34	KS11	27.5	16.4	68.8	8.7	11.0	22.31
35	AS19	21.3	15.3	67.6	7.0	10.8	22.23
36	WS16	23.4	15.2	69.0	8.4	11.0	22.18
37	KS 9	17.7	14.2	67.6	6.6	10.8	22.11
38	AS 8	23.7	17.9	68.1	9.0	10.9	22.06
40	KS 1	27.4	15.7	70.7	11.6	11.3	20.96
42	WS 3	17.5	14.7	66.4	7.0	10.6	20.74
43	AS 7	22.3	16.3	67.8	9.5	10.8	20.43
44	KS14	19.3	13.8	66.7	7.7	10.7	19.88
46	WS 6	20.5	12.1	67.9	8.2	10.9	19.76
47	AS16	22.1	14.7	65.1	7.5	10.4	18.95
49	KS 2	19.2	16.1	68.1	11.7	10.9	18.46
52	WS10	17.2	14.1	63.6	7.0	10.2	17.64
53	AS17	22.0	15.1	65.7	10.0	10.5	17.27
54	AS 5	23.6	12.2	65.4	9.2	10.5	16.29
55	AS20	21.3	12.9	64.6	9.6	10.3	15.42
58	AS12	28.5	14.1	64.0	11.4	10.2	13.65
59	WS 4 B	21.2	16.7	66.3	18.6	10.6	13.63
63	WS 5	17.8	13.9	63.6	12.3	10.2	12.23
65	KS10	17.2	17.1	64.3	21.6	10.3	11.85

Rank	Code	% DM	% CP	D Value	Ammonia N % Total N	ME	Marks /35
BEEF/SHEEP ENTRIES							
16	KS18 S	26.4	14.9	69.5	6.3	11.1	24.63
29	DS 8	22.0	13.9	67.4	5.3	10.8	23.07
32	KS 5	21.1	15.9	67.6	7.0	10.8	22.53
39	KS 3	19.3	15.9	70.6	11.4	11.3	21.15
41	AS14	21.0	12.7	65.3	4.9	10.4	20.74
44	DS 9	26.2	15.4	75.1	13.8	12.0	19.88
48	DS 7	28.4	12.5	64.0	5.6	10.2	18.66
50	AS 2	18.9	13.6	64.8	7.5	10.4	18.12
51	WS11	21.2	13.2	63.2	5.7	10.1	18.11
56	DS 6	28.5	10.6	66.7	11.1	10.7	14.91
57	KS15	20.8	12.3	63.3	9.1	10.1	14.37
60	KS 4	20.4	13.3	63.1	10.6	10.1	13.17
61	AS 3	20.3	13.2	65.0	12.7	10.4	12.90
62	AS 4	19.4	14.4	61.6	10.3	9.9	12.48
64	WS12	30.2	10.5	59.6	6.9	9.5	11.92
66	DS10	32.3	12.7	62.1	10.9	9.9	11.52

R Allbrooke: Clamp Silage Quality 1984-88

The quality of clamp silages over the last five annual competitions is summarized in Table 3. 1988 was a phenomenal year for silage quality. This was not just due to the change in analytical methods last year to the NIR (near infra-red refraction) system, which gives results correlating very well with the *in vitro* digestibility of silage. The percentage of silages with D values above 65 showed a considerable increase over the previous 3 years reaching the 80% recorded in 1984. However, 38% had a D value over 70 in 1988 against only 17% in 1984. The mean dry-matter content remained at the same level as in the last few years, but the mean ammonia once again showed a decrease.

In the Open Class 90% of the entries had a D-value over 65 against 50% in the Beef/Sheep Class. The mean dry-matter content was slightly lower in the Open Class but there was little difference in the mean ammonia N. The silage analysis means for the south-west area were higher than those for Scotland as a whole

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

		Marks		
		Analyses	Inspection	Total
		(35)	(65)	
Open Entries				
Best New Entrant	J & J McColm, Cairngarroch, Drumore.	31.05	43.50	74.55
	R Lindsay, Overlochridge, Stewarton.	29.13	42.00	71.13
1st and Silver Rosebowl Milligan Prize	J & F Carson, Conchieton, Twynholm.	28.60	57.00	85.60
	J Forrest & Son, Meinfoot, Eccelfechan.	28.23	49.00	77.23
3rd	D Yates & Sons, East Logan, Castle Douglas.	27.98	52.00	79.98
2nd	A & I Irving, Largs, Twynholm.	27.04	57.00	84.04
	R D McCreath, Broughton Mains, Whithorn.	26.62	50.00	76.62
	J Stevenson & Sons, Changue, Cumnock.	26.54	38.00	64.54
Beef/Sheep Entries				
1st and BP Trophy	J A Houston & Co, Boreland, Kirkcudbright.	24.63	48.00	72.63
	W T McCombe, Trohoughton, Dumfries.	23.07	49.00	72.07
	G & J Robertson, Meiklewood, Ringford.	22.53	47.00	69.53
Best Big Bale Entry				
	R D Clark, Fineview, Glenluce.	32.09	N/A	N/A

Table 3. Silage Quality 1984-88

Quality	D-Value	% of total in each group				
		1984	1985	1986	1987	1988
Very good	>70	17	0	7	33	38
Good	65-70	63	48	42	31	42
Medium	57-64	20	45	51	34	20
Poor	<57	0	7	0	2	0
Mean DM%		24	20	22	22	22
Mean Ammonia N (% of total N)		10	13	11	9	8
No. of entries		77	56	57	64	66

R Albrooke: Additive Use. 1988

The range of additives used on the silages entered in the 1988 competition is shown in Table 4. 89% of the silages in the Open Class were treated with an additive in 1988 compared with 82% in 1987. However, additive use in the Beef/Sheep Class decreased from 50% in 1987 to 19% in 1988. As in previous years the acid additives were the most popular, 36% of the total entries being treated with one of these compared with 31% in 1987. The acid/formalin additives showed a considerable decrease - from about 19% in 1987 to 6% in 1988.

In contrast, the inoculant additives increased in use from about 19% to nearly 29%. None of the silages in the competition were treated with an enzyme or with molasses in 1988.

Table 4. Additive Use 1988

Type	Additive	Open Class (50 entries)	Beef/Sheep Class (16 entries)
Acid (23)	Add-F	6	-
	Sulphuric	9	1
	Add Save	7	-
Acid/Formalin (4)	Farmlin	3	-
	Sylade	1	-
Inoculant (18)	Bactosyl	2	-
	Ecosyl	3	1
	Microsyl	2	-
	Scotsyl	2	-
	Supersile	7	1
None (18)		5	13
Not known (3)		3	-

Judge's talk

Mr Golightly opened the discussion with a brief description of the farming methods at Jealott's Hill. The farm lies mainly on clay soils, so it is late but grows grass fairly easily. The first silage cut is normally taken about 5 May. Silage making is done by a three-man team plus an additional man who mows the grass and then spreads fertilizer. It is considered important to get the fertilizer on as soon as possible after cutting. To reduce sward damage by compaction on this heavy soil a bogey is fitted to the back of the forage harvester to take the trailer drawbar. In addition all silage machinery has wide wheels attached.

Even with these preventative measures soil damage often has to be repaired by subsoiling and mini-mole draining at about 200 mm depth in October, which gets rid of a lot of water. Sometimes the field has to be rolled over after this operation, but usually it settles back before winter. Another drawback is the growth of chickweed along the lines in a mild winter, and this requires spraying. Every opportunity is given to the cows and sheep to eat silage, and to get maximum intake per animal.



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Production obtained from silage can vary from 2000 to about 6000 per cow. The following table shows the theoretical potential of silage for milk production based on a cow of constant 600 kg liveweight consuming 16 kg of dry matter per day.

	Silage ME (MJ/kg DM)				
	9.5	10.0	10.5	11.0	11.5
DM intake (kg/day)	13.6	14.8	16.0	16.0	16.0
ME intake (MJ/day)	129	148	168	176	184
Milk yield (kg/day)	13.0	16.8	20.8	22.7	24.6
Min DCP (g/kg silage DM)	82	93	103	111	119

Dry matter intake of silages with ME's of 10 or less is limited by low metabolisability, and as a result milk yields from such silages are very low. Theoretical milk yield shows a big increase when the ME increases from 10 to 10.5.

The next table shows the performance of cows and heifers offered grass silage as their sole feed from calving until turnout in five trials.

	Mean	Range
Silage DOMD (g/kg)		663 - 717
Silage intake (kg DM/day) - mean	12.6	11.5 - 13.6
- peak	14.0	12.3 - 18.1
Milk yield (kg/day) - cows	21.1	19.4 - 23.1
- heifers	16.1	15.8 - 16.1
Milk composition (g/kg) - fat	39.2	36.2 - 40.7
- protein	29.6	19.4 - 31.8
Liveweight loss (kg) - cows	46	37 - 59
- heifers	24	13 - 29

The fat and protein levels are lower than would be expected for Friesians, but the liveweight losses are acceptable. From the above results the potential milk yield for this group of animals on grass silage alone could be estimated at about 4700 kg/cow. Other results suggest that the potential intake on grass/clover silages would be higher than that on grass silage but whether this would be reflected in a greater milk yield is not certain. Mr Golightly did not believe that cereals were the best supplements to feed with silage, since these usually reduced silage intake. Molasses or caustic-treated grain did not have this effect, sometimes even increasing silage intake. To date milk prices have been

favourable to the feeding of supplements with silage, but in the future we may have to fall back on our own resources and allow the silage to express itself.

Discussion

Considerable interest was shown in the subsoiling technique described by Mr Golightly and he explained that soil compaction is greatest on the continuously grazed swards, and these are subsoiled every 3 years. On cut swards and those grazed less often subsoiling every 4 years is sufficient. In the last year of a sward it is mole ploughed and then grazed with sheep until ploughed for the cereal crop.

The average milk yield at Jeallot's Hill is 4788 kg/cow with a supplement of only 0.4 tonnes/cow. The supplement is a home mix in the proportion ½ kg fish meal : ½ kg rape meal : 1½ kg molasses : ¾ kg caustic-treated wheat.

The vote of thanks was proposed by Michael Milligan, who thanked Angus Golightly for judging the Silage Competition, and expressed the indebtedness of the Society to the Bank of Scotland for their sponsorship. Finally he congratulated John and Finlay Carson on their success and wished them the best of luck in the Regional and National Competitions.

D Reid

BGS NATIONAL SILAGE COMPETITION 1989 G E D Tiley

For the second year in succession the winners of the South-West Society's Silage Competition took the first prize in the Scottish Regional Competition. This was achieved by John Carson in partnership with his son Finlay. John, with his brother Willie, previously won the Scottish competition in 1985, and proceeded to snap up the first prize in the BGS National Silage Competition also. However, in 1989 the first prize in the UK competition went to a Cheshire farmer, but John and Finlay came very close joint runners-up with a Barnard Castle farmer. Congratulations are due to John and Finlay for maintaining the reputation of the South-West Society for outstanding silage making. The Carson family and Michael Milligan have both come first and second in the National Competition - a performance unmatched by any other UK grassland society.

CONFERENCE ON SILAGE FOR MILK PRODUCTION

John N Watson, Hannah Research Institute, Ayr

This conference organised jointly by the British Grassland Society and the Milk Marketing Board was held at Malvern, Worcestershire in October 1988. A two-day residential meeting, such as this, held in a comfortable hotel provides an excellent forum for formal papers, poster displays and informal discussions. It was fully subscribed with a high proportion of those attending being practical farmers.

Exploiting Silage

The first session of invited papers was opened by Professor Fred Gordon in his usual dynamic manner. In his paper on the making and storing of high quality silage he stressed the ability and necessity of using silage to produce milk and replace concentrates - very important in these times of quotas. D value continues to be the single most important factor in determining milk production. An increase of one unit of D value can enable a reduction in supplementary feed of 0.67 kg/day. Fermentation pattern is a major contributor to high intake silage. Historically formic acid was the most reliable additive, but recent work in Ireland has shown good results with safe-to-use inoculants.

In a paper from ICI, Jealott's Hill A Reeve looked at the milk-producing potential of cows fed *ad lib* silage only. Grass silages, while capable of producing up to 21 kg of milk per day, never seem to perform as well as their analyses would indicate. However, legume silages with a higher voluntary intake, produce more than would be expected from their analyses - up to 26 kg of milk per day.

Giles Tedstone, a grassland dairy farmer from Cheshire, then told the conference he had used no concentrates for the last 4 years and had achieved a margin-over-concentrates (MOC) equal to the milk price per litre. Plenty of high quality, high intake silage was needed for the system to work. With low yields per cow - 4222 litres - more cows were needed to produce the quota and therefore further margin-over-feed-and-forage (MOFF) was obtained. On the silage-only system an extra MOFF of £15,000 was produced compared with the "Milkminster Average". This system was easier on the cow, there being less mastitis and foot problems, conception rates were better and the cows appeared to last longer. This speaker also noted that swards and silage containing clover gave higher intake and higher production.

Supplementing Silage Diets

In the second session of invited papers Professor Phil Thomas and Dr Cled Thomas from the West of Scotland College clearly demonstrated the folly of supplementing silage with cereal-based rations. Higher production and greater silage intakes could be obtained by feeding, for example, 2 kg of fishmeal.

Gordon Newman gave a paper on supplementing silage in practice which both kept the audience awake and made them question the feeding approach they were taking. His main theme was that a variety of good, cheap, bulk-purchased feeds was now available to feed along with silage and that the value of sticking to dairy compounds should be questioned.

In considering the management of silage effluent Nick Offer of the West of Scotland College, David Chamberlain of the Hannah Research Institute and C. Johnston of the North of Scotland College concluded that a return to the use of prolonged wilting periods was unlikely. More attention needed to be paid to the design, construction and maintenance of silos and effluent storage tanks. Absorbents could also play a part in the overall strategy.

Offered Papers

Among the short offered papers was one on the Crichton Royal's study of two systems of producing milk quota, which is reported by Dr Roberts elsewhere in this journal. There were also papers on cow health, contract silage making and many other topics.

EFFLUENT ABSORBENTS AND SILO FLOORS

*A meeting of the CSGS in the Stuart Hotel,
East Kilbride on 12 January 1989*

The two speakers at this meeting were from the West of Scotland College - Nick Offer of the Nutrition & Microbiology Department and Mike Kelly of the Buildings Department.

Absorbents - N Offer

Absorbents should reduce effluent loss from the silo and so decrease the risk of pollution. When a silo is filled with herbage at a dry-matter content as low as 16%, then 6% of the digestible nutrients can be lost in the effluent. This is equivalent to £1800 worth of concentrates per 1000 t of silage. Effluent losses can be avoided by wilting or by the use of absorbents, otherwise great care must be taken to collect, store and dispose of the effluent safely.

As a method of effluent control wilting has many disadvantages. In poor weather it slows down the work and leads to an increase in field losses, which reduces production per ha. In addition, feeding trials have demonstrated that although the intake of wilted silage by the animal is higher, neither milk yield nor liveweight show an accompanying increase.

Ideal absorbents should be resistant to degradation in the silo and should have low solubility. They should also act like other silage additives in improving the feeding value. In addition, absorbents should have a high density, be cheap and be available during the silage season. The relative absorbency of some materials under load is as follows -

Chopped barley straw	100
Dried distillers grains	66
Molassed beet shreds	60
Alkali straw cubes	53
Molassed beet nuts	49
Rolled barley	16

In an experiment using 10 t silos and lasting for 2 years the following four absorbents were compared -

- (1) Straw bales at the bottom of the silo.

- (2) Vita straw cubes at the bottom of the silo or in layers.
- (3) Molassed sugar beet shreds in layers.
- (4) Chopped straw in layers.

There was also a control silo which received AddF at 3 l per t. In the first year the application rate of the absorbents was 60 kg / t of grass ensiled at 14.8% dry matter, and in the second 75 kg / t of grass ensiled at 12.2% dry matter. The results from the experiment are summarized below in terms of the average differences between each of the treated silos and the control.

Treatment	Effluent Volume	Concn	OM Loss	%NH3	D Value	Space
Straw bales	+ 10	- 5	+ 2	+ 15	- 3	+ 80
Chopped straw	- 54	- 13	- 54	- 6	- 14	+ 72
Vita straw cubes	- 11	+ 52	+ 35	+ 15	- 11	+ 17
Beet shreds	- 51	+ 59	- 24	- 11	+ 3	+ 26

The most effective absorbents were chopped straw and molassed beet shreds. Chopped straw lowered the D value and intake of the silages, whereas beet increased the D value, the intake and animal performance. It is important to use the correct application rate for the absorbent. Generally the manufacturer's recommendations are too low. At low absorbent levels more effluent may be produced. If the quality of the herbage is poor it may be necessary to use an additive as well as an absorbent. The suggested application rates for molassed beet shreds are shown below.

Grass dry matter(%)	Wt of shreds / t (kg)	Dry matter at end
15	130	43
18	80	28
20	40	15

The following results were obtained from an experiment in which silages containing different absorbents were fed *ad lib* to Friesian calves together with 1 kg of barley and 0.2 kg of soya.

Absorbent	Wt. gain (kg/day)	DM intake (kg/day)
None	0.97	2.27
Straw	0.86	2.14
Molassed beet	1.10	2.62

Using straw as an absorbent decreased both the intake and weight gain of the calves, whereas molassed beet increased both.

Silo floors - M Kelly

When repairing silo floors the water/cement ratios are important if an impermeable layer is to be achieved, the ideal ratio being 0.4. The most common fault is to use too much water (e.g. a ratio of 0.7), but using too little water (e.g. a ratio of 0.2) is much less common. A good guide is the "boot" test, which consists of throwing a lump of mix on the floor and applying the boot to the surface. If the mix is correct the impression of the boot should be held by the concrete without cracking or spreading out to a "puddle".

New Portland cements set quickly and mixes must be used immediately and treated with a vibrator to expel air. Curing is done by spraying with water or covering with a polythene sheet. If left to dry in air, particularly in warm dry weather, hair cracks will be formed. Floors will crack and should crack at structure joints which should be spaced every 20 square metres. The cracks at the structure joints should be about 12 mm wide and are sealed with a bond breaker with the consistency of foam or rope and a sealant of polysulphide or other suitable material. The bond breaker is placed at the bottom of the structure joint cracks with the sealant on top, giving the sealant a dumbbell shape.

The main problem in repairing silo floors is the time factor. A curing time of about 2 months can be required to achieve the high standard necessary for a long lasting non-permeable surface.

Recent work has shown that 50 mm of asphalt on a bitmac base is suitable for the repair of silo floors and could even be considered as a floor itself if provided with a well compacted base. If cattle are self fed there appears to be no damage to the surface. The only problem has been the appearance of occasional soft spots, but these are easily repaired. The cost of this surface is about £8 per square metre and a great advantage is that no curing time is required.

D Reid & C M McCornbie

1988 GRASSLAND IDEAS COMPETITION

South West Scotland Grassland Society

Winner 1988: A Hogarth, Curragh, Girvan

Milking parlour molasses feed system

Sandy's winning Grassland Idea was stimulated by the difficulty he experienced getting his cows into the milking parlour when concentrate feeding was stopped in the spring. Various types of blocks and other ideas were tried unsuccessfully before adopting the present system. There was already a large tank on the farm in which molasses had been stored for winter use. From this tank troughs were filled manually in a successful trial of summer feeding of molasses in the parlour. In the system now used a 51 mm pipe runs down each side of the parlour with a small gate valve and an on/off tap at each trough. These pipes are supplied by an overhead 100 mm pipe fed from a 900 litre tank outside the parlour at eaves height. When milking starts the gate valves are set to the desired flow rate, which varies from a trickle of about 0.3 l/cow in summer to a greater quantity in the backend.

As well as bringing the cows into the parlour molasses feeding keeps them happy during milking and provides added energy intake in the autumn. The system needs no attention during milking, and is virtually maintenance free.

The Grassland Ideas tankard donated by Kemira Fertilizers (formerly UKF) was presented to Sandy for his winning idea at the Competition Night in Dumfries on 12 January 1989.

The only other submission for the 1988 Competition was a scheme for lengthening the beds in an existing cubicle house with the minimum trouble and expense. Further innovations and ideas are sought for the 1989 Competition.

NEW PRICE ROUNDUP

Simon Stell
Monsanto Agricultural Company

The cost of destroying grass, either prior to reseeding or before establishing an arable crop, has been drastically reduced this year following a 20% reduction in the price of Roundup and Sting.

Grassland destruction with Roundup is well established as an efficient way of eliminating perennial grasses and noxious weeds, thus allowing a reseed to establish competitively. The pre-silage/pre-grazing method, which has been in commercial use for 5 years, provides a further opportunity to destroy grass particularly where there is a time constraint to get the reseed established. For some weeds such as docks and couch, the most effective control is obtained by spraying 5-7 days before cutting the silage crop, as maximum leaf area is available at this time for uptake of the herbicide.

The 1989 price of Roundup makes grass destruction an even more viable proposition. An independent survey in Scotland in 1988 showed that more farmers would use Roundup at a lower price, which was below the economic threshold of affordability.

In the Acrehead project at Crichton Royal, Dumfries where a system based on grass with a high nitrogen input is being compared with a system based on grass-clover without nitrogen, it is particularly important to eliminate perennial grasses and weeds before reseeding the grass-clover swards. This is to eliminate the competition effect from couch grass. In addition, it can reduce the need for post-emergence weedkillers on the reseed, which might check clover establishment. In 1988 Roundup gave effective control of couch in a spring reseed of grass-clover. Another field sprayed with Roundup prior to the second silage cut in August 1987 is now well established.

For destroying grass fields with a small perennial weed content a new low cost product called Sting is now available. This is based on glyphosate, which is also the active ingredient of Roundup, but it is used in a different way. Only 50-75 mm of regrowth is required before spraying, and ploughing or cultivations can begin 24-48 hours later. Excellent kill of old swards has been achieved giving a clean start to the following crop.

CSGS SILAGE COMPETITION 1988-89

*A meeting of the CSGS at the Stuart Hotel,
East Kilbride on 12 January 1989*

Judge: Mr A Bankier, Fernieshaw Farm, Cleland, Motherwell

The Judge first commented on the excellent standard of the silages which had been made in 1988. This was reflected in the very close marking for analyses with only 2.5 marks separating the first eleven silages (see Table 1). Inspecting the silages had been a most enjoyable task, and it was good to see how different ideas had been used to overcome some of the problems which all silage makers encountered. Because of the small differences in analyses marks the inspection inevitably concentrated on the finer details of the silage in the pit and how it was being fed. It was unfortunate that more of the silages in the top twenty or so could not be visited, but there were practical limitations as to how long the on-farm judging could take.

The inspection was not an easy task and indeed a measure of the standard was that it was a case of looking for faults to deduct marks, especially among the top entries in the Open Class. There was still evidence of a little waste on the shoulders in some pits, and it was felt that those who did not use side sheets should consider doing so. In many cases silos had been filled above the height of the walls, and this always made elimination of shoulder waste very difficult. There had to be a limit to how far shoulder waste could be reduced by the extra expenditure incurred in raising wall heights.

In general the silages had been very well made and were of an even good colour with little evidence of mould and fungal development. It was interesting to note that several silages with relatively low dry matter contents (below 20%) had been made without using an additive. When silage-making conditions are good this begs the question as to whether additives are really justified. The essential ingredient in good silage making stressed by nearly every competitor was the speedy filling of the pit. This ensured a good fermentation and reduced losses in the silage-making process.

On the design of silage pits the judge remarked that some were long and narrow (6.1 - 7.6 m) while others were wide (12.2 - 15.2 m). It was always easier to make good silage in a narrow pit but the economics of building silos dictated that narrow pits were no longer

Table 1. 1988-89 Silage Competition - Analyses and Marks

Rank	Code	DM (g/kg)	CP (g/kg)	D Value	Ammonia N % Total N	Marks /35
1	CP10	185.0	152.9	69.4	68	26.00
2	CS14	294.9	125.5	66.7	30	25.98
3	CP26	192.0	139.9	72.7	62	25.90
4	CL 7*	244.3	149.8	71.1	77	25.79
5	CL 1	196.3	139.6	71.1	66	25.70
6	CP11	206.3	214.6	70.5	94	25.42
7	CL 5	200.0	136.4	69.1	68	24.62
8	CL21*	229.8	132.0	66.2	46	24.20
9	CL 4	231.7	122.2	66.1	41	24.11
10	CL20	172.5	158.5	74.0	84	23.65
11	CL24	197.7	116.2	68.7	64	23.50
12	CP 9	208.0	144.0	66.1	60	23.20
13	CL 3	230.7	119.6	64.7	37	22.98
14	CL17	181.6	176.0	67.7	84	22.68
15	CL 6	176.7	144.6	69.4	83	22.67
16	CL19	170.0	146.9	72.5	94	21.95
17	CL25*	172.2	163.4	71.0	107	21.58
18	CL13*	227.3	125.2	65.9	69	21.26
19	CL23*	208.5	153.0	64.7	71	21.18
20	CL15	177.5	133.5	66.6	67	20.95
21	CS 8	190.5	143.5	66.3	77	20.80
22	CL 2	187.0	145.6	68.1	106	19.63
23	CP12	225.0	121.9	64.0	95	16.60
24	CL18*	241.5	103.4	68.9	60	14.07
25	CL22*	234.3	110.0	60.6	92	12.90
26	CS16*	296.5	123.3	58.6	143	6.47

* Denotes entry in Beef/Sheep Class

cost effective. Care had to be taken not to make silos too wide from the point of view both of filling and of avoiding waste at the face when emptying. Deterioration could be rapid where the face was moved back too slowly. It was also easier to make silage to a height of 1.8 - 2.1 m for self feeding than to make it to a height of 4.6 m. The judge had, therefore, given the benefit of any doubt to those with wide and high silos as they had probably exhibited more skill in their silage making.

Mr Bankier commented briefly on individual entries before presenting the marks and awarding the prizes, which are shown in Table 2. The overall winner was Mr Jim Clark, Dunrod, Inverkip, who received the SAI Cup, and the runner up was Mr Robert Miller , Newlands Farm, Uddingston. Third prize was given to Messrs A Struthers, Millhill Farm, Lanark and fourth to Messrs J Kerr & Sons, Kirklands, Dunsyre. In the Beef and Sheep Class winner of the first prize and the Hamilton Reco Salver was Mr Tom Brown, Muirhouse, Libberton. Messrs G & M Hodge, Townhead, Libberton were second in this Class.

The prize for the best new entrant was awarded to Mr Robert Reid, Glen Farm, Falkirk and Mr R Hamilton, East Drumloch Farm, Hamilton received the prize for the most improved silage.

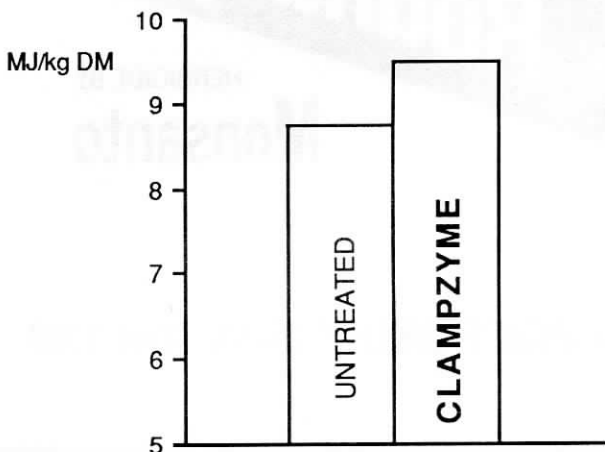
The judge concluded by thanking the Society for inviting him to undertake the judging, which he found extremely enjoyable. Above all he thanked the farmers who had taken part in the competition and those he had the pleasure of visiting.

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I R Fraser - Silage Quality 1979-88

A summary of the mean silage analyses for the last ten silage competitions is given in Table 3. Total entries in this competition showed a slight decrease on the previous year which had been the lowest until then. Dry-matter content and D value were similar to those recorded for 1987, but D value still failed to reach the peak achieved in 1984. In general, however, D value had shown a strong improvement over the period in which the competition had been run.

Table 3. Mean Silage Analyses for Silage Competition 1979-88

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
1988	26	21.1	14.1	65.1	6.9

Table 2. Short list for Judge's visit

		Analyses (35)	Marks Inspection (65)	Total (100)
Open Entries				
1st and SAI Cup	J Clark & Sons, Dunrod, Inverkip	26.00	63.0	89.00
2nd	W S Millar, Newlands Farm, Uddingston	25.70	60.5	86.20
3rd	A Struthers, Millhill Farm, Lanark	23.50	60.5	84.00
4th	J Kerr & Sons, Kirklands, Dunsyre	24.11	59.5	83.61
	W K Carrston, Netherton, Auchinheath	24.62	58.0	82.62
Best New Entrant	R Reid, Glen Farm, Falkirk	25.98	56.5	82.48
	J A Minto, Michhill Farm, Biggar	23.65	58.0	81.65
	A H Lyon, Drumachley, Rothesay	25.90	54.5	80.40
	J M Telfer, High Branchal, Bridge of Weir	23.20	51.0	74.20
Beef/Sheep Entries				
1st and Hamilton	T Brown, Muirhouse, Libberton	24.20	59.0	83.20
Reco Salver	G & M Hodge, Townhead, Libberton	25.79	57.0	82.79
2nd	J Kerr & Sons, Kirklands, Dunsyre	21.58	57.5	79.08

Dry-matter content, having been broadly similar for the last 3 years, tended to peak between 1981 and 1984 when longer wilting periods were more common. With the advent of direct cutting and minimal wilting, dry-matter content would probably continue about the same level in the future. The need for good effluent containment systems at these levels of dry matter was firmly emphasised and it was stressed that there would be continuing pressure to prevent pollution by silage effluent.

Crude protein content rose in 1988 after hitting an all-time low in 1987. However, the 1988 average was still the second lowest in the history of the competition, probably reflecting the unusual growth patterns of the last 2 years.

Ammonia nitrogen content continued to fall indicating better quality fermentation in silages. The large decrease between 1986 and 1987 was probably explained at least in part by a change in the analytical method. Since 1987 only ammonia was measured and not the other volatile nitrogen compounds previously included by the old method. Only the figures for the last 2 years are, therefore, strictly comparable, but the continuing downwards trend in ammonia nitrogen content pointed to better silage making techniques.

I R Fraser

SCARLET OAK - SWSGS TREE AT AUCHINCUIVE

On behalf of the members of the South-West Society the Executive Committee have recently donated a Scarlet Oak tree (*Quercus coccinea*) to the Arboretum at Auchincruive.

A relative of our native oak, the species comes from eastern North America. It is one of the finest trees for autumn colour, the leaves turning to a brilliant glowing scarlet branch by branch. Many of these stay on the tree until Christmas. The tree is medium large when fully grown, but has an open crown and long slender branches, thus allowing grass to grow underneath.

It will be ceremonially planted by the Chairman later in the year. Society members and their families wishing to view this tree or the other trees in the Arboretum would be welcome to do so at any time.

SCHERING AGRICULTURE GREEN SCIENCE GRASSLAND CHALLENGE 1989

The winner of the Schering Grassland Challenge in the South-West Society this year was Executive Committee member Tom Lochhead of Beyond the Burn, Mouswald, Dumfries. The Society congratulate Tom on his success.

The main prize for each winner in the competition is a place on the British Grassland Society's Summer Tour of Dyfed, the largest county in Wales. Schering cover the fees for the tour plus full board and accommodation. In addition, each winner receives £55 worth of Schering agricultural products. Tom will be travelling to the BGS meeting with another grassland winner from south-west Scotland - George Fitzsimon, Tregallon, Lochfoot, Dumfries. George was winner in the Scottish region of the BGS/MLC Grass-to-Meat Award for 1989. The programme for this meeting is excellent, and Tom should have an enjoyable and interesting time.

ISLE OF MAN HIGHLIGHTS

J Harris
Secretary of the Manx Grassland Society

Adapted from the Manx Grassland Newsletter No.11, 1989

Manx Grassland Society Tour of Kirkcudbrightshire - 1988

During this short tour of Kirkcudbrightshire six farms were visited beginning with Alan Campbell's 174 ha farm, Slagnaw, Castle Douglas. The main enterprise here was a 150-cow dairy unit, together with 150 beef cattle and followers, 140 crossbred sheep and 20 ha of barley. The Ayrshire cows averaged 6000 l of milk with only 1.2 t of concentrate per cow, and were trough fed high quality silage.

The group next visited Alex Irving at Largs, Twynholm. This all-grass farm of 100 ha carried 140 mainly Friesians averaging 6900 l of milk with about 1 t of concentrate fed per cow. One of the remarkable features here was Alex's innovative skills. Among other things he designed a machine to drain water out of the tyres covering a silo.

On the Carson brothers' farm Conchieton, Twynholm the group saw a mixed dairy/beef unit on 72 ha with 58 dairy cows, 25 followers and 130 beef cattle. The Carsons were winners of the BGS National Silage Competition in 1985. The average milk yield in the dairy herd was 6334 l with about 760 kg of concentrate per cow. About 200 kg of nitrogen per ha were used on the dairy cow grazing area. The beef unit used maximum silage and minimum barley to finish after summer grazing. Grass was tidied up by 400 sheep in the winter months.

A complete contrast was Coupon, Newton Stewart managed by Jan Vos. This had an ultra-modern umbrella-type dairy unit built on a reclaimed salt marsh. The farm was one of a world-wide chain owned by Holstein enthusiast Wynand Pon, who aimed to build up an elite herd producing maximum milk, and eventually re-export stock to the United States and Canada. On the 109 ha farm there were 119 cows averaging 8602 l with a margin over concentrates of £1000. A basal ration of beet pulp, dark grains, Viton, fish meal, molasses and fat was fed for maintenance plus 26 l. The opinion of the group was that this would have been a really magnificent unit with more and better silage producing a similar yield from considerably less concentrates.

The next visit was to Alan Marshall, West Kirkland, Wigtown to see how good dried grass can be. On this 81 ha all-grass farm there were 135 cows, mainly Friesians and mainly autumn calving. The herd average was 6150 l with 1.7 t of concentrate per cow and a margin over concentrates of 923 kg per cow. Dried grass was cut from 65 ha from 26 April - in 1988 little grass could be cut after July, but three cuts were taken before this. 49 ha were in 0.8 ha paddocks, which were alternately cut and grazed, the cows getting priority for early grass. Drying was by mobile drying chambers loaded and taken to the drier, which used about 22.4-44.8 l of diesel per t of dried grass.

Finally the Manx Society visited Culvinnan, Castle Douglas the farm of Michael Milligan, who was the winner of the BGS National Silage Competition in 1988. This farm of 255 ha, including 81 ha of cereals, had a dairy herd of 90 cows averaging 6026 l with 560 kg concentrates per cow. There was also a beef unit from which 24 heifers and 192 bullocks were sold last year. Quality silage is the rule - since 1973 silage was over 70D in 9 years, culminating in 76.6 D silage with which Michael won the BGS National Silage Competition. His single minded approach to grass and silage was a real eye opener.

"Sweet-n-Dry" absorbent additive - Alan Sayle (Dugdale Ltd.)

Grass is normally harvested at 16-18% dry matter, and up to 50% of the sugar content can be lost in the resultant effluent from the silo. This loss can be reduced by the use of an absorbent additive, but the value of these varies. For example, rolled barley has an absorbency of 1:1, dried beet pulp 1.6:1, treated straw 2:1 and "Sweet-n-Dry" 3.5:1. "Sweet-n-Dry" also has a high feeding value, having an ME of 13 and a DCP of 9%, and is easy to apply evenly. The recommended application rates of "Sweet-n-Dry" per t of wet grass are 15, 30 and 45 kg at grass dry matter contents of 24%, 20% and 16% respectively.

In a trial at Greenmount in Northern Ireland the effluent production was measured from three 50 t silos. The silo receiving no additive produced 3200 l, that with an acid additive 4000 l and that with "Sweet-n-Dry" only 400 l with none in the first 4 days. It was claimed that silage intake was increased because the cows could smell the "Sweet-n-Dry" pellets and kept going for them. However, this product is expensive - about £180 per t - and careful consideration would be necessary before using it.

Farm Walk on Ballachrink, East Baldwin, IOM

Ballachrink is farmed by Graham Crowe who was the winner of the W.L.E. Christian Grassland Management Trophy in 1988. It extends to 199 ha, including 40 ha of rough grazing and 20 ha of permanent pasture.

The sheep flock consists of 370 Greyface ewes with a lambing percentage of 190, and 400 Scotch x Swaledale ewes with a lambing percentage of 166. 150 shearlings are kept for replacements. In addition to finished lamb production 200 Mule ewe lambs are sold annually, together with 300 store lambs if the market is right. All the Greyface ewes have been housed in the winter since 1971. Lambing of these ewes commences on 23 March, and when complete ewes and lambs are turned straight out. The house is then used to lamb the other ewes and shearlings. Feed purchases for the sheep per winter amount to 41 kg for the Greyface ewes and 16 kg for the cross ewes.

All cattle are home reared from purchased Black and White calves, and sold at 24-27 months when about 660 kg. They are wintered on big-bale silage in a slatted floor house and get about 20 t of cake annually.

Only one field on the farm has been reseeded in the last 5 years. The others were reseeded to S.24/S.23 mixtures in the 1970-80 period. Of the 142 ha of fertilized grassland 28 ha are cut for hay or big bale silage giving about 500 t of silage and 45 t of hay. About 6 ha are cut a second time.

D Reid

WINTER FARM VISITS TO KIRKCUDBRIGHT

*Visits of the SWSGS to Conchieton and Largs Farms,
Twynholm on 9 February 1989*

The two farms visited on this interesting and well attended winter meeting in Kirkcudbright were first and second respectively in the 1988 SWSGS Silage Competition. The Society wishes to thank both the Carson and Irving families for the arrangements and success of this event.

Conchieton, Twynholm (John and Finlay Carson)

This 72 ha mainly grass farm with a further 20 ha rented, is on typical undulating Stewartry land with scattered rocky knowes. Some of the knowes have been bulldozed in the past and part of the lower wetter area has been drained. 4 ha of this low lying land is cut for hay every year. 5 ha of barley were grown in 1988, but this will not be continued because the establishment of the undersown grass was unsatisfactory after the combine. The dairy herd, which is mainly Friesian, was reduced from 66 cows in 1987 to 52 at present to meet the quota. There is also a beef unit with about 130 animals finished at 20-24 months. A flock of 400 sheep were wintered on the farm, but had been taken off in mid January.

Vacuum silage was first tried at Conchieton, but was not successful and the pit method has been used since. Silage composition has improved every year. The best quality grass is ensiled in the self-fed clamps. Super-Sile at 2.25 l/tonne was used last year and caused less machinery damage than the acid additives used previously. The inoculant is more expensive and will not be used on wetter or soil-contaminated herbage. Capital investment in machinery is kept to a minimum.

Big-bale silage is also made though this is a lot more work. Grazing is usually by set stocking. Silage fields are grazed whenever possible to provide "clean" herbage for the cows. Strip grazing is only adopted when there is too much grass. Slurry spreading had been delayed this winter, and would be discontinued when the grass became too long because it could affect the enzymes in the silage. Water is added to the slurry from the slatted house when there is a high quantity of ammonia escaping.

The milk production from silage is estimated at 4744 l. Problems of

settling the cows prevent reducing the concentrates further though a molasses trickle could be used instead. It was not considered economic to install effluent-feeding facilities.

The silage clamps are covered with two or three sheets, the last one being a new sheet. The final cover is weighted down by dung at 1 m intervals. Frequent checks are necessary for damage by cats, birds and samplers!

Largs, Twynholm (Alex and Isobel Irving)

This is a 100 ha all-grass farm with a dairy herd of 140 cows - mainly Friesians. Largs has been farmed by the Irving family since 1940, first by Alex's parents, then in partnership with his brother and on his own since 1982. Quota has been purchased twice and now stands at 1 million litres.

Silage is cut with a 2.74 m PZ mower-conditioner, which leaves an even swathe for easier lifting with the chopper. On-farm equipment is preferred to achieve cutting at the right time. 57 ha are mown at the first cut, 40 ha at the second and 8 ha at the third. The tops of the silage trailers have been extended to prevent loss of herbage in the field. Wide trailer axles are also fitted to ensure stability on the rolling ground at Largs.

Alex prefers to use an acid additive and has not experienced health nor handling problems with this type, which works under all conditions whereas inoculants cannot be relied on when most needed. As at Conchieton the clamps are covered with two or three top sheets, here weighted down with tyres. A heavy grade side sheet is also used with a further thin sheet half way down. Silage effluent is saved and fed to the heifers.

When sowing grass the fields are ploughed if possible though some are too stony to allow this. Whichever method is used the target is a firm seedbed. A Castlehill IV seeds mixture was formerly used but the spread of heading dates necessitated cutting out some varieties. Marathon clover blend was included, also meadow fescue to fill in the bottom.

During the summer the cows are set stocked, with grazing and cutting integrated. In winter the cows are housed in cubicles and easy fed silage with a tractor and forage box. Straw is also fed to slow the

SILAGE MAKING METHODS

*A meeting of the CSGS in the King Robert Hotel,
Bannockburn on 22 February, 198*

The panel at this discussion on silage making methods consisted of Mr D B Hamilton of Larkhall, Mr J Owen of Easterton, Kirkintilloch and Mr G B Hill of Blairhill Management, St John's Kirk.

Contractor - D B Hamilton

The first speaker, David Hamilton, had been making silage under contract from the days of the binder through to the era of the self-propelled forage harvester. He ran a fast, efficient service, doing all or part of the job. Most of his clients do their own cutting. Two rowing-up machines were used to give any size of row, and the harvesters gave chop lengths varying from 25 to 40 mm.

David claimed that bringing in a contractor was cheaper than the farmer having his own equipment. In addition, less powerful tractors and fewer trailers were required on the farm. As a result, repair bills were smaller. Other advantages were that less labour was required on the farm, and the job could be done in a shorter time. However, one big disadvantage was that the farmer could not always get the contractor when he wanted him.

Do it yourself - J Owen

John Owen described his method of making silage with his own resources. His farm was 174 ha, and he mowed 65 ha at the first silage cut, 53 ha at the second and 40 ha at the third. The mower used was a 5.5 m Tarrup fitted with an auto swather which put two rows into one. Three 10 t trailers were employed. Silage making was started after morning work, i.e. 9 am, and the herbage was not wilted. The silo was rolled for 1-2 hours using three or four tractors.

Cooperative - G B Hill

According to Blair Hill, the first silage-making cooperative began work in 1978, and the Tinto forage group was formed in 1980. The groups worked on the principle of getting the herbage in quickly and covering the silo quickly. Machinery costs and replacements within a cooperative qualified for 25% grants. There were 30 forage groups

in 1985 increasing to 60 in 1988.

In a group, a dairy farm had first call on silage making. When all three farms in the group had similar enterprises, first call was rotated annually. A group required a leader to organise the servicing and record keeping. To reclaim VAT a company had to be formed, which resulted in a great deal of paperwork.

The vote of thanks to the speakers was proposed by Mr George Hamilton.

D Reid & C M McCombie

DR FRAME - BGS PRESIDENT

Dr John Frame, a founder member and Secretary of the South-West Society from 1975 to 1979, has been elected President of the British Grassland Society for 1989-90. He takes up office at the Annual General Meeting in July during the Society's Summer Meeting in Dyfed, Wales.

John joined the staff of the West of Scotland College in 1958 as an assistant to the late Mr I V Hunt in the Grassland Husbandry Department. He is now Head of the Crop Production Department and present Chairman of the Agricultural Division. In 1987 John was presented with the BGS Award for his outstanding contribution to grassland science. We congratulate him on this new honour, and wish him all success in his year of office.



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NEW ALTERNATIVES IN GRASSLAND

*A meeting of the SWSGS at the Halfway House Hotel,
Symington on 16 February 1989*

At this meeting, which was presided over by the Chairman John Watson, the speakers were D J Roberts from the Crichton Royal Farm, Dumfries and A G Boyd and G E D Tiley from the Crop Production Department at Auchincruive.

White clover systems at Crichton Royal Farm - D J Roberts

David Roberts, Senior Animal Production Specialist at Crichton Royal, opened the meeting with a progress report on the project which began at Acrehead in April 1988. This project was described at a College Subject Day in May 1988 (see *Greensward* No.31). The aim is to compare the profitability of two systems, one based on grass swards with a high nitrogen input, the other on grass/clover swards without nitrogen. The two units are otherwise as alike as possible and are managed to optimize production from the two systems.

The interest in white clover based systems was stimulated by the idea that in the future nitrogen fertilizer inputs may be reduced and that grass/white clover mixtures can be integrated into profitable dairy farming systems. There have been a number of experiments which have shown that cattle eat more grass/clover silage than grass silage of similar quality. This improved intake has led to better growth rates, higher milk yields and improved milk quality.

In a field-scale study at Crichton Royal the silage yield from a grass/clover sward, which received no nitrogen, was about 70% of that from a grass sward given high levels of nitrogen. Encouraged by this it was decided to change one of the Acrehead units into a clover-based system. Clover seed was slot-seeded into about half of the grassland area in July 1987, the remainder was reseeded with grass/clover mixture in the following autumn and spring. These establishment techniques proved to be very successful and clover accounted for about 40% of the herbage dry matter by mid summer of 1988.

The profitability of the clover unit is being compared to a high nitrogen unit. In February 1989 both herds had the same cow numbers, number of youngstock, land area and milk quota. The shortfall in silage yield

from the grass/clover unit is met by buying in extra straw and concentrate. Apart from the smaller yields other problems were encountered with silage on the grass/clover unit in 1988. For example, difficulty was experienced in collecting the short herbage after cutting. In addition, more additive was required than on the high-nitrogen unit, and there was a greater quantity of effluent. Another interesting observation was that the high intakes noted when feeding grass/clover silage were not recorded when grazing grass/clover swards.

The results from this study will be used to produce farm profitability models which will then be tested on a farm scale at Acrehead. It is likely that the land area will be increased on the clover unit to reduce reliance on purchased feed. The profitability of the two systems will depend on the relative cost of nitrogen fertilizer and concentrate feeds.

Improvements in new grass and clover varieties - A G Boyd

Graham Boyd discussed the prospects for further improvements in herbage varieties using the results obtained in the National List Trials and in earlier variety trials at Auchincruive. Trials on perennial ryegrass in the 1950's included such varieties as Ayrshire, Irish, Kent, New Zealand and Aberystwyth S23. By the 1970's these had been replaced by many named varieties, often of Dutch or Danish origin, with a potential yield increase of 5-10% and considerably improved quality and persistence. The first move to improve the testing and control of crop varieties came in 1964 with the Plant Varieties and Seeds Act. This introduced the payment of royalties on new varieties, and also allowed for the testing of more varieties by better methods.

Following the entry of the UK into the EEC, the National List Scheme was introduced in 1974. In this scheme there are two separate types of test. First, a new variety is subjected to a botanical test to determine whether it is a distinct variety, and to measure its uniformity and stability. Second, it is field tested to assess its value for cultivation and use. Here the factors measured are annual dry-matter yield, seasonal distribution of yield, ground cover, winter hardiness, disease susceptibility and quality (D value) for conservation. The field tests are all under a cutting management without animals, so neither intake nor acceptability data are available.

When the National List Trials began at the College, varieties from ten species were tested, but now only perennial ryegrass, Italian ryegrass and white clover varieties are involved. Since 1974 over 20,000 plots

have been used to test about 680 varieties, and of these only about one in seven remain on the National List. The perennial ryegrass varieties are tested under two managements, namely simulated grazing (8 cuts/annum) and conservation (4 cuts/annum). Varieties of Italian ryegrass are tested under only one system in which cuts are taken to simulate an early bite, two silage cuts and monthly simulated grazings thereafter.

Tables summarizing some of the results from the National List Trials on perennial and Italian ryegrass were shown to demonstrate where improvements had been made and further improvements might be achieved.

Alternative grasses and new crops - G E D Tiley

Gordon Tiley spoke about the possibility of using entirely new species of grasses and other crops. These are introduced from time to time and have formed the subject of R & D studies both north and south of the border. The results from some of the Scottish studies are summarized below.

Prairie grass (*Bromus willdenowii*) The variety Grasslands Matua is the principal one tried in Britain. It was bred in New Zealand from plants found in Australia. The grass has a tall, erect habit with broad, pale leaves and a low tiller density. The flower heads are produced throughout the year and the seeds are long and large.

It performs best on fertile soils and under a lax rotational management, and shows spring and autumn peaks of growth and some winter production. Feed value is similar to perennial ryegrass. In trials at Auchincruive Matua averaged 12-15 t/ha over 3 years - 10% above the perennial ryegrass variety Talbot in a six-cut management, and better still when cut four times. However, digestibility was lower with an average ME of 10.5. At Edinburgh Matua suffered winter damage. This grass could complement perennial ryegrass on lighter soils in mild areas if given infrequent cutting.

Reed canary grass (*Phalaris arundinacea*) When this grass was tested at Auchincruive it gave lower dry-matter yields than perennial ryegrass but had higher nitrogen and mineral contents. It showed no seasonal yield advantages.

Phalaris (*Phalaris tuberosa*) This grass has drought-resistance potential but only persisted for 1 year in the west of Scotland.

Brome (*Sweet Brome*) Brome was developed as an alternative to cocksfoot for soils liable to drought. Seeds are large and a high sowing rate is required. The variety Deborah was found to be unsuited to the wet west though it did slightly better at Edinburgh.

Grazing rye (*Secale cereale*) Rye can grow at a lower temperature than most other grasses and thus is one of the first to begin growth in the early spring. It requires cultural conditions like those for grain cereals and should be sown in good arable soils in early September. A light grazing may be taken in November and further grazings in early spring. Yields can be erratic and grazing rye is more suited to arable farms than the average grassland farm.

Forage maize Plant breeding advances over the last 30 years and the development of hybrid varieties have resulted in a northern advance of the subtropical crop maize through Europe into Britain. However, even the most recent hybrids are only reliable in the south of England and then only in warm seasons. About 20,000 ha are grown for silage giving a dry-matter yield of over 12 t/ha in October. Where maize can be grown it has the advantage of being easily made into a high energy silage and it can be grown on land used for the disposal of slurry. Growth and yield are extremely sensitive to temperature and none of the present varieties are reliable under Scottish conditions. Small plots of maize varieties have been monitored annually at Auchincruive and one Wigtown farmer grows a small area every year for zero grazing.

Other new specialized crops which have been tried include a Sorghum hybrid called Topgrass, sunflowers, lupins and Russian comfrey, but none of these are suitable for Scottish conditions. Gordon concluded that grassland farmers should have an eye on the introduction of possible new crops perhaps for special purposes. However, well tried grasses and clovers would form the mainstay of forage production in the foreseeable future.

D. Reid

THE AUCHINCUIVE ARBORETUM

G E D Tiley

Secretary of the South West Scotland Grassland Society

A new Arboretum has recently been established alongside the Ayr-Mauchline road (A758) and near the Nellie's Gate entrance to the College. It has been planned and designed for teaching, advisory, leisure and amenity use and when completed will occupy 13 ha.

The layout consists of rows of trees radiating from two central points and will eventually provide a half-mile avenue towards the 18th century Oswald Teahouse. This notable feature of the Auchincruive skyline is at present being restored by the Friends of Auchincruive. Tree planting began in 1985 and is scheduled for completion in the early 1990's. Trees have been grouped according to appearance and use. Thus, there are rows or groups of hardwoods, conifers, trees with autumn colours, trees for birds or bees, species for wet areas, North American trees, etc.

Planting and care of the Arboretum is coordinated by Ian Dougall of the Horticultural Department. A steering committee chaired by Geoff Dixon, Professor of Horticulture, and including representatives from outside interests, e.g. Forestry Commission, Countryside Commission and Parks Departments, provides guidance.

A major objective has been to stimulate interest and participation by schools, local organizations and individuals, who are encouraged to sponsor and plant trees. A donation of £25 covers the cost of a tree and all planting and maintenance. It is ideal for individuals who wish to feel part of this unique and long term development or who wish to commemorate a family anniversary, etc.

A long-standing member of SWSGS, Bob Paterson, recently dedicated a whole grove of trees (Paterson Copse) for family and College friends. Other members have also given trees and the Society has just dedicated a Scarlet oak. All Society members plus their families would be cordially welcome to visit this tree and the whole Arboretum at any time to watch its growth.

POLLUTION FROM FARM EFFLUENT

Two meetings on farm effluent were held in south-west Scotland in early 1989. Both were well attended indicating the degree of concern felt by farmers over this problem.

The first meeting, sponsored by BOCM Silcock, was at the Hannah Research Institute and was organised by Dr Mike Wilkinson of Chalcombe Agricultural Resources. Advice on avoidance of water pollution was given by Mr R Kerr of the Clyde River Purification Board, who stressed the potency of silage effluent to cause damage to natural river life. The River Boards had a statutory duty to prevent this.

A strategy for combating the effluent problem through a proper design, construction or repair of the clamp silo was advocated by Dr Mike Kelly, Farm Buildings Department, West of Scotland College. It was essential to match specifications in design to individual requirements and expected effluent production. The use of asphalt was proving successful in preventing the corrosion of silo floors by effluent.

Mr Alan Harker from BOCM referred to the advantages of using absorbents to reduce effluent flow and improve the feed value of the silage. He quoted results from laboratory and farm-scale trials, and showed that advantages were possible with both dairy and beef cattle. The second meeting held under the auspices of the Scottish Agricultural Colleges and the Dumfries and Stewartry FFWAG was held in the Embassy Hotel, Dumfries. Mr S Coy of the Solway River Purification Board discussed the different sources of farm pollution - silage effluent, slurry and fertilizers. Milk was also a strong pollutant of water as were residues from fish farming.

The requirements and problems of water, slurry and effluent storage and disposal were the topics covered by Mr Adrian Jones, Engineering Department, West of Scotland College. He referred to nutrient values, tracking of wet soil and atmospheric pollution during slurry spreading. The new Farm and Conservation Grant Scheme provided up to 50% grants for improved effluent handling facilities. With new EEC restrictions on water quality and pollution under discussion, it seemed likely that silage effluent, slurry disposal and nitrate levels would continue to pose problems for farmers.

G E D Tiley

A SPRING VISIT TO WEST CUMBRIA

SWSGS Tour, 2-3 May 1989

A party of fourteen members of the SWSGS enjoyed a brief but extremely interesting tour of five top grassland farms in west Cumbria in May 1989. This visit was made at the invitation of the Cumbria Grassland Society and was arranged by Mr Reg Scott, Secretary of that Society. Thanks are expressed to Reg, to his Committee and to all the host farmers for the particular efforts made to welcome and entertain SWSGS members. A very high level of hospitality was extended to the visiting party and most grateful thanks are expressed for the traditionally excellent Cumbrian refreshments.

Mr W Rawling, The Hollins, Ennerdale

The first visit was to this traditional west Cumbrian hill farm in a high rainfall area. The Hollins has been farmed by the Rawling family since 1568 and consists of 202 ha of inbye land on heavy clay with 178 ha of fell owned, together with grazing rights on a further 405 ha - all poor and heather dominated. Rainfall is 3048 mm. Farming seemed to be particularly difficult on this land where opportunities for improvement are very limited.

Reseeds are 10-15 years old but have suffered damage in recent wet years. Lying mostly within the National Park, grant is not now available for improvement. Buildings also have to be rebuilt in traditional materials.

A flock of 2000 Herdwick and Swale ewes is largely bred pure but some ewes are crossed to Texel, etc. for store lambs. The Herdwick ewes are not tuppied until their 3rd year and are then bred for up to 10 years. The 70 Angus x Friesian cows in the suckler herd are crossed with Blonde d'Aquitaine and Charolais bulls.

Rushes are a problem on inbye land and require regular cutting. Blocks are fed by helicopter on the hill in winter. Ticks and radioactivity from Chernobyl are other problems. On peat land the radioactivity is not locked up and a 30-year half life is in prospect.

Mr E Bushby, Watson Hill, Whangs and Low Walton, Egremont

Totalling 196 ha these three units are situated at 107 m near the west

Cumbrian coast. Rainfall is 1016 mm and well distributed. Medium and free draining soil allows good grass production and early and late grazing. The dairy herd consists of 150 Holstein cows at Watson Hill and 110 at Whangs. Low Walton is used for herd replacements. The herd average milk yield is 7566 l per cow, and Holstein stock are bred for export. Hogs are grazed in winter.

Short and long term leys are combined to produce an extended grazing season and high quality silage production. Swards are alternately grazed and cut throughout the season to maintain herbage quality. High nitrogen levels are applied together with phosphate and potash plus calcined magnesite in spring and autumn. Sod pulling which was a problem in the past has been greatly improved by applications of potash. Where slurry is applied the crusts are turbo-tilled before ploughing to avoid pan formation.

The Bushby family won last year's Cumbrian Silage Championship and also this year's National Safe Silage Competition.

Mr F Chester, Bouch House, Cockermouth

This 97 ha intensive dairy unit was built up over the years from scattered pieces of land. A producer-processor milk and cream bottling plant is operated which requires a minimum input of 2000 l per day. 135 Friesian/Holstein cows are kept with 120 in milk. All heifers are reared and the bull calves are sold at 7-10 days. It is hoped to raise production from 5850 to 6000 l per cow with a concentrate input of only 1 tonne per cow.

Soils are very heavy and easily poached, consisting of clay over a blue clay subsoil. The rainfall is 1400 mm. Drainage is necessary and docks are a problem. Considerable reseeding is planned because of poaching damage during recent wet years. Gold circle grass seeds mixtures are used.

Mr M Richardson, Greenlands, Cockermouth

Greenlands is a western hill/upland farm tenanted from Lord Egremont, and made up of 182 ha of hill and 61 ha of inbye land. 101 ha of the hill is gorse infested and the remaining 81 ha is on heavy soil. About 50 ha of silage is made in one cut by contractor, and about 16 ha of hay is made although conditions are suitable for haymaking in only about 1 year in 10.

Aftermaths are required to promote lamb growth. Sucklers have been built up to 120 cows for store calf production. 900 Swaledale ewes are crossed to Blue-faced Leicester, and 250 Mules to Texel.

A feature of the farm is a very large (104 m by 18 m) wooden-slatted sheep shed which was built 6 years ago at a cost of £15,000 provided by the landlord. The shed is fitted with plastic drain pipes giving a continuous flow of water from a lade, and Netlon netting to prevent snow blow.

The hill land was improved by spraying the bracken and cutting the gorse, but National Park restrictions prevent this nowadays. The SWSGS party were treated to a memorable trip up, over and down the whole hill in Mr Richardson's pickup, going along some steeply inclining tracks in places.

Mr A Johnstone, Westray House Farm, Sunderland, Cockermouth

The last farm visited was a typical family farm that has been built up over the years from a tenancy, now owned, with a nearly marginal farm recently purchased, giving a total area of about 120 ha with some quota leased at 4.2 p. Performance is running at 5400 l of milk with 0.57 t of concentrate and as much silage as possible. Stock consists of 118 Friesian cows and 600 Fell hogs over wintered.

Soils are heavy clay and rainfall 1524 mm. The swards on this all-grass farm are good but easily poached so the stock have to be housed early. 73 ha are cut for first-cut silage and Siloform additive is used. All the slurry is normally applied in January and February but the wet weather prevented this in 1989. The party was shown arrangements to collect water and slurry in a pit for pumping to a storage tank.

There is a regular reseeding programme, with late perennial ryegrass varieties favoured for persistence. Clover is abundant despite high nitrogen usage. One field visited had a dock problem.

Fields on the newly purchased farm have been successfully reseeded with phosphate and slurry applications. An old previously unploughed field did not perform well until the furrow was reploughed to replace the old top soil.

The farmers from south-west Scotland were able to give plenty of

house. Mr Johnston's sons revealed talents in restoring old tractors and modifying machinery as well as being keen competition ploughmen.

Grassland farming in Cumbria

Mr Reg Scott, Secretary of the Cumbria Grassland Society and Vice-Principal at Newton Rigg, gave a short talk on Cumbrian farming at the Crossbarrow Motel, Little Clifton.

Cumbria is the second largest county and the second most rural in England, and one of the most varied. Some of the land is very good, much moderate and some sand and rock. Population is 0.5 million, area 680,000 ha (580,000 ha farmed) with 100,000 ha of common grazing - more than any other county. Forestry covers 37,000 ha and woodland, in which there is an increasing interest, 30,000 ha.

Newton Rigg has a hill farm over Skiddaw with one of the biggest common grazing areas - 10 miles square with no fences. Cumbria has over a million breeding ewes, though nature conservation is creating a pressure against sheep. The climate in Cumbria is cool and wet with a fairly short growing season of 230 days. Rainfall varies from 750 mm at Carlisle, 3048 mm on the fells to 7112 mm on the peaks, and increases by 25 mm for every mile from west to east.

There are 6,500 farm holdings, many part time, with an increase in the 4-8 ha holdings. Tourists are also increasing, some farmers having 10,000 through their backyard on a holiday weekend. One third of the land is grade 3, much being grades 4 and 5. The Eden Valley/Carlisle area and coast are very good but not grade 1. Cereals (spring barley) are grown. Oilseed rape has been tried but little grown now. Fodder beet has also been tried. Farmers would like to grow maize and lucerne. Dairy farms average 100 cows producing 5500 l, and a few produce 8000 l. Dairy farm rents are £150 per ha and fell farms £15-25 per ha. Cumbria is to the fore in importing Limousin.

Within the National Park farmers are subject to much more stringent regulations, especially planning. Common grazing confers a right to graze a given number of sheep. If regulations reduce this number other sheep will come into these 'stints'. The Lake District Planning Board wishes to retain the essential character of the area and thus wants to retain sheep farming. If restrictions on fertilizer use are introduced greater use of clover might ensue.

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