

Teagasc National Hill Sheep Conference 2023

Wednesday 15th February 2023
Westlodge Hotel, Bantry, Co. Cork

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Teagasc Hill Sheep Conference 2023

Programme

Wednesday 15th February 2023

Venue: Westlodge Hotel, Bantry, Co. Cork

Chairperson: Dr. Grainne Hurley, Regional Manager West Cork Advisory Region

19:00 **Conference Opening**

Prof. Frank O'Mara, Director, Teagasc

19.10 **Flock health and production planning – improving returns in hill sheep**

Jason Barley

Agri-Food and Biosciences Institute Veterinary Sciences Division, Belfast, Co. Antrim

19.40 **ACRES Kerry / West Cork co-operation project – an overview**

Patricia Deane

ACRES Kerry / West Cork co-operation project, South Kerry Development Partnership, The Old Barracks, Beaufort, Killarney, Co. Kerry

20.10 **An overview of the practical implications of conversion to organic production on hill sheep farms**

Damian Costello & Elaine Leavy

Teagasc Mellows Centre, Athenry, Co. Galway & Mullingar Advisory Office, Mullingar, Co Westmeath

20.40 **What will the genotyped ram task in the Sheep Improvement Scheme accomplish for the hill sector?**

Kevin McDermott

Sheep Ireland, Ballincollig, Co. Cork

21.10 **Close conference**

Michael Gottstein

Teagasc Sheep Specialist, Macroom, Co. Cork.

21.20 *Light refreshments served*



Foreword

The latest published sheep census statistics (Dec 2021) show that there were 36,163 sheep flocks in Ireland, an increase of 1.6% from 2020. The number of breeding ewes increased by 2.1% on 2020 figures to 2.7 million ewes. Sheep farming is a significant part of our agricultural industry with more than 1 in every 4 farms in Ireland involved in sheep production.

The Irish hill sheep sector plays an important role in the economic health of rural economies and the maintenance of the natural landscape in many of Ireland's most scenic areas. Low output and often depressed markets for male store hill lambs has resulted in low margins for this sector. Teagasc is committed to supporting sheep farmers throughout Ireland. My colleagues in Knowledge Transfer, Education and Research work closely with farmers and stakeholders to assist hill sheep farmers to improve technical efficiency, margins and meet the requirements of the various support schemes.

This year, the Teagasc Hill Sheep Conference focusses on aspects of animal health, an important local ACRES co-operation project, organics and genetic improvement within our hill flocks.

Flock health is the key to productivity on our sheep farms and tonight Jason Barley, from the Agri-Food and Biosciences Institute (AFBI) Veterinary Sciences Division will discuss aspects of flock health and production planning to improve returns in hill sheep farming.

The ACRES Kerry / West Cork co-operation project is one of eight cooperation projects across Ireland which are working with farmers in areas of high nature conservation value as part of the Common Agricultural Policy's national agri-environmental climate measure. Patricia Deane, project manager, will outline the objectives of the project and the role it can play in supporting hill farmers in this region.

The Food Vision 2030 policy has set a target of increasing our land area farmed organically to 7.5% by the year 2030, and the 2023 Climate Action Plan has an even higher target of over 9% by 2030. For some of you a change to organic sheep production may be an option. Colleagues Damian Costello, sheep specialist and Elaine Leavy, organic specialist will present an overview of the practical implications of conversion to organic production on hill sheep farms.

Finally, our last speaker, Kevin McDermott from Sheep Ireland, will outline the progress that can be made from focussing on genetic improvement within our hill flocks and will explore what the genotyped ram task in the Sheep Improvement Scheme will accomplish for the Hill sheep sector.

Over the years a significant amount of new information is presented at the Teagasc Hill Sheep Conference and this year is no different. Continuous generation of new information and reminding yourselves of best practices is critically important, and the incorporation and application of this information into on-farm production systems must be the on-going aim of sheep farmers. This booklet collates and summarises a significant body of knowledge on technical issues in sheep production and should prove an invaluable reference to sheep producers.

Lastly, I would like to thank you for joining us for the National Hill Sheep Conference, and to all of the speakers, and staff who assisted with the organisation of this year's conference.



Director, Teagasc.



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Flock health and production planning – improving returns in hill sheep

Jason Barley

AFBI Veterinary Science Division, Stoney Road, Belfast BT4 3SD

Take home messages

- Flock health plans are important in all sheep farming systems
- Plans should measure both health and production benefits
- Flock health plans are ongoing and open-ended
- Recent work in Northern Ireland has demonstrated the benefits of health plans

Introduction

The concept of flock health planning is not new, however, the idea has had a variable history and opinion on how best to achieve widespread uptake remains divided. Currently, interest is centred on the Great Britain Animal Health and Welfare Pathway and successful pilot schemes in England and Wales, which have seen the uptake of flock health and production planning through local veterinary practices. A similar project with more limited scope is the Northern Ireland Sheep Scab Project which is currently in progress. Recent Department of Agriculture, Environment and Rural Affairs (DAERA) sponsored work undertaken by the Agri-Food and Biosciences Institute (AFBI) and AgriSearch between 2016 and the end of 2019 has demonstrated the effectiveness of proper flock health planning in improving flock health in both hill and lowland flocks in Northern Ireland.

Originally, flock health planning was very much focused on disease prevention and the production benefits of such plans were rarely highlighted. This thinking has now changed with the contribution of health planning to the improved financial position of the enterprise being seen as very important. Thus, the original concept has changed into one of health and production planning focused on better returns. Furthermore, health planning is now seen as an essential part of the proactive approach necessary to comply with current EU and UK animal health and welfare strategies. Importantly, these health and welfare strategies are linked to food chain safety through the concept of Welfare Quality at UK and European level. Another important area in which there is a role for health and production planning is as a part of national and international Antimicrobial Resistance Strategies.

The basis of the planning process

There are many formats in which a flock health and production plan can be presented, varying from the very simple to the very complex. In general, plans at either end of the spectrum are of doubtful practical use in most flocks. All plans should be based around ROUTINE INVOLVEMENT with the flock, preferably through flock visits although with mature plans some review meetings can be held at practice premises. Visits should be timed to match important events in the flock calendar because at these times decisions made will provide input into vital stages of the production cycle. Visits at weaning, pre-lambing and during lactation / rearing are most usual although financial constraints may cause the rearing and weaning visits to be combined.



The basis of the flock health and production planning process is best broken down as follows:

Audit

Establish the baselines within the limitations of the flock recording system. This may well lead to specific actions related to better record keeping.

Recording system

The establishment of fit for purpose recording systems is of vital importance and essential if the health and production benefits are to be analysed. A good example of the straightforward but effective records required has been produced by EBLEX as a part of the Better Returns Programme. Such records can be used in conjunction with trading accounts to calculate financial benefit.

Objectives

Objectives equate to the identification of areas for intervention, these will vary from flock-to-flock. Examples of common objectives derived from the Northern Ireland project are: reduction of abortion and neonatal lamb losses, reduction of levels of lameness, reduction of anthelmintic use through adoption of Sustainable Control of Parasites in Sheep (SCOPS) principles, proper and effective treatment of sheep scab including the control of mites resistant to some common injectable treatments, reduction of levels of mastitis, reduction or removal of specific diseases from the flock (for example OPA, Johne's disease) and improvement of grassland management.

Agreed Interventions

Interventions are agreed and put into place to meet the objectives. Often it is not possible to try to achieve all the objectives within the first year and plans work best if they are allowed to proceed in a step-wise manner.

Review

Review is essential to MONITOR progress against objectives and assess the effectiveness of the interventions made. Review findings can be benchmarked against similar flocks if a network of plan users is established at either local or in some cases national level.

Adjustments

Adjustments must be made on the basis of the review findings and may require modification of veterinary input and a change in the components of the plan (see below).

Components of the plan

Health and production plans should contain some or all of the components listed below, it is through the manipulation of these components that the interventions meet the objectives.

Preventive Medicine

This will include vaccination policy, use of anti-parasitics and the application of SCOPS principles as well as any trace element supplementation identified as being required. Examples are given below.

Flock Health, preventive medicine

● **Vaccinations**

- Clostridial disease, Pasteurellosis, EAE, Toxoplasma, Foot rot, Orf, Louping ill

● **Anti-parasitics / SCOPS**

- Gut worms, Flukes, Coccidia,
- Scab, lice, ticks, flies

● **Trace elements and vitamins**

- Copper, Cobalt (Vitamin B12), Selenium, Vitamin E

Routine treatments

The routine treatments incorporated into a flock health and production plan will vary from flock to flock depending on audit findings and diseases of most concern. Examples are given below.

Flock Health, routine treatments

- **Young lamb treatments**
 - Colostrum supplementation, Hypothermia and hypoglycaemia protocols
- **Lameness control programmes**
- **Mastitis control**
- **Quarantine treatments for all incoming stock**

Health monitoring

Laboratory input into flock health and production planning is very important. Diagnosis and identification of presence of disease is the basis of the setting of the objectives, the interventions decided upon and the design of the preventive medicine and routine treatment programmes. Examples are given below.

Flock Health, monitoring

- **Trace element profiling of ewes at weaning and lambs post weaning**
 - Copper, Cobalt (Vitamin B12), Selenium, Vitamin E
- **Metabolic profiling of ewes pre-lambing**
 - Protein, Energy, Liver function, Minerals
- **Abortion investigation**
 - Samples, lab submissions
- **Faecal egg count monitoring (gut worms and flukes)**
 - Lambs during the rearing period
 - Ewes and rams pre-tupping
 - Away wintered sheep on return to flock

Flock Management

A full management component is optional for a health and production plan and often a better approach is to have separate plans drawn up by qualified flock management advisors and sheep technologists (CAFRE) to cover such areas as: breeding and replacement policy, nutrition, grazing management and marketing plan. However, the health and production plan should include written procedures for quarantine, general and specific biosecurity, culling policy and scanning.

The future for health and production planning

The costs of veterinary involvement in flock health and production planning are variable; however, under all circumstances veterinary input will only be successful if production, financial and compliance benefits can be shown. The impact of health and production planning depends on the baseline situation, the success achieved in increasing output and the extra income derived from that output when compared to plan costs. It is clear that the profitability of the sheep industry is vital to the uptake of health and production planning. It is equally clear that the benefit will vary from flock to flock and will be influenced by outside factors which may affect losses in any one year. Fluctuations in the final market value of the increased production have also to be recognised. Veterinary input has to be measureable and accountable, plans have to be well constructed and provide value for money. In short, the plan has to work to the financial benefit of the sheep enterprise.

However, the requirement for compliance with the requirements of 'Welfare Quality' and its' link to food chain safety is becoming increasingly important to the industry. The 'One Health' approach to antimicrobial resistance is another important area in which health and production planning, in conjunction with responsible use guidelines (RUMA) will help with food chain safety compliance in the future.



In most of the UK health and production planning has been taken up to some extent but is very far from being accepted by all vets and sheep farmers. Government backed initiatives such as the Land Management Contract options used successfully in Scotland are an example of how well thought out pump priming can stimulate uptake. Another level of Government involvement has been demonstrated in England and Wales with the Animal Health and Welfare Pathway.



ACRES Kerry / West Cork co-operation project – an overview

Patricia Deane

Project Manager, ACRES Kerry / West Cork co-operation project, South Kerry Development Partnership, The Old Barracks, Beaufort, Killarney, Co. Kerry

Take home messages

- There is a maximum payment of €10,500 per year available to farmers participating in the ACRES co-operation project. This is made up of two payments: a results-based habitat payment, which is an annual payment based on the habitat quality scores of the land to a maximum of €7,000 and up to €3,500 for carrying out work on the ground called Non-Productive Investments (NPIs) or Landscape Actions (LAs).
- The ACRES co-operation (CP) staff will be deciding what scorecards will be used by the farm advisors who will be carrying out 'habitat assessments' on private land. The CP staff will be carrying out the habitat assessments on commonages.
- All farm advisors will receive training on the use of the scorecards for the results-based habitat assessments from the CP staff. The scorecards to be used include: peatland, grassland, rough grazing, scrub/woodland, chough, coastal grassland and breeding waders. Habitat assessments will be carried out from June to September, by walking over the land
- Farmers willing to complete work on the ground will receive an 'Annual Works Plan'. When farmers are considering actions/non-productive investments they want to carry out they should speak to their farm advisor and select the actions relevant to specific issues on their farmland to increase their results-based habitat score
- Farmers will receive an Annual Works Plan from the CP Team detailing approved actions they have discussed with their farm advisor. It is important to note that any work carried out before the plan is received will not qualify for payment.
- All participant farmers will receive training from the CP team, and the CP team will be in touch with participant farmers in the latter half of 2023

Introduction

The ACRES Kerry / West Cork co-operation project is one of eight cooperation projects across Ireland which are working with farmers in areas of high nature conservation value as part of the Common Agricultural Policy's national agri-environmental climate measure. It is funded by the Department of Agriculture, Food and the Marine and is administered by South Kerry Development Partnership CLG (SKDP).

The overall vision for the ACRES Kerry / West Cork CP is **'to work closely with the custodians of the land - the farmers and their farm advisors to support them to improve the environmental and agricultural condition of their land in a sustainable manner'**.



Supporting our farmers into the future is essential for maintaining the rural-social network of the region and for ensuring the long-term conservation of rare and threatened habitats and species. These are living landscapes; human activities, and agriculture in particular, have played a significant role in shaping them. Farming can have both negative and positive impacts for habitats and species. If properly monitored, grazing can play an important role in maintaining diversity of species and preventing scrub encroachment in many habitats. Sustainable methods of farming can contribute to the protection of watercourses and carbon storage and sequestration. The ACRES Kerry / West Cork CP will work closely with farmers and their farm advisors to achieve our vision.

ACRES Kerry / West Cork co-operation project area

The ACRES Kerry / West Cork CP area covers commonage and private lands in south and west Kerry and west Cork stretching from the Dingle peninsula to Mizen Head, as well as offshore islands including those islands south of Skibbereen as shown in Figure 1. It covers a total area of 2,567 km², the majority of which is High Nature Value (HNV), Natura 2000 designated land.

For administration purposes, the ACRES Kerry / West Cork CP area has been divided into 4 sub-regions (Camp, Beaufort, Kenmare and Bantry) which have been named after the office locations. Figure 2 illustrates the boundaries of the each of the 4 sub-regions. The main Project Office is located in The Old Barracks, Beaufort with 3 additional offices located in:

- O'Dwyer's Digital Hub, Camp Village.
- SKDP Offices, 21 Henry Street, Kenmare.
- West Cork Development Partnership Office, The Warner Centre, Bantry.

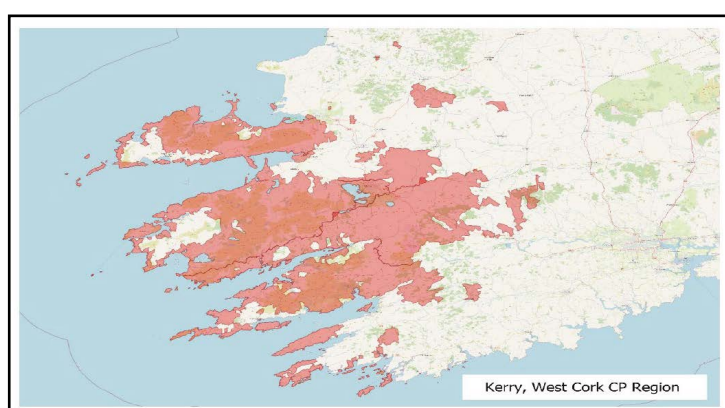


Figure 1. ACRES Kerry / West Cork co-operation area

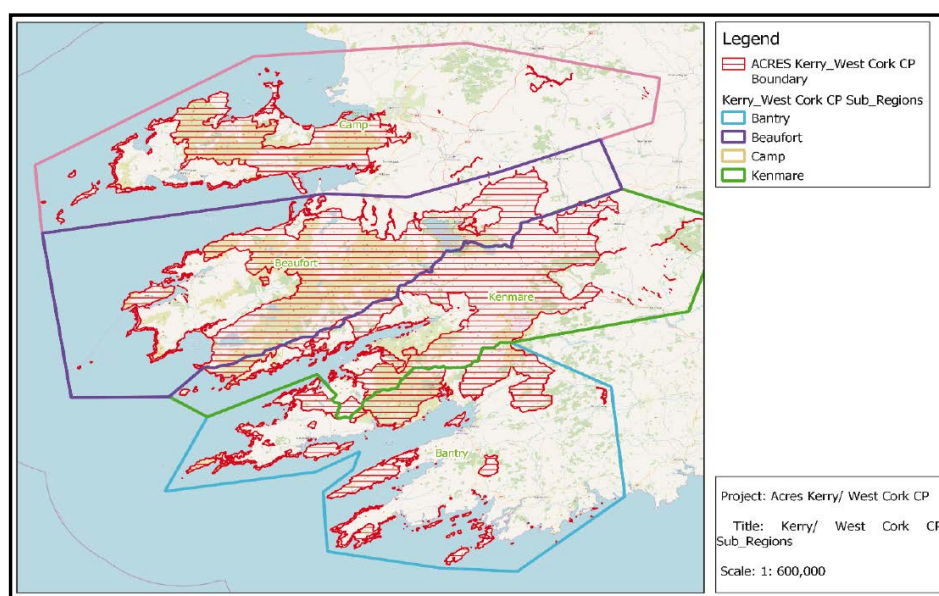


Figure 2. ACRES Kerry / West Cork co-operation sub-regions

Two agri-environment officers will be based in each of these offices.

ACRES Kerry / West Cork co-operation project objectives

The ACRES Kerry / West Cork CP Project has four overarching objectives:

1. The protection of watercourses.
2. Supporting carbon storage and sequestration and the protection of rare and threatened habitats.
3. Supporting the conservation of rare and threatened species.
4. The management of invasive species.

How will the CP project operate?

The ACRES Kerry / West Cork CP Project has 3 main elements:

1. Results-based habitat assessments.
2. Non-productive investments.
3. Landscape actions.

The results-based habitat assessments are designed to reward farmers that have high quality habitats on their farms and incentivise participant farmers to improve the ecological and environmental condition of their land. Habitat scorecards are used to carry out results-based assessments, whereby the participant's farm advisor will walk over each field using the appropriate scorecard, or the CP team in the case of commonages. Each field assessed is given a score relating to its condition. The scores are linked to a payment scale with higher scores receiving higher payments. The maximum annual payment for the results-based habitat assessment is €7,000. Scorecards include: peatland, grassland, woodland/scrub, coastal grassland, chough, breeding waders, rough grazing etc.

Non-productive investments (NPIs) are supporting actions that participants can undertake on their land each year to improve the habitat quality, water quality, address the needs of a specific species or treat invasive species on their land allowing participant farmers who receive a low score to improve the habitat condition of their land and increase the habitat score over time.

Landscape Actions (LAs) are supporting actions which will also help farmers to improve the condition of their land. However, the implementation of landscape actions may be more complex due the scale and / or number of participants involved in undertaking them. Landscape actions will often require work to be carried out over large areas (often extending beyond the land boundaries of a single participant) and require cooperative input from more than one participant. Farmers and the CP team will work closely when designing landscape actions.

The maximum annual budget available for NPIs and LAs is €3,500; however, in some cases farmers may be allowed to exceed this annual budget so long as they don't exceed the overall budget amount over the five-year contract. An example could be carrying out treatment of invasive species across a number of farms or commonages.

Supports to participant farmers and pitfalls to avoid

Farm advisors will play a crucial role in supporting the delivery of the ACRES Kerry / West Cork CP and it is essential that they are provided with in-depth training and ongoing support. While some farm advisors may have experience of results-based schemes through EIP projects, the concept will be new to many. To address this issue, targeted training will be delivered to all participating farm advisors in May 2023 which will cover the use of scorecards and the implementation of NPIs. Training methods and content will be standardised across all CP areas so that a farm advisor that completes a training course with one CP Team will have the necessary skills to undertake assessments in other CP areas also.

Participant training is one of the priority actions proposed by the Kerry / West Cork CP team to achieve our objectives. Our participants, the farmers, are the custodians of the land, and significant environmental improvement will only be possible with their support and the support of their farm advisors. Farmer training was an integral component in a number of Environmental Innovation Projects (EIPs). For many farmers not previously involved in EIPs, this might be their first time participating in an agri-environmental scheme. It is critical therefore that they understand the purpose and goals of the scheme.



Habitat training will be delivered to participants to increase their knowledge and understanding of the importance of the habitats and species associated with their land and to develop a greater understanding of the impacts associated with management actions on the land. The CP team aims to train farmers in four specific areas including:

1. Water quality.
2. Priority habitats.
3. Priority species.
4. Invasive species.

In addition to this, it is envisaged that farmers will require training on specific NPIs and LAs. Specialist training will be given to participants as required, to support them in implementing NPIs and LAs in their annual work plan and to ensure that these actions are carried out correctly using best practice methods. Specialist training is likely to include, but is not limited to, the following:

- QQI Level 5 pesticide training.
- Best practice methods on the treatment of rhododendron.
- Best practice methods on the treatment of Himalayan balsam.
- Tree planting and hedgerow maintenance.
- Protecting barn owls and kestrels (siting nest boxes, improving foraging habitat and the impacts of rodenticides).
- Protecting chough (habitat management and impacts of anti-helminthic drugs).
- Supporting hen harriers (habitat management to improve nesting and foraging habitat).
- Measures for the protection of waterbodies and the importance of high-status waterbodies for pearl mussel and other key species

NPIs or supporting actions will have to be discussed with the participant's farm advisor first who will apply for approval for the action to commence. This will happen after the habitat assessments are carried out from June to September 2023. Works carried out before approval will not qualify for payment. Working closely with participant farmers and their farm advisors as well as with key stakeholders with specialist knowledge and experience, the ACRES Kerry / West Cork co-operation team is confident we can deliver on our objectives.

An overview of the practical implications of conversion to organic production on hill sheep farms

Damian Costello^a, Elaine Leavy^b

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Take home messages

- The Department of Agriculture, Food and the Marine is supporting conversion to organic farming with a 5 year Organic Farming Scheme
- A clearly defined breeding policy is important to breed suitable replacements
- Put a plan in place to optimise utilisation of hill grazing and maintain productivity of the improved grassland
- Maximise the use of forage in the production system so as to minimise the requirement for organic feedstuff
- Draw up a flock health plan in consultation with your veterinary surgeon

Introduction

Organic agriculture is defined as “a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and good quality of life for all involved” (IFOAM General Assembly, 2008).

At farm level in Ireland, the organic sector has experienced a large influx of new farmers in recent years with over 4,000 farmers now farming organically including approximately 2,000 farmers who entered conversion in January 2023. Organically managed land now occupies over 3% of the total utilizable agricultural area (UAA) in the country.

The Department of Agriculture, Food and the Marine (DAFM) are the competent authority for regulating the organic sector in Ireland. A major factor distinguishing organic farming from other approaches to sustainable farming is the existence of internationally acknowledged standards and certification procedures. These standards have been developed to provide organic producers with consistent, clear rules as to how organic food should be produced. The DAFM have designated Organic Control Bodies (OCBs) to provide an inspection and certification service for all organic farmers in Ireland. For full interpretation of the rules and regulations governing organic sheep farming it is essential to study the ‘Organic Food and Farming Standards in Ireland’ document.

DAFM Organic Farming Scheme

The Organic Farming Scheme (OFS) is a five year scheme administered by the DAFM. It is an agri-environment measure and is funded through the Common Agricultural Policy. The scheme aims to offset the costs of converting a farm to organics as well as provide a base maintenance payment to farmers



engaging in organics after the conversion period. The OFS is an area based payment with two payment rates 'in conversion' in years 1 and 2 and 'full organic status' in years 3, 4 and 5.

Table 1. DAFM Organic Farming Scheme Payment Rates

	Year 1-2 1-70 ha (€/ha)	Year 3-5 1-70 ha (€/ha)
Drystock	300	250
Tillage	320	270
Dairy	350	300
Horticulture	800	600

>70 ha receives €60/ha in Year 1 and 2 and €30/ha in Year 3, 4 & 5

Participation payment = €2,000 in first year and €1,400 per annum thereafter

Organic farming on a hill farm system

The appropriate system of sheep production on hill farms is farm specific. It depends on factors such as the quality and amount of enclosed green land available along with the harshness of the hill grazing environment on the farm. A number of non-organic farms on the Teagasc Sheep BETTER farm programme, where sufficient improved ground is available, are successfully running both a dedicated hill flock alongside a crossbred flock. At an adjusted stocking rate this system is also feasible for organic farms. The extent and quality of enclosed green ground on the farm will determine if finishing organic lambs to slaughter is economically viable.

Breeding policy

As with all sheep systems, a defined breeding policy puts you firmly in control of the ewe breed that will make up your flock into the future. The target should be to breed replacements from within the flock. However, in an organic system, with a derogation from the OCB, up to 20% ewe replacements (that have not previously lambed) can be bought in from non-organic sources. Rams may also be sourced from non-organic breeders. As previously mentioned, land type will have a bearing on whether cross breeding a proportion of the ewe flock is an option. Table 2 below outlines how current productivity of a hill flock should be considered when making this decision.

Table 2. Potential breeding strategies for hill flocks at different levels of output

Lambs reared per ewe joined	Pure breeding %	Crossbreeding %
0.80	66	34
0.85	62	38
0.95	56	44
1.00	53	47
1.05	50	50
1.10	48	52

Source: Adapted from Lynch, 2012

The merits of the various hill breeds and strains are often debated among hill sheep farmers. Studies carried out as part of the Teagasc Sheep BETTER farm programme have found that there were more

significant performance differences within the individual breeds and strains than there were among the various breeds and strains of hill sheep. Ultimately, each farm should choose the breed best suited to their hill environment and strive to breed for improved flock performance. As progress is made in performance recording among hill breeders, choosing high genetic merit sires will improve the flock over time. Where crossbreeding to produce lambs for slaughter is part of the farm system, rams that are high genetic merit on the terminal index will produce lambs that grow faster and be quicker to get to market.

Grazing management

The aim should be to graze the hill flock on the hill for the maximum time possible each year at a stocking rate that will neither lead to overgrazing nor undergrazing. For organic hill sheep farms, commonage can be grazed by sheep once they are properly hefted.

It is important to manage the enclosed green ground or improved grassland for optimum grass production to be used at key times such as mating, either side of lambing or lamb finishing.

Maintain productivity of improved grassland

- Soil analysis and applying lime to optimize pH is the first step, where land type and terrain is suitable and safe to travel with machinery.
- If farmyard manure and/or slurry is available, they should be applied to maintain/build P & K indices as per soil analysis.
- Where the stocking rate and output in terms of number of lambs produced justifies it, reseeding suitable areas including incorporating white and red clover into the sward will fix nitrogen naturally. Studies have shown that with a grass and 20% clover sward, there is potential to fix from 100 to 250 kg of nitrogen (N) from the atmosphere, with the greatest potential where no chemical N was applied to the sward as is the case in an organic system.
- It is critical to have the fencing infrastructure to allow rotational grazing and to correctly manage these swards post establishment.
- The control of problem weed species is restricted to physical and mechanical means such as topping. It is also advisable to avoid poaching and rutting with machinery as this can promote weed seed germination.

Flock Nutrition

The main component of the diet in an organic hill sheep system is grazed forage. The aim is to produce the entire forage requirement on farm. On hill farms where silage or hay form part of the late pregnancy feeding regime, the production of high quality silage offers the opportunity to reduce the level of expensive organic concentrates required by ewes pre-lambing.

There are organic concentrates available for supplementary feeding in late pregnancy in the form of pre-mixed nut/ration at a guideline cost in 2023 of €850 - €950/tonne.

In line with organic standards, lambs must feed on maternal milk for at least the first 45 days of life. If any ewe has excess colostrum, collecting and freezing in suitable quantities (200 ml initial feed for 4 kg lamb) is advisable. This can be fed to lambs where mothers have inadequate colostrum supply. Surplus lambs should be cross fostered where possible.

Currently there is no organic certified colostrum substitute and lamb milk replacer on the market. Where maternal milk is not available, non-organic milk replacer may be fed to lambs. These lambs must be clearly identified by tagging and must be marketed as non-organic lamb. The system of indoor finishing of lambs requires good husbandry and is challenging for organic lambs given that at least 60% dry matter of the diet must be from roughage. This applies post weaning and does not apply to the diet of lambs up to weaning. Where supplementary concentrates are required to finish lambs, the preferred option is to supplement at grass.



Organic sheep housing

The traditional practice of outwintering hill sheep suits organic production once it is within cross compliance requirements. There are hill farms that house some or all of their flock for a period of time. When housing sheep organically, there are specific space requirements as outlined in Table 3. At least 50% of the total floor areas must be solid, that is, not of slatted or grid construction and available to stock at all times. Non-organic straw is permitted to be used for bedding.

Table 3. Organic sheep housing floor area requirements

Indoor Area (net area available to each animal)	
Animal Type	m²/head
Adult Sheep	1.5
Lambs	0.35

Flock health plan

When a farmer undergoes conversion to organic status, in consultation with a veterinary surgeon a flock health plan is prepared. The plan will take farm history into account and will outline how the farmer will tackle health issues in the future while conforming to the organic farming standards. The withdrawal periods for medicines/treatments are longer for organic animals - at least double the withdrawal as indicated by the manufacturer. Some meat processors have markets that require up to three times the standard withdrawal period.

The areas addressed in a typical flock health plan for hill sheep would include the following:

- A closed flock to reduce the risk of introducing disease.
- Control of stomach worms in lambs using techniques such as mixed grazing with bovines and grazing lambs on pastures with lower parasite burden after weaning.
- Measuring faecal egg counts regularly to identify parasite burden and if there is a requirement for treatment.
- Appropriate timing of shearing and removal of soiled wool to lessen the risk of blowfly strike. Preventative treatments such as pour-ons for blowfly and other external parasites are allowable, as are dipping products except for those containing organophosphates.
- For lameness, the use of zinc sulphate or copper sulphate in appropriate foot bathing facilities. The use of formalin based footbath solution is prohibited.
- Plan liver fluke control strategy based on farm history. If possible, secure liver reports from factories post slaughter as an indicator of levels of infection. Where practical, avoid grazing high risk areas during the autumn/winter period. Treatment is permitted with veterinary consultation.
- Vaccines are permitted where farm history indicates that they are required.

Marketing organic lamb

It is important to make contact with other organic producers and meat processors about potential markets. Currently in Ireland, there is one main processor of organic lamb. A premium of 15% above the conventional price is usually achievable. On farms where finishing lambs is not possible they may be sold as stores.

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What will the genotyped ram task in the Sheep Improvement Scheme accomplish for the hill sector?

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Take home messages

- The Sheep Improvement Scheme (SIS) presents a big opportunity for the hill sector to establish a baseline in parentage recording. Parentage recording is the bedrock from which the sector can apply systematic breed improvement and monitor inbreeding
- According to the 2021 sheep census, 49% of the national ewe flock is classed as hill or hill cross, and 18% of stock rams are listed as hill rams. Therefore, the influence the hill rams have on the national flock is significant. Yet, in 2022 only 3% of the pedigree flocks set up on the national database were from hill flockbooks. With more hill flocks and data, the hill sector can make the same genetic improvements that are being made in the lowland sector
- Some of the main barriers to capturing parentage information have been overcome via more accessible access to DNA parentage assignments. The SIS has created a demand for hill rams with parentage information, rewarding hill ram breeders who get their rams genomically tested and sire DNA verified
- Sheep Ireland is working with 16 hill groups across Ireland to ensure that there are enough rams that are genomically tested and eligible for the SIS in year one. The main priority for all hill breeders is to get their stock rams genomically tested as soon as possible. If a stock ram dies before being tested, none of his progeny will be eligible for the SIS

Why now?

The genotyped ram task in the Sheep Improvement Scheme (SIS) aims to improve the national flock's genetic potential and breed healthier, more sustainable and more profitable animals. For the first time, there is also a hill breeding element included as part of this national sheep scheme, which is a significant milestone for the sector and a major opportunity to establish a structured breeding programme for the hill sector.

Collecting data such as the sire, dam and date of birth for lowland pedigree flocks is a long-standing tradition, with some flockbooks in the UK dating back to the early 1900s. The same tradition was not established for the hill breeds as animals were being mated and lambed on the hills, making this data collection unfeasible. To an extent, this is still a significant barrier today.

There are now sixteen flockbooks on the national sheep database hosted by Sheep Ireland. Fourteen



flockbooks are for lowland breeds, and only two flockbooks are for hill breeds. These two hill flockbooks are the Mayo-Connemara Blackface and the Donegal Cheviot flockbook, both of which were established within the past three years. When a flockbook is hosted on the national sheep database, all the parentage information and dates of birth are available to be used in the national breed improvement programme. This information can also be made widely available to breeders and commercial farmers via online flockbooks and sales catalogues to help them make more informed breeding decisions.

In 2022, there were 1,744 pedigree flocks in the 16 flockbooks hosted by Sheep Ireland, of which only 55 (3%) were hill flocks. These 1,744 pedigree flocks birth notified (submitted at a minimum information on the sire, dam and date of birth) over 33,000 lambs in 2022. Comparing this ratio of hill vs lowland flocks against the 2021 sheep census, where 27% are hill or hill-cross stock rams - it is clear to see the difference in data capture between lowland and hill sectors.

While the lowland sector is starting to build critical momentum and make more genetic gain each year, the hill sector is, unfortunately, being left behind. This must be addressed. Looking at the 2021 sheep census, 18% of all the stock rams in the census were hill rams, while 49% of the national ewe flock is listed as either hill or hill-cross. Based on these figures, it is estimated that approximately 4,000 new hill rams enter the national flock each year. Within two or three generations of these hill rams entering the national flock, their DNA is in almost half the national ewe flock, making this group of animals the most important sheep in the country each year. Therefore, improving the genetic potential of this group of rams would considerably impact the national flock's performance. The first step in doing this is parentage assignment.

The three main barriers to recording parentage have been established. The first is that for some flocks, ewes are mated on the hills, making it impossible for the farmer to know which ram mated with which ewe. For flocks that know which sire bred with which ewe, the next challenge is matching the ewe to the lamb. For flocks that lamb outdoors or on the hill, this requires catching lambs shortly after birth, giving them an identification number (e.g. tagging) and matching that number to the ewes' identification. This barrier is significantly reduced for a proportion of hill flocks that lamb some or all of their ewes indoors. Sheep Ireland's genomic service can now completely override the need to record the sire of a lamb by assigning the sire via DNA technology.

The second barrier to recording is the need for a flockbook structure or central agency to host all the data and make the flockbook management easily achievable. Sheep Ireland's flockbook management service can offer outstanding flockbook services to overcome this. The service includes an easy to use website, a free App to capture parentage information as well as animal data (e.g. lambing, weights, health), and an online flockbook to help promote and publicise the breed.

The third barrier is tradition, both on the behalf of the seller and the buyer. There is no tradition amongst hill breeders in sending parentage information and dates of birth for their lambs to a central location (i.e. flockbook or Sheep Ireland), and buyers (hill farmers) have no tradition of selecting rams based on flockbook information or performance records. The SIS has overcome this by creating a demand for rams with parentage information, and breeders who DNA sire verify their rams will have a market for the duration of the SIS.

For each barrier raised, a new solution has been provided.

How has the Lowland sector benefited from flockbooks and performance recording?

As a result of the flockbook structures put in place by the lowland breeds, they have been able to reap many benefits. For example, breeders can see the full pedigree of an animal and identify bloodlines they want to avoid or introduce to their flocks before making a new purchase, it ensures the breed's integrity, and it has allowed for systematic breed improvement via genomic evaluations provided by Sheep Ireland. In conjunction with Teagasc, Sheep Ireland has completed a significant amount of research and development in genomic technologies and a genomic delivery service over the last eight years. As a result,

the Sheep Ireland genomic service is now a well-established and trusted technology that is widely used in the lowland pedigree sector. The genomic service offered by Sheep Ireland easily allows breeders to test their animals for parentage, scrapie, genomic inbreeding and much more, all with one tissue sample. While every lowland flockbook already requires full parentage on all animals, parentage verification via DNA enables parentage errors to be identified and corrected. A parentage error can be determined if the animal has been genomically tested and the parent has also been tested. A benefit of a centralised national database is that each animal only needs to be tested once, regardless of which flock the animal now resides in or how many flocks have lambs from that animal. Even in the lowland flockbooks where systems are better suited to parentage recording, approximately 1 in 10 animals have an incorrect sire or dam recorded at the time of parentage verification through simple human error. However, not only can the genomic service find errors, but in 80% of cases, the correct parent can also be identified via DNA assignment.

What value has the national breed improvement programme provided the industry to date?

Research carried out by Abacus Bio in 2021 analysed the performance of the national breed improvement programme. Between 2014 (when the breed improvement programme started to gather momentum) and 2020, the programme has added €17 million of value to the industry. If the programme continues to develop, it is predicted that between 2020 and 2040, it could deliver an additional €115 million to the Irish sheep industry.

National benefits can be challenging to translate back into farm gate benefits. However, further research in 2022 by Teagasc and Sheep Ireland investigated the physical, financial and environmental performance of a low genetic merit flock (1 Star) and a high genetic merit flock (5 Star). The 5 Star flock produced an extra 0.17 lambs per ewe via increased lambing percentage and better lamb survival, and those lambs also finished 13 days faster than those from the 1 Star flock. When all the physical differences in performance between the 5 Star flock and 1 Star flocks were analysed, the net profit per ewe differed by €18 (€45 vs €27), which equates to a 66% increase in profitability per ewe. The final area investigated was the sustainability of each flock of ewes. Based on a life cycle analysis, the 5 Star flock produced 6.9% less greenhouse gas per kilo of carcass produced. This research is based on a commercial lowland system and data collected over the previous decade since Sheep Ireland was established. However, the same research and, therefore, the same benefits cannot be given to the hill sector due to a lack of structure and data. The lowland sector has benefitted from direct investment in breeding flocks via research and DAFM schemes. For hill flocks to be offered the same opportunities to receive investment to conduct this type of research that enables farmers to make more informed and accurate breeding decisions, parentage recording is the first step.

What is genomics, and how to get a ram tested?

At its most basic, genomics gives us the ability to look at the DNA profile of an animal. The DNA profile can tell us what DNA they inherited from their sire and dam, and in some cases, how that animal is likely to perform in the future.

Genomics for the lowland breeds is now a well-adopted technology, with almost 10,000 animals tested via the Sheep Ireland genomic service in 2022 alone. To genomically test a ram is a relatively simple and robust process. First, the flock the animal resides in must have a Sheep Ireland account (this can be completed via www.sheep.ie). Secondly, the animal needs to be added to the database. The minimum data required to add an animal to the database is the animal's National Sheep Identification System number (DAFM tag number), date of birth and breed.

Providing additional information, such as the sire and dam ID, is beneficial and optional. Then a genomic test can be ordered via the breeders' Sheep Ireland account. A tissue tag is then sent to the breeder. When inserted, the tissue tag collects a small piece of tissue from the animal's ear and seals the tissue sample



in a collection vial with the animal ID printed on it (Figure 1). The sample is then sent to a laboratory in a pre-addressed envelope. The DNA is extracted, and the results are sent to Sheep Ireland for analysis. After the analysis, Sheep Ireland reports any parentage information that has been obtained as well as the scrapie status and genomic inbreeding percentage of the animal. Breeders should allow up to four weeks from the time samples reach the laboratory until they can expect to have results. The critical element of this service from the hill sector's point of view is that it quickly identifies an animal's parentage via DNA technology.



Figure 1. Collecting a tissue sample for DNA analysis is as simple as tagging an animal with the green tissue sampling kit. The tag number of the ram is also printed on the green tag to reduce sampling errors on farm.

What has been learned from previous hill recording initiatives?

For hill flocks, the focus must be on establishing basic parentage information, initially capturing the sires via DNA predictions. Other initiatives have been tried in the past to develop some hill parentage recording, but not all have been successful. However, lessons have been learned. The two most significant issues with previous initiatives were that there was no easily accessible genomic service to make parentage predictions, which meant that all sires needed to be assigned by the breeders. This has now been resolved as outlined above. The second issue was when flocks did start recording parentage, they did not see any extra demand for those rams as it was such a novel idea to their customers, and therefore they did not believe the reward was worth the effort. With the genotyped ram task in the SIS, this is resolved for at least the next five years. At this point, purchasing a hill ram with parentage information will no longer be a novel idea.

What is the genotyped ram action in the SIS, and how do I comply as a hill farmer?

As part of the SIS, every farmer must purchase a sheep that has been genomically tested via the Sheep Ireland genomic service in their selected year(s). Flocks with a reference number greater than 150 ewes must complete the action twice. Hill flocks can purchase a hill ram that is DNA sire verified and scrapie type 1, 2 or 3. For lowland flocks, the ram must have a genomic evaluation, be 4 or 5 Stars on the Replacement or Terminal Index at the time of purchase and scrapie type 1, 2 or 3. The lowland option is also available to hill flocks. A ram can be claimed more than once over the lifetime of the SIS by different flocks.

Why is there a scrapie element to the SIS?

This step will help to protect our industry from producing a classical case of scrapie. Ireland's last case of scrapie was reported in 2018. Ireland needs seven years without a reported case to be considered scrapie free on the international market, potentially leading to new markets being developed in Asia.

Animals that are scrapie type 4 and 5 are least resistant to scrapie. There are currently 850 hill animals with scrapie results on the database, and 94.5% are scrapie type 1, 2 or 3. Therefore, it will only eliminate a small percentage of rams from the SIS. However, it is a direct signal to hill ram breeders that they should consider the scrapie genotype status of their stock rams before mating to reduce the chance of breeding a type 4 or 5 scrapie genotype ram.

Will there be enough SIS-eligible hill rams, and where can they be found?

Sheep Ireland is actively engaging with all the established hill groups around Ireland, of which there are 16, listed below. Sheep Ireland is working with all groups to genotype as many of their stock rams as possible in the coming months because if a sire dies before he is genomically tested, then none of his progeny can become SIS eligible. As an added incentive, Sheep Ireland is initially providing free genotyping for pure hill stock rams that are part of breeding groups.

As described earlier, the process of getting an animal genomically tested is simple. The breeder can complete it without any outside help. However, as this is a relatively new principle for most hill breeders, Sheep Ireland is organising DNA collection days across the country where group members can take the rams they wish to sell and get their DNA collected by a Sheep Ireland technician. Based on all of these actions, we believe there will be a sufficient supply of rams for the SIS flocks.

Based on the years selected by hill farmers to complete their genotyped ram task, it is expected that 1,264 SIS hill rams are required in year one, with a total of 5,820 hill rams needed over the five years of the scheme.

Rams eligible for the SIS can be easily found using Sheep Ireland's www.ramsearch.ie website. All animals suitable for the SIS can be found and verified via this website. The second option is via sales catalogues. Sheep Ireland will be working with all the groups to help them generate sales catalogues containing all the necessary information in a standard format.

The list of 16 established hill groups that Sheep Ireland are working with to ensure adequate supply of hill rams that will meet the requirements of the Sheep Improvement Scheme are:

- Brockagh Perth Blackfaced Sheep Breeders Association
- Brockagh Swaledale Mayo Blackface Sheep Breeders Association
- Connemara-Mayo Blackface Sheep Breeders Association
- Cooley Sheep Breeders Association
- Donegal Blackface Sheep Breeders Association
- Donegal Cheviot Sheep Society
- Kerry Blackface Breeders Association (Dingle)
- Kerry Blackface Sheep Breeders Association
- Mayo-Connemara Blackface Sheep Breeders Association
- Munster Blackface (Ram Lamb) Association
- Sliabh Liag Longwool Perth Sheep Breeders Association (Donegal)
- Sub-A district South of Ireland Swaledale Sheep Breeders Association
- Tir Chonaill Blackface Group
- Waterford Blackface Sheep Breeders Association
- West of Ireland Lanark Sheep Breeders
- Wicklow Cheviot Mountain Sheep Breeders Society

Conclusion

The SIS provides a unique opportunity to kick start a national hill flockbook. Breeders should seize this chance, or it could take years for another opportunity to arise. A hill flockbook will bring many benefits to the hill sector, including more informed breeding decisions, managing inbreeding, and opening up the



possibilities for future research and investment in the hill breeds that are currently missing due to the lack of a flockbook structure to work with. To ensure the long-term success of the genotyped ram task, as many breeders as possible must get involved and genotype their stock rams and rams for sale. The sooner rams are genomically tested, the sooner any potential issues can be raised and dealt with efficiently. Hill farmers that plan to purchase a DNA sire verified hill ram in 2022 could benefit by contacting breeders they may want to purchase from to inform them that they need a DNA sire verified ram and that the breeder should act now to make sure they have a ram to sell them later in the year.



Meet the speakers



Jason Barley

Jason Barley qualified as a veterinary surgeon in 1985. He subsequently worked in mixed practice, at the Royal Veterinary College as a Research Fellow where he gained a PhD and in the pharmaceutical industry before joining the Agri-Food and Biosciences Institute in Belfast to work in diagnostic pathology. He is a past president of the Sheep Veterinary Society.



Patricia Deane

Patricia Deane is the Project Manager for the ACRES Kerry / West Cork Co-operation Project, having previously managed the award winning MacGillycuddy Reeks European Innovation Partnership Project. Trisha comes from a small family farm in Mid-Kerry and has been working closely with farmers since commencing employment with the Local Development Company, South Kerry Development Partnership. She feels strongly that farmers need as much support as possible to continue farming and more needs to be done to encourage young people to become interested in farming.



Damian Costello

Damian Costello has worked as a sheep specialist, based in Teagasc Athenry, since 2018. As part of his role he has worked closely with a number of the Teagasc Sheep BETTER farm participants with hill sheep enterprises in Donegal, Sligo, Mayo and Galway. Prior to joining the sheep specialist team, he has filled a number of advisory roles in Teagasc since first joining the organisation in 1996. On the home farm in his native Galway, Damian runs a lowland sheep enterprise in his spare time.



Elaine Leavy

Elaine Leavy has been an organic specialist adviser with Teagasc since 2007. Her role is to provide information on organic farming practices; she provides support to local Teagasc advisors, delivers courses, farm walks, gives talks and prepares printed material for the organic industry. She works with other stakeholders within the sector and participates in projects with advisors from other countries.



Kevin McDermott

Kevin McDermott is the Sheep Ireland manager. Sheep Ireland is the national body responsible for improving the rate of genetic gain in the Irish Sheep Industry. Growing up on a sheep and beef farm near Moville, Co. Donegal, Kevin pursued a career in agriculture, graduating from UCD in 2011 with a degree in Animal & Crop Production. Following this, he completed a research Masters in ewe and lamb nutrition in late pregnancy at the UCD Lyons Research Farm. Since joining Sheep Ireland in 2013, Kevin has focused on improving the rate of genetic gain in Ireland via improved genetic evaluations, better performance recording infrastructure, and farmer education.

