Farming for a Better Climate

Glensaugh Research Station

Glensaugh was originally established as an experimental farm in 1943. It extends to 1,000 hectares (ha) and lies in the Grampian foothills about 7km north of Laurencekirk beside the B974 Cairn o' Mount road. It rises from 115 m in the valley of Slack Burn to 450 m at its highest point. The mean annual rainfall at 195 m is 1040 mm.

Glensaugh's primary land use is hill farming, which continues to support the research programme. Over 700 ha of acid moorland complemented by improved pasture and arable land (about 70 ha) is used to feed the 400 flock of Blackface and 500 crossbred ewes, 50 Blue Grey suckler cows and 90 breeding hinds.

Glensaugh lies in a transition zone and is typical of a large number of farms in upland Scotland. Its main natural advantages are an extensive land area allowing low stocking densities, its isolation from neighbouring livestock farms, useful core area of fertile improved land and its proximity to arable farming area and local markets, plus the space to grow timber/self sufficiency in wood fuel.

Name	Donald Barrie
Farm	Glensaugh
Locality	Laurencekirk
Farm type	Hill sheep
Size	1000 ha

How might climate change affect Glensaugh?

In spite of its relatively low altitude, Glensaugh lacks shelter from the north and west and is shaded by Finella Hill, resulting in a long period of low or no growth, prolonging the winter feeding period.

Weather related events which test our grazing systems are not new; hill farmers have developed adaptation strategies over the years. However a combination of a poor summer followed by a poor winter places a severe strain on production systems as happened in summer 2009/ 2010 and more notably in 2012/ 2013.

While winter weather is often the focus of attention, poor summer weather is a bigger threat. Summer rain, low soil temperatures and impaired plant growth lead to discontented animals with poor growth rates. The variability in weather conditions is making farming more of a challenge; these challenges could increase if we see more 'un-seasonality' in current weather patterns, as predicted under climate change.

climate change

The James Hutton Institute

SRUC

The Scottish Government
Riaghaltas na h-Alba

Case Study

Find out what other farmers are doing to improve profitability and adapt to a changing climate in our series of case studies.

There are five sets of Practical Guides covering :

Use energy and fuels efficiently

Develop renewable energy

Lock carbon into soils and vegetation

Optimise the application of fertilisers and manures

Optimise livestock management and the storage of manure and slurry

Find further information, including links to other Practical Guides and Case Studies, at

www.farmingforabetterclimate.org

Funded by the Scottish Government as part of their Climate Change Advisory Activity

Websites

www.farmingforabetterclimate.org
www.hutton.ac.uk
www.leafuk.org
www.climatexchange.org.uk
www.adaptationscotland.org.uk
www.farmingfutures.org.uk/
www.soilassociation.org/scotland

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Coping with weather extremes

The value inherent in the hefting of Blackface ewes to their ground became evident when the system was "tested" by severe winter weather events. The resilience of the system was demonstrated by the ability of these ewes to forage over snow covered ground. The old wisdom of never feeding hill sheep was founded on the knowledge that ewes would not forage once removed from their own ground. Modern weather forecasting allows us to predict these "killer" events and ewes are removed from the hill in advance of a bad storm. Supplementary feed is offered at times of severe stress, and then withdrawn in a managed way as animals return to their own ground.

Woodland planting

Recent tree planting at Glensaugh has been focussed on replacing substantial shelter woodlands which once protected the heart of the property. The shelter woodlands were felled during World War I and not replanted. The benefits of replanting include:

- shelter for livestock
- creation of a timber and/ or wood fuel resource
- carbon sequestration
- habitat and landscape enhancement

Working to our strengths

In order to make ready for further climate change we must understand the dynamics of our systems. Systems which rely on conserved winter feed (suckler cow herd and low ground sheep flock) are vulnerable to poor summer weather because feed quality will be impaired. Those which rely on extensive grazing throughout the year will be less vulnerable, but will be at the mercy of winter storms. It is easy to provide winter feeding if feed stocks are plentiful and of high quality. One might therefore conclude that the main risk to our systems is created by poor summer weather. So far we have coped with shortening summer weather windows by substituting silage for hay and introducing new technology like the use of silage preservatives and inoculants. Reducing reliance on conserved winter feed is brought about by substituting sheep for suckler cows and hill sheep for low-ground crossbred ewes. All of these changes are in harmony with our belief that in the long term we must devise production systems that are less reliant on external energy support.

Energy and Renewables

In 2010 we commissioned a 50 kW Atlantic Orient Canada AOC 15/ 50 wind turbine, the power from which is sold directly into the grid. Unfortunately the turbine has fallen short of its designer's expectations.

In 2011 we commissioned a 70 kW Ekopal RM20 biomass boiler (from Poland) which burns metre length cordwood to heat Glensaugh Lodge and adjoining buildings in a mini district heating scheme. The project budget was £46,000, 50% of which was met by the SRDP. It has successfully displaced the burning of about 6,000 litres per annum of LPG and generates some income.

We are evaluating a second biomass project to heat the office, Animal House and farm cottages.

Woodland planting is well supported by the SRDP and we are using this scheme to restock former woodland areas which were cleared through emergency wartime felling. This will provide valuable shelter and a long term fuel wood resource.

Making best use of inputs

Glensaugh's soils are shallow, free draining and nutrient deficient. The principles of Glensaugh's nutrient policy are:

- annual soil analysis of all "arable" fields
- nutrient applications are based on proven need
- lime is applied when required
- P and K are applied through summer applications of dung [FYM] and/ or slow release Gafsa type products, to replace seasonal offtake and set up land for the following season
- clover rich swards reduce reliance on purchased ammonium nitrate (AN), **but**
- 40kg/ ha of AN is applied in spring when soil temperatures are low; **and**
- a further 40kg/ ha AN is applied to sila ge land to allow yield potential to be realised and to prevent clover swamping the grass

Only higher potential land is managed to this level of intensity. Lesser quality permanent pasture is limed occasionally, and managed as low input sheep pasture. Efforts are made to control weeds across the farm.