SUSTAINABLE AGRICULTURE:

FOOD, FARMING AND THE ENVIRONMENT

NFU CYMRU

#WeAreWelshFarming

Contents

Foreword

Welsh farming occupies over 80% of the Welsh landmass; Welsh farmers, as a result, play an irreplaceable role in looking after our cherished natural environment.

This is a role that Welsh farming has played over centuries shaping the countryside we all enjoy. Today every sector – livestock, dairy, arable, upland, lowland, organic, conventional and tenanted – and every type of farm continues to carry out a huge amount of work to maintain and enhance our iconic Welsh landscapes, encourage wildlife, improve soil and water quality, and reduce our climate impacts.

This report looks at the key areas of the environment where farmers can, and do, play an essential role in tackling the challenges we face – landscape, biodiversity, soil, water and air and climate. It highlights and celebrates NFU Cymru's greatest asset – our members – bringing to life their experiences about the work they are undertaking on their own farms to maintain and enhance our nation's vital natural assets whilst at the same time producing high quality, affordable food to world leading standards.

Looking at this report, one thing is abundantly clear. There is an inherent connectivity between agriculture, our environment, our landscapes, our communities, our culture and our heritage with many inter-dependencies.

I am optimistic that, in Wales, we have the legislative framework and ways of working to recognise this fact. In the context of Brexit I believe we can move forward to develop and deliver a truly sustainable vision for Welsh agriculture that goes beyond seeking to balance or compromise a number of seemingly competing objectives, but rather aims to develop a vision that embraces equally the environmental, economic, social and cultural aspects of sustainability.

This report aims to start a new conversation about our farmed environment. On my own farm, I have a genuine ambition to leave my farm in a better state for my children and the generations that come after them. I am clear there is more we can all do. I am also clear this has to be done on the basis of evidence, on the development of a shared understanding, and through collaboration and working in genuine partnership – through the development of an approach that recognises and respects that farmers have a unique knowledge and perspective on the farmed environment and also a unique contribution to make in its ongoing management and enhancement going forward.

John Davies
NFU Cymru President

Introduction

Policies put in place today will shape the future of food production, the environment, and our rural communities in Wales for years to come. This report aims to provide an important benchmark against which to measure future improvements in our efforts to maintain and enhance the farmed environment. It also aims to bring to life the experiences of farmers who undertake this valuable work for society.

Farming plays a significant role in protecting and enhancing the environment. During the past 30 years, there has been substantial engagement by Welsh farmers in voluntary agri-environment schemes such as Tir Gofal and Glastir. In addition, science, research and innovation, and their deployment on Welsh farms, have increased our resource efficiency and further reduced environmental impact.

While a lot of good work has been done by farmers, we are clear there is more we can do. We have ambitions to continue to make improvements in all areas, and we need the future agricultural policy for Wales to reflect this ambition whilst keeping food production at the heart of everything we do.

This report tells us that:

- Farming has shaped our landscapes through continual management over generations, creating a patchwork of unique environments across the whole of Wales;
- Farmers play a major role in the provision of public access to our landscapes and to the well-being of people in Wales and further afield. We recognise the value and importance of engaging with the public and helping them to learn more about the countryside and food production;
- Farming is integral to protecting, maintaining and enhancing our treasured habitats and wildlife, including more common biodiversity, which is often overlooked and underplayed;
- Good management of soil underpins our food production system and helps to deliver a number of public benefits. But soil is a complex system and good quality data is needed to help farmers benchmark progress;
- A clean reliable source of water is vital to all farms, but taking steps to manage flood risk and reduce agriculture's impact on water quality are also essential elements of the work that farmers do;
- Agriculture is unique when it comes to dealing with the challenges of improving air quality and reducing greenhouse gas emissions because it can remove carbon dioxide from the atmosphere and store it in soil and vegetation, and generate low carbon renewable energy.

There are costs associated with the delivery of these valuable environmental and wider public goods for society. Continued improvements in productivity, through more efficient and careful use of our natural resources, can reduce our emissions and environmental footprint without impacting on our productivity, but this will only happen if farm businesses are given the support they need to survive and thrive. The bottom line is that farm businesses need to be productive and profitable to be able to continue to deliver the environmental benefits we all want to see.

A productive, profitable and progressive Welsh agricultural sector has wider public benefits too. Welsh farmers are a central part of rural economies, providing jobs and driving growth in diversified industries such as renewable energy and tourism as well as food production.

In the context of the future challenges to our global food production system, domestic food production and the continued supply of safe, high quality, traceable food is also important. Any reduction in domestic food production would mean greater reliance on imports, resulting in us exporting – and likely increasing – our environmental footprint as well as making us more vulnerable to the effects of climatic and market volatility.

NFU Cymru vision for a new Welsh Agricultural Policy

Following extensive consultation with our members, the NFU Cymru vision for a new Agricultural Policy was launched in early 2017. Our vision proposes a single, integrated, flexible framework based around three cornerstones – productivity, environment and stability.

Productivity – Designed to support and incentivise farmers through an iterative process of measurement, action and review. Our vision proposes instruments like capital grants and incentives, coupled with knowledge exchange and training, to drive measurable improvements in production and resource efficiency with positive economic and environmental benefits.

Environment – An easily accessible scheme that recognises and fairly rewards every farmer in Wales for the continued and enhanced delivery of a full range of public goods including biodiversity, carbon, soils, water and air quality coupled with an advanced approach offering bespoke contracts for the delivery of specific environmental outcomes, for example, the management of designated sites, the creation and management of habitats for particular species and so on.

Stability – Aimed at addressing the inherent volatility faced by farmers which weakens the economy and the delivery of environmental outcomes, a baseline support measure that is open and accessible to all active farmers, underpinning agriculture and food production and the standards required to build trust and integrity in sustainable agriculture in Wales. The conditions attached to receiving this support could cover a range of environmental, climate change and animal health and welfare measures.

The three cornerstones combine to give a truly integrated and sustainable agriculture programme that will continue to deliver and enhance our contribution to the economic, environmental, social and cultural well-being as well as the sustainable management of natural resources across Wales.

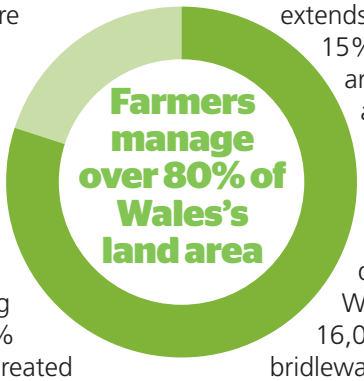
In this context, future policies need to recognise:

- Our landscapes are living, working, dynamic landscapes and the ongoing management of them is only possible if it is economically sustainable;
- Food producers must be at the heart of future environmental policies because farmers are in the best position to manage land for future environmental benefit;
- The future environment/public goods approach needs to be voluntary, open to all farmers, simple to apply for and administer, and offer a fair reward for public goods delivered now and additional public goods in the future;
- Support for farm infrastructure projects, new technologies and innovative tools is needed to help improve productivity while reducing our environmental footprint;
- There are still significant gaps in our knowledge about current farm practices and how these contribute to environmental improvement. We need better data on wider biodiversity delivery, like insects, and more data on the quality of our soils and emissions to air such as ammonia;
- Regulation adds cost and undermines business confidence. Where it is deemed necessary, it should be proportionate and targeted providing local solutions to local problems and focussed on outcomes. It should not be applied in a blanket fashion, especially where better and more cost-effective solutions to problems are available.

Today's Landscape

Farmers are the primary caretakers of Wales' iconic landscapes – landscapes that have been shaped by generations of farmers over hundreds of years.

Wales is predominantly rural and Welsh farmers manage over 80% of Wales's land area – 1.84 million hectares. Wales' landscapes are not natural per se, they are working environments which are dynamic and constantly changing as a result of continuous management by farmers through the grazing of livestock, the growing of crops and the management of boundaries.



Many of our high quality landscapes fall within the boundaries of Wales' National Parks and Areas of Outstanding Natural Beauty (AONB) which cover 25% of Wales. These landscapes have been created and are maintained by farming. Farmers also provide the cultural dimension to the visitor experience. To keep them we need to have viable farming businesses in these areas.

80% of Wales' agricultural land is located in the uplands and defined as Less Favoured Area (LFA)

Through the actions of farming, many of our traditional landscape features have been created and are maintained through the generations. Boundaries such as Wales' 106,000km of hedgerows and dry stone walls are a central feature, contributing to a 'sense of place' whilst also supporting a vast array of wildlife and providing connectivity between habitats. 80% of Wales' agricultural land is located in the uplands and defined as Less Favoured Area (LFA). Wales' upland areas are recognised for their iconic landscapes where livestock farming plays a significant economic role.

Trees and woodland are also important landscape features and, in Wales, woodland and forestry cover extends to 306,000 hectares. This is almost 15% of the land area and a tripling of the area since the 19th century. In Wales, approximately a quarter of all woodland is located on Welsh farms.

Wales is one of the most accessible countries in the world. Welsh farming delivers a significant proportion of Wales' access provision which includes 16,000 miles of footpaths, 3,000 miles of bridleways, 1,200 miles of cycle network with a further 460,000 hectares of open access land – a threefold increase in land accessible by right since devolution.

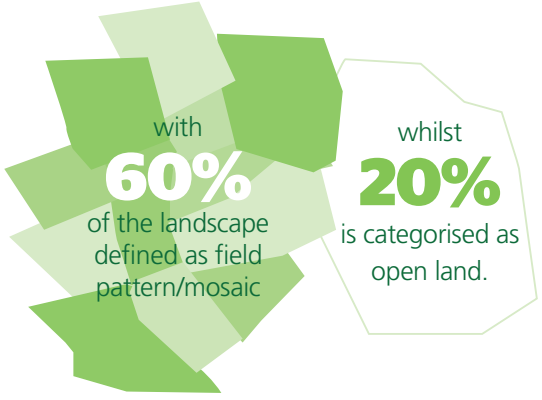
This provides access for the purpose of recreation and enjoyment to some of Wales' most spectacular areas for the people of Wales and for visitors across the world, making a key contribution to their physical and mental well-being.

Alongside their core food production activities, Welsh farmers, through their ongoing management of the landscape and the countryside provide the backdrop for the Welsh tourism industry worth over £2.8bn welcoming over nine million overnight visitors annually from Great Britain alone.

Wales has the greatest length of rights of way per square km of any nation in the UK

as well as significant access land covering over 20% of the land area for the purpose of outdoor recreation

Wales is a predominantly rural landscape



Welsh farmers are the key providers of the landscape and countryside upon which many access and recreational activities depend. Access to the countryside improves public understanding and appreciation of farming, alongside many health and social benefits. Access provision can, however, have high costs and impacts to farm businesses. For example, dog worrying is an increasing concern with livestock subjected to horrific and often fatal injuries – losses of sheep and other farm animals by dog attacks amounted to £285,000 in Wales in 2018. There are also a number of diseases carried by dogs, for example Neospora, which pose risks to both livestock and human health.

Fly-tipping is another issue that affects members of the farming community disproportionately. It is farmers who frequently have to face the consequences of fly-tipping with impacts on their business, both in terms of time and money. It is farmers that have to clear up the mess and pick up the bill for waste illegally dumped on their land. Fly-tipping also presents a risk to farm animals, wildlife and the environment. The reality is that there is no accurate information on the number of incidents of fly-tipping on private land as there is no requirement to collect this data.

35,434 recorded incidences of
fly-tipping
in 2017/18,
however this does not include incidences on private land

Other anti-social behaviours that impact on farm businesses include illegal off-roading, trespass, illegal camping, littering, damage to fences, leaving gates open and inconsiderate parking on narrow lanes and in gateways, which prevent and hinder day to day farming activity.

Welsh farming provides the backdrop for the tourism sector in Wales contributing £2.8bn to the Welsh economy

There has been a threefold increase in land accessible by right since devolution

this includes
over 16,000 miles of footpaths,
3,000 miles of bridleways,
1,200 miles of cycle network and
460,000 hectares of open access land

Wales has three National Parks and six AONBs

covering 25% of Wales' land area

What's needed for the future

Farmers play a pivotal role in maintaining and enhancing our landscapes and in providing access to the countryside so it can be enjoyed by everyone. To enable them to continue to do this, it is important that the work they do is recognised and supported by future policies.

- The continued maintenance of Wales' iconic landscapes cannot be guaranteed where the viability of farm businesses is challenged. Positive landscape outcomes are underpinned by ongoing active management by farmers. Landscape, and the maintenance and enhancement of it, is an important public good that should be fairly valued in the future policy for Wales.

- Welsh Government policies must recognise that our landscapes are productive, working landscapes that are dynamic and constantly changing. Our designated landscapes must reflect this and the purposes of both National Parks and AONBs should seek to enhance equally economic, environmental, social and cultural well-being in line with the Well-Being of Future Generations Act.

- Trees and woodland are important landscape features and many farmers in Wales recognise the multiple benefits of woodland on farm. Appropriate incentives and rewards are required for the planting and ongoing management of lone trees, small groups of trees, hedgerows, shelter belts, field corners and parcels. This support should be simple and straightforward for farmers to apply for.

- Future policy must also recognise the constraints of hill farming and its important economic, environmental, social and cultural contribution across Wales' uplands. This can only be achieved through appropriate reward for food production, environmental management and public goods delivery.

- Wales has the greatest length of rights of way per square km in the UK as well as significant access land (in excess of 460,000 hectares) for the purpose of outdoor recreation, the aim of future policy should be to better promote and resource improvements to existing access opportunities rather than creating more.

- Access provision can have high costs and impacts to farm businesses. Any new public access should be voluntary, should not increase the liability on farmers, and future policy should fairly reward farmers for the provision of permissive access and education access.

- More action is required to prevent and address livestock worrying by dogs with increased awareness of, and adhering to, the Countryside Code with increased levels of accountability on dog owners where they do not.

- A partnership approach including local authorities, the police, Natural Resources Wales, private landowners and the public is required to prevent, clean-up and prosecute incidents of illegal fly-tipping. A statutory duty should be placed on local authorities to investigate incidents of fly-tipping on private land.

- Concerted action is needed from the police, Natural Resources Wales and the local authorities to address and stamp out anti-social behaviours on and around Welsh farms.

Case Study

William Lawrence

Dairy and arable farmer, St Davids

"For me, it is a privilege to call this landscape my office.

My family have been farming here for generations. We run a dairy and arable farm on the Pembrokeshire coast, where we have over two miles of public footpath welcoming visitors from Wales and across the world. We have farmed alongside the footpath since it opened, and are used to the public using the paths. It is something we try and embrace as we understand its importance to the local economy, also recognising the benefits of engaging with members of the public so they develop an understanding of how their food is produced.

The beautiful landscape which we farm only looks as it does through active farm management, such as cattle grazing. It is important to remember that much of the Welsh landscape is managed and maintained by farmers, and this work is only possible where there are viable and productive farm businesses. Ours is just one example of how a farm can be managed productively and sustainably whilst caring for the environment. It is not in my interest as a farmer to damage the environment in any way, as it is a major asset of my farm and fundamental to our success now, and in the future

It is key to our business that we are able to graze this landscape, essentially transforming grass into high quality protein. It is a process that we are proud to share with the public. We continually fence off habitats, allowing cows to graze safely and to ensure they don't encroach onto the footpaths to improve the visitor experience. This also has an environmental benefit, protecting habitats for wildlife.

Footpaths such as the ones on our farm provide a number of health benefits to the public. As well as being a place to exercise it offers tranquillity, somewhere to relax and get away from the hustle and bustle of modern life. The footpaths on our farm do at times bring some challenges. From gates left open and dogs off leads, but by and large the public are very aware, considerate and respectful of the landscape and of farming.

It hadn't escaped our attention as to how popular this area of Wales was becoming. One of the reasons people come to the area is to see a farmed landscape. The public seem to have a genuine interest in farming, though were often passing through with a lack of understanding as to what was happening on farm. This access to the public, our consumer, allows us as farmers to explain how we produce food, and care for our animals. This was one of the reasons we diversified and created Pointz Castle Ice Cream. The ice cream parlour is linked to our dairy herd, having a short supply chain of around 10 yards, providing a cow to cone experience. This allows the customer to see where their food comes from as well as experience a working, productive dairy and arable farm.

We as farmers have a lot to be proud of; we produce top quality food and care for the iconic Welsh landscape. It's a responsibility and a privilege to farm this landscape."

Today's Biodiversity

Farmers recognise the important contribution of biodiversity to productive, profitable and progressive farm businesses. A range of crops rely on, or benefit from, pollination from bees and other pollinating insects; creatures including beetles, hoverflies and spiders can help improve productivity by reducing the threat to crops from pests; boundaries, trees and woodlands provide biosecurity benefits and shade and shelter for livestock, particularly in extreme weather.

Alongside producing safe, high quality, affordable food, Welsh farmers play an integral role in protecting and enhancing the countryside, providing habitats for a range of species, and contributing to the resilience of ecosystems through habitat diversity, connectivity between habitats and ongoing active management.

Many valued habitats and species are found on Welsh farmland and are reliant on active management by farmers – this includes lowland meadows, upland hay meadows, arable field margins, hedgerows and ancient woodlands. Farming also plays a critical role in creating and protecting other significant habitats, for example, the grazing of upland habitats and salt marsh.

Farming has played a key role in the creation of these habitats which are now valued for their biodiversity, the best examples of which have been protected as sites of special scientific interest (SSSI) because of, and not in spite of, their ongoing management by farmers.

We must highlight the very important role of our native Welsh livestock breeds, in particular, hefted flocks that are becoming threatened with under-grazing of habitats increasingly observed. This genetic resource is afforded protection under Aichi Target 13 and it is vital that the genetic diversity of our farmed livestock, together with the highly specialised skills, required to keep them are not lost.

Scientists estimate that one quarter of species on planet Earth live in soils

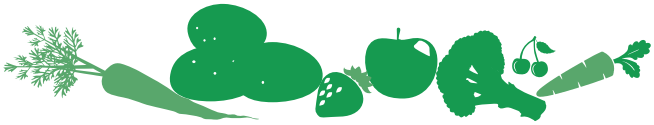
Wales has a wide range of species across a broad range of taxonomic groups with estimates varying from 25,000 to 50,000 species

It is estimated that pollinators add approximately

£600 million

per year

to the value of UK crops through increased yield in oilseed rape and the quality of fruit and vegetables



The Natural Resources Wales (NRW) State of Natural Resources report identifies that the diversity of habitats across Wales, from sea level to over 1000m, has been moulded by a long history of land management changes, and has resulted in a wide representation of species across a broad range of taxonomic groups with estimates varying from 25,000 to 50,000 species. For many species there is simply insufficient data collected to understand population trends. Much of the data that is currently collected on biodiversity focusses on specific species and habitats, particularly birds.

Evidence collected on the impact of a type of habitat management tends to focus on one species and not all the species benefitting from that habitat with the resulting in more common plant and animal species often being overlooked, and significant gaps in data emerge because it is not recorded. This lack of data means that the role of more general farm management in providing for more common biodiversity gets underplayed, even though it is still important.

The Glastir Monitoring and Evaluation Programme identified the overall picture of biodiversity in Wales is complex and variable. Some positive trends have been observed, including the presence of plant species which are indicative of good condition for habitat and improved land. This includes an improvement in the priority habitat Blanket Bog where a significant increase in Sphagnum cover has been observed since 1990. There has been stable overall bird diversity over the last 15 years; and whilst there has been a historic decline in specialist butterfly species, there has been no further decline over the last 10 years and there are stable trends for more generalist butterfly species.

Wales has 106,000km of hedgerows

Birds are considered to provide a good indication of the broad health of the environment because they occupy a wide range of habitats. Unfortunately the recognised dataset for farmland birds counts shows just 19 species found on farms and these have shown long-term decline since 1970. We know that many more species are found on farmland as demonstrated by the Game & Wildlife Conservation Trust (GWCT) Big Farmland Bird Count which recorded 93 species in Wales in 2019, with a total of 20 red-listed species.

As farmers, we recognise, there is much more we can do. Farmers want to engage in environmental delivery for biodiversity, maintain and improve habitats for specialist and general species on land and in our freshwaters. But this needs to be simple, easily accessible and work within current farming systems. Solutions need to be designed in partnership and offer flexibility recognising the local knowledge that farmers have, as well as the full range of factors influencing the presence or otherwise of species. This includes predation which is a significant issue contributing to the decline of some species. The delivery of outcomes for biodiversity also requires a long-term commitment to funding from Welsh Government if meaningful outcomes are to be realised.

Overall much more evidence is needed on population trends and also factors influencing species populations. The impact of climate change on species populations and distribution also needs to be understood, with recognition that climate change impacts may mean a moving baseline, and that things in the future will be different because the climate is changing. For example, an increase in biodiversity should not necessarily be expected to mean more numbers of the same species or more species which a habitat might be expected to support currently, climate change may mean that species and numbers may be different in the future. Overall changing weather patterns and increases in temperature will pose a challenge for biodiversity with both beneficial and unfavourable impacts possible.

1,500 species of insects pollinate plants in the UK

including bumble bees, honey bees and solitary bees, wasps, butterflies and moths

There are approximately

75,700 hectares of woodlands on Welsh farms

about a quarter of all woodland in Wales

A significant increase in Sphagnum cover since 1990 has been seen, suggesting a trend towards gradually improving condition in Welsh blanket bog

The spread of invasive alien species is also a growing challenge, and agriculture is often on the frontline in terms of picking up the costs and dealing with the impacts when these species establish themselves on farmland and on waterways.

Similarly, decisions on reintroducing species, particularly where they have been absent for hundreds of years, need to be taken in the context of the impact they will have on local wildlife and biodiversity, as well as agricultural systems.

Whilst rewilding, as a concept, has received increased focus in recent years, it has many and varied definitions, and means different things to different people. Rewilding and non-interventionist approaches to land management are at odds to how we use our land in Wales currently, where over 80% is farmed for the production of food alongside the delivery of environmental goods. Rewilding also challenges the delivery of economic, environmental, social and cultural well-being and the duties placed on public bodies established in the Well-Being of Future Generations Act.

The 2019 GWCT's Big Farmland Bird Count saw over

90 species

20 of which were on the Red List of Birds of Conservation Concern

What's needed for the future

Farmers will continue to play a pivotal role in improving biodiversity by providing and maintaining habitats and food sources for a diverse range of wildlife. To enable them to maintain and enhance this work it is important that the work they do is recognised in future policies.

We need:

- Recognition that farmers will be in the best position to manage land for environmental benefit if they have profitable businesses. Food production and positive environmental benefits for many species are intrinsically linked and ongoing active management by farmers should be fairly rewarded.
- Future policy should be simple and accessible to all farmers in Wales and work within farming systems. It should be flexible and recognise the local knowledge of farmers as well as the need to support broad environmental delivery – sustainable agricultural systems across Wales - that supports the wider range of species and habitats found in the farmed environment.
- Policy should secure the continued maintenance of existing habitats in addition to measures for creation and restoration – including both temporary measures such as annual wildlife flower margins and longer term such as hedgerow management and woodland creation.
- Future policy should recognise that many of our most precious species and habitats arise on agricultural land and are reliant on ongoing management by farmers. Widespread land use change or non-interventionist approaches should not be the desired outcome of a future policy approach.
- A long term commitment is needed to agri-environment approaches if the outcomes for biodiversity are to be realised. This support should be directed at the active farmer and the tenant where the farmer does not own the land that they farm, recognising that outcomes are often linked to agricultural activity and rely upon ongoing management by farmers.
- Extensions to Glastir contracts should be offered and continued until the new schemes are fully operational to avoid a cliff edge in environmental delivery.
- Future policy must recognise that the baseline is changing as a result of climate change.
- The collection and provision of better data on wider biodiversity and more general species and habitats found across the landscape is needed together with the full range of factors influencing species populations so appropriate measures can be put in place where protection is needed.
- The reintroduction of species should be subject to full consultation taking into account the concerns of local farm businesses.
- Rewilding approaches at all scales should be subject to full impact assessment which considers the economic, environmental, social and cultural impacts.

Case Study

Alex Higgs

Livestock farmer, Llanidloes

"I have been farming with my husband Jolyon on 400 acres near Llanidloes, mid-Wales for around 40 years. We have suckler cows and run Welsh and Welsh mule ewes to produce prime Welsh beef and lamb. We work with the environment to enhance the beautiful landscape that we farm through productive farming. We find that many of our farming methods complement habitat restoration and creation, as well as encourage biodiversity.

Over the years we have planted around 5km of mixed species hedges and laid and managed original farm boundaries. As the farm runs up to 1,200ft these act as valuable shelter in winter and shade in summer, while at the same time providing nesting sites and food for birds, cover for small mammals and pollinating flowers for insects. These hedges connect with woodlands so that there are corridors for wildlife. We have planted deciduous and conifer woodland, and fenced out and thinned existing woodland. Also, we have provided bird boxes for additional nesting sites and are pleased to see many species benefiting from these projects. All these trees, of different maturity and size, are capturing carbon while at the same time enhancing our work place and increasing biodiversity.

The farm has brooks and a river. We have fenced out some waterways to stop erosion and allow regeneration of long grasses and flowering plants. Along the river we have reduced stocking levels to allow flag iris and meadow sweet to flower and to minimise damage to the banks. The river is full of invertebrates, small trout and salmon. It is great to watch the dippers speeding up and down the river 'high-way' and the odd glimpse of an otter are always exciting. In summer as the flies hatch they provide food for acrobatic swallows, house martins and swifts.

There is a large expanse of rock covering 30 acres on the farm. This area is hard to gather and shepherd so over the years we have decreased the numbers of sheep. This has encouraged heather, wood sage, broom, flowering plants and small shrubs. In July the Craig looks spectacular and provides a wild area for mammals and reptiles to live, and there is plenty of nectar for butterflies, moths, bumblebees and honey bees.

On the farm we have a small upland bog where peat was cut until the mid-19th century. We graze this area with cattle in late summer after the plants such as the sundew, bog asphodel, lousewort, common orchid and bog bean have flowered. The cattle eat small birch trees which stops the area becoming wooded. Too many trees would suck the water out of the bog and destroy the unique habitat.

Using government environmental grants, which have been available over the past 30 years, we have enjoyed enhancing the environment on our farm. We have seen the benefits to the ecosystems and the infrastructure of the holding. Over the years we have carried out surveys to evaluate some of the wildlife: the invertebrates, plants and fish, lichen on trees and rocks, and a dawn chorus survey of the birds within a few different habitats. Seeing and hearing the wildlife as we undertake our daily jobs enhances our enjoyment of farming.

Our goal is to leave the farm in a better condition than when we took it on, whilst at the same time making a living from top quality beef and lamb. In our experience food production and habitat creation can, and do, work together. As farmers we are best placed to care for the environment we live and work in, but this can only be done if our farming businesses remain profitable."

Picture © Gary Short Photography

Today's Soil

Healthy soil provides the foundation for life. It supports plant life, helping to create the oxygen we breathe and cleansing the water we drink, as well as being the basis for all food production.

Good quality soil not only underpins our farming systems, it also helps deliver a diverse range of public goods for society – helping to enhance water quality, supporting habitats and biodiversity, enabling carbon storage, increasing resilience to climate change, and mitigating against flooding.

Farmers have an inherent interest in maintaining their land and in ensuring its long-term fertility and productivity. Wales has more than 400 different types of soil. Farmers have long focussed on soil chemical properties, addressing acidity through liming, and optimising nutrients available to crops through soil sampling. Recent years have seen an increasing interest in, and wider adoption of, practices designed to maintain and enhance soil quality – physical, chemical and biological properties.

This includes the use of techniques such as the use of reduced tillage technology so soil is not overworked and damaged, cover cropping to reduce soil erosion and replenishing nutrients essential for crop growth, and the use of low-impact machinery to reduce soil compaction, which can restrict root growth and make it more difficult for water to penetrate the soil.

Welsh soils contain 410 million tonnes of carbon

Measures such as boundary run-off control, erosion management and riparian zones are also of fundamental importance in protecting topsoil as an important resource. But while all these steps are acknowledged as being beneficial to soil health, there is very little in the way of recently collected data to support this knowledge. Soil is an extremely complex system and there is still much to be researched and learned on a practical scale. No data exists on the extent of compaction in grassland and arable land across Wales specifically. The severity and spatial extent of soil erosion has not been directly quantified in Wales. There is also a general lack of information on the current state and trends of soils in Wales.

Levels of soil phosphorus in improved land are stable and within the appropriate zone for sustainable production whilst presenting a lower risk to waters

The more farmers know about their soils, the better placed they are to actively make strategic management decisions to maintain and improve the health of their soil, from informed choices about cultivation methods and crop rotations, to decisions regarding the input of organic matter. The use of compost and digestate can help improve soil organic matter, reduce the use of manufactured fertilisers, and means more material is recycled into the land.

Good data is absolutely essential to benchmarking the current situation and measuring our progress towards improving our productivity, whilst reducing our environmental footprint and enhancing the delivery of the diverse range of public goods described above. More research is also required to understand climate change related risks and how these may impact on the services that our soils provide.

Whilst progress is being made there is more work to do. Farmers have become increasingly aware of the link between good soil management and increased productivity and of the need to protect and enhance this precious resource for all the services it provides for the future.

A teaspoon of soil contains more living organisms than there are people living on earth

Going forward, more must be done in this area of research, with the findings of the latest research transferred into practical on-farm actions.

For example, the Glastir Monitoring and Evaluation Programme (GMEP) observed that soil carbon has been stable in improved land for 30 years.Soil acidity declined for all habitats up until 2007, a trend that has now reversed in improved land with an increase in acidity observed – possibly reflecting lower levels of lime usage over the period.

The same study also reported 40% of drains in arable and improved grassland are in need of repair or replacement. Both these trends have implications for productivity. It is also important to recognise there are also implications for the environment - poor drainage of grassland can result in enhanced emissions of nitrous oxide emissions - an important greenhouse gas - and an increase in soil compaction issues.

It is important to recognise that the productivity gains and returns from the market are likely to be insufficient to drive widespread uptake and change on their own and appropriate measures and support from government will be required.

Soil carbon has been stable in improved land for 30 years

Soil nitrogen levels are stable in improved land. The observed decline in soil N in habitat land is likely to be beneficial for native vegetation

Soil is the world's largest Carbon sink and Wales has more than 400 different soil types

What's needed for the future

Healthy soils provide the foundation for life. Good quality soil not only underpins Wales' farming systems, it also delivers a range of public goods. To enable farmers to continue to improve soil health requires a focus on biological, chemical and physical properties. It is important that this work is recognised and supported by future policies.

- More research and the collection of more reliable and robust data on soils that can be used at a farm level to help farmers make informed management decisions for their businesses, is needed.
- Given the diversity of soils in Wales, future policy on soil management should not be oversimplified. A 'one size fits all' approach could be detrimental to soil health in some sectors and some areas of the country.
- Policy should reward farmers for deploying a range of actions for improving soil health such as cover cropping, increasing soil organic matter, nutrient management planning and reduced tillage if appropriate to the farming system.
- Future policy should also include investment support to incentivise uptake of the latest machinery and technologies that contribute to improved soil health in Wales.
- Further work is required to understand and quantify the public good/ environmental benefits of practices, such as liming, to reduce soil acidity and drainage repair and replacement in arable, and improved grassland and the role of future agricultural policy in supporting these measures which are win-wins for the environment and productivity.

Case Study

Walter Simon

Potato farmer, Pembroke

"As a potato grower, healthy soils form the foundation of all I do.

For me it is vital that I have an understanding of my soil. With knowledge I am better placed to make decisions to maintain and improve my soil health. The soil type of most of the land I farm in Pembrokeshire is mainly sandy loams, but there is a variation in most fields. Because of this soil type, I have to be selective where to plant the potato crop. There is little point in trying to grow a quality crop of potatoes in a field that has too high a clay content, or in a field where the soil condition is poor. I want to produce the best product I possibly can. In order to do this I need to understand my soil, and be flexible to the needs of each field, adapting my farming methods to suit.

There are a number of ways I manage and monitor my soil. Getting the correct crop rotation is one way to improve and maintain the health of the soil. To sustainably produce a quality crop of potatoes I need a wide rotation. A wide rotation is important as it is ensures there is no carry over of pathogens from the previous crop, and is a way of making sure all the inputs are efficiently utilised, helping grow a high yielding crop. In each field, I grow a crop of potatoes every six years and in the intervening years the soil grows a range of crops, with some fields in a grass rotation and others in an arable rotation.

I want the soil to be healthy as it will then produce a quality crop of potatoes; the use of cover crops helps achieve this. Having a cover crop planted over the winter months helps transpire water out of the soil, stabilising the soil with its roots, and feeding the soil micro-organisms. Also, soil compaction can be an issue, which is why it is important to have a cover crop growing over winter, helping to protect the soil from heavy rain fall. This makes the soil more friable when I come to cultivate and plant the potato crop. I plant a cover crop of oats and vetch in fields following cereals, planted in September and cultivated in late March, early April. I chose these varieties for a number of reasons. Oats help capture any nitrogen but are also different to wheat and barley which are also in the rotation. Vetches help balance the nitrogen levels in the soil and add diversity to the rotation.

"Cover crops also help deliver an integrated solution for pests, weeds and diseases. I plant the cover crops using a minimum tillage method with the aim to reduce soil compaction. Also, when appropriate I use nutrients to increase the health of the soil. These include farmyard manure, lime and artificial fertilisers.

Over 80% of the land on which I grow potatoes is rented. For me, it is important to properly manage the soil of all of the land I use, rented or owned. Firstly, it is important to me, as a farmer to properly manage my own land and that of my friends and neighbours from whom I rent from. It is also vital for my business that I have land available, so proper management is crucial. I assess the soil before deciding on any rental agreements. I check the soil type across the field, as well as asking the land owner of their experience of the fields growing conditions.

Healthy soil delivers so much for the environment, it is home to diverse and complex ecosystems, stores carbon, alongside producing top quality food."

Today's Water

A clean, reliable source of water is vital to all farms. But water management is about more than ensuring farmers have enough water to meet their business needs.

Flood risk management (taking steps to reduce the risk of flooding and managing flood water when flooding does occur) and water quality (taking steps to reduce agriculture's impact on water) are also essential elements of the work farmers do.

By storing water on land at times of flooding, using water more efficiently, and reducing water run-off from land, farmers are helping communities cope with extremes in rainfall and dry weather conditions and maintaining and improving water quality. But farmers can only deliver these benefits, whilst producing high quality food, if their businesses are resilient to volatile weather and markets.

Flood Risk Management

Farmers carry out a range of work to help mitigate flood risk, and farmland plays a key role in flood management, but this work is often not well understood or acknowledged, and the impact of flooding events is not fully realised.

The work farmers do helps to increase the resilience of their land as well as reducing the risk of flooding to local communities. Actions such as soil management, cover cropping, strategic tree planting and farmyard water management are already widespread, and are important public goods for society. More research is needed to get a clearer picture of the flood mitigation farmers are involved with, and also on the development of further practical measures applicable at farm level in the context of a changing climate.

There are an estimated

9,500-16,000km

of headwater streams

in Wales and there has been an ongoing improvement in condition based on macroinvertebrate and nutrient levels

Pesticide use is now highly targeted with 50% less active ingredient being applied since 1990

Wales has approximately

24,000km of rivers and streams

and

558 lakes

including

150 large scale reservoirs

A strategic approach to flood risk management which recognises the importance of food and farming to the wider economy is needed. It is important that if farmland is allowed to flood and protect urban communities further downstream, that this is voluntary and is done by design rather than default, and that the full value of this land in terms of food production, environmental benefits and infrastructure protection as well as the full costs of remediation are acknowledged.

Water Resources

Water is essential to grow high quality food and to sustain Wales' largest manufacturing sector, food and drink, which contributes almost £7billion to the country's economy. Water is a vital element across all agricultural sectors, from dairy and livestock to arable and horticultural production.

Most farm businesses require access to a reliable source of water all year around for a wide range of activities including livestock drinking, supplementary irrigation, washing and cleaning.

Farmers use less than 2% of the total water abstracted in the UK

57%
of farmers

say they have experienced extreme weather conditions in the last 10 years

Farmers rely on a combination of rainfall, mains water and abstracted water to meet their needs. In Wales, 74% of our farmland is grassland, reflecting the fact that we are blessed with the natural resources to produce high quality protein in the form of meat and dairy products from grass. It takes an estimated 14,000 to 17,000 litres of water to produce a kilo of beef, however, in water-rich countries such as Wales as little as 0.4% of the total water needs of livestock production is 'blue water' from public supplies.

Increasing demand for water arising from population growth, coupled with climate change and events like the 2018 drought, already threaten farmers' access to secure water supplies for some farming sectors and their ability to produce high quality food at affordable prices.

It is important to recognise that water use for food production in Wales is much smaller than when compared to many countries we import food from. With British farms currently producing only 61% of the country's food there is an increasing focus on the impacts of food imports, not least the impact on water used to grow imported food. Of the UK's total water footprint 75% is attributed to 'external sources' or imported goods.

In line with the Well-Being of Future Generations Act and the goal to be a 'globally responsible Wales' there are persuasive reasons to increase the production of home-grown food, where possible, to replace products from overseas that have a higher water footprint.

Farming Connect

have supported nutrient management planning on over

1,800 Welsh farms with 1,383 farmers having undertaken the pesticides training via the programme

Farmers use less than 2% of the total water abstracted in the UK, meaning water allocation for food production is minor compared to the public supply and energy sectors, however, this water is often required in the driest years and in the driest months when resources are most under pressure.

Farmers are efficient users of water but more can be done to increase their performance and also in contingency planning to improve resilience to extreme weather events, such as the dry weather of summer 2018. Some farmers have built reservoirs to collect and store surplus water for use during periods of dry weather. These are also valuable havens for wildlife, and future policy needs to include mechanisms so more farmers are able to undertake this type of activity.

Water Quality

Over the past 25-30 years, farmers have been able to reduce the negative impact they have on water quality through a variety of measures which includes the increased use of precision technology and nutrient management planning, and ensuring nutrients are applied during the right conditions and with the right quantity to meet and not exceed crop needs.

Nitrogen fertiliser applications
have reduced by
45%
between 1990 and 2013

The efficient use of nutrients plays a major part in improving water quality and Nitrogen fertiliser applications reduced by 45% between 1990 and 2013 with applications of phosphorus falling by 37%.

The application of slurries, manures, composts and digestate in appropriate conditions and to meet crop needs is a valuable practice and has multiple benefits including productivity, soil condition and reducing reliance on inorganic fertilisers.

Responsible use of pesticides is common practice on Welsh farms, pesticide use is now highly targeted with 50% less active ingredient applied since 1990. Almost 1,400 farmers have undertaken pesticide training in the current Farming Connect programme. Steps like fencing out watercourses, creating buffer strips, and soil and land management techniques all assist in reducing run-off rates and protecting water courses.

Overall water quality in Wales continues to show general improvement. Water Framework Directive investigations show that agricultural practices are contributing to the failure of less than 15% of waterbodies in Wales. In terms of agricultural pollution incidents each year, there are in the region of 100-200 incidents, 20-25 are classified as category 1 and 2 – the more serious type.

Over the period 2001 to 2018 there is no discernible trend so whilst the situation, in terms of number of incidents, may not be worsening, it is not getting better either. As a result, tackling water pollution caused by agriculture, from both point and diffuse sources, continues to be a key priority for the sector.

At a practical farm level this requires a focus on:

- Farm infrastructure including fit for purpose slurry, manure and silage stores and clean-dirty water separation
- Effective nutrient management with applications under appropriate conditions and targeted to meet crop needs
- Good soil husbandry to reduce sediment run-off
- Responsible utilisation of pesticides

NFU Cymru is committed to supporting the development and implementation of a framework that supports farmers to take action where this is necessary. This work, taken forward by a partnership of organisations through the NRW Wales Land Management Forum Sub-Group on agricultural pollution, sets out the spectrum of approaches required if we are to achieve the outcomes we all want to see, including advice and guidance, well-resourced investment support, enabling innovation and the development of voluntary 'earned recognition' approaches underpinned by a backstop of regulation as last resort.

Water Framework Directive investigations show that agricultural practices are contributing to the failure of less than 15% of waterbodies in Wales

In 2018

The majority of bathing waters in Wales were classified as excellent. None were classified as poor

What's needed for the future

Farmers will continue to work to reduce the risk and deal with the consequences of flooding, to use water even more efficiently, and to reduce farming's impact on water quality. To enable them to do this, it is important that the work they do is recognised and supported by future policies.

- Future policy should properly recognise and value the flood risk management service that natural flood management provides to downstream communities, and fairly reward farmers who get involved in these approaches.
- Greater value should be placed on agricultural land in flood risk appraisals recognising the importance of having a resilient food and farming sector.
- The future policy should include volatility/ stability measures including those designed to help farmers cope with extremes in weather and climatic events, as well as measures that enable farmers to make investments in water management infrastructure like reservoirs and drainage.
- Farmers, now and in the future, should have a fair share of available water to grow our food, with improved security of supply at times of water scarcity.
- Future policy should support a base tier of actions, such as nutrient and pesticide management, common to most farming systems and also include options for improving water quality including buffer strips and fencing of water courses.
- Future policy should also include investment support for infrastructure projects like slurry storage and clean dirty water separation, new technologies like low emission spreading equipment and innovative tools like nutrient management planning software.
- The regulatory framework around water should be reviewed to ensure a more holistic, practical, outcome focussed approach that is proportionate and spatially explicit.
- Government and regulator should pro-actively support the development and implementation of 'earned recognition' approaches where these are able to deliver the same, or better, outcomes than regulation.
- More work is needed to encourage the development and support of new approaches to funding improvements to water quality, such as Payments for Ecosystems Services, through the private sector.

Picture © Gary Short Photography

Case Study

Aled Jones

Dairy farmer, Caernarfon

"I am always striving to improve farm management standards, animal health and welfare, genetics, nutrition, animal and soil productivity, all of which whilst taking care of the environment.

Farming near the town of Caernarfon with my son Osian, my family have nine generations of unbroken farming tradition. The herd currently consists of 450 pedigree Holsteins milked three times a day. All the dairy heifers are reared on contract from four months of age before returning one month before calving at 23 months of age. Some of the forage is grown on contract with slurry or manure exported in exchange.

The relationship between water quality and agriculture has increasingly been under the spotlight and if put simply, I do not want myself, or the industry, to be branded as a polluter. My family have been farming for a long time and hopefully for many more generations to come. As a caretaker of this land I aim to pass the farm on in a better condition than I received it.
From a business perspective, any water contamination represents nutrients being lost which has a financial implication, as is soil erosion. As farmers it is important that we appreciate the monetary value of slurry, and understand how to make better use of it to enhance our businesses. Inorganic fertilisers are unlikely to become cheaper, adding to the importance of making better use of the natural nutrients we have on farm.
As a business we have made significant reductions in the amount of fertiliser we purchase through targeted application of slurry.

One of the key requirements of better slurry management is having sufficient storage capacity and significant investments have been made on our farm over the last 40 years. We accept that these facilities will need to be continually reviewed to make sure they fulfil the business requirement. We must be in control of slurry, and not be controlled by it.

A Farm Nutrient Management Plan has helped to maximise the economic value of farm slurry and manure nutrients, safeguarding over application. The plan identifies soil types, topography, water courses and springs. Crop nutrient requirements can be calculated based on soil analysis, pH, P & K, and target yields.

Government grant aided support has been a key factor in past investment decisions, stimulating the decision making process whilst easing the financial burden. It must however be stated that there are times during low milk price periods that no capital investments can be made, even if grant funding is available, finding surplus cash to cover total costs can be impossible.

I cannot stress enough the importance of good practical advice given in a way that is non-legally threatening, building on an acceptance of trust and a sincere willingness to make positive change, taking into consideration that we do not live in a perfect world. Farming is influenced like no other industry by changeable and extreme weather patterns, the last two years weather is enough testimony. If regulations were to be imposed with strict calendar dates for slurry spreading, the inflexibility would cause immense management difficulties on my farm. With a changing climate we find a 'farming by calendar' approach is increasingly challenging.

At the heart of our business is the desire to produce top quality milk, adhering to the highest animal health and welfare standards. Everything I do takes into account our environmental and social responsibility whilst being efficient and productive, appreciating our role as farmers to protect natural resources."

Today's Air & Climate

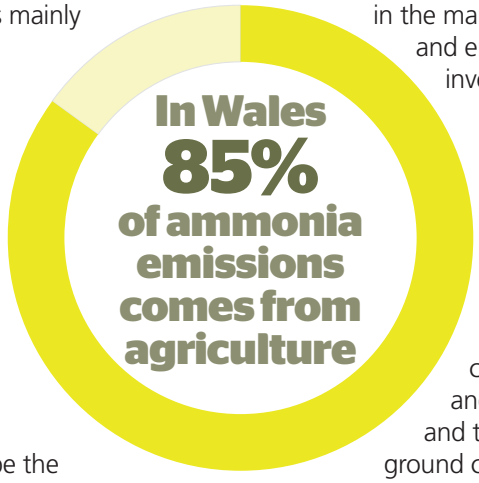
Air is the least visible element of our environment. As a society, we face two major challenges – mitigating the impacts of climate change through the reduction of greenhouse gas (GHG) emissions and improving air quality.

Greenhouse Gas Emissions

Farming is on the front line in terms of climate change impacts, being particularly vulnerable to extreme weather events. Agriculture also has a key role and is unique as a sector, being both a producer of GHG and also an important carbon sink, removing carbon dioxide from the atmosphere and storing it in soils and vegetation; also providing a range of green renewable energy.

Agricultural emissions like methane and nitrous oxide, however, are governed by biological processes that are not as easily controlled as industrial processes.

Emissions from agriculture make up 12% of Wales' total emissions currently with methane and nitrous oxide the main sources. Methane is mainly produced by livestock, particularly cattle, and nitrous oxide emissions come from the use of fertilisers on agricultural soils. At a UK level, greenhouse gas emissions from farming decreased by 16% from 1990 to 2008, with little change since.



Farmers recognise the contribution they have to make in tackling climate change and improvements in productivity, carbon capture and renewable energy production will be the most effective way to reach the ambition of agriculture net zero targets by 2040. Achievement of net zero for agriculture will require a portfolio of policies and practices, all working in combination with a focus in three key areas.

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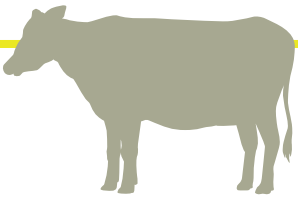

Research from the UN's Food and Agriculture Organisation shows that

beef production in Western Europe is 2.5 times more carbon-efficient than the global average

Improving farming's productive efficiency, to reduce our GHG emissions, will require continued improvements in productivity, through marginal gains in the management of crops, livestock, soils and energy supported by infrastructure investments.

On farms across Wales, carbon dioxide is being removed from the atmosphere through the process of photosynthesis. Grassland stores substantial amounts of carbon, as do hedgerows, trees and woodlands. Suitable management of grassland can improve above ground productivity and lead to enhanced root biomass, and therefore greater amounts of below ground carbon storage. The sequestration potential of hedgerows can be enhanced through active management and restoration, and Welsh farms conserve important carbon stocks located mainly in Wales' uplands. Peat soils are estimated to cover over 90,000 hectares in Wales (4.3% of the total land area) of which 75% is located in the uplands.

Farming has already made a significant contribution towards decarbonisation of its operations and the UK economy through renewable energy production, with nearly 40% of farmers already investing in some form of renewable energy production for their own supply or export to other users. There is huge potential in this area and such diversifications offer farm businesses stable and predictable financial returns, which in turn help to improve business resilience.

Policies will be needed to drive uptake and change across the three areas identified. A key issue currently relates to the fact that progress for Welsh farming is

Peat soils are estimated to cover over 90,000 hectares in Wales
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of which 75% is in the uplands.

difficult to demonstrate, as the current GHG inventory accounts for emissions for agriculture separately to the positive contribution farms can make as carbon sinks (accounted for in Land Use, Land Use Change and Forestry LULUCF in the inventory) as well as renewable energy generation. The marginal improvements across many areas of farming practice and livestock husbandry at farm level are also difficult to capture and reflect in progress. A shadow GHG inventory that reflects the farm as a system – both source and sink – is needed.

There is also a need for Wales, in addressing its climate change responsibilities, to be 'globally responsible' and recognise that climate change will not be halted by limiting Welsh food production and off-shoring it to countries across the world, which may not have the same environmental conscience, or ambition to reduce their climate impact.

The climate impact of Welsh grazing is amongst the lowest in the world. Already, research from the UN's Food and Agriculture Organisation shows that beef production in Western Europe is 2.5 times more carbon-efficient than the global average.

It is also important that Welsh policies to address climate change and meet emissions targets do not result in widespread land use change, with the burden of decarbonisation falling unequally on Welsh farming or on our rural communities with associated social and cultural impacts.

Air Quality

Ammonia is an atmospheric pollutant which is harmful to human health. Whilst in low concentrations, on its own it has no direct impact, when combined with other industry pollutants such as carbon dioxide and sulphur dioxide, the particulate matter can cause major cardiovascular and respiratory illnesses.

Ammonia is released when organic manures and fertilisers come into contact with air. In Wales, agriculture accounts for 85% of ammonia emissions with losses occurring at various stages of the agricultural process including livestock housing, manure storage, manure and fertiliser applications.

Nitrogen fertiliser is a crucial nutrient for good healthy crops, and will continue to be needed to ensure that we meet the food needs of our growing population. Manures, slurries and inorganic fertilisers are key sources of nitrogen. Most agricultural soils do not contain enough naturally occurring nitrogen to meet crop needs, so supplementary applications using manure or manufactured fertilisers are vital. However, these are significant sources of ammonia.

Ammonia emissions are reducing. Between 2000 and 2016 the National Atmospheric Emissions Inventory reported a 6.4% reduction.

Whilst ammonia emissions are an inevitable consequence of farming, there are ways they can be managed so the loss into the air is minimised and nitrogen content for crop growth is maximised. This includes:

- Changes to animal diets;
- Improvements to housing and manure storage such as slatted flooring systems or acid air scrubbers for poultry;
- Efficient spreading of manures and fertilisers with the use of low emission spreading equipment.

Investment in infrastructure and technologies to enable improvements to be made is crucial. However, it is important to note that in many cases the cost of these improvements greatly outweigh any potential business gains. Volatility in farm incomes also makes investing in the replacement of old and inefficient infrastructure difficult.

Ammonia emissions are reducing

Between 2000 and 2018 the National Atmospheric Emissions Inventory reported a 6.4% reduction.

What's needed for the future

Mitigating the impacts of climate change and improving air quality are two of the biggest challenges we face. Farmers are taking steps to reduce the amount of emissions generated by the industry, enhancing the carbon sequestration potential of their farms, as well generating green energy. To enable more work to be done, future policy should:

- Future policy should support a transition to net zero agriculture with a focus on productivity and measures that increase on-farm sequestration.
- Future agricultural policy should fund measures to lower greenhouse gas intensity and ammonia emissions by targeting investment, supporting research and development, and incentivising the adoption of technical advances coupled with training, uptake of new techniques, advice and encouraging collaboration.
- Policy measures also need to facilitate further widespread uptake of on-farm renewables addressing current barriers and enabling a route to market for both small to medium and large scale renewable energy projects.
- Welsh Government policies to meeting climate change responsibilities and GHG targets should not be achieved through off-shoring food production to other parts of the world; policies to decarbonise should also not result in widespread land use change and fall unequally on Welsh farms and rural communities.
- Policy should include options for improving air quality and investment support in the form of grant funding, to support investment in infrastructure and new techniques such as slurry stores or slurry bags and covering yards to enable further significant reductions in ammonia emissions to be made.
- Improved data capture is needed so farmers get recognition for changes in on-farm practice and uptake of techniques to improve air quality and GHG emissions.

Case Study

Guto Davies

Livestock farmer, Betws-y-Coed

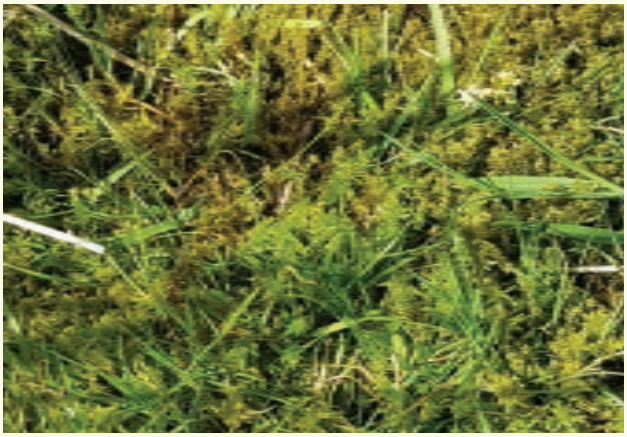
"Sustainable farming systems are crucial in addressing the problem of climate change. As farmers, we play an important role through the management of our farm environment whilst producing top quality food. On our farm, we try to ensure that our farming methods work with the natural environment and resources available.

Our farm near Betws-y-Coed belongs to the National Trust, with 50% of the land under SSSI designation. We became tenants in January 2014 on a 15 year Farm Business Tenancy. Securing this tenancy was an enormous achievement for me and my wife, providing us with a home and livelihood to raise our family. We farm 245 hectares, with grazing rights on the adjoining common. On the holding we farm 40 Limousin and five Highland cattle. The sheep enterprise comprises of a hefted flock of 530 ewes, mainly the hardy Welsh Mountain breed with some Welsh Hill Speckle sheep. Our farming system is well suited to the nature of the land and allows our quality grasses to be utilised. We are participants in Glastir schemes and a Sustainable Management scheme.

Carbon storage is one of the ways we, as farmers, help mitigate climate change. The grasses, trees and hedgerows take carbon dioxide from the atmosphere and on my farm, we manage deep peat, something that is also crucial for carbon capture and storage.

Historically, on our farm the peat carbon store was under grazed, with vegetation such as Molinia grass dominating and hindering the growth of sphagnum mosses underneath. In 2015 we undertook grip blocking. This allowed the water to rise providing a better environment for sphagnum to form and in turn build up the peat. We have also introduced cattle grazing to these areas, which has a positive environmental impact, suiting our cattle system as well as creating a healthier carbon store. The grazing cattle help to break the thatch and clear the vegetation, allowing for sphagnum to grow and to form peat. Hoof prints further help the formation of peat though creating pockets of water. This also limits the bare peat, so other mosses and heather can germinate, helping to increase the diversity and resilience of the habitat.

As well as peat creation, this process has had a number of other benefits. There are seasonal ponds providing a diverse habitat for wildlife such as the Short-eared owl, the Curlew, Lapwing and Golden Plover. Sphagnum moss also provides a healthy seed bed for heather vegetation.



This land would store carbon without intervention from farmers. However, through sustainable management combined with productive farming methods such as livestock grazing, the peat reserves are protected, can grow and build-up at a faster rate. Farmers are key providers of a healthy habitat, the carbon stores on my farm is just one example. Livestock management increases species diversity and adds resilience to the landscape, while providing food to the highest of standards and enhancing our natural resources.

In order to achieve what we have at Hafod Las, it is important to be flexible and recognise that no two years are the same. Our objective of producing top quality food, alongside managing our farmed environment, will always remain the same, however our grazing management has to be flexible to account for changing conditions, such as the weather.

It is important that there is trust in farmers to produce food and enhance the environment. I care for, and have developed, a deep understanding of my farm and the surrounding lands. A healthy environment provides a healthy habitat for wildlife and livestock alike. I am proud to be a farmer and to be able to care and manage the environment while producing top quality food."

Case Study

Harri Parri

Livestock farmer, Llŷn Peninsula

"I am a partner in my family's farming business. We rear livestock on two lowland farms in the heart of the Llŷn Peninsula and an upland unit near the Caernarfon coastline.

We aim to continually improve our business, making efficiencies and increasing productivity. Through producing more from less we are reducing the Greenhouse Gas emissions intensity per unit of production.

Profitability can at times be marginal in suckler beef and sheep production. As a business we are very detailed in the way we manage our soils and livestock. Ensuring high health, and providing balanced nutrition for both soil and livestock, enables our genetics to thrive. This has allowed us to develop a sustainable and profitable livestock system well matched to the land we farm, and making the most of the natural advantages we have here in Wales – with abundant rainfall and the ability to grow grass as well as high yielding arable crops. A big part of maximising efficiencies is selecting the right breeds that best suit our business, for example our Stabiliser cattle. For us to be as efficient and productive as possible, we needed a breed with strong maternal instincts, have high fertility and easy calving. This high fertility level and ease of calving has a significant impact on the productivity of our farm per hectare, which in turn reduces our carbon footprint.

Stabiliser cattle measure and test for Net Feed Efficiency; this identifies cattle that eat less feed but perform just as well, therefore improving profitability, using fewer resources and lowering our greenhouse gas footprint.

We have a whole farm approach, utilising all of the assets of the farm. The farm is different from field to field, providing diversity in the landscape and producing a variety of different benefits. We aim to rear our animals as much as possible on grass. We also grow our own barley, oats and fodder beat to feed to the livestock. This is beneficial for a number of reasons. It controls the risks for our business as we know the costs of production and are sure of its quality. It also reduces the farms carbon footprint as we are minimising our reliance on brought in feed. We also use the muck produced from wintering cattle inside to fertilise the land, building organic matter within the soil, holding carbon and water, helping to build sustainable and productive soil so we can grow more from less.

Being as efficient as we can on farm helps the profitability of our business, but also reduces our carbon footprint. We are not carrying inefficient cattle, and reducing the number of days to slaughter is an example of this. Twenty years ago our bull beef were going to slaughter at around 15-16 months, now they go to slaughter at 12-14 at the same slaughter weight, eating less feed, and producing a higher quality product.

Monitoring and measuring is a big aspect of our farming business. Through this, we can see the gains in productivity and growth of our stock, allowing us to set targets and to improve year on year. We have to get better to be sustainable – economically, and environmentally.

As farmers, we can help reduce climate change whilst producing top quality food so that it does not have to be imported from across the world where standards may be lower. In my experience, having a sustainable way of improving efficiency on the farm is crucial for profitability, and goes hand in hand in reducing our carbon footprint. Having that sustainability in the business, both environmentally and through efficient production, allows me to ensure that my children will be able to farm in the future and care for the land that my family have been farming for hundreds of years."

Conclusion

This report sets out the role that farmers have managing and enhancing our natural environment – Wales' key asset; bringing to life the experiences of our members, and the work they are undertaking on their farms, to maintain and enhance the quality of our nation's vital assets, whilst at the same time producing high quality, affordable food to world leading standards.

As Welsh farmers, managing 80% of the land area of Wales, we are uniquely placed to deliver a full range of environmental outcomes such as the management of our iconic Welsh landscape for the public to enjoy; maintaining and enhancing our treasured habitats and wildlife, management of our soils and reducing our impact on water, improving air quality, and reducing emissions of GHG alongside our role as food producers.

As an industry we recognise there is more we can do, farmers have a desire to leave our farmed environment in a better condition for the next generation. This report aims to start a new conversation about how we, as farmers, can be enabled to do that.

We are up for the challenge and ready to work in partnership to deliver the outcomes we all want to see, in-line with our ambition to become globally recognised as leaders in sustainable agriculture underpinning economic, environmental, social and cultural well-being in Wales and delivering for our rural communities, environment and society.