The role of trees in sheep farming

WOODLAND TRUST

NSA

Contents

iStock. Duncan Payne

Introduction

The Woodland Trust and National Sheep Association are proud to present this handy guide for sheep farmers. It contains practical advice and important information for key decision-makers on how to embrace trees for the benefit of sheep farming businesses.

This guide explains how native trees and shrubs, carefully integrated into sheep management systems, can boost production, improve animal health and welfare, provide wider environmental benefits and ultimately boost your bottom line.

Leaving the EU will herald the biggest change in support and regulation of land use and management in the UK for 40 years. Sheep farming throughout the UK has a critical role in the delivery of a new sustainable land management policy that delivers for our landscapes, countryside and producers.

Therefore, this guide also highlights for policymakers how trees integrated into sheep farming systems will deliver for sustainable farming, the environment and animal welfare. Trees are a valuable tool to help meet the Government's ambitions for farmers to be rewarded for delivering public goods alongside food production. As well as providing shelter and shade for livestock and supporting grass management and product diversification, agroforestry can help the Government meet its ambition for a more dynamic, more self-reliant agricultural industry.

This is also a timely opportunity to learn from our European neighbours, where farming and forestry are often seen as mutually inclusive, to increase timber supplies to be utilised on farm and help the UK meet its climate change mitigation targets.

Trees can boost production, improve animal health and welfare, provide wider environmental benefits and ultimately boost your bottom line.

Current situation

Despite the many benefits of trees, barriers currently exist to discourage holistic approaches to integrating them into farmland.

Funding of small-scale tree planting on farms is a grey area in the UK. Planting density in agroforestry is typically 75-200 trees per hectare, too low for woodland creation grants which require a minimum of 400 trees per hectare. Agroforestry remains ambiguous for eligibility under the pre-Brexit Basic Payment Scheme, with the interpretation of rules down to individual Rural Payment Agency inspectors. Such uncertainty has contributed to the separation of the forestry and agricultural sectors and has meant sheep farmers have not been able to fully realise the benefits that well placed trees, hedges and woodland can deliver for the sustainability and resilience of their business.

"Trees can help deliver a sustainable future for sheep farmers and the countryside."

Beccy Speight, Chief Executive, Woodland Trust

"We believe trees and valuable areas of scrub no longer being classed as the 'permanent ineligible features', as directed under the EU Basic Payment Scheme, could provide an opportunity to enhance the support for tree planting on farms without the restrictions which are currently in place."

Phil Stocker, Chief Executive, National Sheep Association

It is therefore important that a post-Brexit UK domestic agricultural policy has a more holistic approach that removes barriers for tree planting in order to enhance biodiversity and assist with the delivery of other public benefits such as water management and the wellbeing of people.

For many people, when travelling through the countryside, it is the canopy of trees across the landscape that is most valued and gives many landscapes their cherished character. Sheep and livestock grazing has played an integral part in the creation of these resilient landscapes that have withstood the test of time.

The Woodland Trust and the NSA therefore encourage the integration of trees on farms. As well as having environmental and societal benefits, trees provide production, health and welfare gains for sheep. From minimising losses in outdoor lambing systems by providing shelter, to planting boggy areas that harbour the mud snail involved in the liver fluke lifecycle, tree planting can be hugely positive with minimal loss of productive farmland.


National Sheep Association

The benefits of trees to sheep flocks

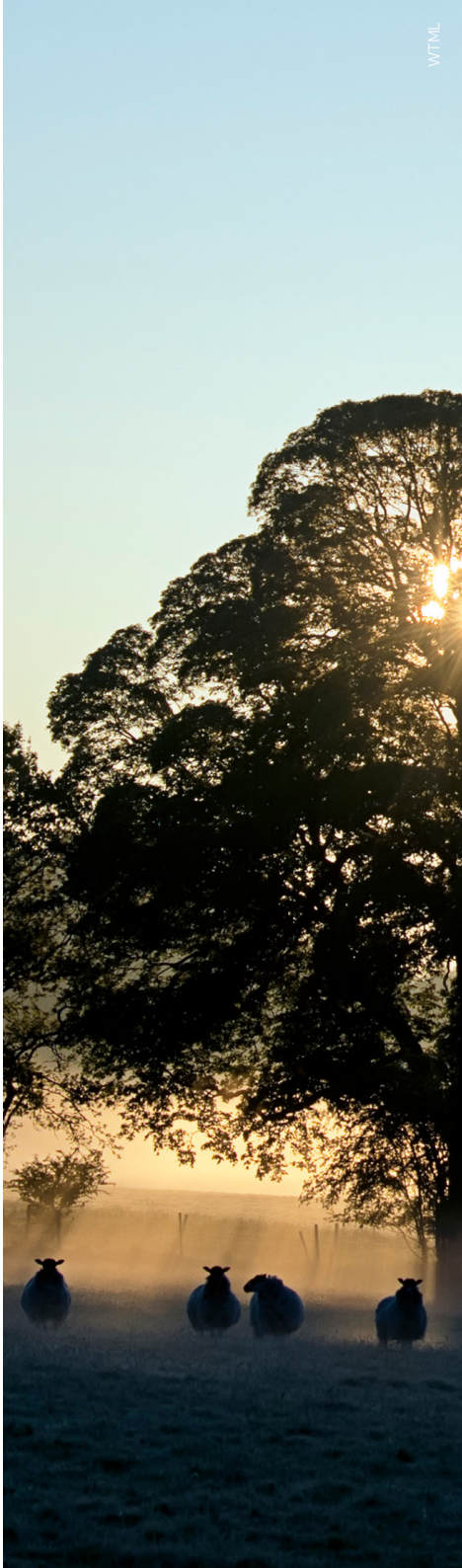
Shelter and shade

Exposure to the cold is a cause of major neonatal loss of lambs, with around one-third of lamb deaths attributed to exposure and starvation. Whether lambs are born in outdoor lambing systems or ewes are quickly returned to the field once they've given birth, good shelter can make a real difference to survival rates in young lambs.

Sheltered, well-drained fields provide the best physical conditions for outdoor lambing systems and good mothering. By creating a favourable situation for ewes and young lambs, lamb mortality can be reduced through improved bonding with the ewe, better suckling and colostrum intake, and lower exposure to disease risk, all of which also give greater resistance to the cold.

Studies have shown that in cold, wet and windy weather, lamb losses can be reduced by up to 30% if good shelter is provided. Twins and triplet lambs derive the greatest benefit from shelter due to their relatively lower birth weight and higher susceptibility to cold, wet and windy conditions. Trials have also shown that daily liveweight gains will increase by 10-21% as a result of good shelter provision.

With the exception of the Pontbren project (see page 11), much of the hard evidence that exists about the impact of shelter on farm productivity comes from research conducted in other countries. The Multiland project (see page 8) plans to rectify that and quantify the impact of shelter in the farmed landscape.



CASE STUDY

Thomas Gibson – providing shelter at lambing time in Ballymena, Northern Ireland

Thomas places great value on the trees his father Ian planted at Rathsherry Farm, Broughshane, in the late 1980s. He has stuck with them, even when the Government completely changed its stance on planting densities, believing the benefits are there for his flock.

The challenge. As on many farms, Thomas frequently faces cold winter winds and snow just before and around lambing time. In years without snow, warmer and wetter conditions have made liver fluke more of a problem too. More extreme weather patterns in both summer and winter means he is increasingly seeing the benefit of the trees planted by his father – but changes in agri-environment policies over the years have brought mixed messages and made it difficult to know what to do with the land that was originally planted under a Government scheme.

The solution. Thomas explains: "My father planted 14 hectares of agroforestry nearly 30 years ago, using grant funding that covered the land preparation, fencing and planting. Trees were planted at six-metre intervals, running north-south and east-west, with the spacing dictated by a policy specifically aimed at integrating trees into livestock grazing systems. Changes in Government policy saw my father rip some of the trees out, as we were unable to claim the land under the Single Payment Scheme (as it was then). We were told there was not enough space between the trees for livestock to graze and the leaf litter made it ineligible. This seems such a waste – to be paid to do one thing by one Government and then forced to do the opposite not many years later. However, we have kept around 8ha and it's a huge benefit to the farm."

"The trees are a good source of shelter for the sheep all year round. During the summer months the trees prove useful in providing shade from the sun and during the winter months the sheep are able to shelter from the elements, protecting them from issues arising from exposure, such as wind chill. This means the sheep can put their energy into lamb production, rather than into keeping warm. The trees have been beneficial and effective in keeping the land dry too, which helps to reduce liver fluke within the flock. Having the trees is also a boost for the local wildlife and habitats, which brings more biodiversity to the farm and allows us to take part in countryside management schemes."

Thomas Gibson, Northern Ireland sheep farmer

RESEARCH UPDATE

The Woodland Trust is supporting research with Bangor University to gain further understanding of how trees and hedges can make sheep farms 'weather smart'. Using an electric sheep to mimic a breeding ewe, the Multiland Project is collecting data to measure how much energy sheep need to survive in adverse weather conditions and quantify the benefits of shelter.

Dr Andy Smith, senior lecturer in forestry at Bangor University's School of Environment, Natural Resources and Geography says: "If it's very cold, a sheep burns more energy to keep warm for survival and it needs more food. Conversely, if it's too hot, animals tend to eat less and seek shade to keep cool. Both situations affect weight gain and productivity because energy that could go into growth is used to regulate metabolism instead."

The project is examining how the strategic placement of hedgerows and tree shelterbelts could improve animal welfare and productivity by maintaining a positive energy balance and providing an alternative source of browse. Hedgerows and shelterbelts also support the delivery of public goods such as habitat connectivity, landscape character, carbon capture and flood mitigation.

The project has the potential to improve economic sustainability of sheep farming through:

- Reduced animal mortality especially during lambing
- Increased liveweight gain per animal
- Increased liveweight gain per unit of feed input
- Increased sward production per unit area
- Reduced costs associated with sward management
- Mitigation against the impact of extreme climatic events such as heatwaves and heavy snow
- Increased confidence to lamb flocks outdoors
- Reduced costs associated with supplementary feeding, concentrate and licks
- Enabling farmers to access additional sources of income via agri-environmental schemes, and potentially the delivery of public goods in the future

Early data has shown that an average three-month winter temperature of 6°C requires a flock of 100 animals to eat 189kg of dry matter silage just to stay warm and replace energy lost from production. Reducing losses to the environment by increasing shelter could therefore increase the efficiency of food utilisation.

Once further data has been collected, a web-based app for farmers and advisers is planned. The app will support the design of tree and hedgerow shelter for maximum benefit to a flock's wellbeing and performance, while enhancing the provision of public goods in the farmed landscape.

Animal health and welfare

Trees and hedges contribute to improved animal health and welfare in a number of ways. In addition to potentially reducing neonatal lamb or adult losses due to exposure to hot or cold weather extremes, trees can help improve general health and welfare through improved nutrition, reduced stress and improved immune function.

Liver fluke. In recent years, the tendency for winters to be wet and warm has favoured conditions for the tiny mud snail that is a vital part of the liver fluke lifecycle. This has increased incidences of the disease, heightening the need for fluke-infected farms to employ new management techniques for effective treatment and control, and for non-infected farms to quarantine stock to avoid introducing the parasite. When siting tree shelterbelts, the opportunity can be taken to fence out wet areas where the mud snail and, therefore, liver fluke is known to be prevalent. Tree shelterbelts and wide hedges – particularly those on a slope – can also increase water infiltration into the soil, reducing water and wet conditions where the snails hosting the parasite will live.

Mastitis. Teat lesions in ewes increase the likelihood of mastitis-causing bacteria entering ewes' udders and causing disease. Exposure to cold winds can worsen teat lesions and contamination of the udder by mud can predispose ewes to infection. Therefore, providing tree shelterbelts may reduce the risk of mastitis.

Lameness. There are many causes of lameness, that all adversely affect sheep because they are painful. Lame ewes are less likely to conceive, leading to reduced lambing percentages, and as their body condition is affected they give birth to smaller lambs and, due to reduced milk production, rear lighter lambs too. Lameness can also lower fertility of rams. Damp conditions underfoot can lead to lameness due to the softening of the interdigital space on the foot which increases the chance of infections such as footrot. Poorly drained pasture together with overstocking causes poaching, which can increase incidences of lameness, the spread of disease and soil balling on hoofs. Adding in tree belts across a slope can help to intercept runoff and reduce water collecting on pasture, therefore reducing poaching and the associated issues.

CASE STUDY

Jimmy and Graeme Sinclair – reducing flooding in Midlothian, Scotland

Crookston Farm is owned by Lord Borthwick and, for the last 18 years, has been farmed by Jimmy Sinclair. With his son Graeme now also involved, the 800ha beef and sheep unit at Heriot, near Edinburgh, has been adapted to incorporate some 90ha of trees.

The challenge. Crookston Farm is prone to flooding and over time Jimmy has struggled with high losses of stock due to the wet ground and flood water. A particular 20ha area has been rendered near unusable due to its severe flood risk and lack of quality for the sheep to graze. Rather than leaving this land as unusable Jimmy wanted to explore his options and even considered installing solar panels, although he soon discovered that the farm was too remote for these to connect to mains and so would be unrealistic.

The solution. Jimmy was introduced to the Tweed Forum, which assists farms across the region with land management, and assisted him with the necessary paperwork and permissions. He then planted a wide variety of trees in the 20ha that were deemed too poor for stock, including 5% scots pine, 37% downy birch, 19.6% pedunculate oak, 11% rowan and 2% hazel. Through this he also has a carbon purchase agreement with a fuel card company. They also put in ponds amongst the trees to hold the water better, which Jimmy says has also benefited the local area as the water has been held upland, rather than running into the villages. The trees have had a positive impact on the farm and animal welfare through greater infiltration of the water from flooding and providing some shelter for lambs. As well as this some trees will be felled for financial return and to also benefit the habitat, before being replanted.

National Sheep Association

"When we were looking for a way to better manage the land, we were introduced to the Tweed Forum. We soon found trees to be a sensible and efficient way to achieve a good use for the land, without losing profitability. It costs us nothing to have them, but the assistance they bring is irreplaceable. It's definitely a win-win situation for us, and I would recommend having trees as a way to very efficiently manage land for animal welfare. Our losses have dropped noticeably since having the trees and the benefits to having them are numerous, they really suit our farm."

Jimmy Sinclair, Scotland sheep farmer (pictured on the left)

Water management

Even modest increases in tree and hedge cover can dramatically increase water infiltration and reduce runoff. This has two implications for water management:

- Water which infiltrates into the soil in tree belts or hedgerows is less likely to carry potential pollutants into watercourses, such as sediment, organic matter, faecal organisms and nutrients. This saves the farm by reducing lost resource and potential fines, and also has positive implications for water treatment costs further downstream
- By increasing infiltration, the rate at which rainwater reaches streams and rivers is slowed. The effect is to reduce peak flows in the watercourse and potentially reduce flood risk downstream.

The Pontbren project. Ten neighbouring farmers in Powys have led the way in demonstrating a sustainable approach to sheep production. They worked up plans for their individual farms and were undeterred when they realised none of the existing schemes were appropriate, as they were too inflexible and did not allow them to enter as a group. They therefore developed their own scheme and sought funding from other sources supported by Coed Cymru. When tree planting began, only 1.5% of the group's land was woodland. Ten years later, 120,000 new trees and shrubs have been planted, 16.5km of hedges have been created or restored and nearly 5% of the land now has tree cover. This has been achieved with no loss of agricultural productivity.

Subsequent research has shown the strategically planted, narrow, fenced shelterbelts across slopes capture surface runoff from the pasture land above and allow it to soak more rapidly into the soil. Water infiltration rates inside the planted area were 60 times those on the pasture 10 metres away.

Farmers in the Pontbren project found water infiltration rates inside the planted area were 60 times those on the pasture 10 metres away.

CASE STUDY

Jonathan Francis – enhancing flock health and field drainage in Powys, Wales

Tyn-Yr-Wtra Farm has been in the Francis family for generations. Situated near Caersws in Powys, this 113ha farm includes 25ha of largely unimproved hill ground. Jonathan currently runs a flock of 100 purebred Welsh ewes and 300 Mule ewes producing finished lambs, and a 60 suckler cow herd of Hereford-cross and Saler cattle to sell as stores.

The challenge. Jonathan wanted to improve the productivity of the farm by addressing key environmental issues, largely caused by substantial levels of rainfall and a lack of shelter. Surface water runoff caused waterlogged fields and soil erosion into watercourses, meaning some fields could not be used by stock in periods of heavy rainfall and land alongside watercourses was being lost. Some fields had limited shelter, reducing their suitability as early turnout sites and farm boundaries needed to be made more bio-secure. The hill ground was unimproved and unfenced, so could not be managed as productive grazing land.

The solution. Based on the experience of the nearby Pontbren farmers Jonathan looked to trees and hedges to help improve grassland quality, create shelter and increase biosecurity. With the help of Coed Cymru adviser Mike Richards, Jonathan has planted 6.1ha of trees and built just over 4km of fencing. This includes 16-18m wide shelterbelts on the hill land, supported by the Welsh Government's grant scheme, Glastir, and a 6m wide belt along the top of a 13ha sloping field, funded by AccorHotels and delivered through the Woodland Trust's PUR planting project. The latter belt was planted with 2,250 native trees such as birch and oak and also contains dense hedgerow species to provide low shelter for livestock. In addition, a wider buffer strip was planted through Glastir alongside a stream at the bottom of the field, preventing livestock entering the watercourse and protecting areas vulnerable to erosion.

Farm boundaries of trees, linear shelterbelts and small clusters of woodland are helping to create sheltered, well-drained fields which provide the best conditions for early lambing turnout and good mothering. The belts have already strengthened the effect of boundary fences and improved biosecurity.

Jonathan plans to plant more shelterbelts with support from a partnership between the Woodland Trust and Coed Cymru.


WTML

"Apart from losing a bit of ground, I can't see a downside to planting the trees with all the benefits it will bring."

Jonathan Francis, Wales sheep and beef farmer (pictured on the left)

National Sheep Association

Biosecurity and sheep handling

General biosecurity of the farm can be increased by creating tree belts or thick hedges around the farm boundary, reducing the possibility of direct contact and spread of disease from neighbouring flocks. Well sited hedges and shelterbelts can aid management by helping with stock control and providing shelter for stock handling areas.

Grass growth

Shelter reduces wind speed and therefore reduces evapotranspiration of water from grass. In dry springs and summers – increasingly frequent even in upland areas – this can be a critical factor in continuing grass growth. The shelter increases soil temperature in the early spring and late autumn, extending the growing season for grass. These protected areas have shown a 20% increase in average annual pasture growth.

Shelter increases soil temperature in the early spring and late autumn, extending the growing season for grass.

CASE STUDY

Paul and Nic Renison – providing mob grazing and wildlife shelter in Cumbria, England

Paul and Nic Renison farm nearly 1000 ewes, 30 suckler cows and 70 dairy heifers over 57ha of rough grazing and 105ha of improved pasture and cultivated land at Cannerheugh Farm, Renwick. When they took the farm in 2012, it was conventionally farmed with large walled or fenced fields with only a few trees in blocks.

After trialling mob grazing, they are now consistently using this approach across their North Pennine farm. As part of their decision to change how they farmed, they realised that the farm had little natural shelter, so they also began planting new trees and hedges, breaking up a couple of big fields in the process. The benefits were soon realised in better grass utilisation across smaller, easy to manage paddocks, and increased shelter for their flock reducing lamb loss.

The challenge

On the edge of the Pennines the land can be cold and exposed – particularly in the face of the helm wind. The farm lacked shelter, impacting the health and performance of the flock but also limiting grass growth at the beginning and end of the season. To help the farm's productivity Paul and Nic investigated mob grazing of animals, which is also known as rotational grazing. This method is based on high intensity stock management over short periods of time in small paddocks, forcing the sheep to eat all the plants and reducing their ability to be selective. The waste created during the grazing becomes the mainstay of fertility addition. More natural shelter was needed across the farm to help address these issues and was gained by creating hedges within large fields.

The solution

Over the past five years the Renisons have planted 1100m of new hedgerow and 9.9ha of trees across their land. This has supported the introduction of a mob grazing system, with the trees and hedges providing vital shelter and shade for the stock, as well as stimulating grass growth and nutrient and water cycling. The mob grazing system has naturally increased the diversity in the sward and the occurrence of clover, with its important nitrogen fixing properties. It has also reduced dependency on inorganic fertilisers, which has cut costs and reduced the impact on the environment.


WTML

Don't dither - plant trees! At first I was worried about the loss of grazing land from the double fenced hedges but even within the first season I was convinced of their value."

Nic Renison, Cumbrian sheep farmer

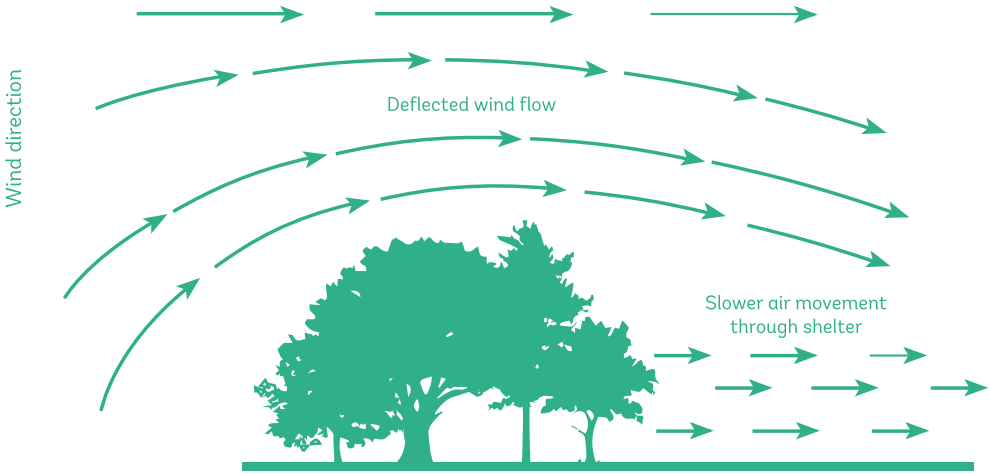
Diversification

While the primary design of shelterbelts or small areas of woodland should be based on developing shelter to support sheep production, trees can also provide useful products, such as timber from conifers and broadleaves, to use on farm or sell. Firewood and chip for wood-fuelled boilers can be produced from thinning or coppicing the trees as part of routine management. Woodchip can also be used to provide alternative bedding, either to replace straw or to mix in.

Practical guidance and considerations

Shelter should be designed to provide good cover down to the ground. The use of shrubs to give a dense base to tree shelterbelts will ensure plenty of low-level cover. Similarly, hedges should be maintained to be free of gaps that can funnel wind. Laying hedges or planting hedging shrubs to fill gaps will maintain protection from the wind.

If drift lambing or mob grazing is being practised, shelter can also be used to divide a large field into paddocks.



Tree shelter belt diagram: John Davis

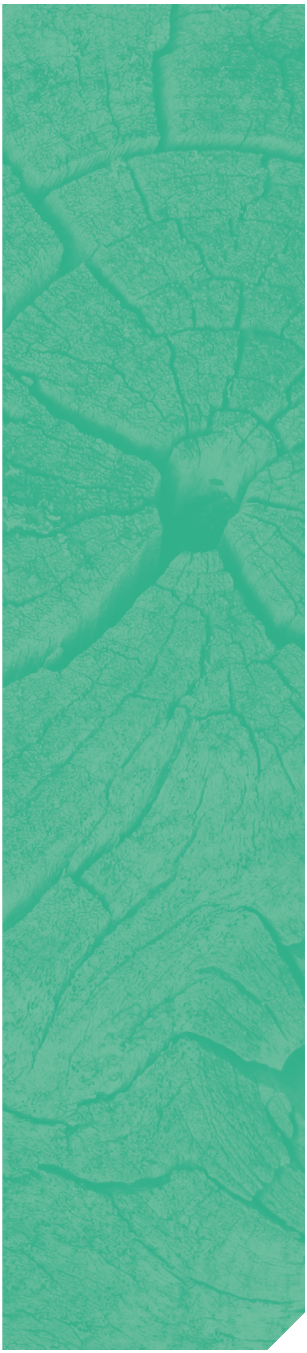
Scheme design

It is important to have clear objectives and a plan in place before starting any planting. Being clear about planting objectives will make it easier to select the right tree species and the spacing for the planting, and determine the follow up maintenance required.

New hedgerows and shelterbelts are usually planted where they create the best shelter, enhance or fill gaps in an existing hedgerow line, restore former historic landscape field boundaries or join up with woodland features.

As well as maintaining and restoring existing hedgerows, developing new hedges to aid sheep handling or divide large fields can provide additional shelter to help overall management of the flock.

The greatest shelter benefit can come from belts of trees. These can be integrated by planting adjacent to existing hedges, on the northern side to avoid shading out the hedge.



Species choice

Choosing UK native tree species will help ensure the trees are well suited to the site and able to deliver wider benefits to wildlife as well as your business. Exact choice will depend on location, soils and altitude, as some species will be more likely to adapt to different local environments and climates. The species mix you decide on will depend on how you plan to maintain the planting going forward and your objectives.

Planting

The best time for planting is usually from the end of October to the end of March. Planting early in the season is best where possible, as this gives the feeder roots time to establish. However, start dates will be provided if you are in a grant scheme.

Advice and maintenance

Weeding. Weeding each spring in the first couple of years after planting will reduce competition for moisture and nutrients, helping your trees establish more successfully. If you are going to use chemicals, choose herbicides with minimal effects in the wider environment that break down quickly in the soil. Spray around the base of each tree to create a weed-free ring approximately 1m in diameter. As with all pesticides, take care when applying and be careful not to touch the tree with the chemical. If you would prefer not to use chemicals, you can use mulch, such as bark chips, squares of old carpet or straw, around each tree to suppress weeds. You will need to use plenty to prevent them being blown away or dispersed, and will need to top them up annually. You can also buy mulch mats that can be pegged into the ground to keep them in place.

Watering. Your trees should adapt to the natural conditions of your site so watering shouldn't be necessary and is in fact discouraged as it can encourage the roots to grow towards the soil surface rather than down towards groundwater. If there is a particularly long dry spell and you feel watering is necessary, saturate the ground thoroughly to ensure the water soaks deep into the soil.

Check tree guards. Strong winds can blow trees over so make sure your guards, canes or stakes are upright and pushed firmly into the soil. Remove grass growing inside the guard by removing the guard, pulling up the grass and replacing the guard once the grass is cleared.

Pests and diseases. Although guards are intended to prevent damage, diseases and pests such as voles, rabbits, hare and deer can cause damage inside the guards, so check the tree stems and guards for signs. Keeping tree guards firmly in contact with the soil and maintaining a weed-free area around your trees will help. If you suspect disease, pull up the tree and dispose of it to avoid it spreading.

Fencing and stock. If livestock are near your planting areas, they will need to be fenced off from the young trees. Electric fencing or post and wire will prevent livestock from reaching, eating or knocking over the trees.

A rowan sapling - WTML/Niall Benvie

Delivering public goods with trees

Public goods are officially accepted as being those that can be accessed by everyone, such as clean air, safe water, healthy soils, beautiful scenery and public access, but for which no formal markets exist. Thoughtful planting and management of trees and hedges protects and enhances valuable natural resources by helping to absorb water and air pollution, and prevent soil erosion and flooding, while creating wildlife habitats and improving landscape character.

Many species of birds and insects benefit from the shelter afforded by trees.

Climate change and soil management

Grazed permanent pasture, a common feature on the majority of sheep farms, acts as a vitally important carbon sink. In arable situations, sheep help in land-use diversity and offer a return to mixed farming, improving soil quality and supporting above and below-ground ecosystems. In either situation, integrating trees at a significant scale can dramatically increase the amount of carbon sequestered.

Agroforestry systems act as a barrier by protecting soils from erosion by wind and water. Trees with long root structures hold soils firm while increasing soil organic matter in the form of decomposing leaf litter.


Bigstock/guppy images

Landscape and biodiversity

Across the UK, commercial sheep farming supports a complex mosaic of habitats, much of which has been created and highly influenced by livestock grazing.

Incorporating natural features such as trees, woods and hedges onto the farm increases the area of habitat available to wildlife. Many species of birds and insects also benefit from the shelter afforded by trees. Fruits, pollen and nectar from flowering trees and shrubs provide food, particularly early in the season before many non-woody plants come into flower.

As the climate changes, natural features in the landscape will aid the movement of species as they seek to adapt to changing conditions.

As well as improving habitat diversity and connectivity, trees in the farmed landscape can contribute to the aesthetic quality and meet with public perception of high quality land management.

Water management

Agroforestry can also be a cost-effective flood mitigation method. The careful siting of trees on farmland can improve soil infiltration and water retention, reducing the impact of flooding by increasing the capacity of the land to retain water. Trees can play a key role in reducing the impact of farming practice on watercourses by capturing runoff. By incorporating trees these aims can be achieved without a significant impact on farm productivity.

Cultural heritage and rural vitality

Integrating trees into sheep farms enhances the landscape, visually and environmentally, and can contribute to productivity so farm businesses can operate and thrive. Profitable and productive enterprises are an essential part of thriving rural communities, due to the 'trickle-down effect' of money going to ancillary services, such as vets, feed and machinery merchants, hauliers, markets and abattoirs. Integration is therefore a particularly positive way to bring the benefits of trees while ensuring land in agricultural and rural communities continues to be vibrant and sustainable.

In conclusion. Despite all the positive elements of integrating trees into sheep farms – be it shelterbelts, hedgerows, management of wet and boggy corners, agroforestry systems, or woodland plantations – there is a nervousness within farming communities about planting them.

A policy framework. This is why the UK Government needs to provide a policy framework that supports rather than hinders tree planting, overturning the historical situation where farmers were penalised for having trees on their farms, causing conflict and contradiction between farm support programmes and agri-environment schemes. While farm support programmes are now moving away from direct payments, where trees were classed as 'ineligible features' and the land beneath their canopies incorrectly considered to be taken out of livestock production, the legacy of that situation cannot be underestimated or similar mistakes made again.

Reward for public goods

The challenge facing agricultural policymakers and land managers in the immediate future is finding a support system to provide long term confidence, and incentives and reward for the delivery of these public goods.

The Woodland Trust and NSA share a vision for a new, integrated approach to land use, supporting positive land management that delivers public goods.

Agroforestry, including orchards, can be a key mechanism to deliver public goods as it offers the opportunity for upland and lowland sheep farmers to diversify income streams and benefit from multifunctional land use. Trees integrated into sheep farms can simultaneously benefit food and fuel production (normally considered private goods), provide environmental protection and biodiversity gain, and allow farms to adapt to or mitigate the effects of climate change (normally considered public goods).

In addition to a public good reward scheme, it is logical for tree planting to be eligible for capital investment grant schemes. Such investment is crucial for sheep farmers to realise the benefits of integrating trees and increasing plantings, and must include capital, advice and land management funding. It is important this covers tree stocks and planting, but also tree guards and fencing materials and costs, in order to make projects viable. Long-term maintenance is also important, so schemes should extend beyond the point of just getting the trees in the ground and ensure planning extends past the initial work, including advice and encouragement for sustaining the trees in the long-term.

How can we deliver public goods?

Public goods are those which everyone can access (in theory) from which no-one can be excluded. As an example, agroforestry can be a key mechanism to deliver public goods as it offers the opportunity for multifunctional land use.

Hedges for targeted species

A new hedge is identified as a key tool to connect and extend suitable habitat for particular species such as lesser horseshoe bats, a species of conservation concern. Dense thick hedges with mature trees are of greater value for the majority of wildlife including insects who are better pollinators.

Action: plant new hedges and thicken and maintain existing hedges to improve their biodiversity value, icluding planting trees for structure.

Public goods delivered: improved biodiversity, pollination services and landscape aesthetics.

Issue: need to increase width of existing hedge from standard 2m width, by changing existing management in both timing of operations and type of maintenance (biennial flail to 15-year rotational laying) and add additional trees.

Support needed: long term management payments supported by advice, capital payments for trees and tree protection/fencing.

Hedges and shelterbelts for livestock shelter

Hedgerows and tree shelterbelts can provide shelter and browse to improve animal productivity by maintaining a positive energy balance for the livestock. This also supports improved grass growth while enhancing ecosystem service provision.

Action: plant new shelterbelts to support livestock wellbeing and performance.

Public goods delivered: enhanced biodiversity, pollination services, water management, landscape character; **private goods delivered** – improved productivity and wellbeing of stock.

Issue: advice needed on siting of shelterbelt, planting and long term management and capital support.

Support needed: capital payments for trees and tree protection, initial advice on siting and planting partially paid through scheme, longer term advice on management provided through farmer network/independent advisers.

Upland tree planting for downstream flood prevention

In an initial landscape assessment of flood risk, a number of upland areas are identified as potential sites for tree planting to reduce water flow and help prevent downstream flooding.

Action: plant a number of woods in specified locations as part of a co-ordinated series of flood prevention activities.

Public goods delivered: decreased risk of flooding of roads and other public spaces, as well as on individual properties.

Issue: needs co-ordinated activity to achieve results, advice on planting and management of trees and support to find long-term management payments.

Support needed: co-ordination on an area basis, capital payments for trees and ten year management payments to achieve establishment, support to broker long term management payments from new sources.

Bigstock/naumoid

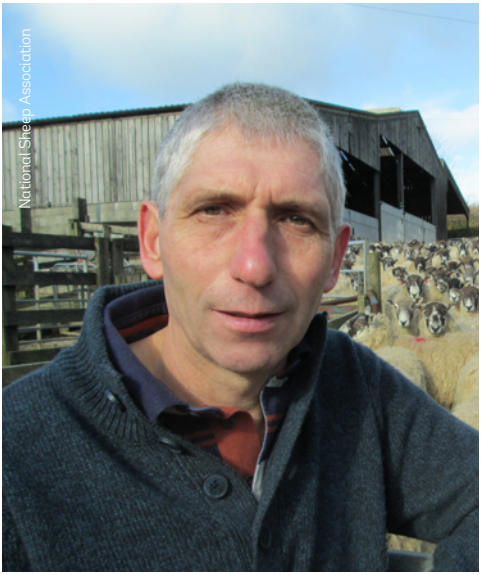
Further help and support

If you're looking to plant a large number of trees on your farm or private land the Woodland Trust can help. Expert advisers offer guidance on trees, protection, grants and funding. Please contact them on 0330 333 5303 or visit www.woodlandtrust.org.uk/enquiry

The Woodland Trust is the largest woodland conservation charity in the UK. It has over 500,000 supporters. It wants to see a UK rich in native woods and trees for people and wildlife. The Trust has three key aims: i) protect ancient woodland which is rare, unique and irreplaceable, ii) restoration of damaged ancient woodland, bringing precious pieces of our natural history back to life, iii) plant native trees and woods with the aim of creating resilient landscapes for people and wildlife. Established in 1972, the Woodland Trust now has over 1,000 sites in its care covering over 22,500 hectares. Access to its woods is free.

National Sheep Association is a support organisation for sheep farmers. As well as offering practical advice via a series of communication routes and regional networks, it is committed to highlighting the vital role of sheep farming to Government policymakers, non-governmental bodies and the wider public. This work ensures the people involved in keeping sheep are enthusiastic, knowledgeable and aspire to best practice – and those not keeping sheep are increasingly aware of the contribution sheep make to society and of the core aspects of the sector. This work is funded by membership subscriptions and information is available at www.nationalsheep.org.uk.

iStock, Duncan Payne



"Sheep are a characteristic part of the British landscape, playing an important role over the centuries in shaping the UK's rural communities, industry and economy. I feel that trees integrated into farmland complements and further develops the incredible benefits of sheep farming to the environment and society, as well as potentially helping flock productivity."

Bryan Griffiths, NSA Chairman and Devon sheep farmer

"From a flock health point of view there are a number of situations where a sheltered field is invaluable – not least in reducing the risk of hypothermia in newborn lambs. Tree and hedge planting can improve both shelter and field drainage, playing a vital role in integrated sheep farming, which must be good for both the flock and the environment."

Dr Fiona Lovatt, sheep veterinary consultant

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