

# Biodiverse hedgerows for carbon

## Practical Guide



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1. Use energy and fuels efficiently
2. Renewable energy
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4. Making the best use of nutrients
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### Websites

[www.farmingforabetterclimate.org](http://www.farmingforabetterclimate.org)

See also:

[Farm Carbon Storage Network - SAC Consulting](#)

[Technical Note \(TN738\): Hedges - Carbon, Conservation & Compliance Farm Advisory Service](#)

[MoreHedges Scheme - Woodland Trust](#)

[GAEC 7 Retention of landscape features](#)



Scottish Government  
Riaghaltas na h-Alba  
gov.scot



It is estimated that Scottish hedgerows extend to around 22,000km. Correctly managed, these provide a wide range of benefits to the farm, including:

- Carbon sequestration - managed, rejuvenated hedgerows, including hedgerow trees, can help sequester and store carbon on the farm.
- Shade and shelter for livestock, reducing exposure in new born lambs, and heat stress in dairy cattle.
- Shelter for crops and soils. Hedgerows will intercept pollutants, reducing run-off and protecting watercourses from diffuse pollution.
- Biosecurity - can prevent nose to nose spread of contagious diseases between neighbouring livestock
- Habitat for birds, small mammals and insects, many of which can improve crop pollination and provide integrated pest management benefits.

**This Practical Guide explores the benefits of biodiverse farm hedgerows**

### Hedgerow management



Hedgerows have the potential to capture carbon dioxide and lock it away both below ground in roots, leaf litter and soil organic matter, as well as in above ground biomass in woody growth. Integrating hedgerow trees regularly throughout the length of the hedge increase levels of carbon stored.

Hedgerow growth should be managed to maintain sequestration, but annual trimming will release some of the carbon captured. Hedges should be allowed to grow to a minimum of 1.5m in height and maintain the regulated (GAEC) 2m buffer from the centre of the hedgerow.

Hedgerow trees should be allowed to grow to maturity every 50-100m. Any gaps  $\geq 5$  m should be replanted with a diverse mix of hedgerow plant species. A hedge should be a wildlife larder for most of the year - providing flowers and fruits for insects, birds and small mammals. Most woody plants do not flower or produce fruit on first year growth.

Therefore hedges should be trimmed on a 3-4 year basis, with no more than a third of the total length of hedges on the farm trimmed in any one year. Staggered trimming ensures that part of the hedgerow produces flowers and fruit.

Hedge laying or coppicing can rejuvenate the hedgerow and prevent it from degenerating. Traditional hedge laying involves removing excess side growth and weaving the partially cut stems through stakes. The alternative is conservation laying where the stems are partially cut and then pushed over, often using a digger bucket. Either method helps to thicken a thinning hedge and provide dense habitat for wildlife.

## Farm Carbon Storage Network

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The Farm Carbon Storage Network was a Scottish Government Knowledge Transfer and Innovation Fund project, and the first of its kind in Scotland. It took a group of five Scottish farms and estimated the carbon stocks using a combination of soil testing and LIDAR (Light Detection and Ranging) aerial surveys. This quantified the carbon stock held within the above ground biomass in farmland trees and hedges at the point in time that the survey was undertaken.



For those farms where the landscape and climate were suited to hedgerows, the results quantified significant carbon stocks within them and any wooded area. Generally, the recommendations were to increase or rejuvenate/gap up existing hedges to increase carbon stocks.

Adding the carbon stocks from trees and hedgerows to the soil organic carbon stocks assessed using soil sampling, allowed the total farm carbon stock to be assessed. Whilst this doesn't influence the greenhouse gas emissions from the farms, it has provided a baseline measure which can in future be reassessed to identify which sequestration management decisions make the most impact on carbon stocks for each farm. Find out more at <https://bit.ly/3KIVbrU>

## Planting and gapping up hedges

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Before planting a new hedge, there are several considerations. Siting should allow linkage with existing hedges and/or woodland areas. With hedgerows providing habitat for predators, it is important to avoid placing them adjacent to wader breeding sites. The ground should be relatively free draining. A minimum length of 20 metres is preferable to provide conservation benefits. A wider, structurally sound hedge will provide more benefits for both carbon capture and wildlife benefits; a minimum of 1 metre and optimally at least 2 metres in width.



*Rosa canina* - dog rose

Whether creating a new hedge, or gapping up an existing one, work should be carried out during autumn, or winter. Ideally, existing vegetation will be removed, and regular weed control during the first few years of establishment is crucial. A variety of plant species should be selected to provide a long period of flowering and fruiting throughout the year e.g. blackthorn, hawthorn, hazel, dog rose, holly or elder. Hedgerow tree species could include oak, rowan, birch, crab apple, or cherry.

Whips should be planted in a double staggered formation with at least six plants per metre; increasing the plant density to seven or eight plants per metre will provide a much denser fence bringing increased shelter and stock-proofing benefits.

Plants roots should be fully covered to the top of the root collar. Once planted, all of the whips (except holly plants) should be cut, using secateurs or a sharp knife, at an angle and to a height of ~10-15cm (4-5") above ground level. This encourages branching from a low level. Hedgerow trees of ~1-1.5m tall should be planted regularly throughout the length of the hedge. They should be spaced far enough apart to allow them to mature to their natural spread. Planting them closer together will allow for an increased wind break effect and sun shadow when mature. If taller than 1m the plants may need a stake to help support them for the first year.; protecting with a tree guard can help to identify them and prevent damage from trimming. Once planted, the hedge can be mulched with bark or stones. Plastic can be used to suppress weeds, but must be secured at both sides by pushing into the soil using a spade and covering with gravel or stone.

The new plants should be protected from grazing animals, including wildlife. This may include tree guards, temporary scare fencing or a stock proof fencing erected on each side and at least 2 metres apart, but remember to leave foot gates or styles to allow access for hand weeding or planting up gaps in future.



*Prunus avium* - wild cherry

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