

Optimising plans to utilise on-farm benefits from shelterbelts

By Dr Lindsay Whistance, Organic Research Centre

Now is the ideal time to consider the positive effects trees could play on your farm ready for tree planting from late November says the Woodland Trust.

The health, welfare and performance of sheep flocks are at threat from changing and increasingly extreme UK weather patterns. Yet there is an expectation to produce food in an economically sustainable manner while helping to restore nature and reduce emissions.

Reduce losses

The Woodland Trust suggests trees may offer one solution to this problem as evidence shows trees on farms benefit flock welfare and the wider environment. For example, the presence of good shelter can reduce mortality by a third and helps establish strong ewe-lamb bonds. New-born lambs can lose up to 10°C of their body heat in the first half-hour of life. Therefore a lack of shelter increases the risk of hypothermia.

In hot weather, seeking shade is key for maintaining thermal comfort. When too hot, sheep reduce their feeding behaviour, which has a negative impact on gut health, milk quality and quantity in ewes and slows down lamb growth rates. It can also impair oestrus expression and foetal development alongside sperm production and libido in rams.

The type and extent of benefits shelterbelts can provide varies depending on their size, location, species choice and orientation. They are typically planted to reduce windspeeds in exposed conditions and, when positioned

perpendicular to the prevailing/cold wind, in-field microclimate conditions can be improved by their presence. The amount and quality of shelter gained is influenced by four main factors – profile, porosity, height and length.

Profile and porosity are key to minimising wind turbulence by lifting some wind smoothly up and over while allowing some wind to pass through the shelterbelt. The optimal level of porosity is 50% in temperate conditions.

Height plays its part by redirecting the wind upwards and the higher this is lifted, the longer it takes for the two airstreams to re-join. This extends the available shelter far beyond the shelterbelt to around 20 times its height.

Wind turbulence is also created at the ends, so a longer shelterbelt creates more shelter. Gaps can also increase wind speeds making parts of the field more exposed than when no shelterbelt is present. Similarly, too little density at ground level will lead to increased wind speeds creating a draught resulting in poorer conditions in colder weather.

Planning

To optimise shade benefits, plant large trees close to eastern and southern edges then concentrate shrubs on northern and western edges.

Some recommended designs for a shelterbelt can be up to 30m wide. While these multiple-row structures with wide between-row spacings can offer high levels of biodiversity it requires a lot of land to be lost from the productive field area.

Currently the smallest government funded width in England is 10m and in Scotland 15m, yet research carried out in the late 1990s suggests an optimal shelter – the amount of shelter gained



for the land used – is achieved with a five-metre-wide shelterbelt.

The optimal shelterbelt design consists of four rows of trees. Rows one and two face the prevailing wind and are composed of shrubs, such as hawthorn, buckthorn, hazel, spindle and guelder rose. These are spaced at 1m apart with 1.5m between rows. Rows three and four are planted with taller tree species, spaced at 2m apart with 1.5m between rows.

Intermediate trees in row three include field maple, silver birch, bird cherry, rowan and crab apple. Large trees in row four include Scots pine, common alder, aspen, black poplar and hornbeam.

There are many different designs for in-field and field-edge tree planting, such as alley planting, clustered and random planting (for example wood pasture), grid designs (for example orchards), or linear planting including hedgerows and shelterbelts. Here we have focused on shelterbelts but factsheets on alley and in-field planting are available.

Don't forget the Woodland Trust offers tailored advice on farm tree planting.

More at www.woodlandtrust.org.uk.

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