

A practical guide to Establishing farm woodlands: Fences and protection

SUMMARY

- **Young trees are vulnerable to damage from a variety of animals, protection from these creatures is essential if the planting is to succeed.**
- **Always fence against farm stock. Ensure that the fence is fit for purpose - cattle fences may not be sheep proof.**
- **Choose the most cost effective form of protection for your site, but do not cut corners. Usually large areas are best fenced and small areas are best protected by individual shelters.**
- **Rabbits are a serious threat to young trees. A combination of control and protection is almost always required. Rabbit control should start long before planting and continuous monitoring is needed.**
- **Deer should be excluded from vulnerable areas by fencing. On sites where trees most likely to suffer damage are placed in shelters and large areas of conifers remain unfenced, culling will be the most effective form of control.**
- **If in doubt take advice, as doing nothing is not an option and will be expensive in the long run. Don't cut corners and spend early on protection to save in the future.**



Vulnerable trees protected by tree shelters

Introduction

Once planted, trees can die. Possible causes are varied and include natural phenomena such as drought, flooding or physical abrasion (such as blown sand) and disease. Other factors are more controllable and relate to the quality of the planting process and aftercare. These would include poor quality of plants supplied, careless plant handling, poor planting and excessive competition from weeds. As well as the threats listed above, herbivorous animals also represent a common and avoidable cause of damage or death to young trees. Also, in some cases protection from man is unfortunately necessary, especially in urban fringe situations.

As it is expensive to replace trees, protection from possible threats is an important consideration at the outset. Protection may be needed for several years until the trees have grown beyond the vulnerable stage. Also, if planting is undertaken with grant aid, protection operations will not be funded retrospectively. It is therefore essential to make decisions about how, and against what, the trees will need to be protected well before the planting work commences.

Protection from climatic factors

Whilst climate cannot be modified, some of its adverse effects can be reduced. Tall vegetation growing between newly planted trees will provide protection from drying winds, provided it is not allowed to compete directly with the young tree roots. Grass growing between tree rows should, therefore, not be cut without good reason.



Grass mown between trees for Fox control!

Tree shelters can produce a very favourable, sheltered micro-climate and should be considered for more sensitive species, such as birch or Norway maple. On an exposed site, however, they should be kept as short as possible. This will reduce the chances of the emerging tree shoots becoming deformed by the wind.

Spring droughts are a feature in many eastern areas. Thorough weeding in the area immediately around each tree (a one

metre diameter circle is usually a good guide) starting early in the growing season will greatly reduce moisture loss from the soil and enhance tree survival. Mulching around each tree with old carpet, hay or plastic sheet known as mulch mat and specifically designed for this job, conserves moisture within the soil and suppresses weeds. Mulching however is expensive and rarely used on any scale.

Protection from damage at planting

This is covered in detail in Technical Note # on plants and planting methods, but includes choosing healthy, balanced planting stock, handling plants carefully and avoiding situations where plant roots may dry out, even for very short times. Good planting techniques and use of V or T-shaped notches when planting should also be used.

Protection from vandalism

Unfortunately in some areas this is a valid concern. Particular attention needs to be given to choice of tree size and all other forms of protection, as both shelters and fences may become a target. Generally the less visible the planting, the less of a challenge is offered. Wide community support prior to planting is a must, as well as ensuring adequate provision is made for access to the site. Where possible, set trees well back from access routes and consider mowing open areas and edges to reduce potential fire hazards. Use of existing vegetation or even planting prickly species such as brambles can be a means of deterring access to specific vulnerable areas. Often damage is concentrated in early years, although fire will always be a danger. Ultimately there is no one answer to such problems.

Protection from Animals

This can be divided into two categories:

- **Protection from farm livestock**

Livestock should ideally be kept out of woodlands at all times. All herbivores, cattle and sheep, especially will eat young trees. They can also damage even well established trees by poaching the ground with their hooves and snapping stems.

Livestock can be excluded with any suitable and serviceable stock fence. However, if you are in receipt of a grant which includes a fencing element, you must ensure that the fence construction is as specified in the grant contract. It is important to allow for livestock that may be on the farm in the future, rather than just those that are initially present. For example, some farmers may find that a three strand barbed wire fence is normally adequate for excluding cattle from woodland. However, this will not be a suitable barrier if the grazing is subsequently let out for sheep. If you are contracted in to the Scottish Forestry Grant Scheme the use of rylock type netting is considered the only acceptable method of stock fencing.



Stock fencing, keeping sheep out

High tensile (HT) net fencing with a top wire is recommended for the exclusion of livestock in most circumstances. High tensile net can be strained tighter and is both stronger and more elastic than mild steel. Its strength allows the use of fewer posts and strainers, saving time and money.

Provision should be made for gates in the fence line, to allow access for vehicles and machinery for woodland maintenance work and to let out any livestock that may get in. It is also helpful to put up stiles at suitable access points, especially if the woodland is to be used for sporting purposes.

Cattle and horses can reach a surprising distance over fences, so plants should never be planted within 2 metres, and preferably 4 or 5 metres, of the fence line.

- **Protection from wildlife**

Animals causing most damage to young trees are voles, rabbits, hares and all species of deer. Grey squirrels may become a problem with older broadleaf trees grown for timber, especially thin barked species such as sycamore. Foxes and moles do no harm at all to trees. Badgers, however, can dig up young plants and use them for bedding and will also damage rabbit fences which cross their runs. Whilst badger-gates can help to reduce such damage, they will rarely eliminate the problem.



Rabbit fencing

The distribution of each species varies considerably, so it is important to assess the numbers of animals present locally to determine the most cost effective method of protection.

Each method has advantages and disadvantages, and should be fully assessed and costed for each individual plantation. All new woodlands will attract wildlife, so it pays to plan ahead. For example, when erecting stock fencing around new woodland where deer may become a problem, it is sensible if erecting a stock fence to use longer deer fence strainers. This will make it relatively cheap to upgrade to a deer fence at a later date, if needed.

Protection from wildlife is a complex subject, as each site will differ. The following observations are based on experience of a range of situations.

Methods of protection

There are three main options available to protect young trees from wildlife.

- **Active control**

This involves deliberate action taken to keep particular damaging animal numbers at appropriate levels. The appropriate population level is usually determined after deciding what will be an acceptable level of damage to the trees. The impact of a set cull level can then be assessed and numbers adjusted as required, bearing in mind that damage is accumulative. This method is most suitable for deer, hare and rabbits. Hares are rare in some areas of the country and are the subject of a biodiversity action plan to increase their numbers, so control must only be carried out in extreme circumstances. Hares can be tolerated at much higher densities than rabbits.

Active control is essentially composed of shooting, gassing, snaring and ferreting as appropriate. Traditionally such work

was carried out by the estate game keeping or forest ranger. It is a much more difficult operation than is first appreciated, and requires a high level of commitment and skill.

Broadleaved trees are much more vulnerable than conifers to damage from wildlife and, as a consequence, need a higher level of protection. They can cope with only very low levels of deer, before damage becomes unacceptable. Most sporting properties usually prefer to maintain quite high numbers of deer, which are likely to result in unacceptably high levels of damage. On properties seeking to establish new woodland and where shooting is important, deer control is often a source of conflict. On a small scale, alternative methods of tree protection can be used to avoid such problems. In most cases, however, it is often necessary to accept a compromise involving increased culling levels until trees are sufficiently established to allow deer numbers to rise again.

Game has value and should be regarded as a source of income. Active protection can be undertaken by means of a sporting let on the woodland, with safeguards to ensure that the required cull is both undertaken and monitored. Deer stalking is becoming increasingly popular, so finding a stalker is not difficult. Always ensure that the control is on your terms and that you have a signed lease. This should stipulate where shooting may take place, what may or should be shot and should include a termination clause in case an adequate level of control is not maintained. Beware though, that those paying high prices for sporting lets often have a vested interest in maintaining high deer populations, which is not compatible with establishing young woodland.

Use of fencing and/or a programme of gassing are the only effective way to exclude and control rabbits. The chemicals used are highly toxic and gassing should only be carried out by trained operatives. Gassing is most effective if carried out in winter months, when population levels are low.



Deer stalking equipment

- **Passive control**

Passive control involves the use of an inert system of defence to deter or to prevent damaging animals from gaining access to individual plants or areas of trees. Fencing and tree shelters are the two main means used to exclude a range of animals from young trees.

Where red deer or domestic stock are present, fencing is essential. In areas populated with voles, rabbits or by the smaller deer species such as roe, tree shelters can be used as an alternative form of passive control. Tree shelters are less frequently used to protect conifer species than broadleaves. This is because shelters are less cost efficient for conifer areas, which tend to be planted more densely and also do not suit the bushier habit of these species.

The choice between fencing and shelters is often a matter of economics. These are greatly affected by the shape of the woodland and the species to be planted. For example, a long narrow strip of broadleaves is likely to be most economically protected by tubes. The same strip, if planted with spruce, is more likely to be protected with rabbit netting overlaid onto the stock fence as there are a greater number of trees to protect which although vulnerable to rabbit damage, are far less likely to be damaged by deer browsing.

Use of fencing:

There are several types of fencing, which include deer, stock and rabbit fencing as well as various combinations of these types.

Rabbit netting is generally unlikely to be economic compared with shelters for areas of less than 1 hectare. Similarly, enclosures generally need to be larger than 5 hectares before deer fencing is cost effective.

Rabbits can climb over fences, so netted enclosures should be inspected monthly and intruders dealt with before they can establish new warrens. Large areas of planting may benefit from being sub-divided with internal rabbit fences. Remove any stumps or high humps close to the fenceline as rabbits will use these for take-off points. Rabbit fencing with a top wire is often a deterrent to hares, although it will not totally exclude these animals.

If rabbits are also damaging arable crops or grass, then netting woodland will reduce the problem by denying the rabbits breeding areas in the woodland. Some farmers have found it cost effective to maintain rabbit fences permanently around established woodlands to protect their crops.

Whatever fence is erected, consideration should be given to access. Your site will need to be maintained, rides cut and trees sprayed, you may wish a shoot to use the land or the public might want to walk or ride through it. Gates are the easiest system to operate but they must not become a weak point in the fence. If you fence against rabbits then the closed gate must be rabbit proof. If you wish to keep a gate locked, then a stile should be provided. Self-closing pedestrian gates can also be useful. It is important to note that in Scotland the public has a right of responsible access to woodlands by horse, bicycle or foot so your choice of gate or stile must reflect the type of access being taken. If you fail to provide suitable access, the penalty can often be damage to fences.

Deer fences are often used on more extensive areas of planting, where active control alone is unable to achieve the desired level of damage limitation. Landform is an important consideration when sitting fences. This is both for landscape reasons and, where possible to provide deer jumps which allow an escape route for animals that do manage to become trapped within a fenced area. Some element of active control will usually be required in combination with fencing to cover this latter circumstance.



Deer fence

In Black grouse and Capercaillie areas consideration should be given to marking fences in order to deter accidental bird strikes. This is usually done with chestnut paling or softwood droppers. The local capercaillie or blackgrouse project officer can provide advice on the siting and marking of the fence.

Deer and rabbit fences need to be inspected regularly, especially sections adjacent to mature woodland which may be prone to damage from falling branches.

It is desirable to remove fences, especially deer fences, when no longer needed. This is most important in areas with woodland grouse or high amenity value.

b) Passive protection using tree shelters.

Shelters are tubes of solid plastic or mesh, secured by a stake or cane and are used to protect individual plants. Small diameter unsupported shelters are known as tubes. Shelters can be found in a range of heights and styles and perform several basic functions. As well as physically protecting trees from browsing, they provide a greenhouse effect around each tree that usually boosts growth and enhances survival. Additionally, they provide protection from accidental spray damage from herbicides during weeding operations. As shelters are easily visible, little time is wasted looking for the trees during maintenance operations such as weeding or beating up.



0.6 metre Wrap shelters are easy to spot

Shelters tend to be more cost effective on smaller schemes. An intimate mixture of broadleaves and conifers can be difficult to protect economically and is best avoided if there is an alternative.

The shelter height required is determined by the wildlife present locally. A 60 cm shelter will protect from rabbits, but 75cm is needed if hares are present. Where roe deer are present, a 1.2 metre shelter is required. If the planting is in an upland area where snowfalls can be heavy, then the shelters should be at least 15 cm taller than normal, or consideration given to fencing as an alternative.

Taller shelters are available that, in theory, can protect against cattle, horses and red deer. These however need very solid stakes and are likely to result in drawn up and weak trees. As such, they are not recommended. There may be a temptation to consider such shelters where trees are planted at wide spacing, but both the Farm Woodland Premium Scheme and Farmland Premium Scheme stipulate that no agricultural use is made of the planted area, which includes the grazing of horses.

Some species do not do well in shelters. Beech frequently is attacked by aphids when ventilation is poor and should only be used in a mesh shelter. Conifers with dense foliage, such as noble fir and spruces can also do poorly in shelters, and again a mesh type is preferred. Alternatively, a 60cm tube may be sufficient. Shrub species such as dog rose, elderberry or hawthorn are better suited to shelters of 0.75 metres or shorter.

The use of spiral guards supported by bamboo canes is not generally recommended for protection of tree species. Although cheaper, they provide few of the benefits of normal shelters and often need repeated maintenance following windy conditions.

Short spiral guards are commonly used for protection against voles, where population levels are high. These can be put on retrospectively if required, as vole populations can fluctuate widely from year to year and damage can be difficult to predict. If no guards or shelters are used on broadleaves, then thorough weed control is essential for at least three years to prevent damage by voles. These thrive in the cover provided by long grass, but tend to avoid crossing open ground where they are vulnerable to predators such as kestrels.

On exposed sites, it is best to avoid shelters if possible, as both plants and shelters are likely to require a high level of maintenance. Tree foliage catches the wind and plants may come to rely heavily on the support provided by the stake for several years. In these circumstances it can be beneficial to prune the young tree to reduce the canopy size. If shelters

must be used, then keep height to the minimum required and preferably use types that are made of mesh, or have a mesh guard on the upper half. This results in a better balanced tree that is more robust and less likely to blow over. However, branches may penetrate mesh guards and there are added costs due to the need to prune these back. Removal of mesh guards is also more time consuming for this reason.

Typically shelters will require maintenance and need to be removed at the end of their useful life. Some manufactures now offer recyclable tree shelters, which because of the nature of the plastic involved have to be specified, on the order, well in advance of planting. An alternative is the use of shelters made of cellulose (a plant based material) which biodegrades quicker than plastic. These, cellulose, shelters have considerably less impact on the environment than plastics. Neglected shelters have an adverse impact on the landscape and set a bad impression. The time and costs involved with maintenance and pruning can be considerable and should be allowed for when choosing the method of protection. It is not uncommon for some stakes and ties to need replacing after a few years and a proportion of shelters may need to be straightened after high winds to prevent trees growing at an angle.

When buying stakes, always use a solid stake of treated softwood, sweet chestnut, heartwood oak or European larch. If a stake will not last six or seven years then it is useless with a 1.2 metre shelter. Stakes for shorter shelters do not need to be quite so durable. Shelters should be erected so that the stake is on the windward side of the tube on level ground, or on the uphill side on a slope.



1.2 metre tree shelters

- **Combined control**

Quite simply combined control is a mix of passive and active controls, tailored to the site. It is almost always the required option for areas protected against wildlife by fencing.

Deer which gain access to fenced woodlands will need to be removed and this can only be undertaken by active means. Deer may only be shot with a rifle as prescribed in law.

It is good practice and financial sense to ensure the destruction of rabbits within a fenced area before the trees are planted, which will again mean using active control methods. Once a fence has been erected, rabbits may still gain entry to the site, either by tunnelling, climbing, or travelling over the net using snow drifts. Breaches in nets can be made by animals such as badgers or by fallen tree limbs. It is important therefore to establish a regular regime of inspection. Breaches must be quickly repaired and tunnels blocked. Animals that have gained entry to the area you wish to protect must be shot, snared, gassed or trapped as appropriate.

Some fences can be erected with rabbit boxes, specially designed traps which must be inspected at a minimum of 24 hour intervals.

Finally; take expert advice. Protection is expensive and both the initial capital costs and longer term maintenance costs need to be taken into account. The best solution is often a compromise, but cutting corners can be an expensive mistake as planting grants will be recovered if the woodland fails to establish.

Table 1: Recommended forms of protection

Species	Fencing	Shelters & Guards	Shooting	Chemical, gas
Large deer	✓	X	✓	X
Small deer	✓	✓	✓	X
Rabbits	✓	✓	✓	✓
Hares	X	✓	✓	X
Stock	✓	X	X	X
Voles	X	✓	X	X

Further Information

Publications

- HODGE, S. and PEPPER, H.
(1998) *The prevention of mammal damage to trees in woodland*.
Forestry Commission Practice Note 3. Forestry Commission, Edinburgh
- JACYNA, S.
(2004) *Protecting Young Woodlands from Vole Damage* SAC Technical Note 566. SAC, Edinburgh.
- MAYLE, B.
(1999) *Managing Deer in the Countryside*.
Forestry Commission Practice Note 6. Forestry Commission, Edinburgh
- PEPPER, H. W.
(1992) *Forest Fencing*. Forestry Commission Bulletin 102. Forestry Commission, Edinburgh
- PEPPER, H.
(1998) *The Prevention of Rabbit Damage to Trees in Woodland*.
Forestry Commission Practice Note. Forestry Commission, Edinburgh
- POTTER, M. J.
(1991) *Treeshelters*. Forestry Commission Handbook 7. Forestry Commission, Edinburgh.
- Deer Commission Scotland – *Best Practice Guidance*.

Web Sites

- www.forestry.gov.uk/scotland
- www.dcs.gov.uk

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