

How to install a tree guard

The effectiveness of a mesh tree guard in protecting individual trees from wildlife damage depends not only on careful selection of the tree guard itself and the stakes supporting it, but also on the care taken during installation. Some simple rules need to be followed to install a tree guard properly and to ensure that it does its job until it wears out and has to be removed.

Three essential steps

Three steps are required to protect individual trees from wildlife damage.

Before planting, the forester must choose the right type of protection, i.e., a tree shelter made of a suitable type of UV-treated, high-density polyethylene mesh, or an individual mesh fence to be attached to one or more stakes or wooden posts. The necessary technical specifications will depend on previous identification of the animal species responsible for the damage observed on trees or in neighbouring plant populations. The height, diameter, weight, mesh size, thickness of the mesh wires or strands and the colour of the protective device must be chosen carefully. The type, height, size and number of stakes per plant will depend on the type of protection chosen, the tree species requiring protection and the planting density.

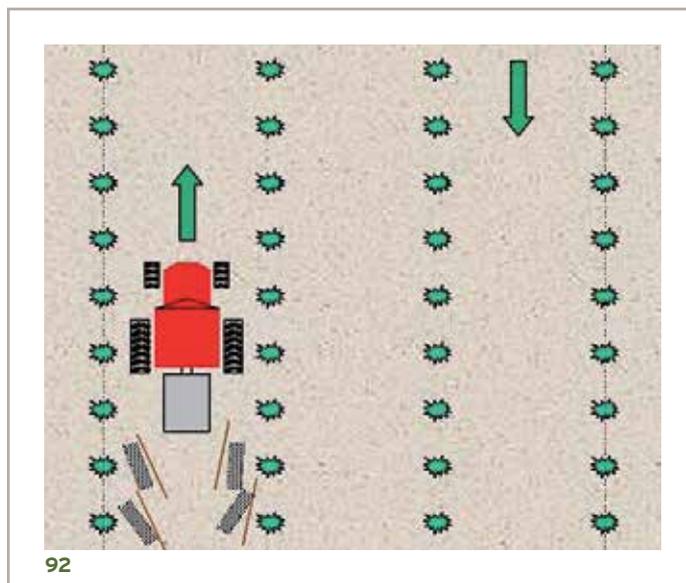
During planting, it is essential to protect the trees on the day they are planted. If the installation of tree shelters or individual fences is postponed, there is an almost immediate risk of animal damage to some of the newly planted trees. Particular care must be taken when positioning the stakes to ensure that they will remain upright (a point which is all too often neglected).

After planting, regular inspections of the trees are essential to check the stability and effectiveness of mesh tree guards or individual wire mesh fences. As soon as plastic mesh becomes worn (or wire mesh comes into close contact with the bark of the tree and liable to become embedded in it), it must be removed.

Installation

Distributing the materials on site

Tree shelters or individual fences must be installed as soon as the young trees are planted. The mesh supplies and stakes can be quickly distributed around the worksite (Photo 93) using a farming or forestry tractor and trailer, or a quad bike with a quad-box.



92

When planting over a wide area, the supplies can be distributed very efficiently: the tractor or quad driver should skip a row at each turn (Photo 92) so as to drive each time between 2 rows of trees where the tree shelters have not yet been installed.

Two people will be needed to distribute the tree shelters and stakes together along each row.

Positioning a mesh tree guard

For rabbits and hares

Placing a lightweight tree guard for rabbits and hares is fast and easy. When installed, the mesh must be under sufficient tension to keep it from sagging.

The recommended procedure is as follows:

- slide the mesh sleeve (L 50 or 60 cm, Ø 14 cm) down around the tree, taking care not to damage the terminal bud;
- insert 2 bamboo stakes (L 60 or 90 cm), one on either side of the tree, driving the large ends (Ø 6-8 or 8-10 mm) deep enough into the ground to ensure they will remain firmly upright;
- make sure the distance between the stakes corresponds to the diameter of the tree shelter (which should be oval); if the operator chooses to install 3 stakes, they should be positioned to form an equilateral triangle;



93.1



93.2



93.3



93.4

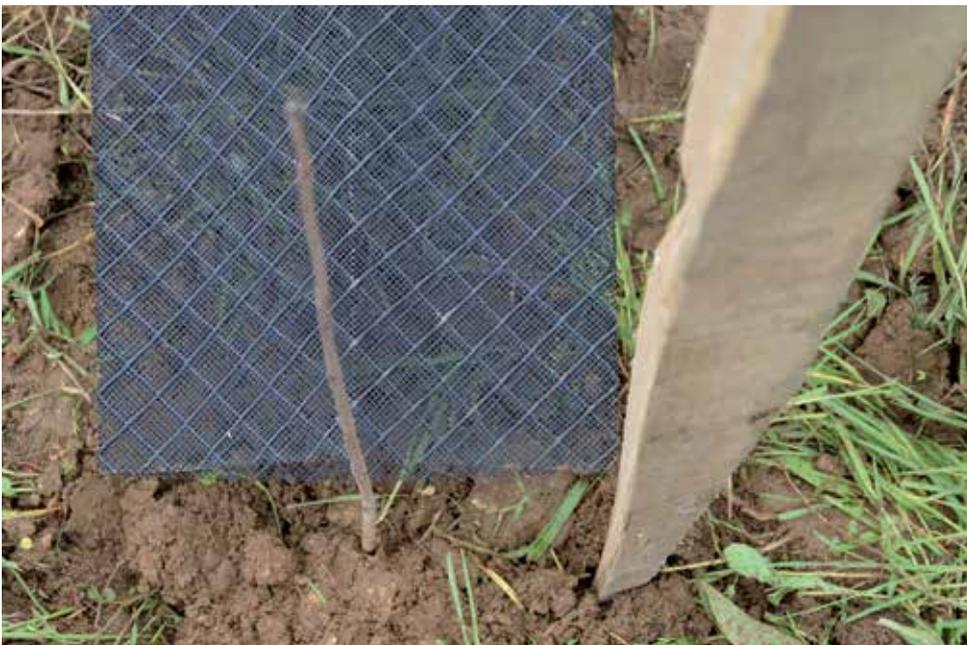


93.5

92 - Route taken by a tractor to distribute tree shelter supplies in an open plantation.

93 - To install a mesh deer guard, you will need a chestnut or locustwood stake (93.1), a lump hammer or sledgehammer, a staple gun (93.2) and staples (93.3). The recommended staple leg length varies from 6 to 10 mm (93.4). High (≥ 150 cm) wide-meshed (≥ 5 mm) tree guards can be attached to a wooden stake with ties or reusable plastic hose clamps (93.5).

94 - The stake must be driven in at a distance from the tree equal to half the diameter of the tree guard (94.1), so that the tree is at the centre (94.2) and will grow properly inside the mesh.



94.1



94.2



95



97



98



96



99.1



99.2



100



101



102



103

95 - Drive the post in straight with a lump hammer or sledgehammer to a sufficient depth to keep it upright.

96 - Press down on the outer folds of a tree guard (that has been delivered flat before installing it) to open it into an oval section.

97 - Pressing on the outer folds places them in a central position, with the centre folds on the outside. The mesh can now be rolled up lengthways.

98 - Rolling a reinforced double-mesh tree guard lengthways before opening it up will help to maintain an oval section.

99 - After pressing and rolling, open up the tree guard to form an oval section (99.1). It is now ready to be placed on the tree. The oval section ensures that the sapling is centred and will grow properly inside the guard.

100 - Slide the mesh sleeve gently down around both tree and wooden stake.

101 - Hold the tree so that its terminal bud will not rub or catch on the mesh.

102 - Starting at the top end, staple the mesh to the wooden stake.

103 - Make sure one of the staples is approximately half way down the mesh.



104



105



106

104 - Deer guards should be stapled from top to bottom. Some operators prefer to use 5 wire staples 20 cm apart.

105 - It is best to staple along one of the main folds of the mesh to help maintain an oval section.

106 - Never let the mesh extend past the top of the stake, or the wind will cause it to fold over and prevent the leader from growing out of the top of the tree guard.

- position the stakes at a slight angle so as to stretch the mesh slightly and thus reduce the risk of wind damage;
- to maintain the oval section of the tree guard (when delivered flat), position it so that the folds are perpendicular to the ground between the stakes;
- make sure that the base of the tree guard is in close contact with the ground.

For roe deer

The stake (sawn, pointed locustwood stake, L 150 cm - S 22 x 22 mm or split, pointed chestnut stake L 150 cm - C 18-22 cm) (**Photo 93.1**) must be driven in straight (**Photo 95**) to a depth of 30 cm to prevent it from leaning, and even deeper if the soil is gravelly or was ploughed with a subsoiler.

In windy areas, a (split) bamboo stake can be placed opposite the wooden stake to stop the wind from shifting a light- or standard-weight tree guard.

When positioning the stake, the following must be checked:

- diameter of the tree guard (Ø 14-15 to 20 cm): the distance from the stake to the tree must be equal to half the diameter of the tree guard (on average 7 cm for a deer guard protecting a broadleaved tree) to ensure that the sapling

Installing a mesh deer guard

Tree guards to protect trees from roe-deer damage are more complicated to install than rabbit and hare guards (cf. p. 52).

Work in three stages, observing several technical rules to ensure long-term stability and effectiveness:

- drive the stakes in close to the tree;
- slide the mesh very gently down the tree;
- fasten the mesh firmly to the supporting stake.

is centred and will grow properly inside the tube (**Photo 94**);

- prevailing wind direction: the stake should be placed face to the wind, in front of the sapling, so that the wind will not twist the flexible mesh around the stakes. This is a common problem with light- or standard-weight mesh. It can harm the plant by twisting the stem or snapping its branches, and interfere with the height growth of the leader;
- slope of the planting site: the stake should be placed on the uphill side of the tree and driven in 10 to 20 cm deeper than usual, depending on the angle of the slope;
- the pre-folded (2-4 folds) mesh should be pressed by hand



107



108

to form an oval section (Photo 96) so that it will slip easily over the plant. This is done by pressing on the outer folds of mesh guards that have been delivered flat (Photo 97). Reinforced double mesh tree guards may also need to be rolled lengthways (Photo 98) to help maintain an oval section (Photo 99) once they are opened and installed;

- slide the mesh down around both plant and wooden stake (Photo 100). This must be done gently (Photo 101) so as not to damage the terminal and lateral buds by rubbing or tearing. To keep rodents out, always make sure that the base of the tree guard is in close contact with the ground;
- staple the mesh to the stake with three wide, 10-mm or 12-mm staples placed at an equal distance along the height of the tree guard (in the middle and at each end) (Photo 102, Photo 103 and Photo 104). Position the tree guard so that one of its folds is in contact with the stake. Stapling along one of the outer (main) folds will help to keep the tree guard open (Photo 105);
- never let the mesh extend past the top of the stake, or the wind may cause it to fold over and stop the leader from growing out of the top (Photo 106). If necessary, fold the top end over like a sock so that it is level with the top of the stake. This is essential with lightweight, standard and some mixed-mesh tree guards, and may even be needed for heavy, reinforced and more rigid guards.

The stability of mesh guards around saplings in an agroforestry plantation can be improved by attaching them to 2 wooden stakes

with fence ties or reusable plastic hose clamps (Photo 93.5).

For red deer

Mesh tree guards against red deer damage are usually fixed to sawn pointed square-section chestnut stakes (L 210 cm, S 28 x 28 mm). If the density is high, we strongly recommend using 2 round chestnut or treated pine posts (L 250 cm - Ø 4-6 cm, or better 6/8 cm) to support a heavyweight mixed reinforced mesh tree guard (ht 180 cm, Ø 20 cm, or better 30 cm). Avoid ultra-wide mesh guards.

The trickiest phase when installing a mesh tree guard for protection against red deer damage is the positioning of the wooden stakes:

- the stakes must be equidistant from either side of the plant (Photo 108). The distance between them will correspond to the diameter of the tree guard;
- using a crowbar, make starter holes (at least as deep as a quarter of the length of the wooden posts) to ensure better long-term stability. A simpler method would be to drive the posts directly into the ground, but there is a much greater risk of damaging the wood and this is the least reliable method of installation;
- drive each post into its starter hole to a depth of 40 to 50 cm. A high (ht 180 cm) wide-diameter (20-30 cm) mesh tree guard is placed by sliding it gently down around the tree and the wooden supports;
- attach the tree guard to its wooden support with fence staples 20 to 30 cm apart.

107 - Round pointed chestnut posts (L 250 cm, Ø 6-8 cm).

108 - The distance between the wooden posts will correspond to the diameter of the tree guard. This ensures unobstructed growth of the sapling inside the mesh guard until it emerges from the top.

Checking the trees

Regular maintenance

It would be a mistake to think that mesh tree guards will last for a long time without any maintenance.

After planting, owners or plantation maintenance or management contractors are strongly advised to make regular site inspections in order to straighten, repair or replace tree guards damaged by animals or high winds. In the event of vandalism (theft or wanton destruction), the tree guards and their supports should be quickly replaced.

During the winter following the first growing season, all the stakes should be reinforced (average work time: 100 to 110 stakes per hour). In sites ploughed with a subsoiler, stakes will often sink by a further 10 to 15 cm. Stapling should also be reinforced at the same time, if necessary.

When checking wide-mesh tree guards, any leader shoots that have grown out through the mesh should be (gently) pushed back. To avoid this problem, it is advisable to restrict this type of mesh to conifer and tall deciduous saplings (stems > 150 cm).

With beeches protected by fine-meshed tree guards, the spring shoots, which always bend downwards, cannot straighten out if the guard is too narrow. This results in unacceptable malfor-

mation of the trunk unless the site is checked at least twice a year (in late spring and in the summer) and the problem corrected (Photo 62). An alternative solution is to use saplings that are nearly as tall as their tree guard (or better still, to use tree guards at least 20 cm in diameter that are attached to 2 stakes to keep them wide open.

The top edges of heavyweight reinforced double-mesh tree guards can be abrasive (Photo 109.1) and should be folded over, like a sock (Photo 109.2), or slit around the top (Photo 109.3), to prevent damage to trees with thin bark in windy sites especially.

Anticipating health problems

Some health problems affecting young trees are directly attributable to mesh tree guards. Two potential problems are overheating of the trunks and creating shelter for wood-eating insects.

The trunks of thin-barked species, such as beech, cherry, maple and especially poplars, are particularly susceptible to overheating when the plastic mesh is too tight.



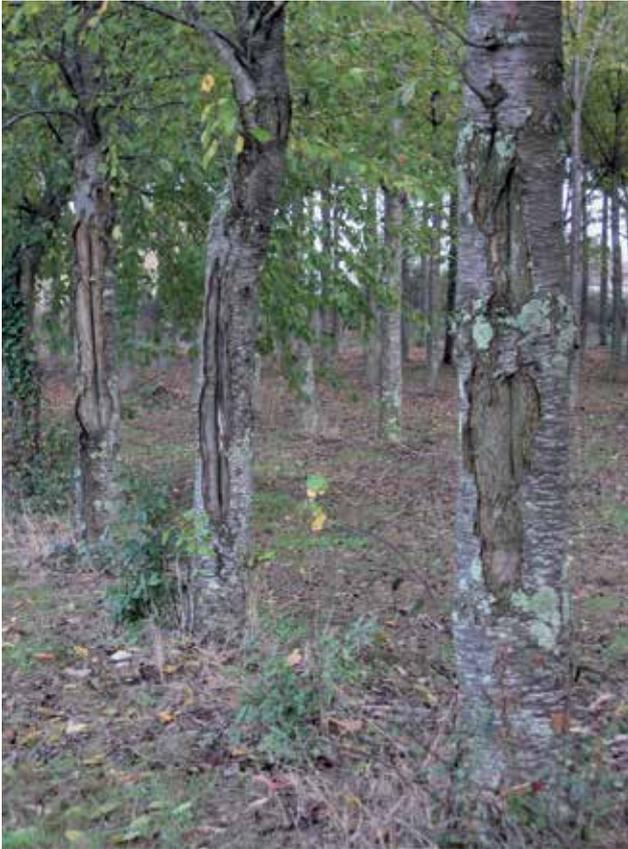
109.1



109.2



109.3



110.1



110.2

High temperatures and exposure to sunlight will promote bark lesions inside the mesh guard (Photo 110), which consistently develop on the southwest side. Black plastic mesh will cause the most severe damage.

3 to 8 year-old plantings seem to be the most affected. Symptoms are peeling bark and calluses forming around the lesions. The wood becomes exposed and these fragile areas may be colonised by wood-rotting fungi (Photo 111).

In poplar groves, wood-eating insects, especially longhorn beetles (*Saperda carcharias*) and goat moths (*Cossus cossus*), may lay their eggs inside the tree guard, where they are protected from predators. These insects are especially attracted to trunks when there is little space between them and the mesh.

The damage caused by these wood-eating insects may not be very serious, unless a woodpecker spots the larvae and then pecks large holes in the wood to get at them (Photo 112). Occasionally, tree guards may also become a refuge for rodents. They can also create a microclimate favourable to the

development of aphids (e.g., black cherry aphid, woolly poplar aphid).

Mesh tree guards must be removed when they become tight against the trunks because the risk of overheating is greatest at this point (Photo 113). If they are not removed in time, the stake to which the mesh is attached can become embedded in the trunk (Photo 114).

109 - The edges of heavy reinforced double-mesh tree shelters are potentially abrasive (Photo 109.1) and should be folded over like a sock (109.2) or slit around the top (109.3) to prevent damage to species with thin bark.

110 - In thin-barked tree species such as wild cherry (110.1) and poplar (110.2), high temperatures and sunlight on plastic mesh tree guards that are in close contact with the trunks will promote bark lesions.

Removing worn tree guards

Banned disposal methods

Foresters or farmers who have used mesh tree guards, plastic mulch, fertiliser bags or plant containers might be tempted to abandon them on the plantation. They may decide to stockpile these worn materials in the corner of a field to burn or bury them at a later stage.



111



112

111 - Bark peeling caused by overheating of the trunk and colonisation of the exposed wood by wood-rotting fungi.

112 - The holes in this "Beaupré" poplar were made by a woodpecker to get at the wood-eating insects colonising the tree.

113 - Heavyweight reinforced mesh tree guards may need to be removed when they become tight against the trunks.

114 - The wooden stake embedded in the lower part of the trunk (114.1) will reduce the technological quality of the butt log (114.2).



113



114.1



114.2

Abandoning, burying, stockpiling and illegal burning of plastics are polluting and dangerous for the environment, and strictly forbidden by French law (Forest Code, Environment Code and local by-laws).

Abandoned plastic sheets pollute the environment visually, float on the surface of lakes and rivers, obstruct gratings, canals and ditches and can be deadly when ingested by animals. Stockpiling in a corner of a forest plot or elsewhere can be considered as fly tipping and may therefore be illegal under local regulations.

Open-air burning can pollute the air (because the various materials burning in the bonfire can produce noxious smoke), create wildfire risks and cause burns to people (falls and flare-ups) as well as damaging soil fauna and flora.

Buried plastics break down much more slowly than the plant materials. The plastic fragments degrade soil quality and prevent, water and micro-organisms from circulating freely.

To maintain the health and vitality of forest ecosystems, worn plastic mesh tree guards (**photo 115**) must be recovered and transported to a recycling facility when they no longer provide trees with any protection (**Tip 8**).

How to dispose of plastic waste?

Worn mesh tree guards are removed when the trees are large enough to resist animal damage.

If a worn plastic tree guard is tight against the bark, an operator using an inappropriate method to remove it may injure the tree.

Cutting off the plastic mesh with a standard boxcutter blade can injure the bark and the wood beneath. We recommend using a carpet knife, as the large hooked blade with rounded edges avoids damage to wood tissues, while the sharp tip easily cuts through the plastic mesh.

115 - Deteriorated plastic mesh tree guards must be removed when the trees no longer need protection.

116 - Careless removal of worn tree guards with a knife can injure the bark and the wood beneath it.



115



116

Tip 8 - Disposal of plastic waste without polluting the environment: what French law says

At the end of their useful life, worn plastic mesh tree guards become “waste”. By definition, waste is a product disposed of, or to be disposed of, by its owner.

There are no specific regulations for plastic waste, which must be disposed of, like any other waste, in accordance with statutory rules and in compliance with the Environment Code in particular.

This stipulates that any person producing waste must dispose of it without endangering human health or harming the environment, and in particular without causing risks to water, soils, flora and fauna, without causing offensive smells or noise pollution and without damaging sites or landscapes (Art. L541-1).

Any person who produces or owns waste (Art. L541-2) is:

- required to arrange for its collection and transport for recycling or disposal;
- responsible for the management of their waste up to its disposal or final recovery, even when the waste is transferred to a third party for processing.

All foresters, farmers, plant nurseries, horticultural operators and fruit-growers, local councils, other local authorities and private companies using plastic materials (such as motorway and railway operators) are considered as producers or owners of plastic waste and are responsible for its disposal.

By participating in the recovery of plastic waste, they are complying with the law and contributing to the constant effort to reduce the large amount of plastic mesh waste abandoned in the environment (estimated at an average of 220 to 240 tonnes per year in France⁽⁹⁾).

⁽⁹⁾ Some 1.8 to 1.85 million mesh rabbit and hare guards and 1.2 to 1.25 million mesh deer guards are sold every year in France to protect forestry and landscape plantations. The average weight of rabbit (or hare) and deer guards is 40 and 130 grams per unit respectively.

Recycling plastic mesh tree guards

Although worn plastic mesh tree shelters are fully recyclable, only a small proportion is recycled at present.

Foresters and farmers are responsible for the disposal of their waste, but numerous technical, economical and environmental restrictions can prompt illegal disposal.

For many years, disposal in landfills was an easy and legal solution, but this is now banned. Since 1st July 2002, non-hazardous waste disposal facilities can accept only final non-recyclable waste, and worn tree guards do not come into this category.

The main problem for any owner or producer of plastic waste is to identify a waste recovery operator able to provide local waste collection services.

Plastics manufacturers are gradually becoming organised to address this problem. One manufacturer of mesh tree guards has implemented a Europe-wide environmental quality charter for recovering and recycling their products.

Plastic waste must be delivered by users to collection points managed by distributors who have signed up to the charter.