ORCHARDS EAST
RECORDING CONSERVING CREATING

Suffolk Traditional Orchard Group

PROTECTING NEW AND OLD ORCHARD TREES (INCLUDING PARKLAND)

Advice Note 4 (STOGAN4)

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HERITAGE FUND

1. HISTORIC TECHNIQUES OF PLANTING AND PROTECTING ORCHARD TREES

1.1 "English grass orchards"

There were several routes to the "English grass orchard", as some early twentieth century writers called it.

One was to plant the trees on large rootstocks relatively close together, say 3-4m apart, and then when the tree canopies touched, alternate trees were removed to leave more widely spaced trees, 6-8m apart. Land between the trees was often initially ploughed annually with a special shallow plough share for a few years and crops were grown in the rows until the trees shaded them out.

A second common method was to plant with wide lanes between closer planted trees and crop the lanes with soft fruit (for example strawberries or blackcurrants) or even cereals or vegetables, until the trees were big enough to shade out the "intercrop". Then the orchard was grassed down (termed "*letting down to grass*", or "*tumbling down to grass*") and later some of the trees were removed from the rows.

In almost every case the grassing down, and subsequent animal grazing, came later, after the intercropping ceased. Careful planning was needed in order to leave the pollinator trees as well as the main crop trees, especially for pernickety self-sterile cherries.

Clearly not all orchards went through this process and perhaps small farm house orchards (almost universal near every single farm throughout England) were planted directly into existing grassland and grazed immediately after planting.

1.2 Replanting in old orchards

Many orchard sites associated with farms and houses are of considerable age, although the individual trees themselves do not live to a great age (with the notable exception of pears). Trees were replaced regularly (not always with the same species and often not in exactly the same place). This was perhaps to avoid disease, especially as poor growth of the same species into the same hole after the removal of an old tree has been reported for centuries. This style of planting has resulted in shaky lines, or no lines at all, after a century or so.

New small trees needed protection from gazing animals and several methods were described in the literature before the advent of modern plastic tubes and sheep netting. These included the post and rail square or triangle, with close rails, close-woven hazel or willow hurdles instead of sheep netting. In the nineteenth century "paling" was used, made of split wooden stakes, usually sweet chestnut, held by two twisted horizontal wire lines.

2. MODERN TREE PROTECTION METHODS

2. 1 Protection from grazing animals

1.2m Tubex tree guards (other makes, round or square in section are also available) supported by a peeled-and-pointed post (or MRP, machine-round-pointed) 2/3" x 5'6"-6' (50-65mm x 1.60m) is best to protect against downland sheep, muntjac, fallow and roe deer, and the occasional red deer, and 1.5m tubes for heavy deer pressure. Cattle grazed sites require heavy duty 4-post and rail protection (Fig. 1). Open mesh tubes are unsuitable as the animals can see and smell the leaves and try to reach them (also leader shoots can pass through the 1-2cm mesh, distorting the leader and they can get eaten).

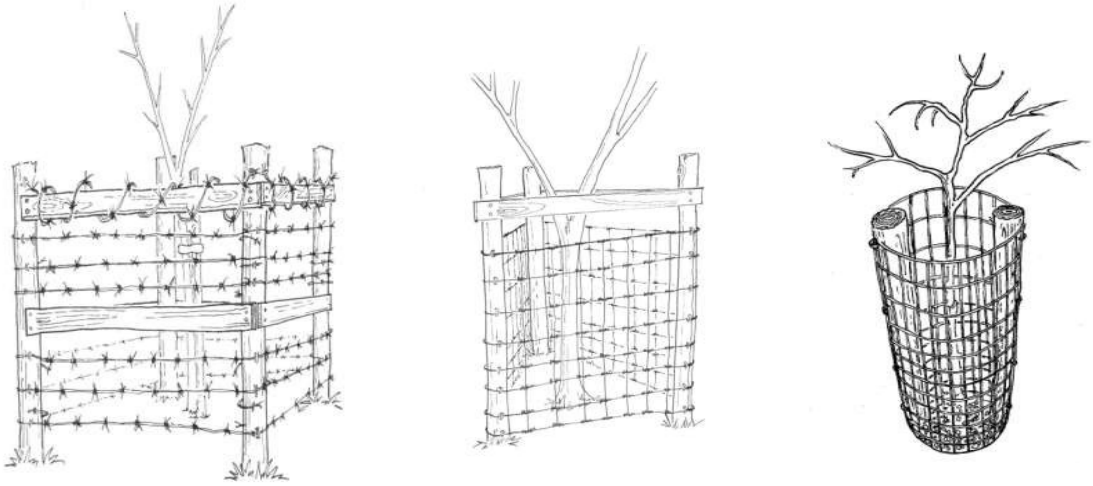

Fig 1 Natural England's recommended orchard tree protection systems

***Left*: For small sheep (only recommended with stout posts and very heavy gauge welded steel, or split chestnut paling (and NOT chicken wire netting).**
***Centre:* For larger sheep breeds. *Right:* For cattle.**

2.2 Planting and pruning using tall protection tubes

Fig 2. A new orchard planting

1.2 m Tubex and 65 mm x 1.68m (6 ft) posts, 7m apart, in lines 8m apart. This is a quincunx* arrangement (see explanation in box) and is intended for grazing by small sheep breeds. Trees reach out of the tubes and are intended to be half-standards branching at about 1.5m.

This is completely different from conventionally recommended fruit tree protection methods. Whenever possible, plant trees which are already at least 1.5m high. On planting directly into a tall tube the trees are pruned of all side shoots to the height of the tube. (If the trees do not reach beyond the tube this will slow down the growth and should be avoided).

Two year old trees may be branched and a Tubex-type shelter may need to be split to place it round the trunk and closed with cable ties. An annual inspection of every tree and its protection is essential, plus repair of failing protection, to ensure a split tube is replaced or repaired, that unseen side shoots or grown out rootstock suckers aren't filling the tube, or that ants haven't filled the tube with a nest!

Do not stake the tree within the tube. The tree will make a better, firmer root system if free to move.

**** A quincunx is a geometric pattern consisting of five points arranged in a cross, with four of them forming a square or rectangle and a fifth at its centre.***

Fig 3. A new hedge around a newly planted grazed orchard with damsons, bullace and cherry plums amongst native hedge species. The saplings are protected by quills (50cm narrow tubes) or spirals.

Planting hedge crop species one year earlier than the other species helps them establish faster.

Stock fencing should be a minimum of 1.5m from the hedge centre on each side to minimise browsing and allow larger hedges.

Tube guards eventually burst (initially at the base) as the trunk expands, and bare stems will then be vulnerable to grazing at the base by rabbits. (If taken off before any splitting seriously distorts the plastic, most tube tree protectors can be re-used. They will need to be completely spilt to remove them from the original tree and then re-assembled around a new planting with cable ties to hold the tube in shape).

Fig 4. Tree protection with tubes

1. A 1.2m Tubex and a 25mm square unsuitable for any grazing animal.

2. 60/65mm post and 1.5m Tubex suitable for initial planting in sheep or deer grazed areas. 1.2m may be enough for small downland sheep breeds and muntjac.

3. A Tubex just starting to distort as the trunk fills the tube – the post may be now redundant and can be removed, but in this example has been left to retain the label.

4. Tubex splits, initially at the base as trunk diameter increases, and becomes vulnerable to stripping by grazing animals. This should have been replaced by a simple plastic mesh tube (or the 3 or 4 post-and-rail system in section 2.3).

Fig 5. Labels

Initially attach labels to posts if possible, not the tree.

This label is cut from 2mm UPVC sheet with a self-adhesive Brother TV industrial laminated label tape and screwed to the post with a stainless steel screw and washer.

The best thermoplastic laminated labels on PVC sheet have lasted for over 25 years.

Make a separate plan of a planting to record variety names and rootstock.

Keep digital versions in at least two separate locations and on different media such as CD, DVD etc.

Make a paper copy as well!

2.3 Three or four post protection systems

In regularly sheep grazed sites, three or four post protection systems (shown in Fig 7 for new trees) is recommended from initial planting (if funds permit). This is by far the best solution and safer than just a post and tube, but expensive. For large sheep breeds, such as Suffolk, Norfolk Horn, Leicester, and Romney this will be necessary; with care small breeds, Southdown, Ryland, Portland and Shetland are reasonably safe with just a 65mm post and tube, although accidents will happen!

Fig 6. 1.2m high, four-post-&-rail sheep protection

A post-&-rail and stock fence wire protector replacing a Tubex about 6 years after planting. Four x 65mm x 1.6m posts, four rails and C80/15/15 wire stock fence.

There is no top wire, the rail replaces the wire in a traditional 1.2m high sheep stock fence scheme.

The label has been attached to one of the corner posts.

Under a Natural England Countryside Stewardship Scheme, this system can be funded at the same time as planting. It is probably the most secure protection system against sheep, roe deer and muntjac grazing.

An optional single line of barbed wire at ground level adds to the protection with minimal risk to stock.

Fig 7 The Natural England three or four post-&-rail system

The three or four post-&-rail system uses 80cm sheep fencing (C or L 80/15/15).

Treated posts are MRP 65mm x 1.8m. The centre post supports a 1.2m Tubex. This tube could be replaced by a 60 or 75cm version if 1.2m high sheep fence is used.

A triangular (or square for 4 posts) template is used to set out the post positions. This speeds up the assembly process.

4" or 5" nails are placed through drills at the top of the posts and into the end grain of the rails, in this case 80cm x 60-65mm posts.

The stock fence is stapled to the posts and tensioned to make the entire structure rigid.

NE also recommends a set of lower rails at the bottom of the wire with space below to allow grazing up the tree stem. Also suggested is optional barbed wire at the top and bottom of the stock wire.

Rabbits will graze inside the stock fence and therefore some protection is always essential inside the stock fence.

Fig . 8 For protection against cattle grazing: a 2m high post-&-rail system.

Fig. 8 shows a 2m high post-&-rail protection for a plum tree in a cattle grazed orchard. The stock fence runs up to the rails and above the top rail there are one or two lines of barbed wire.

For cattle grazed orchards, Natural England specify an additional lower rail, a 1.5m stock fence, and spiral winding or barbed wire around the outside post from base to top bar.

Picking of the fruit is via ladders!

2.4. Planting directly into grass

Planting into grass will slow initial growth down**.** At Home Farm, we clear the ground around the new tree in a 1m radius (by turf removal, or with glyphosate) and mulch wherever possible, but remember that some mulches, like hay and fresh grass cuttings, will be eaten. Old, even mouldy, wet hay or straw, or bark and woodchips, if older than 1-2 years, are best. Expensive felt discs can work quite well.

Water in the first year only (and only when necessary), and bear in mind that the highest risk from drought is from May to July.

2.5. Unsupported heavy plastic netting

Netting of this sort, for example ground protection netting, such as that used for paths or car parks, with an approximately 1.0 - 1.5cm square mesh, can be used for protection**.** In recent years, some affordable plastic mesh designed for light fencing, with a mesh of about 2cm and in heavy gauge, has been sold for “tree protection”, sold as rolls, cut as required and joined with nylon cable ties. Open mesh guards like this are NOT recommended for young trees as branches, and even the leader, may grow out through a mesh, but they are ideal as a long term protection when the initial tube protection splits after 5-7years. In the winter of 2019-2020 quite old apple and pear trees and, even more unlikely, cherry plums over 15 years old, and over 40cm in diameter, were attacked by rabbits and muntjac deer.

Fig. 9 A sheep grazed orchard over 10 years old, now protected by a 1 m high plastic mesh tree protection system.

Fig 9 shows a sheep grazed orchard planted more than 10 years ago in which most posts and Tubex have been removed and replaced by a 1m high plastic mesh tree protection system.

The post can be left to hold the label or, as shown, removed and labels either attached to the mesh, or a tree branch by a looped cable tie; this is unsuitable in cases of grazing by cattle, or horses.

Chicken wire is still widely used, but may be pushed in, or pulled down by stock, and is not recommended for protection over 40cm in height unless supported by posts. See Section 2.8 for using mesh for large trees.

2.6 Cultivars needing permanent protection in a grazed orchard

Not all cultivars will make vigorous enough large trees to be left unprotected in a grazed orchard. Even on vigorous rootstocks, some varieties may always need to be surrounded by post and rail (Cox's Orange Pippin or Pitmaston Pineapple are good examples). Even when quite old, apples and plums have succulent bark and will always need protection from rabbits, deer and sheep. Post and rail in a square or triangle with sheep netting is expensive and time consuming to make, but is the only system that can be absolutely relied upon.

Old low branched apples, the traditional fenland Bramley Seedlings for example, may need a 2.5m square enclosure round every tree. A single stemmed standard will need a 1.0 – 1.5m triangle or square 1.5m high. (Nice metal tree protectors as used in parkland can cost a great deal of money and many are too high to pick over!)

3.0 PROTECTING GRAZED TRADITIONAL ORCHARDS UNDER COUNTRYSIDE STEWARDSHIP SCHEMES

Natural England guidance

Higher Level or Higher Tier Stewardship requires a high standard of tree protection which must be in existence for at least five years. Over the years several types have been required and these requirements have changed almost annually. Currently the two methods advised are as follows (*original Natural England text*):

Orchard tree guard (sheep proof)

There are two alternative specifications, using either weld mesh or sheep netting. Either style of tree guard should be 1.5m high, adequately supported and designed to last for five years. The guard should prevent sheep from rubbing against the tree and protect it from grazing livestock, deer, rabbits and other mammals. To exclude red deer it may need increasing in height to 1.8 metres. It should not cause any damage to the tree as it grows, or through branch rubbing. It must be checked regularly and removed once the tree has become established.

1. *The guard should comprise two stakes placed at least 50 cm apart. One stake should be at least 1.5 metres high - the other should be at least 50 cm high. Weld mesh, at least 1.5 metres high, should be wrapped around the outside of both stakes and securely fastened to both stakes in a circle to maintain a distance of at least 25 cm between fencing and trunk. The weld mesh should be bent so that the vertical strands of wire face outwards, to prevent the trunk rubbing against them. Alternatively, a piece of rubber tubing can be slit lengthways and pushed onto the top of the circle of wire, to prevent the tree rubbing against the metal.*
2. *Alternatively a 1.5m high triangular guard consisting of three wooden posts with atop and a bottom rail may be used. Sheep netting should be secured between the top and bottom rails. The bottom rail may be raised off the ground at a height which is low enough to allow stock to graze underneath whilst preventing them reaching to the base of the tree. If it is necessary to increase the height of the guard, longer posts can be used and an additional strand of wire strung above the sheep netting. For both types of guard, two strands of barbed wire may also be wrapped spirally around the guard to prevent the sheep rubbing against it.*

The first method has been found to be unsatisfactory if larger sheep or cattle are to be kept away from the trees. The weld mesh is only held by two posts and can be crushed inwards by the weight of stock. Once bent in, it stays in and is difficult to reshape. It may be suitable where only smaller deer are a risk, but it is not recommended.

The second method is illustrated in Fig. 7, except that bottom rails are recommended. These complicated structures have been found to be vulnerable to strong grazers pushing up the bottom rails. Also sheep graziers do not use barbed wire if they can avoid it and this is the only technique that prevents animals from pushing up the rail. Some graziers have used the lower rail for its added strength, but run the stock fence to the ground. The method used in Fig. 7 seems to be the most practical solution for sheep.

4.0 PROTECTING LARGER TREES

Trees become particularly vulnerable when they are too large to need the support of a stake and/ or outgrow the protection of the original system, but still have thin succulent bark. In the case of apples on M25, pears on Wild Pear, and plums on St Julien A or Brompton this is about 10-20 years after planting. Apples may require another 10 years to be un-attractive to sheep, although most goats and all horses can kill a tree of almost any age by barking. The three- or four-post system should be sufficient protection, but if that is not used, then some form of protection must replace a simple tube. The only viable alternative is the permanent use of plastic or metal protection mesh tailor-made to fit the tree.

5.0 MULCHING NEW TREES IN GRAZED SITES

Mulching reduces water evaporation, helps trees to establish quickly, protects them from summer drought and prevents grass and other plants from competing for water and nutrients by suppressing their growth. However, in open country and in grazed sites, organic mulches may be eaten by grazers or removed / turned over by birds.

Some organic mulches, placed inside post and rail protection with stock fence to the ground, are very effective and can be reasonably long lived. A thick mat of old wet hay, partially decomposed straw or rotting long-grass cuttings work well and old fully rotted wood chips or shreds are a second choice. Peat (a very bad idea for other reasons!), composts (mushroom or garden), sawdust etc., does not last long, and is usually dug up and scattered by rabbits and birds and even wind.

At Home Farm, for trees without post and rail protection, we have used heavy mats of wet hay with some success, but the best is pieces of old carpet (*old* carpet, i.e. made of wool or cotton, before plastic warp, wefts and tuft!), pegged down with sharpened sticks. Black plastic sheeting we find messy and time consuming to lay; we are sure it can be effective (but it offends the eye, blows away, and requires an even greater effort to remove!).

6.0 GRAZING ORCHARDS WITH HORSES AND OTHER ANIMALS

Apart from their use as a spring garden (see STOGAN 9 Suffolk Traditional Ground Flora Natural and Planted), the most common secondary use for orchards in Suffolk seems to have been for **chickens, geese, guinea fowl, or turkeys**, all easy to manage, once there is a secure boundary fence, and not just to keep the birds in. At Home Farm, we have twice lost chickens in an orchard to a fox in daylight! Our best system is a post and rail fence, intended for a pony, with 2m tall, 2in square timbers screwed to each upright and 2m high chicken netting stapled to them from the ground up.

Sheep grazed orchards still exist in East Anglia. **Goats** are more active browsers and can de-bark large trees. They also readily climb into trees if a slightly sloping trunk allows and will browse right into the canopy.

Pigs were traditionally put into orchards in the west-country in autumn to eat windfalls, but even when this was done, it was only for a few days at a time. This doesn't appear to be an East Anglian practice and where it has been carried out (as has been the case in a well-known orchard site in Norfolk for example) the pigs create a battlefield-like appearance between the trees that is still present and cannot be easily flattened.

The only breed of pig that does not rootle is the New Zealand Kune Kune and these are sometimes grazed in woodland; we have these at Home Farm, but never risked them in an orchard.

No orchards should ever be grazed with horses, or ponies. Horses and ponies can reach higher than any other grazing animal, will routinely de-bark trees, and are widely recognized as the most common cause of orchard loss apart from planned development. A record exists of a horse completely stripping bark up to 2m from ten well established old trees in just two weeks in winter, in Scole, Norfolk.

There is virtually no sensible protection against horses that can be applied to existing trees that have been planted for harvesting with just a step ladder! Horses reach high branches and pull them down until they snap. In effect, once horses are put into an orchard to graze, the trees are lost.

For many years an orchard on the side of the M2 in Kent was a testament to this – the huge barked apple and cherry trees stood as dead sentinels to the horses that had grazed it. Finally in 2014 the trees were felled – it is no longer an orchard.

Fig 10. These apples are on a semi-dwarfing rootstock, MM106, which do not do well in grassland and never make large standard trees…. but these cattle will ensure that they won't be here for much longer. Horses are even quicker at demolishing fruit trees!

FURTHER READING AND INFORMATION

Hoare A. H. *The English Grass Orchard and The Principles of Fruit Growing*, Ernest Benn, 1928

Juniper B E & Juniper S B (Editors), Anon (By a Lover of Planting), The Compleat Planter & Cyderist, London 1685, (Reprinted 2003).

BE4 Management of Traditional Orchards

www.gov.uk/countryside-stewardship-grants/management-of-traditional-orchards-be4

STOGAN 2 and 3 - Suffolk Traditional Orchard Group: *www.suffolkbis.org.uk/biodiversity/projects/stog/advicenotes*, **Orchards East:** *www.uea.ac.uk/orchards-east/advisory-notes*

Some online suppliers/search words for tree Protection:

Green-tech: *www.green-tech.co.uk/*

Suregreen Ltd: *www.sure-green.com/fencing-supplies.html*

The Farm Forestry Co Ltd: *www.farmforestry.co.uk/*

Tubex: *www.tubex.com/*

Paul Read

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Suffolk traditional Orchard Group: www.suffolkbis.org.uk/biodiversity/projects/stog

Orchards East: www.uea.ac.uk/orchards-east