Traditional orchards: a summary

The term *traditional orchard* generally refers to extensively managed groups of fruit and nut trees planted on vigorous rootstocks at low densities in permanent grassland. Widely distributed across England, they include apple, pear, cherry, plum and damson orchards and cobnut plats. This information note provides a summary of the key information contained in the series of Natural England Technical Information Notes on traditional orchards and a list of orchard related organisations and bibliography. Other information notes in the series provide guidance on various aspects of traditional orchards and their management. For details see *Further information* at the end of this note. For an explanation of terms used in this leaflet see TIN021 *Orchard glossary*.

Site selection

Site selection

At one time most farmhouses had an orchard providing a range of fruit for the family. While in areas like Kent and the three counties of Gloucestershire, Herefordshire and Worcestershire there were also larger, commercial orchards.

Today, while the management and restoration of existing orchards takes priority, the creation of new orchards is valuable for wildlife and can restore and reinforce landscape character. New orchard planting should fit in with the surrounding landscape, ideally on historic orchard sites, but not on sites that are of archaeological interest.

It is important to establish fruit trees properly, whether planting a new orchard or replacing trees in an existing one. Orchards can be grown in most situations, but the ideal site is in a sunny, sheltered, south-west facing location, away from frost pockets such as valley bottoms.

Tree selection

Tree size

Maidens are generally cheaper and establish better than standards. However, standards have the advantage of already having had some formative pruning.

Rootstocks

Dwarfing rootstocks have been developed to produce smaller trees, often planted in bush-tree orchards and gardens. However, traditional orchard trees need to be grown on vigorous rootstocks to support a tall trunk and to raise the branches above the reach of grazing animals.

Varieties

There is a huge choice of varieties, particularly apples. Many varieties are old and confined to a small area, even to a single village. Many are either rare or have become extinct. Species and varieties may be chosen for a number of reasons, such as their cultural and historical value, their suitability for local conditions, or the uses to which the fruit is to be put (ie eating, cooking or juicing).

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Planting and establishing fruit trees

Pre-planting

Correct planting and aftercare is crucial to a tree's long-term survival. If not carried out correctly the tree may struggle or die no matter how good the aftercare.

Pattern and density

In an existing orchard new trees should fit in with the existing planting pattern. However, it may be necessary to plant to one side of the original planting hole to reduce the risk of disease.

Planting densities depend on the tree species and ground conditions. Apples are generally planted 8-10 metres apart, pears and cherries further apart, while plums can be planted more densely.

Time of year

Bare-rooted trees can be planted from November to March, when they are not in leaf. The roots need to be kept cool and moist before planting. Container trees can be planted throughout the year, but if planted in the summer they will need a lot more watering. Planting should not be carried out during periods of frost.

Planting the tree

First clear the vegetation in a one-metre circle where the tree will be planted. Where the soil structure is good, maidens can be notch-planted. For larger trees, and where soil structure needs to be improved, dig a hole that will accommodate the roots without bending them. Keep the topsoil and subsoil separate.

Drive a short stake into the hole leaving no more than 30 cm above ground level. This will allow the tree to flex and strengthen the trunk and roots. Next, put in the tree and carefully backfill the soil around the roots, ensuring that the final soil level is at the root collar. It should not be necessary to apply fertiliser or organic matter.

The tree should be watered regularly and thoroughly for the first few weeks and during any dry spells for the next year.

Guards

Guards will be required to protect trees from grazing livestock and wild animals, which eat the leaves and bark, and rub against the tree. Guards need to be checked regularly as the trees grow and adjusted if they are causing the tree any damage.

Weed control

Competition for water and nutrients can severely affect trees, particularly when young. Therefore, a one metre circle around the tree should be kept clear of grass and weeds for at least three years after planting, preferably by applying a thick mulch.

Ongoing management

Once trees are established the sward can be allowed to grow up to the trunk and there should be no need to apply fertilisers. Guards should be maintained for at least 10 years. Mature trees may also require protection from livestock.

An introduction to pruning

Pruning is an essential part of successful fruit growing. It:

- Helps to develop and maintain a balanced tree, of manageable size and even shape.
- Rejuvenates the tree, stimulating strong growth and new fruit-bearing branches.
- Lets in light and air, encouraging a regular crop of healthy fruit.
- Removes branches that are diseased, damaged, crossing and badly placed.

Equipment

Five tools are useful for pruning:

- bow saws for large branches;
- pruning saws for medium branches;
- loppers for smaller stems;
- secateurs for twigs and shoots; and
- a pruning knife for young growth and tidying up larger cuts.

Keep all tools sharp, use the right tool for the job and disinfect tools after use.

How to make pruning cuts

Small cuts

When cutting stems with secateurs or loppers cut back close to a bud. Not so close as to damage the bud, but not leaving a stub which will die back. A sloping cut will allow water to run off. When pruning diseased wood always cut back to healthy growth.

Large cuts

Generally branches forming wide angles to the trunk or other branches are stronger than branches forming narrow angles. When removing branches with a saw do not make a stub cut and leave a section of branch that will die back. Pruning cuts should never be made flush with the main branch or trunk, as this removes the branch collar, which helps the wound to heal.

Do not cut through the branch in one go. Make a separate cut underneath so the branch doesn't split. Clean up any rough edges with a pruning knife.

Do not paint wounds but allow them to heal naturally. Anything that is too big to tackle with a bow saw should be left to a professional with a chainsaw.

What to do with the prunings

These can make a good wildlife habitat if they are stacked in a pile, particularly larger pieces. However, any diseased wood should be removed and burnt.

Formative pruning

Introduction

Formative pruning is the initial pruning of a young tree to develop a balanced shape. Young growth is pruned back to encourage the tree to grow in the right direction and develop thick branches that will support heavy fruit crops. The aim is to develop an open, balanced network of strong, unshaded branches above the height of any grazing livestock and machinery.

Trees should be pruned to the shape and style of those found locally. The amount of pruning required will vary according to the species and variety of fruit tree.

Stone fruits do not respond as well to continuous pruning and should be pruned as little as possible.

Although there are local variations tree form can generally be broken down into three main sections:

- The trunk; the initial central leader which forms the main stem of the tree.
- Framework branches; permanent major limbs which radiate out from the trunk.
- Lateral branches; smaller side branches coming from the framework branches, which bear leaves and fruit and are pruned and renewed on a regular basis.

Forming a trunk

Trunk formation is important as it allows for livestock grazing. The height of the trunk (ie the point where the first branches start) depends on the type of stock grazing the field. Normally between 1.5-2 m high is sufficient for sheep and cattle. On half-standard trees the framework branches arch upwards in place of the trunk to create a multi-stemmed tree.

Forming the framework branches

The aim is to have 4-8 secondary leaders which resemble the spokes of a wheel when viewed from above. These will form the framework from which fruit-bearing side branches will develop.

At the required height several secondary leaders that have formed wide, strong angles with the trunk should be selected and the rest removed. These may emanate from the same point or be staggered up the trunk. The central leader can also be removed or left in place. This is not a regimented process and different styles and shapes of tree have developed around the country.

Forming the lateral branches

This begins after about 10 years when the emphasis of pruning moves towards maintenance pruning and the development of fruit bearing growth.

Maintenance pruning

Introduction

After about 8-10 years of formative pruning the basic shape of the tree should be formed and the emphasis moves towards fruit production. The aim is to keep the crown open to let in light and air. This is done by removing diseased, damaged and badly positioned branches and ensuring that the remaining branches do not crowd, shade or rub against each other.

The timing and amount of pruning required can vary considerably depending on the type of fruit tree. Each tree is individual and should be pruned accordingly.

Maintenance pruning helps retain a balance between generating vegetative growth (to produce young wood and rejuvenate the tree) and inducing the formation of fruit buds (to produce good crops). Problems develop when this balance is lost.

Without pruning most buds develop as fruit buds rather than shoots. Conversely, pruning hard makes a shoot or branch grow back more vigorously. Therefore, the general rule is that strongly growing shoots should be left alone, moderately growing shoots should be pruned lightly and poorly growing shoots should be pruned hard.

With sensitive maintenance pruning it should be possible to generate a large, high quality fruit crop without significantly reducing the wildlife value of the orchard.

Growth forms and fruiting habit in apple and pear trees

Apples and pears both form buds along each year's maiden laterals in the base of each leaf. These buds can develop into either fruit buds or growth buds, or remain dormant. In the second year growth buds form new laterals, while fruit buds form spurs that produce flowers and bear fruit. Over time these develop into clusters called spur systems.

Tip vs. spur-bearers

Tip-bearing varieties form fruit buds near the tip of each lateral, while spur-bearers form them at the base.

This determines the way the tree is pruned. Most varieties are spur-bearing varieties.

Methods of pruning apple and pear trees

Regulated pruning

This is the oldest and most basic way of pruning standard trees. Up to 20% of the wood should be removed each year to maintain a balanced tree. Entire branches are removed rather than individual laterals or spurs, which means this is quick and requires less skill than other methods.

Branches should be selected for removal if they are diseased and damaged, weak and unproductive, crossing, congested, or growing back to the centre of the tree. This is the best method to use to maintain wildlife benefit, partly because it is a more extensive management technique than other methods of pruning. Most traditional orchards will be pruned this way.

Spur pruning

This method was developed to maximise fruit production, with each branch considered separately. It is easy to follow but time-consuming and can only be used on spur bearing trees.

The tree is shaped to form a framework of permanent branches. Vigorous and upright shoots are removed in favour of horizontal, fruit-bearing laterals and fruit spurs. When these become too big or cease to fruit they are cut out and new shoots, arising from dormant buds, are allowed to replace them.

Renewal pruning

This method is a compromise between the above two methods. As with spur pruning a framework of permanent branches is created. Each branch is considered separately then managed in the way that regulated pruning is applied to the whole tree.

Temporary fruiting branches are maintained on permanent branches, but spurs are not encouraged. Most maiden laterals arising from the main branches are not pruned but allowed to develop both fruiting and vegetative growth.

Having borne fruit for a few years these laterals are removed in favour of new growth.

Timing of pruning of apple and pear trees

Winter pruning tends to promote shoot growth over fruit production, while summer pruning suppresses growth and stimulates fruit production. Standard apple and pear trees are normally pruned during the winter between late October and early April while the tree is dormant. Pruning late in the winter is preferable.

Pruning other types of trees

Stone fruits

Pruning of these (plums, damsons, gages and cherries) should be kept to a minimum and confined to summer, as they are extremely susceptible to bacterial canker and silver leaf fungus. They should be pruned to form an open-centred tree in a similar manner to regulated pruning. It is usually sufficient to just remove any dead, damaged or poorly placed wood.

Cobnuts

Pruning normally takes place in winter. Cobnuts are usually pruned to form a bush tree with approximately 15 branches about 2 m high. Hard pruning is necessary to maintain this.

Walnuts

Established walnuts should be pruned with caution as they are prone to dying back after pruning. Any pruning should be carried out between mid-summer and early autumn.

Other pruning management techniques

Fruit thinning

In a good year a tree can produce a heavy crop. However, the weight of these crops can damage branches and crowded fruits are often small and disease-prone and ripen poorly. Damaged or misshapen fruitlets can be pinched-out while they are small, as can the central fruitlet in each cluster. This leaves evenly spaced single or double fruits that have sufficient space and light to develop fully.

Bark ringing

This is done to reduce the amount of nutrient moving up the tree, thus reducing its growth while still retaining the sugars that help in fruit development. It is done at blossom time and involves removing lateral strips of bark from the trunk.

However, this process increases the risk of the tree becoming diseased.

Restoration and management of mature and neglected orchards

Introduction

Traditional orchards that have escaped agricultural 'improvement' are very important within the historic landscape and may support a range of wildlife. To retain their value the trees and grass sward in traditional orchards require regular management.

Orchard assessment

Before an orchard is restored it should be assessed and, if necessary, a management plan written. The assessment should record the condition of the trees and any other features present and will, together with the management plan, allow the management objectives to be set. In most traditional orchards these objectives should be fruit production and the preservation of trees for their cultural, historical, landscape and wildlife benefits. The fruit varieties present should be identified, particularly if they are thought to be rare.

Assessment of individual tree condition

The health of each tree should be considered. The amount of dead and decaying wood, new growth and signs of disease should be recorded, along with the trees' overall size and shape. Old trees are very important for landscape and wildlife and should be preserved for as long as possible.

Causes of poor condition

There are a number of factors that can contribute to the poor health of a tree. These include pests and disease, unsuitable soil conditions, poor nutrition, stock damage,

shading and competition, and over- or under-pruning. Often a tree's poor condition may be for several reasons, or caused by a combination of factors. It may be an ongoing problem or the result of something that happened several years previously. This means it is often difficult to identify the cause of the problem straight away.

Dead and decaying wood

These are not necessarily signs of poor health. Dieback and decay are natural processes that may actually prolong the tree's lifespan and create valuable wildlife habitat. Even dead trees are important for wildlife and should be retained wherever possible.

Restorative pruning

Restorative pruning can help maintain a balanced shape and reduce the chances of windthrow. It can also rejuvenate a tree by letting in light and stimulating new growth.

What to remove

Diseased wood should be removed first, then poorly placed branches. It is better to make a few large cuts than lots of smaller ones. Any suckers should be removed.

Timing

The work should be spread over several years. This puts less stress on the tree and allows time to assess its response. No more than one-third of the woody growth in the crown of the tree should be removed in one year.

Fruit tree health

Extensively managed traditional orchards are less likely to suffer from significant pest and disease infestations or nutrient deficiencies than commercial bush orchards. However, problems can still occur.

Weed competition

Competition for water and nutrients can severely affect trees, particularly when young. The area around the base of a new tree should be kept weed free for at least three years after planting, preferably by mulching. Weeds, particularly brambles and scrub around mature trees, should be cleared if necessary and re-growth controlled by mowing or livestock grazing.

Nutrient status

Nutrient deficiencies

These will not usually be a problem in a traditional orchard, particularly if fruit production is not the sole aim. If a deficiency is suspected it can be determined through soil analysis.

Fertilisers

Generally these should not be used unless there is an identified need. This is because they reduce the species diversity of grassland and may harm trees in the long run by causing them to abandon their mycorrhizal associations (see below). If used, fertilisers are best applied only around the base of young trees and below the canopy and drip line of older trees, leaving the bulk of the sward unfertilised. Well-rotted farmyard manure is preferable to inorganic fertilisers as it releases nutrients slowly and increases the soil's organic content. Liming can damage the mycorrhizae/tree relationship and should be avoided.

Fruit trees and mycorrhizae

A tree's root system develops associations with fungi called mycorrhizae. These beneficial fungi colonise the roots and extend into the surrounding soil, extracting and making nutrients and water available at times of stress as well as acting as natural barriers to root pathogens.

Pests and diseases

Fruit trees may be affected by various pests and diseases which can reduce fruit yield, damage and even kill the tree. Regular inspections of the orchard are important. Most common fruit tree diseases such as scab, canker, fireblight and silverleaf can be controlled effectively by removing affected branches and leaves at the first signs of infection. All infected material should be removed and burnt.

In a traditional orchard most pests will be controlled by predators before they reach unacceptable levels. Creating good site conditions is important: well spaced trees, pruned to allow in air and light, are less likely to suffer from disease and infection. Potential problems can be reduced by planting a mixture of varieties that are adapted to local conditions or are naturally pest and disease resistant.

Chemical use

Traditional orchards, managed without pesticides, provide the richest wildlife habitat. Herbicides, fungicides or insecticides will be detrimental to invertebrates, lichens and fungi and their use will alter the natural balance of habitats and species present, often removing beneficial predators as well as pests and leading to the need for further spraying. They should therefore be used only sparingly, or preferably not at all. Where commercial considerations make pesticides necessary, only appropriate chemicals that are specific to the problem should be applied. This will reduce their impact on non-target invertebrates.

Organic control

Organic control relies mainly on prevention rather than cure. One of the best control methods on young trees is to remove pests and diseased material by hand. However, this can be time consuming. Natural predators such as ladybirds, hoverflies and birds should be encouraged by providing suitable habitats for them. Biological pest controls such as hormone traps can be used to control some pests. Grease bands can be tied round the trunks to prevent moths and other insects climbing up them to overwinter or to feed in the spring.

Picking and storing fruit

Fruit should generally only be picked when ripe and inspected individually for pests, disease and damage. Slight insect damage (or scab or russeting on apples) on the skin is harmless, but any bruised blemished, imperfect fruits fruit should be discarded or cooked.

Fruit can be stored in a cool, dark, ventilated, frost-free environment, in loose in containers which allow air to circulate around the fruit, or individually wrapped in tissue paper or newspaper. Alternatively they can be refrigerated in perforated plastic bags. Fruit should be inspected regularly for signs of rotting, decay and damage.

Orchards and wildlife

Ecologically, traditional orchards resemble mini-parklands or wood pasture due to their combination of open-grown fruit trees, grassland and hedgerow boundaries or scrub. They are an important habitat for a wide range of species: for example, mammals such as dormice, hares and bats; birds such as barn owls, woodpeckers, bullfinches, tree sparrows and thrushes; rare insects such as noble chafer and stag beetle; and plants such as mistletoe, as well as a range of lichens.

Although the most important habitat for wildlife is usually the old fruit trees, orchards may also contain associated habitats including scrub, hedgerows, unimproved grassland, fallen dead wood, ponds and dykes. Much orchard wildlife depends on this mosaic of different habitats.

Extensive management

Low intensity management without the use of chemicals is the key principal to maximising an orchard's wildlife value. With this approach it should be possible to achieve a reasonable yield of fruit while still preserving habitats.

Orchards in the landscape

As well as conserving individual orchards, it is important to conserve networks of them on a landscape scale. Individual orchards may not be large enough to sustain populations of some of the animals that rely on them, but a network of orchards and other habitats allows populations to move between individual sites. Having other open-grown-tree habitats such as hedgerows, parkland and wood pasture in the surrounding landscape is important.

Orchard trees

The individual trees are the most important wildlife habitat in the orchard. Veteran trees and dead wood, standing or fallen, harbour a wide variety of decayed-wood insects and other invertebrates. They also provide nesting and feeding opportunities for a diverse range of birds. Dead and decaying wood should be retained wherever possible and only removed where it is diseased, unsafe or interferes with necessary operations. Dead trees should be left standing, and large cut branches and fallen dead wood should be retained on site. Most orchard plants and animals depend on the maintenance of a full age-range of orchard trees. New trees may need to be planted, either within the

existing orchard or by creating a new one nearby, to ensure this continuity.

Hedgerows

Hedgerows, scrub and non-fruit trees on the boundaries of orchards or within them also add biodiversity value by providing shelter and food for wildlife. Hedgerows should not be trimmed every year as this will reduce the crop of berries and flowers. When they are trimmed, they should be cut slightly further out each time to avoid cutting into old wood. In the long-term, hedges should be maintained through laying and coppicing in rotation.

The orchard floor

Grasslands in orchards can be rich in wildflowers such as wild daffodil and green winged orchids or, in cobnut plats, woodland plants like primrose and toothwort. Colourful waxcap fungi are also found in orchard grasslands. Bumblebees and other insects nest in areas of longer grass and in patches of bare ground. Sward management should be tailored to the wildlife present but grazing should keep the sward height between 5 and 15 cm. Hay cuts should be late enough to allow wildflowers to set seed, and areas of rough grass in corners and along hedges should be left ungrazed or unmown in rotation to provide wildlife habitats.

Useful organisations

Orchard Network

Launched in April 2010 the Orchard Network website acts as a signpost to existing national and regional resources, covering a range of topics from national and local Habitat Action Plans, to orchard management and planning issues. Produced on behalf of the Traditional Orchard Habitat Action Plan the site highlights the work of a number of different organisations all working to conserve Traditional Orchards.
www.orchardnetwork.org.uk/

Brogdale Horticultural Trust

Home to the National Fruit Collections, Brogdale also offers a postal fruit ID service.
Brogdale Road, Faversham,Kent, ME13 8XZ
Email: info@brogdale.org
www.brogdalecollections.co.uk/brogdale-identification.html

RHS Fruit Group

Has information on growing fruit and a fruit identification service
South West Secretary
S Harris, Holme Close, Western Road, Holsworthy, Devon, EX22 6DH
www.rhs.org.uk/plants/plant_groups/fruit.asp

Common Ground

Initiated Apple Day in 1991 and has published a range of useful information and publications, including community orchards **www.commonground.org.uk/appleday/a-corc.html**, and the Orchard Path **www.england-in-particular.info/orchards/o-index.html**
Gold Hill House, 21 High Street, Shaftesbury, Dorset, SP7 8JE
Tel: 01747 850820
www.commonground.org.uk/

People's Trust for Endangered Species

Carried out a national survey of traditional orchards.
www.ptes.org/?page=203

National Orchard Forum

An umbrella organisation for local orchard groups, produces a newsletter on behalf of local orchard groups and has links to many local orchard group websites and contacts.
www.nat-orchard-forum.org.uk/

Local orchard groups

Colwall Orchard Project

A parish group in the Malverns
www.greener.colwall.info/Orchards/orchards.html

Mid-Shires Orchard Group

Covering Warwickshire, Northamptonshire, Oxfordshire and Buckinghamshire
www.msog.btik.com/

Further information

Natural England delivers Environmental Stewardship, a grant scheme which provides funding to farmers and other land managers in England for the management of traditional orchards and other habitats. This note is aimed

at managers of traditional orchards and agri-environment scheme land management advisers. Other notes include:

- TIN013 *Traditional orchards: site and tree selection*
- TIN014 *Traditional orchards: planting and establishing fruit trees*
- TIN015 *Traditional orchards: an introduction to pruning*
- TIN016 *Traditional orchards: formative pruning of young trees*
- TIN017 *Traditional orchards: maintenance pruning*
- TIN018 *Traditional orchards: restoration and management of mature and neglected orchards*
- TIN019 *Traditional orchards: fruit tree health*
- TIN020 *Traditional orchards: orchards and wildlife*
- TIN021 *Traditional orchards: glossary*

General orchard and fruit books

Blackburne-Maze, P. (1986) *The Apple Book* Collingridge Books, Middlesex, England ISBN 0-600-30689-5

Clifford, S. & King, A. (2007) *The Apple Source Book* Hodder & Stoughton ISBN 0-340-95189-7

Common Ground (2000) The Common Ground Book of Orchards Common Ground, London ISBN 1-870364-21

Common Ground (2008) *The Community Orchard handbook* Common Ground, London

Fabrizio, I. (2008) *Protecting our Orchard Heritage* Sustain, London ISBN 1-903060-46-9

Greenoak, F. (1983) *Forgotten Fruit* Andre Deutsch Ltd, London ISBN 0-233-97396-6

Juniper, B.E. & Mabberley, D.J. (2006) *The Story of the Apple* Timber Press Inc. ISBN 0-88192-784-8

Morgan, J. & Richards, A. (2002) *The New Book of Apples* Ebury Press, London ISBN 0-09-188398-9

Russell, J. (2007) *Man-Made Eden - Historic Orchards in Somerset and Gloucestershire* Redcliffe Press Ltd, Bristol ISBN 978-1-904537-75-5

Sanders, R. (1989) *The Apple Book* Philosophical Library (Out of Print)

Orchard management books

Baker, H. (1986) *The Fruit Garden Displayed* (new ed.) Cassell Ltd for the Royal Horticultural Society

Baker, H. (1999) *Growing Fruit*, (new ed.) Octopus Publishing Group, London for the Royal Horticultural Society

Brickell, C & Joyce, D (2006) *RHS Pruning and Training* Penguin Books Ltd, London

Hills, L.B. (1976) *Grow Your Own Fruit* Faber and Faber, London

Rotherham, I.D. (ed) (2008) *Orchards and Groves: Their History, Ecology, Culture and Archaeology* Wildtrack Publishing, Sheffield ISBN 978-1-904098-09-6

Woodward (1991) *Pruning Hardy Fruits* RHS Wisley handbook, Cassell, London

Fruit identification books

Bultitude, J. (1983) *Apples A Guide to the Identification of International Varieties* Macmillan Press, London (out of print)

Clark, M. (2003) *Apples A Field Guide* Whittet Books Ltd, Stowmarket, Suffolk

Copas, L. (2001) *A Somerset Pomona* The Dovecote Press, Wimborne, Dorset

Grub, N.H. (1949) *Cherries* Crosby Lockwood & Son, London (out of print)

Hogg, R. (1884) *The Fruit Manual* (5th ed.) Langford Press, (facsimile, 2002) ISBN 1-904078-03-6

Taylor, H.V. (1946) *The Apples of England*, 3rd ed. Crosby, Lockwood & Son, London (out of print)

Taylor, H.V. (1949) *The Plums of England*, 1st ed. Crosby, Lockwood & Son, London (out of print)

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