Fruit Growing Manual

Prepared as part of the Food for Life Partnership

garden organic
the national charity for organic growing

food for life PARTNERSHIP

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Introduction

This manual gives advice on how to grow fruit in schools using organic methods. Crops covered include apples, pears, strawberries, cane fruits (raspberries, blackberries and hybrid berries) and bush fruits (gooseberries, blackcurrants, redcurrants and whitecurrants).

Also included is a section suggesting ways in which the school and wider community can reconnect with the food they eat through growing fruit.

We appreciate that teachers and learning support staff are already very busy, with little additional time to devote to high-maintenance crops. So, from a time and maintenance perspective, these are the easiest fruits to grow. Varietal recommendations are based mostly on the ability of the variety to fruit within the school summer or autumn term-time, although precise date of harvest will obviously vary between regions, according to local climatic factors.

We have not included a chapter on stone fruits (plums, cherries, apricots etc) as they are a little trickier to grow and many varieties ripen during the school summer holidays. Likewise blueberries, although popular with children, are a difficult fruit to grow well (although with due care and attention it is possible to grow them in containers whilst keeping soil pH low). Most blueberry varieties also ripen during the school holidays. However, we would not wish to deter anyone from having a go at cultivating these fruits, therefore advice on the cultivation of all fruits can be found in the recommended literature in Chapter 2.

Encouraging children to get involved in all aspects of fruit, flower and vegetable growing from an early age (especially when they can be rewarded with delicious crops they have grown themselves) can help instil a life-long love of gardening and an appreciation and respect for the environment around them. What could be better than growing the freshest, tastiest food and sharing fun and companionship in the school garden?

Whether you have a small area in which to grow just a few fruits, or a large orchard where children can run and play amongst the trees, we hope you will find lots of advice and ideas within this manual to inspire you to get started on your journey into growing fruit organically.

Contents




Growing fruit in schools

Why grow fruit?

Fruit is popular with adults and children alike. By the time children reach school age, most will have developed a fondness for fruits such as strawberries, raspberries, apples and pears.

The problem is that fruit is often expensive to buy in the shops (particularly organically-grown and out-of-season fruit), so sadly many children may not be eating enough to count towards a healthy diet. Also, children are not often introduced to the wider variety of fruits that can be grown in this country, which is a great pity. Many will never have seen hybrid berries, gooseberries, redcurrants, whitecurrants or blackcurrants as these are seldom offered in shops, yet these crops are cheap and easy to produce and the UK has a long heritage of growing and using them in many dishes.

Encouraging children to grow and use these fruits ensures that their appeal will remain for future generations and that they will continue to be enjoyed for years to come. Exposing children to a wide array of different fruits and the subtle differences in taste and texture between varieties (as with apples) will help encourage them to try new foods and maybe become a little keener to persevere with fruits they originally may not have liked.

Gardening and tending crops from an early age encourages children to develop a life-long love of gardening and food, which may naturally progress to an interest in cooking and healthy eating. The importance of eating five portions of fruit and vegetables a day has been emphasised for some time. As well as eating fruit fresh, there are so many interesting ways in which fruit can be used in cooking – these can include traditional children's favourites such as simple stewed fruit, pies and puddings, tarts, pavlovas, jams, jellies, chutneys and other preserves, juices, smoothies, cordials, ice creams and yoghurts. Children will derive even more pride and pleasure from eating something they have grown themselves (especially something as delicious as a strawberry!) and also having the opportunity to take home fruit that they have grown at school as something they can give to friends and family.

Growing fruit is not only a pleasure in itself, but opens up a world of learning for children, which can include pest ('mini beasts') and disease identification (leading to problem solving!), looking for beneficial insects, recognising and naming different varieties (eg of apples) and finding out how to use them in cooking. Children love to be involved in outdoor projects and are not often deterred by messy work – digging and 'messing about with dirt' is something enjoyed from toddlerhood. Outdoor work can not only be exciting, but it can bring a sense of adventure and experimentation. It is a great way of teaching basic gardening and outdoor skills (eg recognising weeds, pests and diseases) which will last a lifetime and foster a love of outdoor activities.

Gardening, and particularly fruit growing, is an immensely satisfying and rewarding pastime – and a pleasure that may well continue well into adulthood. Children can learn the basics of where food comes from and the lesson that everything is sustainable. It also helps children understand how plants grow – from how the plant develops after planting, to buds forming and the flowers and fruit produced, to what plants need to grow and the various ways in which they need to be cared for. Above all, fruit tastes great and is a pleasure to eat, as well as being wonderfully good for you! No further convincing should be necessary…so get growing!

Why grow organically?

Growing fruit organically, with minimal inputs and without artificial pesticides, fungicides or herbicides will ensure the food you grow is healthy, delicious and perfectly safe to eat – after all many fruits are picked and 'popped into the mouth' straight from the garden, often without washing first, so it's good to know that there are no nasty chemicals involved.

Fruit can have a reputation for being difficult to grow, but this tends to be the case where fruit trees, canes and bushes are grown on a large scale, or in close proximity to other fruits where pests and diseases can become troublesome. Growing a small amount of fruit in school grounds is less likely to attract the attention of pests and diseases. Information about reducing pests, diseases and weeds culturally is given priority in the following chapters. In any case, don't be put off growing fruit – most fruits are easy to grow and if you follow the advice given in this manual it will set you on the right path (and point you to other sources of fruit-growing information to expand your knowledge). For trickier subjects such as pruning, don't be afraid to have a go, or ask an expert to help you if you feel unsure about anything.

The only downside to growing fruit is that it can take a while to produce any results, although strawberries can be cropped the same year after planting. For this reason, it makes sense to integrate fruit growing with other quick growing vegetables and flowers, which will provide almost immediate interest, whilst the fruit remains a permanent backdrop to the school garden, but becomes centre-stage at harvest time. This sense of permanence will remain with the children as they progress through their school career – enabling them to watch the fruit trees, canes and bushes they planted flourish, as well as leaving a lovely legacy of delicious crops for future pupils.

The practicalities of growing fruit in schools

Here are some top tips to help you plan for growing fruit:

- Select fruits and varieties which won't need harvesting during the summer holidays (unless you can organise a community harvest day). With this in mind, make sure someone is available to water and care for the plants during school holidays (see also Food for Life Partnership Food Growing Manual B4.11 – 'Holiday care of the garden').
- Start with easy plants like strawberries which don't take a lot of room or maintenance and will give results quickly.
- Fruit trees can provide a permanent back-drop to a vegetable or flower area, where annual crops come and go. They can be used to divide borders and can be pruned and trained into very attractive shapes along permanent supports such as a post and wire framework or along fences, walls, trellises, archways and pagodas – all of which can look stunning in a school garden. School orchards (or even just a few large trees) also make fantastic features.

An espalier-trained pear tree

- Keep it small and simple to start off with. If you have a large area, it is easy to find a class-sized plot for children to start working in – you can always add more as you gain in experience and confidence.
- If you only have a small area available for growing, try growing fruit in containers. A wide variety of planters and gardening containers are available from high street and online stores and it is also possible to use your own containers made out of unwanted household or garden objects such as old water butts, wheelbarrows, etc.
- Some fruits can be trained up walls, fences, trellises and other vertical frameworks – this is a brilliant way of gaining valuable growing space and helps children understand how plants grow and the different ways in which they can be trained to form attractive features.
- Raised beds are great for growing soft fruit (strawberries, cane and bush fruits) and trees on dwarfing rootstocks, especially where the underlying soil is poor.
- Use fruit growing to tie-in with other topics including, eg composting, encouraging wildlife (or grow fruit trees in a wildlife garden), pest and disease spotting and problem solving, recycling and cooking.

A fan-trained cherry tree growing against a wall

Large apple trees in a traditional orchard

Raised beds are ideal for growing soft fruit

A word on health and safety

There are a wide variety of gardening tools specifically designed for children to use, which will help them feel more involved and are less likely to put them off gardening. Children should be supervised at all times when using tools – particularly sharp cutting equipment like secateurs and heavy tools such as spades, rakes and wheelbarrows. Even small trowels can be dangerous and should always be used under adult supervision.

For more advice on health and safety, please refer to advice given in the following sections of the Food for Life Partnership Food Growing Manual:

B3.2 – Using garden tools

B3.3 – Health and Safety Guidelines

B3.4 – Manual handling and back care

Getting started

Fruit can be grown in most parts of the country, although some crops are hardier and more tolerant of wetter conditions than others ('easy' crops include culinary apples, blackcurrants, blackberries and hybrid berries). Specific site and soil requirements for each fruit crop are given in Chapter 3, however basic requirements are listed below. General information on 'where to grow plants' is also provided in B4.3 and A8 of the Food for Life Partnership Food Growing Manual.

The ideal site should be

- Sunny (preferably in full sun, but most crops can tolerate partial shade).
- Sheltered from strong winds.
- Not in a frost pocket (where cool air collects in hollows).
- Not where fruit has been grown before.

The ideal soil should be

- Well drained and at least 45cm (18") deep.
- Fertile – with at least 10% organic matter content.
- Loam (or sandy-loam, clay-loam mix). Poor, light, shallow or heavy soils can be improved with bulky organic composts and manures to improve depth, structure, moisture retention/drainage and fertility.
- Slightly acidic pH (between 6.0-6.5 for most crops).
- Free of perennial weeds before planting.

See also

B4.4 – Building soil fertility

A9 – Testing soil and improving fertility

Buying plants

You can buy fruit trees, bushes, canes and strawberry plants from a variety of outlets, including garden centres, nurseries and by mail order from specialist nurseries. Several nurseries offer organically-raised plants. Do some research first before you buy anything, to make sure you are getting the varieties and rootstocks (for apples and pears) suitable for your needs and growing conditions. A good place to start getting ideas is by looking through seed and plant catalogues (most have a small section devoted to fruits and offer a good selection of the most popular varieties). Specialist fruit suppliers will have a broader range of varieties on offer and it is worth contacting them directly for a catalogue or advice (see list of suppliers at the end of this chapter). Many nurseries have catalogues

Potted trees for sale in a garden centre

on their websites which can be accessed and browsed through on-line, at leisure. Involving the children in planning and choosing varieties (and maybe even taking them to a local nursery so they actually see some of the fruit trees and plants) will give them a sense of anticipation and excitement for what is to come!

When buying fruit trees, canes or bushes, try to ensure that they are certified pest, disease and virus-free, where possible. Most propagators of fruit trees and plants will have had their stock registered with the DEFRA Plant Health Propagation Scheme, which ensures plants are certified true to type and healthy. This scheme operates for blackcurrants, raspberries and strawberries and a few varieties of hybrid berries. Blackberries, redcurrants and gooseberries are also available within the certification scheme. Tree fruits may also be certified, although many of the old varieties are not, in which case a reputable supplier should be sought. Trees and plants offered for sale in garden centres, nurseries and other retail outlets should all originate from a registered propagator and have certification details on the label, where applicable.

A ready-trained espalier apple tree

Planting

If you order your fruit trees, bushes or canes from a specialist fruit tree nursery, they will usually arrive as bare-root plants (without soil, but wrapped in damp peat and protective sacking, or damp roots in a polythene bag) during the dormant season (November to March). (Strawberries are slightly different – see section on strawberries in chapter 3.) Plant them as soon as possible after they arrive, but if the soil is too wet, dry or frozen, keep the plants in a frost-free place and keep the roots moist to prevent them drying out. Before planting, the roots can be soaked in a bucket of water for an hour.

Container-grown fruit trees, canes and bushes can be bought all year-round and planted at any time, provided soil conditions are suitable. Give the plants a good watering an hour or two before you plant them, to help prevent the roots drying out.

Steps for planting fruit trees

The following advice refers to planting fruit trees (apples, pears, plums, cherries, etc). For advice on obtaining planting material and planting fruit bushes, canes or strawberry plants, see the specific information given in each fruit section. See also A36 – Planting a tree.

- Choose a suitable site – see Chapter 1 or follow the advice given in each fruit section.
- Mark out the exact positions where the trees, canes or bushes are to be planted. Use a tape measure and some markers to help you measure planting distances and lay out the area.
- Prepare the soil at least a month in advance if possible, digging it over thoroughly to break it up. Dig a large hole (about a square metre in size), digging down until you come to a lighter layer of subsoil. Dig over the surface layer of subsoil lightly to help break it up a bit, working in a layer of garden compost. Making a slight mound at the bottom of the planting hole will help position bare-root trees better – giving them something to 'sit on'.

Other useful resources

Food for Life Partnership Food Growing Manual
A14 – Clearing weeds and grass
A10 – Building a raised bed
A11 – Planting in containers
A36 – Planting a tree
S3.4 – Planting fruit

- Remove any weeds or large stones.

Removing a container-grown tree from its pot

- Bang in a sturdy supporting stake (if required), driving it in firmly so that it doesn't move around. Bare-root trees should have the stake driven straight in vertically, placing it on the side of the prevailing (south-west) wind. Container-grown trees may need the stake to be driven in at an angle, so that it doesn't get in the way of the tree's roots when planting. Drive this stake into the soil on the opposite side to the prevailing wind, so that it leans into the wind. Supporting structures for cordons and espaliers will also need to be in place before planting.
- Place your tree into the planting hole, turning it until you are happy with its positioning. The stem of the tree should be set about 8cm away from the stake. Trees to be grown as cordons will need to be positioned at an angle (see cordon description).
- Do not plant too deeply – the graft union between the rootstock and the upper portion should be well above the surface level of the soil. If there is an old soil mark on the trunk (darker in colour) – use this as the depth. Do not plant too shallowly – if there are roots poking above the surface level of the soil, you will need to dig a deeper hole.
- Examine the roots of bare-root trees and trim any damaged or very long roots over 30cm (12") long. This will make them easier to plant. Spread the roots out evenly within the planting hole and back-fill with a good planting mix of topsoil, compost and organic all-purpose fertiliser, gently shaking the tree to disperse the soil around the roots and firming with your hands as you go. After back-filling some more, start to gently firm the tree in using your foot, but do not tread too heavily.
- For container-grown trees, carefully slide or cut the rootball from the container and position in the planting hole, adjusting the depth with more or less planting mix as required. Gently tease some of the roots away from the rootball and back-fill the hole with planting mix, gently firming as above.

Group tree-planting session

- When you have filled the planting hole give it a final firm, then make a shallow depression around the base of the tree to form a water-retaining basin, which will help water soak into the rootball. Give the tree a good water-in. Using a tree tie, secure the tree to the stake (positioning the tie near the top of the stake). If the tree has a long trunk (eg half standard or standard), fix a second tie near the base of the stem.
- If rabbits are a problem in the area, protect your young trees using galvanised netting or rabbit guards around the base of the trees.

Caring for your fruit trees during establishment

- After planting, and in the first couple of years during establishment, keep your trees well-watered during dry weather. To keep weeds down and conserve moisture, apply an 8cm (3") mulch of organic garden compost to the base of the tree in spring, but make sure it doesn't touch the stem.
- Remove any blossom that develops on the trees during the first two years after planting – although it is very pretty, it will help your tree establish better if it doesn't produce any fruit during this time.
- Keep an eye on the tree ties – loosen any which begin to get too tight as they can easily strangle the trunk.

Strawberry plants growing in a terracotta pot

Growing in containers

If you don't have much space, you can grow small dwarf fruit trees in pots (use a tree on a very dwarfing rootstock) and soft fruit such as strawberries, cane and bush fruit in containers. Follow the advice below for fruit trees, canes and bushes and the general advice in the Food for Life Partnership Food Growing Manual A11 and B4.6 - Growing in containers. (See strawberry section for separate advice on growing strawberries in containers.)

- Choose a 30-40cm container of wood, plastic, or terracotta and place a layer of crocks or gravel in the base for drainage, before filling with planting mix (use a heavy multi-purpose compost, mixed with topsoil and garden compost).
- Plant the trees, canes or bushes to the depth of the old soil mark, with the exception of blackcurrants which should be planted 5cm (2") deeper. It is a good idea to use a stake for support where necessary – a bamboo cane (with cane cap on the end) or something slightly thicker will do.
- Water the pot regularly (daily in hot weather) and feed every two weeks during the growing season with a high potash feed (tomato food is good). Do not allow the pot to become waterlogged – place the pot on bricks to help drainage if necessary.
- If your potted trees produce a lot of fruit, you will need to remove some of it to prevent the branches breaking (it is best to thin out the fruitlets (immature or 'baby' fruits) in June, before they get too big – pinch out surplus fruits to leave one or two fruits per cluster). Gooseberries can also benefit from being thinned in late May, if you want to try and grow really big fruits (see bush fruit section for specific details).
- Follow the advice given for pruning according to the fruit grown (eg for apples and pears, prune in winter, as outlined for a 'bush' tree (see pruning instructions in each fruit section).
- Protect terracotta containers from frosty weather during the winter – either by moving to a shed or greenhouse or by wrapping in sacking or bubblewrap, otherwise they will shatter.

A range of terracotta pots and containers (some specifically for strawberries) can be found at most garden centres

The principles of pruning

Pruning fruit trees and bushes can seem a daunting prospect, but if you follow a few simple rules, it need not be complicated. All fruit trees and bushes will grow and fruit better if pruned regularly and it is a rewarding and satisfying task! All pruning activities should be supervised by an adult.

The main aims of pruning are to encourage the production of more fruiting wood, and to remove unwanted growth. 'Training' goes a step further to control the shape and size of the plant. Pruning and training for each type of fruit is outlined in each of the specific fruit sections, but there are a few basic facts to keep in mind before you start:

- Use sharp secateurs (adult supervision required) and try to make a clean cut with no rough edges.
- When pruning, make a slanting cut just above an outward- or upward-pointing bud. If you are pruning

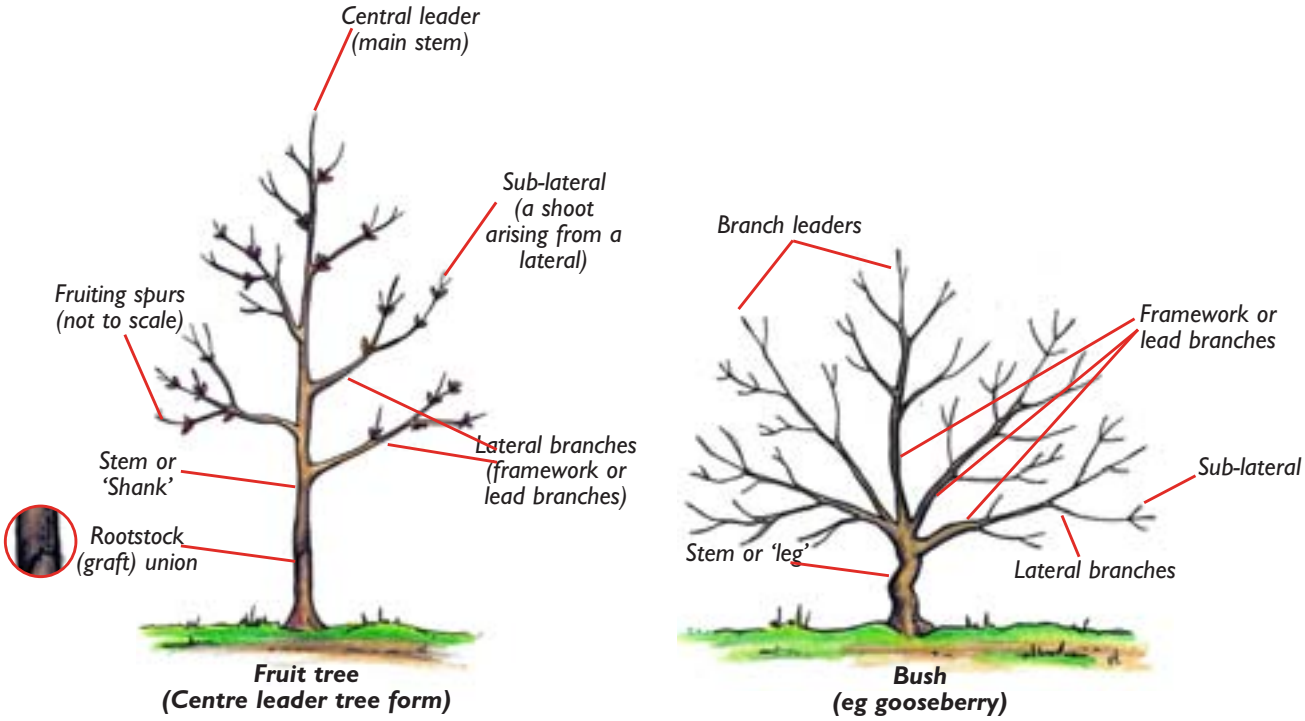
back to a vegetative (shoot) bud, a new shoot will develop in the direction that the bud is pointing.

Make sure you prune at the right time of year, according to the type of fruit you are growing. Most pruning is carried out during the dormant period (November – March), but summer pruning may be required on a number of crops (particularly trained fruit trees) to remove unwanted growth. Specific details of when to prune are given in each fruit section.

On fruit trees, you can tell fruiting wood apart from new wood as the fruit buds along it are rounder and fatter than vegetative buds – this is most noticeable in March, when the buds begin to swell – so if you are unsure, leave pruning until then.

Prune out any dead, diseased or damaged wood whenever you see it – this helps prevent the spread of diseases.

Fruit bud (top) and vegetative bud (bottom)



Top tip

Pruning

Don't worry if you prune the wrong bit – it is all part of the learning process! Fruit trees and bushes are normally very resilient and will recover from even the harshest of cuts. If you think you have done something wrong, ask someone who knows about pruning to have a look and help you out. (Major pruning cuts and removal of large branches on trees are best left to adults.)

For more information on pruning see the list of useful fruit growing books provided at the end of this article.

See also:

Food for Life Partnership Food Growing Manual
A61 and G4.10 - Pruning and training fruit

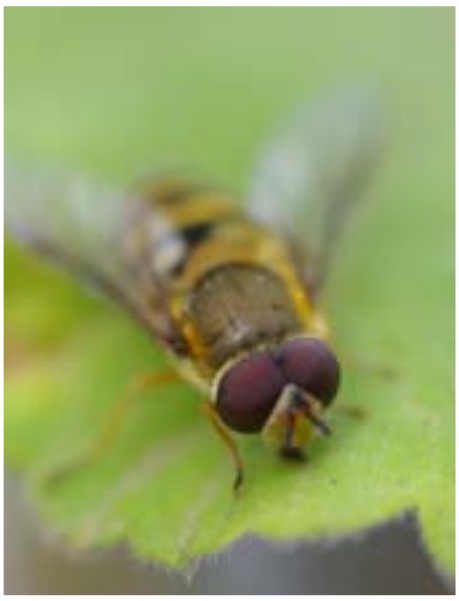
Preventing and reducing pests and diseases the organic way

Organic gardeners strive to work in harmony with the natural environment. Fruit, vegetables and flowers are grown using minimal artificial inputs and attention is focused on maintaining a healthy, fertile and productive soil, which in turn creates healthy plants, and, ultimately, healthy people!

Pear scab

Fruit can be trickier than other crops to grow organically since the trees, bushes and canes are in the same piece of ground for a long time (often 15-20 years or more) and, with the exception of strawberries, crop rotation is not an option. Pests and diseases can therefore build up over time. However, there are lots of things organic gardeners can do to ensure their plants remain healthy (see also B5.10 – Controlling pests and diseases). Here are some key points to keep in mind when growing fruit organically:

- Choose a suitable site with good soil (see earlier advice or specific advice in each fruit section).
- Use clean, healthy planting material (certified virus-free where possible).
- Try to keep the soil healthy and fertile without overfeeding. (Follow advice for preparing the soil before planting and care during establishment).
- Encourage beneficial insects that will eat pests by growing flowering annuals or wildflowers near to (or even amongst) your fruit and vegetable crops. Creating beetle banks (rough grassy mounds) and providing artificial insect refuges (eg 'bug boxes') can help create ideal sheltering and over-wintering places.
- Encourage birds and other beneficial wildlife (eg bats which feed on moths, frogs, toads and hedgehogs which eat slugs and snails). Creating wildlife-rich environments such as ponds, wildflower areas, hedgerows and shelterbelts will help attract a wealth of wildlife to the area.



Hoverflies are useful as their larvae prey upon pests such as aphids

Bees are essential for pollinating fruit crops

Flowering annuals like this poached egg plant, are very attractive to beneficial insects

Top tip

Bug hunting

It is great fun to go bug hunting – look at your plants carefully and see how many 'beasties' you can spot and identify. Use a magnifying glass or hand lens to help you identify insects easily. Keep a record of what you find so that you can make comparisons over the years.

A ready-made 'bug box'

Useful references:

Food for Life Partnership Food Growing Manual

B5.11 – Attracting wildlife

A29 – Ladybird House

A30 – Apple bird feeder

A31 – Lacewing hotel

- Keep the base of fruit plants weed-free. Weeds can act as host plants for pests, diseases and viruses, as well as competing with the plants for water and nutrients. (See also B5.9 – Weeding made easy.)
- Use varieties with resistance or tolerance to specific pests and diseases.
- Prune regularly, to encourage strong growth, new wood and open the plant up to light and air, helping foliage dry quickly after rainfall.
- When watering, try to water the soil around the base of the plants (rather than watering the foliage), so that leaves stay dry. Damp, shady leaves encourage diseases. (See also B5.6 – Watering plants.)
- Pick fruits before they become over-ripe and more susceptible to pest and disease attack. Only store disease-free produce. (See A32 – Storing produce.)
- Keep fruit trees, canes and bushes clean by removing dead and diseased plant material and damaged or infected fruits. Tidy up old leaves and prunings promptly as these may harbour pests and diseases.
- Try not to over-feed plants with fertilisers (especially those high in nitrogen) as this can encourage soft, sappy growth which is more prone to pest and disease problems.
- Keep an eye on your plants and check them regularly for signs of any pests or diseases. Spot-treat problems early, before they have a chance to spread.

No-one likes spraying nasty chemicals around, especially on the things we are going to eat. If you care for your trees organically and in an environmentally friendly way, you will be helping to minimise the use of pesticides, fungicides and herbicides and letting nature give you a helping hand keeping pests, diseases and weeds at bay. Gardening organically usually involves tolerating a certain number of pests and diseases – after all, they are part of the world we live in – but if your trees are otherwise well cared for they will be able to cope with a certain amount of pest and disease pressure.

Occasionally, when pests or diseases do get out of hand, it is possible to spot treat problems with a limited number of organically approved plant protection products (most of which are derived from natural plant extracts), *although applications of these should preferably be carried out by an adult (or under close adult supervision)*. Options for dealing with specific pest and disease problems are given at the end of each fruit section in chapter 3. For more details on whether certain products are acceptable for use or not, please also refer to the Organic Gardening Guidelines.

Top tip

Bag up diseased waste

Diseased plant material, perennial weeds and larger woody waste (twigs thicker than your little finger) can be bagged up and collected by local authority kerbside 'green waste' recycling schemes to be turned into green waste compost. Non-diseased material can be composted.

Organic Gardening Guidelines are available on the CD inside the Food for Life Partnership Food Growing Manual or may be downloaded from the Garden Organic website at www.gardenorganic.org.uk/guidelines/contents.php

Commercial fruit growing

In the UK, fruit is grown commercially (on a large scale) by farms producing it specifically for supermarkets, wholesale markets, processing, juicing and cider-making. In 2009, a staggering 415,000 tonnes of fruit was produced commercially in the UK with a value of £571 million*. Many types of fruit are grown – the most common fruits grown include apples, pears, strawberries, raspberries, blackcurrants, blackberries and, to a lesser extent, plums, cherries and blueberries. Other soft fruits such as gooseberries, redcurrants and whitecurrants are only grown on a very limited scale commercially, as much of the fruit used for processing and sold in the shops is imported. There are currently only a handful of farms which produce fruit organically and, sadly, much of the organic fruit on offer in shops is also imported.

You will find fruit farms up and down the country as fruit is grown commercially in all areas of the UK. In 2009, the amount of land used to produce fruit in the UK amounted to 28,000 hectares – that's the equivalent of roughly 28,000 football pitches! The principle areas for commercial growing include the counties of Kent, Worcestershire, Herefordshire, Gloucestershire and Somerset (the latter three counties are popular for growing cider apples and perry pears). Apples are the most popular fruit grown commercially in the UK and many different varieties are grown. These include dessert apples such as Cox, Egremont Russet, Gala, Spartan, Discovery, Worcester Pearmain, Jonagold and Braeburn. Bramley apples are also grown on a large scale – these are sold as cooking apples or used for processing. Pear varieties grown commercially include Conference, Comice and Concorde. The strawberry variety Elsanta is grown on a large scale commercially, but you may occasionally see other varieties offered for sale in supermarkets such as Sonata, Lambada, Darselect, Elsinore and Everest. Other crops such as blackcurrants are grown to make cordials and drinks such as Ribena.

For more information on the commercial cultivation of fruits in the UK, plus some great information (including recipes for using fruit) visit the websites below:

- The Summerfruit company (soft fruit marketing): www.sfcmarketing.com
- English Apples and Pears (top fruit marketing): www.englishapplesandpears.co.uk
- The blackcurrant foundation (blackcurrants): www.blackcurrantfoundation.org.uk

Commercial strawberry production

A commercial apple orchard at harvest time

**Defra Basic Horticultural Statistics (provisional 2009 data)*

Glossary

Glossary of terms used in fruit growing:

A

Annual cropping: The practice of growing plants for one year only to produce a crop that year, such as strawberries, before disposing of the plants

B

Bare-rooted: A plant sold with no soil around its roots

Berry: A pulpy fruit bearing several or many seeds

Bush fruit: Any fruit which is grown on small-medium sized bushes (eg gooseberries, currants, blueberries)

Biennial bearing: A tree (usually apple) that produces a good crop of blossom or fruit every other year, with little or no crop in the intervening years

Breaking bud: A bud which has started to open

C

Cane: A long and slender shoot arising from the base or crown of the plant

Canker: A common disease of tree fruits (eg apples and pears)

Central leader: The main vertical leader at the centre of the tree (the trunk)

Chlorosis: Unusual yellowing or discolouring of the leaves due to lack of chlorophyll

Compatible: A term used to describe the successful union between a fruit tree rootstock and grafted scion variety (top portion), or where two or more varieties are able to pollinate one another

Cordon: A tree trained vertically or obliquely (at an angle) with the central stem pruned to produce spurs

Crotch: The angle between the branch and the trunk of the tree

Culinary fruit: Fruit which is cooked or processed rather than eating fresh

Cultivar: A 'cultivated variety' which originated in cultivation and not in the wild

Current year's growth: Shoot development which has been made this season (also 'new wood')

D

De-blossoming: Removing flowers or flower trusses to direct vigour into vegetative growth instead of fruits

De-horning: Cutting back large, stout branches to a point where another branch arises

Dessert fruit: Fruit which is suitable for eating fresh

Dormant period: The time when plant growth has naturally ceased over winter

Dual-purpose fruit: Fruit which is suitable for cooking or eating fresh

Dwarf bush: A tree pruned to give an open, rounded canopy on a short 0.5-1.5m (1.5-2ft) length stem

Dwarf pyramid: A tree pruned to form a conical shape with a central, lead trunk (central leader), about 2m (7ft) high

E

Espalier: A supported tree trained to form a vertical stem with pairs of branches stretched horizontally to form a series of tiers

Extension growth: A shoot which has grown from a bud on the tip of a stem

F

Fan: A supported tree trained to form a fan shape, where the main branches are spread outwards from the main trunk to resemble the ribs of a fan

Feathered maiden: A one-year-old tree with some lateral shoots already developed (as opposed to a 'maiden whip', which has not yet developed laterals)

Flush: A crop of flowers or fruit, which may be followed by further 'flushes'

Foliar feed: A fertiliser which can be sprayed onto plants and absorbed by the leaves

Framework: The basic woody trunk and main branches of a tree or bush

Free-standing tree: A tree grown without any horizontal supports

Frost pocket: An area where cold air collects during winter, leading to the development of frost

Fruit: The seed or seeds of a plant contained on or within a pulpy or fleshy structure

Fruitlet: An immature fruit

Fruit bud: A large, fat, rounded bud which produces blossom (and then fruit) rather than vegetative growth (leaves or shoots)

G

Grafting: The preparing and placing together of plant parts so that they may grow together

Growth bud: A small, flat bud which develops into a shoot (opposite to a fruit bud)

H

Half standard: A tree pruned to give a 1m (3ft) length of trunk

Hardy: A plant which will survive outdoors over winter without needing protection

Heading back: Pruning lead branches, or the central leader

Heeling-in: Temporary planting of new plants pending suitable weather or soil conditions for permanent planting

I

Incompatible: Where a fruit tree rootstock and scion cannot be grafted (joined) successfully, or where two or more varieties cannot pollinate each other

L

Lateral: A side-shoot or side-branch arising from a lead shoot or branch

Leader: A main branch

M

Maiden: A one-year-old tree

Maiden whip: A one-year-old tree with no lateral shoots

Mulch: A layer of bulky organic material (eg garden compost) placed on the soil around the stems

N

New wood: Current year's growth

O

Old wood: Growth produced before the current season (usually darker in appearance than new wood)

P

Plug: The central core of certain types of fruit (eg raspberry), often detachable

Pollination: The transference of pollen from one plant to the sigma on the flower of another

Pome fruit: A hardy tree which bears fleshy fruit with small seeds in the central cavity (apples and pears)

Primary branches: The first branches to develop on the main stem or trunk

Primocane: A cane in its first year of growth

Pruning: The removal of parts of a plant to improve its shape, encourage fruiting or remove damaged or diseased parts

Pyramid: A tree pruned to form a conical shape over 2m (7ft) in height

R

Regulatory pruning: The removal of weak, diseased or overcrowded branches

Renewal pruning: Removing wood to ensure a steady supply of new shoots

Rootstock: The lower (root) portion of a tree

Runner: A shoot which grows along the soil surface and can root into the soil (eg strawberry)

Russet: A brown roughening on the surface of some fruits, eg apples and pears. Some varieties are specific 'Russet' varieties

S

Scion: The non-rooting, stem part of a tree (eg the scion variety grafted onto a rootstock)

Secondary branches: Branches which develop on a primary branch

Self-fertile: A flower which can be successfully pollinated by its own pollen or from pollen produced by other flowers on the same tree or bush or neighbouring trees or bushes of the same variety

Snag: A short stump or tear of bark left after careless pruning

Spawn: Young growth of raspberry canes

Spur: A short and slow-growing branch which bears fruit buds

Standard: A large tree pruned to give a 2m (6.5ft) length of stem

Step-over: A supported, low-growing tree with a single tier of branches growing horizontally

Stone fruit: A hardy tree which bears fleshy fruit with a single large, hard seed at the centre (eg plums, cherries, etc)

Stool: The base of the plant from where roots and new aerial growth arise

Strig: Small, delicate stems bearing fruit clusters (eg redcurrant, whitecurrant and blackcurrant)

Sub-lateral: A side-shoot or branch on a lateral shoot or branch.

Sucker: An unwanted shoot growing from the rootstock

Supported tree: A tree which is grown against a fence, wire framework or wall and is supported horizontally and vertically

T

Terminal bud: A bud at the end of a one-year-old shoot

Thinning: The practice of removing surplus fruits to allow remaining ones to develop and enlarge

Tip bearer: A tree which produces most of its fruit at the tips of one-year-old shoots (previous season's wood)

Truss: A cluster of fruit or flowers

U

Union (eg graft union): The point at which the rootstock and scion meet

V

Variety: A named cultivar or naturally-occurring variation of a species

Vegetative growth: Shoot and leaf growth (instead of blossom and fruit)

W

Water shoot: A vigorous, soft, sappy shoot which is unfruitful

Seeking advice

If you have a problem with any aspect of growing fruit, your first port of call is a good book on fruit growing (useful books for amateur fruit growers are listed below). Otherwise, it is possible to seek advice from gardening organisations such as Garden Organic, The Royal Horticultural Society and The National Fruit Collections at Brogdale (these are membership organisations which provide free advice to members). Fruit tree suppliers, biodiversity or tree officers from your local Borough Council and local gardening clubs or allotment groups may also be able to offer advice. Go along to events such as your local apple day if you can – such events are held annually (apple days usually occur in October) at locations up and down the country. There are often experts on hand to assist with any queries.

Useful contacts

For information on local orchard or fruit groups and to find out if there is one in your area visit **www.nat-orchard-forum.org.uk.** They often hold training workshops and events and are a great source of knowledge on local apple varieties. They are a great way of networking, sharing ideas and equipment.

Brogdale - National Fruit Collections – the largest collection of fruit varieties in the world with over 3,500 named apple, pear, plum, cherry, bush fruit, vine and cob nut cultivars.
www. brogdale.org

Common ground – pioneers of the Community Orchard concept. Their publications include The Community Orchard Handbook and Apple Source Book.
www.commonground.org.uk

Garden Organic – the national charity for organic growing. Information and advice on organic gardening, farming and food.
www.gardenorganic.org.uk

The Royal Horticultural Society – expert advice, features, news and events on fruit growing.
www.rhs.org.uk

Useful books on fruit growing

***Baker, H.*, Growing Fruit (Royal Horticultural Society's Encyclopaedia of Practical Gardening)**, Latest edition 1999, published by Mitchell Beazley. ISBN 184000153 4

***Baker, H.*, The Fruit Garden Displayed (Royal Horticularly Society).** 9th revised edition 1998, published by Cassell Illustrated. ISBN 030435001X

***Bird, R.*, Pruning Fruiting Plants: A Practical Gardener's Guide to Pruning and Training Tree Fruit and Soft Fruit,** illustrated edition 2006, published by Southwater. ISBN 1844762858

***Brickell, C., & Joyce, D.*, Pruning and Training (The Royal Horticultural Society): The definitive practical guide to pruning trees, shrubs, roses and climbers** (includes fruit). Latest edition 2006, published by Dorling Kindersley. ISBN 1405315261

***Hessayon, D.*, The Fruit Expert, 1993, Pbi Publications. ISBN 0903505312**

***Morgan, J.* & Richards, A., The New Book of Apples: The Definitive Guide to Over 2000 Varieties,** 1992, Ebury Press, published in association with the Brogdale Horticultural Trust). ISBN 0091883989

***Woodward, J.*, Pruning Hardy Fruits (A Wisley handbook),** 1990, published by Cassell Illustrated. ISBN 0304311030

Suppliers

There are many fruit tree suppliers nationally – here are a selection of some of the largest which have a good range of varieties and can offer advice and expertise. They are, however, not endorsed by Garden Organic and no criticism is implied of other nurseries which are not mentioned.

Bernwode Plants
Kingswood Lane
Ludgershall
Buckinghamshire
HP18 9RB
Tel: 01844 237415
www.bernwodeplants.co.uk

Blackmoor Nurseries
Blackmoor
Nr Liss
Hampshire
GU33 6BS
Tel: 01420 477978
www.blackmoor.co.uk

Chris Bowers and Sons
Whispering Trees Nurseries
Wimbotsham
Norfolk
PE34 3QB
Tel: 01366 388752
www.chrisbowers.co.uk

Deacon's Nursery
Moor View
Godshill
Isle of Wight
PO38 3HW
Tel: 01983 840750 or 01983 522243
www.deaconsnurseryfruits.co.uk

Frank P Matthews Ltd
Trees for Life
Berrington Court
Tenbury Wells
Worcestershire
WR15 8TH
Tel: 01584 810214
www.frankpmatthews.com

Highfield Nurseries
(Western Forestry Company Ltd)
School Lane
Whitminster
Gloucester
GL2 7PL
Tel: 01452 740266 or 01452 741309
www.highfield-nurseries.co.uk

Keepers Nursery
Gallants Court
East Farleigh
Maidstone
Kent ME15 0LE
Tel: 01622 726465
www.keepers-nursery.co.uk

Suffolk Fruit and Trees

The Orchards
Oaktree House
Braiseworth near Eye
Suffolk
IP23 7DS
Tel: 01379 870759
www.realenglishfruit.co.uk

The Organic Gardening Catalogue
Riverdene Business Park
Molesey Road
Hersham
Surrey
KT12 4RG
Tel: 01932 253666
www.organiccatalogue.com

Thornhayes Nursery
St Andrews Wood
Dulford
Cullompton
Devon
EX15 2DF
Tel: 01884 266746
www.thornhayes-nursery.co.uk

Walcot Organic Nursery
Lower Walcot Farm
Walcot Lane
Drakes Broughton
Pershore
Worcestershire
WR10 2AL
Tel: 01905 841587
www.walcotnursery.co.uk

Apples

There are over 2000 varieties of apple, but you will usually only see a handful of varieties in the shops. Growing some of the more unusual and less well-known varieties in school grounds will help introduce pupils to the range of apples available and give them a chance to experience the array of tastes, colours and textures of the fruit.

Apples are a fantastic and relatively straightforward fruit to grow for everyone. A single tree will last for at least 15 years and will soon cover the cost of investment. The trees are adorned with beautiful blossom in spring and pupils will enjoy watching the young fruits grow and swell through the summer, before harvesting and using the apples in early autumn for eating fresh, juicing or cooking.

Varieties

There are two main types of apple – dessert varieties which are eaten fresh and culinary or 'cooking' apples which are generally large in size and very sharp if eaten raw and need to be cooked before eating (usually with the addition of sugar). A few varieties are dual-purpose – they can be used either for cooking, or eaten raw after a period of storage to allow the apples to sweeten. There are also varieties grown specifically for cider-making.

Some varieties of apple are ready for harvest as early as late July, but most will be ready for picking in September or October. For the benefit of the school calendar, we have selected varieties which will be ready for harvesting at the start of the school year in September. Most of the varieties listed below have good or partial resistance to scab or mildew, which are common disease problems in apple (see later section on 'pests and diseases') and are relatively easy to grow.

Easy to grow and reliable varieties

Easy to grow dessert varieties: (l to r) Adams's Pearmain, Fiesta, Egremont Russet, (top of page) Red Windsor

Dessert varieties	Picking time*	Pollination group	Storage life
Katy	Early September	B	Best eaten fresh
Early Windsor	Early September	A	Best eaten fresh
Lord Lambourne	Mid September	A	2 months
Egremont Russet	Mid-late September	A	2 months
Fiesta (Red Pippin)	Mid-late September	B	2 months
Red Devil	Late September	C	2 months
Kidd's Orange Red	Early October	B	4 months
Bright Future	Early October	C	3 months
Saturn	Mid October	C	4 months
Adams's Pearmain	Mid Ocotber	C	4 months

Culinary varieties

Easy to grow culinary varieties: (l to r) Bramley, Lord Derby, Howgate Wonder

Culinary varieties	Picking time*	Pollination group	Storage life
Lord Derby	Late September	C	2-3 months
Howgate Wonder	Early October	C	6 months
Bramley	Mid October	B	5 months

** Approximate date of harvest will vary with region and weather conditions during the growing season.*

Local varieties

It is often fun to grow varieties that have originated from, or are local to, your own county – many of which are less well known. A list of traditional apple varieties local to each English county is provided at the end of this apple section. This list contains some of the more popular traditional (Victorian/Edwardian) varieties, but is by no means exhaustive, and many more varieties exist, although you will need to approach specialist fruit tree nurseries to order most of these. If you want to research further varieties specific to your county, sources of information are provided below:

Blenheim Orange – a variety which originated in Oxfordshire

- The New Book of Apples: by Joan Morgan and Alison Richards (revised edition 2002), Ebury Press. ISBN: 0091883989.
- www.england-in-particular.info (provides a link to information on community orchards and the work done by Common Ground in championing traditional varieties).

Apple blossom is very attractive

Crab apples are good pollinators for apples during flowering – the fruits can also be used to make jelly

Pollination requirements

Top tip

Your fruit tree supplier or nurseryman should be able to advise on the suitability of varieties to ensure successful pollination.

All varieties of apple will set a better crop if pollinated by at least one other different variety. A few, such as Bramley, require two. Growing a good mix of varieties will help, but if you are limited to just a few, choose varieties which have the same or adjacent pollination groups (flowering periods). In most towns and villages where schools are located, there should be enough apple trees in the near vicinity to help with pollination, but if your tree is consistently producing blossom but no fruit, you may need to consider adding another variety or two. Crab apples also generally make good pollinators for apple trees provided they flower at roughly the same time. An alternative is to have a 'family' tree – this is a single stemmed tree with at least two or three compatible varieties grafted onto it. This ensures that all the varieties on one tree will all pollinate each other and is particularly useful for growing several varieties where space is at a premium.

Rootstocks

Commercially available apple trees usually consist of a specific variety grafted (artificially bonded) on to a rootstock (lower portion) which governs the vigour and eventual size of the tree. Where space is at a premium or restrictive tree forms (eg cordon, espalier) will be used, dwarfing rootstocks should be chosen. Trees on such stocks will produce fruit within three to four years, provided the soil is fertile and they are not suffering competition from grass or neighbouring plants.

For a more traditional-looking 'bush' tree given more space, a semi-dwarfing rootstock can be used. This will produce a first crop after four to five years. Trees on this stock are ideal for planting in a lawn or rough grassy area on average soils. Vigorous rootstocks should only be used if there is plenty of space and the soil very poor, since these will make extremely large trees (similar to those found in very old orchards), which will be difficult to pick and prune without ladders. After planting, it will be six to seven years before any fruits are produced on these stocks. If in doubt, seek advice on the most appropriate rootstock for your situation from your fruit tree supplier. (See also the summary table below.)

Rootstock	Vigour	Tree height (bush form) when mature*	Suitable tree forms
M27	Extremely dwarfing	1.5-2m (5-6.5ft)	Small bush, cordon, step-over, container growing
M9	Very dwarfing	2.5-3m (8-10ft)	Bush, cordon, step-over, small espalier
M26	Dwarfing	3-3.5m (10-11ft)	Bush, cordon, espalier, half standard
MM106	Semi-dwarfing	4-5m (13-16ft)	Bush, cordon, espalier, half standard, standard, compact column
M2, MM111	Vigorous	5m+ (16ft+)	Standard

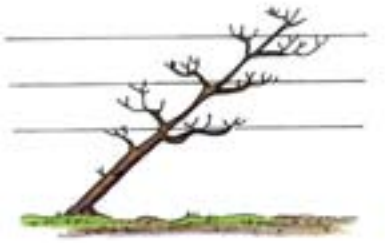
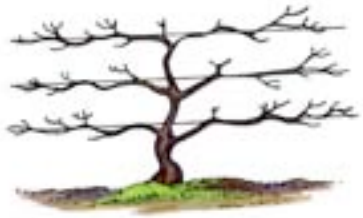
** Actual height and size will depend on variety, tree form and growing conditions*

Tree forms

There are many different ways in which apple trees may be trained and pruned resulting in the eventual form they take and amount of space they occupy. However, even in the tightest of spaces, apples can be grown as compact columns, cordons or as small bushes in containers. Espalier, cordon and step-over forms are very decorative and can be used to provide edges to borders or trained against walls and fences, although they need more care and attention in pruning and training to achieve the desired effect. If choosing the latter 'restricted' forms, it is possible to source trees which have already had their framework established by the nurseryman so that all the initial hard work has been done for you, although such ready-trained trees will be more expensive.

Where space permits, simple 'bush' or even half standard trees planted into a grassy area will work well for most varieties. Again, it is possible to buy three to four-year-old trees which have already been trained and formatively pruned by the nurseryman. These will provide a crop almost straight away. However, it is cheaper to start with a maiden (year-old) tree and prune it yourself. (See later section for pruning and training advice.)

An espalier growing at Garden Organic's Audley End display garden

Tree form and planting distance between trees		Description
Compact column Planting distance: MM106 – 60cm (2ft)		Easy to grow, especially where space is tight. Forms a single stemmed, upright tree. Suitable for lawns, tubs, borders and hedging. Choice of varieties is limited. May require staking in exposed areas. **No pruning required!**
Step-over Planting distance: M27 – 1.5m (5ft) M9 – 3m (10ft)		A very attractive and old fashioned method of growing apples as an edging for a bed or border. A single-tier espalier is grown along a wire support 25-30cm (10-12") above ground level. Summer pruning required.
Cordon Planting distance: M27 & M9 – 0.75m (2.5ft) M26 & MM106 – 1m (3ft)		Ideal for growing several varieties in a small area. Trees are planted at a 45° angle against a supporting structure (eg tier of wires, wall or fence). Summer pruning required. Makes an attractive feature.
Espalier Planting distance: M9 – 3m (10ft) M26 – 3.5-4m (11.5-13ft)* MM106 – 4-4.5m (13-15ft)*		Attractive and traditional method of training – although requires more space than a cordon or step-over. Ideal trained against wires on a wall or fence. Tiers of branches 50-60cm (20-24") apart are trained to run horizontally from the main trunk. Summer pruning required.
Bush Planting distance: M27 – 1.5m (5ft) M9 – 3m (10ft) M26 & MM106 – 3.5m (11.5ft)*		A very popular and easy-to-manage tree form. Trees have a short trunk with a rounded but open canopy (like a tea cup). Winter pruning required. Staking required for trees on M27 and M9 rootstocks.
Half standard Planting distance: M26 – 5m (16ft) MM106 – 6m (20ft)		Ideal for traditional orchards with large trees needing plenty of space. Makes a large crowned tree with a trunk length of just over 1m (3ft). Difficult to care for properly. Winter pruning required.
Standard Planting distance: MM106 – 7m (23ft) M2 & MM111 – 8-9m (26-30ft)*		Very large and tall trees with a trunk height of around 2m (6.5ft). Good for grazing sheep underneath, or establishing a wildflower/wildlife area but very difficult to care for properly. Winter pruning required.

** Use the wider recommended spacing for trees on vigorous rootstocks or fertile soil*

Site and soil requirements for apple trees

- Choose an open site, but not too exposed to strong winds.
- The site should be sunny (south-facing where possible) and frost-free. Slightly sloping ground is ideal.
- A well-drained, fertile soil is ideal for trees on dwarfing and semi-dwarfing rootstocks.

How to prune apples

Pruning fruit trees can seem a daunting prospect, but if you follow a few simple rules, it need not be complicated. All fruit trees will grow and fruit better if pruned regularly and it is a rewarding and quite therapeutic task!

The main aims of pruning are to encourage the tree to bear more fruit and to remove unwanted growth. 'Training' goes a step further to control the shape and size of the tree. Keep in mind a few basic facts:

- Most apple varieties are spur bearers – producing fruit buds on short, stubby shoots called 'spurs' which develop on two to three year-old wood. However, a few are tip bearers, or partial tip bearers, producing all or most of their fruit buds at the very tips of the branches. Be careful when you are pruning tip-bearing varieties not to cut off all the shoot tips, or you will not have any fruit in the following years!
- Fruiting wood can be distinguished from new wood as the fruit buds along it are rounder and fatter than vegetative buds – this is most noticeable in March, when the buds begin to swell – so if you are unsure, leave pruning until then.

(For more of the basics on pruning fruit, see Chapter 2)

Useful expert guides for pruning fruit (including apple trees)

Baker, H., Growing Fruit (Royal Horticultural Society's Encyclopaedia of Practical Gardening), Latest edition 1999, published by Mitchell Beazley, ISBN 1840001534

Bird, R., Pruning Fruiting Plants: A Practical Gardener's Guide to Pruning and Training Tree Fruit and Soft Fruit, with over 350 photographs and illustrations and easy-to-follow advice. Illustrated edition 2006, published by Southwater, ISBN 1844762858

Brickell, C., and Joyce, D., Pruning and Training (The Royal Horticultural Society): The definitive practical guide to pruning trees, shrubs, roses and climbers (includes fruit). Latest edition 2006, published by Dorling Kindersley, ISBN 1405315261

Pruning and training according to tree form

Step-over

Step-overs are trained and treated as single-tier espaliers (see details on next page) although are usually trained on a single supporting wire set at a height of 25-30cm (10-12") from ground level.

Starting from scratch:

First winter (after planting)

- After planting a maiden tree in winter, prune back the main stem to a bud just above the level of the supporting wire.

First summer (after planting)

- In late summer, select and tie in two new shoots to horizontal positions along the wire. Remove all other shoots.

Pruning during and after establishment:

- Prune as for cordons (see section below).

Cordon

These are usually planted in rows against a wall, fence or post and wire framework and set at an angle of 45° to reduce the growth at the tip and concentrate the tree's energy into flower and fruit production. It is possible to create double, triple or even quadruple-stemmed cordons from one tree, with two, three or four vertical limbs respectively, although growing and training a single cordon (as outlined below) will allow you to grow more varieties in a tight space.

Starting from scratch:

First winter (after planting)

- Start with a one-year-old (maiden) tree. Prune back the main leading stem by about a third. Cut all side shoots back to leave them 7.5cm (3") long. From now on, only summer pruning will be required.

Summer pruning (during and after establishment):

- Late the following summer, and in all subsequent summers, prune back any lateral shoots arising from the main stem to 7.5cm (3"), as above. If the laterals have produced shoots (sub-laterals) of their own, prune these back to about 2.5cm (1") to encourage the formation of short, stubby, fruiting spurs. The main stem can be kept growing until it reaches the desired height, whereupon it can be treated as a lateral and new growth cut back by several inches each summer.

Espalier

Traditionally, these are trained as three symmetrical tiers of limbs on either side of the main stem, against a 2m (6.5ft) wall, fence or supporting post and wire structure. Each tier of branches is set 50-60cm (20-24") apart, trained and tied in to strong wires.

Starting from scratch:

First winter (after planting)

- Start with a maiden tree planted against a tier of wires set 50-60cm (20-24") apart. The first tier should be set at this distance from ground level. After planting, cut the main stem right back to a bud just above the lowest wire. A bamboo cane can be used to help secure the main stem into position.

First summer

- During the growing season of the first year, at least three new shoots should grow out. Towards mid-late summer, two of these shoots can be tied in horizontally along the first tier of wires, on opposite sides of the main stem. The third should be trained upwards (along the bamboo cane) to form the main stem. Remove any other shoots.

Second winter

- In the winter, prune back the main stem to a bud just above the second wire (as for first winter).

Summer pruning (second summer)

- During the second summer, the process can be repeated as for the first year (tie in two newly-produced shoots horizontally and one vertically).
- Prune the branches of the first tier as for cordons (outlined above) by cutting back side shoots to 7.5cm (3") and any shoots arising from those to 2.5cm (1").

Winter pruning (third winter)

- Repeat the process outlined above to make a third and final tier. Select only two new shoots to tie in horizontally to complete the espalier. Remove any other shoots.

Pruning once established:

- Annually summer prune the espalier as you would for a cordon, cutting back side shoots to 7.5cm (3") and any shoots arising from those to 2.5cm (1"). No further winter pruning is required.

Bush

This is a sturdy open-centre tree on a short trunk. The centre of the bush is kept light, airy and uncluttered so that sunlight and good air flow can penetrate all parts of the tree – helping to discourage pests and diseases. Most varieties of apple respond well to this system of pruning and training, however very upright-growing varieties (eg Egremont Russet) and some varieties of pear are better trained as centre leader trees (see section on pears).

Starting from scratch:

First winter (after planting)

- Start with a maiden (one-year-old) tree, with a few lateral branches (side shoots or 'feathers') where possible.
- Cut the main stem back to about 75cm (30") in length, leaving at least two good buds (if no laterals) or three to five evenly spaced lateral branches below the cut which will later form the main branch framework. Trim these laterals back by one-third to one-half of their length, to an outward-facing bud. Remove any unwanted laterals (eg poorly-placed, weak, low growing) by cutting right back to the main stem.

Second and third winter

- During the second and third year after planting, these laterals, now lead branches, will grow to form the main branch framework. Prune the growth they made from the previous summer by about half its length, to an outward-facing bud, to promote bushiness. Sub-laterals required to fill in any gaps in the branch framework can also be shortened by half. Unwanted laterals (eg weak growing, overcrowded) can be removed completely or pruned back to four buds to help form fruiting spurs.

Fourth winter

- Having formed the basic framework, only light pruning is required. As above, prune the lead branches and sub-laterals back by one-third to one-half the length of the previous summer's growth. Laterals not required to extend the main branch framework can be shortened back to four buds to encourage the formation of fruiting spurs. Prune out any vigorous, upright-growing shoots as these will crowd the centre of the tree.

Winter pruning an established tree:

- Prune out any dead, diseased or damaged wood back to a healthy bud or stem.
- Continue to keep the centre of the bush uncluttered – prune out any weak-growing, very upright or crossing shoots and branches.
- If some of the lead branches are weak growing they can be lightly trimmed back to stimulate more growth.
- Remove any worn out and unproductive wood (generally more than three years old) by cutting back to a suitable replacement shoot.
- Remove any congested or overcrowded laterals or shorten to four to six buds to encourage fruiting spurs to develop. Retain about a third of the newly-formed laterals.
- If fruiting spurs become overcrowded, thin them out leaving one or two fruit buds per cluster.

Half standard and standard

Starting from scratch:

First winter (after planting)

- Using a maiden (year-old) tree, the procedure is the same as that outlined for a 'bush' tree form (see earlier), although the height at which the main stem is pruned back differs. For large, standard trees the maiden should be pruned to a height of 1.8-2m (6-6.5ft) and for half-standards, a height of 1.2-1.4m (4-5ft). It may be necessary to wait a year or two until the tree has grown tall enough to prune it to the required height.
- Thereafter, pruning during establishment is the same as for bush tree forms (outlined earlier). Once the tree has formed the main crown framework, any laterals which have formed below the crown can be removed to give a nice, straight, clean trunk.

Pruning once established:

- Due to the size of the trees, it will be quite difficult to prune established trees with the same attention to detail as that given to other forms. It is best to limit pruning to the basics – just remove overcrowded, congested or crossing branches and dead or diseased wood, where you can. Do not cut too much off in one year – if there is a lot of wood or major branches to remove, spread the work out over several years, or the tree may suffer shock.

A standard Bramley tree

Removing an unwanted crossing branch

Caring for established trees

- Continue to keep the base of the tree weed-free. Mulch and water if necessary.
- Thin overcrowded fruitlets by hand in late June to leave one to two fruits per cluster. This will help achieve a good fruit size.
- Continue to check ties and fastenings regularly – loosen if required.
- Inspect trees regularly for signs of pests and diseases.
- Prune during the winter or summer as required.
- Apply a dressing of organic general fertiliser to the base of the trees in early spring, or use a bulky organic mulch to give the trees a spring feed.

A cluster of fruitlets in need of thinning

Harvesting and storing fruit

Apples are ready for picking when the stalks detach from the tree easily without pulling and tugging. Cup the apple in your hand and lift and twist – if it is ready is should come away easily. Try not to press or handle the fruit too much or it will bruise.

Apples can be stored for several weeks or months (depending on variety). Choose clean, unblemished fruits for storing as they will quickly rot if bruised or damaged. Inspect and handle the fruits carefully. Wrap each fruit individually in a sheet of newspaper before placing them in a seed tray, shallow box or basket and leave in a cool, frost-free, place (a garden shed or garage is ideal). Alternatively, place six-eight blemish-free apples in a perforated clear polythene bag - twist the top to seal and store in a cool place. Check them periodically over winter and remove any which show signs of rotting. Cooking apples may be peeled, cored, chopped and frozen in bags for later use.

Pests and diseases

Troubleshooting

Fruit trees are hosts to an abundance of wildlife, although not all of it will be welcome. Be vigilant and observe your trees regularly for signs of any problems. This is particularly important when the trees are young since an early infestation of pests and diseases can cripple the trees, resulting in poor establishment. They tend to be more resilient as they get older!

Top tip

Encourage children to look at the trees and see how many 'beasties' they can spot and identify – many, such as ladybirds, will be easily identifiable.

Common pest problems

Distorted (curled and twisted) young leaves and shoots

This is usually caused by aphids (greenfly) - there are many species which are problematic on apple. Most over-winter as eggs in bark crevices and buds on the trees and hatch in spring, sucking sap from shoot tips and fresh young growth. Infestations are often patchy and localised.

Solution: Your first defence is encouraging natural predators such as ladybirds and lacewings into the area, eg with the provision of wildflowers and insect boxes*. You can also buy packs of ladybird larvae and adults* to boost predator numbers quickly.

For spot treatments through the season, use soft soap (insecticidal) sprays, and products made from natural oils or plant extracts (eg Bug Clear, Pyrethrum Insect Killer)*. Low numbers of infested shoots can also be picked off and destroyed.

*Curled/distorted leaves caused by rosy apple aphid (*Dysaphis plantaginea*) (inset - rosy apple aphids)*

Young leaves folded together and webbed

The culprits here are usually larvae (caterpillars) of tortrix moths (*Archips podana* and *Adoxophyes orana*) which feed on shoots, leaves and fruits, often webbing foliage together for protection whilst they graze. Caterpillars emerge in late March and April and are active until June, before pupating and emerging as adults several weeks later. Adult moths will then mate and lay eggs, producing a second generation of larvae which hatch in summer and feed on the trees until autumn, before over-wintering on the tree. Winter moths (*Operophtera brumata*) are another common species which behave in a similar way; the larvae feed on the tree during the growing season before pupating in the soil and emerging as adults during October-January. The wingless winter moth females crawl up the tree to lay their eggs in bark crevices and eggs hatch in early spring.

Tortrix larva and webbed foliage

Solution: Remove and squash the offending caterpillars when seen! A pheromone trap* hung on the tree from May onwards will help trap male tortrix moths and prevent them mating with the females, which will reduce caterpillar numbers the following year. This approach is best used where there is a small orchard, and examining individual trees in detail is impractical.

For control of winter moths, greasebands or gluebands* tied around tree trunks from October until March will help trap the wingless females as they make their way up the tree and before they have a chance to lay eggs.

Pheromone traps are useful for trapping male moths of several pest species

* = *products available from The Organic Gardening Catalogue - www.organiccatalogue.com*

Caterpillars within the apples

Internal feeding damage caused by larva of the codling moth

The classic 'maggot in the apple' is the codling moth larva (*Cydia pomella*). Adult moths are active from May until August, laying eggs on developing fruitlets which then hatch and the resulting larvae burrow into and feed on the apple. Once mature, the larvae leave the fruit and pupate under loose bark or in leaf litter on the ground, emerging as adults in August or September, or in late spring the following year (depending on temperature). Attacked apples usually have a characteristic entry hole on one side, blocked with dry, brown frass.

Solution: attacked fruits can be removed and destroyed when seen during the growing season (particularly where the caterpillar is still active inside). Using pheromone traps* that catch the male moths from May-August and prevents them mating with the females will help reduce moth populations the following year.

Corky, ribbon-like scars on fruit, and sticky brown frass near a small hole

Scarring on fruit surface caused by sawfly larva

This is characteristic damage caused by apple sawflies (*Hoplocampa testudinea*) – the larvae of which burrow beneath the skin of developing fruitlets, resulting in the formation of scars on the fruit surface (which becomes most obvious on mature fruits), before burrowing into the core of the apple to feed on the pips, sometimes causing premature fruit drop. During the growing season, the presence of larvae in the fruit can be more easily detected by the wet, brown-black frass exuding from a small hole in the fruit. The larvae can move between fruits, before dropping to the ground to pupate, emerging as adult sawflies in spring the following year. Eggs are laid on young blossoms in April and May and the cycle starts again.

Solution: adult sawflies are particularly attracted to apple varieties which have very bright, white blossom (such as Discovery) – so one method of control is to hang white sticky traps on the trees during warm weather in spring to help trap flying adults, although other insect species may also be caught. Otherwise, removing attacked fruitlets during the growing season will help reduce populations – pick off any fruits which have characteristic holes and wet brown frass present. It is particularly important to carefully examine fruitlets growing together in clusters as this provides an ideal hiding place for the larvae and opportunity to move between fruits.

Common disease problems

Brown spots on leaves and fruit

Apple scab

The most common cause of this is apple scab (due to the fungus *Venturia inaequalis*) which is a problem on susceptible varieties during wet weather. All parts of the plant are attacked, but brown corky lesions on leaves and fruit are the most obvious symptoms. Infection occurs mostly during April-June, particularly when leaves remain wet for prolonged periods. Infection on the fruit is superficial – once the skin is peeled, the fruit is perfectly acceptable for eating.

Solution: Use resistant varieties where possible, especially in areas which experience frequent rainfall. Do not store infected fruits. Prune the trees to encourage an open and airy habit, helping leaves to dry quickly after rainfall. Rake up and remove fallen apple tree leaves in autumn to prevent disease carry-over.

* = *products available from The Organic Gardening Catalogue - www.organiccatalogue.com*

White powdery deposits on leaves and stems

This is caused by powdery mildew (*Podosphaera leucotricha*) which tends to occur during dry spells. Young leaves and shoots become infected from April onwards when primary mildew develops, although infection continues during the growing season in warm, dry weather and badly infected leaves will become brown and shrivelled. The fungus overwinters in buds and shoots. Infected fruits are often russetted, but perfectly good for eating.

Powdery mildew

Solution: It is important to cut out infected shoot tips when symptoms are first seen in spring, to prevent the fungus spreading. Ensure trees are receiving adequate water and nutrients so that they are better able to withstand infection. Some varieties are resistant.

Brown blistered and corky lesions on the stems

This is caused by canker (*Nectria galligena*). Some varieties are more susceptible than others, but in severe cases it can cripple affected trees. Fungal spores enter the tree during autumn at leaf fall through openings in the bark in bud scales and leaf scars and via wounds caused by pruning, pests and diseases. Affected shoots and branches become sunken and blistered in places, resulting in die-back and eventual death of the affected branch.

Solution: The best way of dealing with canker is to cut out and dispose of infected shoots and branches – ensuring that you prune back to a healthy part below the cankered area. The best time to do this is during late winter and early spring.

Brown cavities within the apples

The most common cause of this condition is 'bitter pit' – which arises as a result of a shortage of calcium and water, especially on large cooking apples such as Bramley. Affected fruits do not store well.

Solution: applying a general purpose fertiliser containing calcium – particularly those which contain calcified seaweed*, or similar preparations or soil improvers which contain calcium and lime, during the growing season. Ensure trees are watered regularly.

Leaves brown and wilting

This is usually caused by a shortage of water, especially in newly planted trees during hot weather. Ensure that trees receive adequate water during establishment. Mulching the base of the tree with organic material (eg compost, well-rotted manure) will help retain moisture. Mulch mats can also be used to keep the weeds down*.

Poor growth

There are many possible causes of poor growth, but where young trees are affected it is most likely to be due to competition from neighbouring grasses and weeds, especially if trees are planted into a rough pasture area. Ensure that the base of the tree is kept weed-free up to a radius of 0.3-0.5m around the trunk – using an organic compost mulch or mulch mat will help. Feed and water the tree well during the growing season.

Not much fruit

Many possible causes, but usually linked to inadequate pollination, either where there are insufficient pollinator trees nearby, few pollinating insects, or even frost or wind damage during flowering. Planting a few crab apples or other apple varieties to improve pollination may help. Encouraging beneficial insects by growing plenty of flowering plants nearby and providing wildlife habitats will help improve numbers of naturally occurring pollinating insects.

Some varieties of apple are naturally biennial – producing abundant crops one year and 'resting' the next. This can be discouraged by thinning the fruits adequately during late June in years of heavy fruit set.

Bumblebees and honeybees are excellent pollinators

* = *products available from The Organic Gardening Catalogue - www.organiccatalogue.com*

Origins of traditional apple varieties (by English county):

Key:

c = culinary

d = dessert

dp = dual purpose

Bedfordshire

Ballard Beauty (d)
Bedfordshire Foundling (c)
Laxton's Superb (d)
(+ many other 'Laxton's' varieties)
Lord Lambourne (d)
Owen Thomas (d)

Berkshire

Charles Ross (dp)
Miller's Seedling (d)
Reverend W. Wilks (c)

Buckinghamshire

Aurthur Turner (c)
Cox's Orange Pippin (d)

Cambridgeshire

Chivers Delight (d)
Emneth Early (Early Victoria) (c)

Cheshire

Lord Derby (c)

Cornwall

Cornish Aromatic (d)
Cornish Gilliflower (d)

Cumbria

Carlisle Codlin (c)
Duke of Devonshire (d)

Derbyshire

Newton Wonder (c)

Devon

Woolbrook Pippin (d)
Woolbrook Russet (c)

Dorset

Buttery Door (c)
Melcombe Russet (d)
Profit (dp)
Warrior (dp)

Essex

D'arcy Spice (d)
George Cave (d)
Queen (c)

Gloucestershire

Ashmead's Kernel (d)

Hampshire

Hambledon Deux Ans (c)

Herefordshire

Herefordshire Beefing (c)
King's Acre pippin (d)
Pitmaston Pineapple (d)

Hertfordshire

Brownlee's Russet (d)
Lane's Prince Albert (dp)
Thomas Rivers (c)

Isle of Wight

Howgate Wonder (c)
Sir John Thornycroft (d)

Kent

Christmas Pearmain (d)
Gascoyne's Scarlet (d)
Kentish Fillbasket (dp)
Lady Sudeley (d)
Wanstall Pippin (d)

Leicestershire

Annie Elizabeth (c)
Dumelow's Seedling (c)

Lincolnshire

Allington Pippin (dp)
Barnack Beauty (d)
Ellison's Orange (d)
Isaac Newton's Tree (c)
Peasgood's Nonsuch (dp)
Stamford Pippin (d)

Middlesex

Hounslow Wonder (c)
Scarlet Pearmain (d)

Norfolk

Adams's Pearmain (d)
Baxter's Pearmain (d)
Golden Noble (c)
Hubbard's Pearmain (d)
Norfolk Beefing (d)
Striped Beefing (c)

Northamptonshire

Lord Burghley (d)

Nottinghamshire

Bess Pool (d)
Bramley's Seedling (c)

Oxfordshire

Blenheim Orange (dp)

Shropshire

Downton Pippin (d)
Yellow Ingestrie (d)

Somerset

Beauty of Bath (d)
Court of Wick (d)
Hoary Morning (dp)

Suffolk

Lady Henniker (dp)
St Edmund's Pippin (d)
Sturmer Pippin (d)

Surrey

Claygate Pearmain (d)
Duchess's Favourite (d)
Scarlet Nonpareil (d)

Sussex

Crawley Beauty (dp)
Forge (dp)
Sussex Mother (d)

Warwickshire

Wyken Pippin (d)

Wiltshire

Roundway Magnum Bonum (d)

Worcestershire

Gladstone (d)
Lord Hindlip (d)
Worcester Pearmain (d)

Yorkshire

Ribston Pippin (d)
Sharleston Pippin (d)
Yorkshire Greening (c)

Pears

Pears are a popular fruit which can be purchased year-round from supermarkets, yet the season for UK-grown pears runs from September until just after Christmas. Although they can often play second-fiddle to apples, many varieties are softer and easier to eat (a great fruit to give to children – especially when soft fruits such as strawberries are not in season). They are also useful for cooking and can be turned into many appealing sweet or savoury dishes. However, pears are not everyone's cup of tea – many people dislike the gritty nature or musty taste of some varieties, although the more modern varieties such as Conference are sweet, smooth, melting and juicy when fully ripe (or deliciously crunchy when hard!).

Pears are more challenging to grow than apples, but given the right conditions will crop well. The trees are very long-lived and can easily survive for over a century – so a great tree to plant if celebrating or marking any sort of anniversary or occasion.

Varieties

There are far fewer pear varieties compared to apples – the variety Conference is probably the best known and most widely available in shops. Although it is possible to grow culinary and perry pear varieties, where space is limited to just a few trees it is best to grow dessert varieties as these can be eaten fresh and, when firm, are also good to use in cooking. Pears tend to be a little fussier than apples, and many varieties will not grow well without ideal conditions. However, the varieties listed on the next page are generally reliable and with due care and attention will produce regular crops when grown with a suitable pollinator nearby. Some, but not all, have disease resistance.

Comice

Onward

Relatively easy to grow and reliable varieties

Dessert varieties	Picking time*	Pollination group	Storage
Beth	Late August	D	1 month
Concorde	Late October	C	2 months
Conference	Late September	B	2 months
Fertility Improved	Late September	B	1 month
Louise Bonne de Jersey	Late September	A	1 month
Onward	Mid September	C	2 weeks
Winter Nelis	Late October	C	2-3 months

** Approximate date of harvest will vary with region and weather conditions during the growing season.*

Conference

Concorde

Pollination requirements

Some varieties of pear are self-fertile, but all varieties will crop better if cross-pollinated with another variety. Most varieties require just one other pollinating partner, but it may occasionally be necessary to provide two (in this case your nursery or tree supplier will be able to advise you on any special requirements). Pears are classified into four flowering groups from 'A' (early-flowering varieties) through to 'D' (late-flowering varieties). Some books also classify these flowering groups by number (ie 1-4 from early through to late-flowering varieties). Most varieties will pollinate others in the same flowering group, or in adjacent groups when flowering periods overlap. Occasionally, certain varieties may prove incompatible with others

Pear blossom

from the same flowering group, but your tree supplier will be able to advise you on special pollination requirements and suggest suitable pollination partners.

Where space is limited to just a few varieties, it is worth considering growing pear trees in the form of cordons (where several different varieties can be grown in close proximity) or as a 'family' tree (as for apples).

Rootstocks

Pears are usually grafted on to quince rootstocks to ensure they make small to medium-sized trees which are suitable for the garden. Trees on these stocks are widely available and will bear fruit around four years after planting. They require staking for at least the first five years (preferably permanently for dwarfing rootstocks). The dwarfing rootstock Quince C needs a fertile soil and will not perform well where the soil is poor or where there is competition from weeds and grass (trees on this rootstock will need to be permanently mulched and/or kept weed-free around their base if planted in a grass lawn). Quince rootstock 'A' and the new introduction 'EMH' are more suitable for a wide range of soil types, including relatively poor soils. If in doubt, seek advice on the most appropriate rootstock for your situation from your fruit tree supplier.

Pyrus (pear) rootstocks are sometimes available, but these make very vigorous, large trees which are generally unsuitable for the garden, unless the soil is very poor. Trees on this stock will produce fruit five to six years after planting. A relatively new semi-dwarfing pear rootstock (Pyrodwarf) is now being offered by some nurseries, which can be used for most soil conditions including relatively poor soil and grassed orchards. These pear rootstocks will benefit from a stake support for the first three to five years after planting.

Dwarfing rootstocks enable fruit trees to be grown closer together - as in this commercial pear orchard

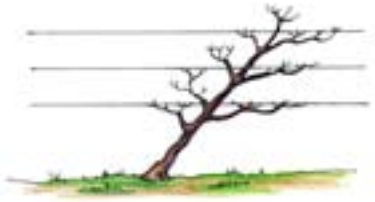
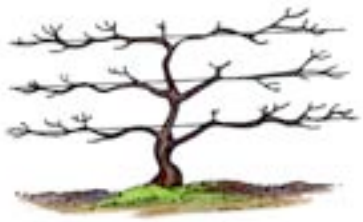
Rootstock	Vigour	Tree height (bush form) when mature*	Suitable tree forms
Quince C	Dwarfing	2.5-3.5m	Bush, cordon, espalier, step-over, centre leader
Quince EMH	Dwarfing	2.7-3.5m	Bush, cordon, espalier, centre leader
Quince A	Semi-dwarfing	3-3.6m	Bush, cordon, espalier, half standard, centre leader
Pyrodwarf	Semi-dwarfing	4.5m+	Half standard
Pyrus	Very vigorous	6m+	Standard

* *Actual height and size will depend on variety, tree form and growing conditions*

Tree forms

Pears can be trained and pruned in much the same way as apples and can be grown in the tightest of spaces in the form of cordons and espaliers against a wall or fence or as small bushes in containers. As with apples, if choosing cordon or espalier tree forms, it is possible to source trees which have already had their framework established by the fruit tree supplier so that all the initial hard work has been done for you, although these ready-trained trees will be more expensive and will need pruning in summer. Occasionally, pears are trained as step-overs or fans, but due to their inherent vigour and upright habit, this form of training and management is best left to specialists.

Free-standing pear trees are most easily grown as bushes, which require simple winter pruning, although dwarf pyramid, centre leader trees, half standards and standard tree forms are also possible.

Tree form	Planting distance between trees *		Notes
Cordon	Quince C & EMH – 0.75m (2.5ft) Quince A – 1m (3ft)		Summer pruning required.
Espalier	Quince C & EMH – 3.5-4.5m (12-15ft)* Quince A – 4.5-5.5m (15-18ft)*		Summer pruning required.
Bush	Quince C & EMH – 3m (10ft) Quince A – 3.5m (12ft)		Easy to manage. Suits vigorous and spreading varieties. Prune in winter.
Centre leader	Quince C & EMH – 2.5-3m (8-10ft)* Quince A – 3m (10ft)		Suitable for most varieties. Prune in winter.
Half standard	Quince A & Pyrodwarf – 4-6m (13-20ft)*		Large trees – difficult to care for. Need a lot of space. Prune in winter.
Standard	Pyrus – 6-9m (20-30ft)*		Large trees – difficult to care for. Need a lot of space. Prune in winter.

** Use the wider recommended spacing for more vigorous rootstocks or trees on very fertile soil*

Site and soil requirements

- Pear trees flower early (during April) and require a long, warm summer to ripen fruit properly, so are best grown in a sheltered position in plenty of sunshine (given these conditions they will also grow well in northern situations).
- Pears grow well in a well-drained but moisture retentive soil. The addition of organic matter into the soil will be beneficial if the soil is less than ideal, although they will do less well in sandy or chalky soil. They do not like drought, so keep the soil well-watered in times of dry weather.

How to prune pears

Follow the advice given in the apple section and Chapter 2 (principles of pruning).

Pruning and training according to tree form

Guidelines for pruning pear trees trained as cordons, espaliers, bush, half standard and standard forms are the same as that outlined for apples.

Centre leader trees

Some varieties of pear are very upright-growing in habit, and can be difficult to manage as bush trees without some form of branch manipulation (eg tying down branches to a more horizontal position when the growth is most pliable in late summer). Growing trees as centre leaders (sometimes called 'spindlebush') is a good way to manage such varieties, and trees can be planted slightly closer together than bush forms. Trees grown in this way take on a shape akin to that of a cone shape or Christmas tree, where early (formative) pruning encourages the development of a dominant strong, central stem with several tiers of well-placed lateral branches beneath it. Staking is usually required to allow the central leader to be secured.

An example of a commercially-grown centre leader pear tree (before pruning)

Starting from scratch:

First winter (after planting)

- Start with a maiden (one-year-old) tree with a few lateral branches (side shoots or 'feathers') where possible. (Unfeathered maidens should be pruned back by one-third of their height, to a vigorous, healthy bud which will encourage side shoots to develop during the growing season.)
- Retain three to four well-placed lateral branches to form the main tree framework – these should be evenly spaced and well-distributed, but not less than 60cm (2ft) from the ground. Prune these back by about a half to an outward-facing bud. Prune out any poorly-placed (eg overcrowded), narrow-angled or weak-growing laterals completely. Cut back the central leader to the third bud above the topmost selected lateral.

First summer (after planting)

- A new central leader should have grown and can be secured against the supporting stake by tying-in gently with some soft twine. Upright extension growth of newly-developed laterals can be encouraged into a more horizontal position by gently tying down to an angle of 30° above the horizontal (branches can be tied down using twine attached to a temporary stake, lower branch or pegged into the ground). This will help spread the branches out and prevent them becoming too upright and competing with the central leader.

Second and third winter

- Prune the central leader by about a third of the previous summer's growth – preferably to a bud on the opposite side to that of the previous year's cut. This helps to keep a straight lead stem. The central leader should be gently tied in to the stake to provide support.
- Prune other laterals by a third of the previous season's growth, preferably to a downward and outward-facing bud.

A young centre leader pear tree

Winter pruning an established tree:

- Continue to tie down any strongly-growing vigorous or upright shoots (except the central lead shoot) to a position just above the horizontal; this will help encourage fruiting. Once the trees are cropping well, the weight of fruit will help pull the branches down and there will be less need for tying down.
- Lightly pruning or 'tipping back' lead branches by a few inches to an outward facing bud will help encourage further laterals to develop along the branch if the branches are bare. Branches at the top of the tree should be kept shorter than those beneath to prevent shading the lower canopy.
- Continue to prune the central leader by a third of the previous summer's growth each year (as detailed in step four). When the central leader has reached a height at which it can be comfortably managed, eg 2.5-3m (8-10ft), it is replaced by pruning back to a weaker lateral, or left un-pruned and cut back to a fruit bud on two-year-old wood the following year.
- Other strong-growing laterals and unproductive wood older than three years can be cut out completely or cut back to fruit buds. Retain about one-third of newly formed laterals (the previous season's new wood) to supply next year's fruit.
- Old or congested fruiting spurs may be thinned to one or two fruit buds.
- Prune out any damaged, diseased or crossing/rubbing branches.

Caring for established trees

- The base of trees grown on dwarfing rootstocks should be kept weed-free. Mulch and water if necessary.
- Thin overcrowded fruit clusters (fruitlets) by hand in late June to leave one to two fruits per cluster. This will help achieve a good fruit size.
- Continue to check ties and fastenings regularly – loosen if required.
- Inspect trees regularly for signs of pests and diseases.
- Prune during the winter or summer as required.
- Apply a dressing of organic general purpose fertiliser in early spring, or use a bulky organic mulch to give the trees a feed.

Thin to 1-2 fruits per cluster to achieve good fruit size

Harvesting and storing fruit

Pears need to be picked very gently as they can bruise easily. Hold the ball of the fruit in the palm of your hand. Place a finger against the top of the stalk and lift the fruit upwards. If it doesn't come away, it isn't ready. Pears can be ripened-off indoors, but storage life is considerably shorter than for apples and most varieties will not keep for more than two months in a cool place.

Pests and diseases

Pears are generally less prone to pests and diseases than apples, although they share many common problems which affect apples (eg aphids, codling and tortrix moths, winter moth, scab, mildew, canker). Birds such as bullfinches are very partial to the buds in early spring – so trees may need protecting with scarers or small-guage netting where bullfinches are a problem. As with apples – inspect your trees regularly for signs of any problems and take prompt action to prevent pests and diseases getting out of hand. Pest and disease damage to fruits is mostly cosmetic – fruit is perfectly safe to eat, although you may wish to peel the pears before eating to remove any tough or damaged pieces of skin.

Canker on pear

Winter moth larva (inset) and damage to pear fruitlet

Common pest problems

Distorted (curled and twisted) yellowing leaves

As with apples, this is usually caused by aphids – the most common and damaging species on pear being the pear bedstraw aphid (*Dysaphis pyri*), which are plump, pinkish coloured insects covered in a mealy wax. They feed on the foliage in early spring, often producing large colonies by the end of May, which can spread to neighbouring pear trees. The aphids produce large amounts of honeydew as they feed, making the foliage sticky and often black with the growth of sooty mould.

Solution: Encourage natural predators such as ladybirds and lacewings into the area, eg with the provision of wildflowers and insect boxes*. You can also buy packs of ladybird larvae and adults* to boost predator numbers quickly. As a last resort, use soft soap (insecticidal) sprays, and products made from natural oils or plant extracts (eg Bug Clear, Pyrethrum Insect Killer)* to spot treat infestations when seen. Low numbers of infested shoots can also be picked off and destroyed.

Pear bedstraw aphid colony
Photo: Jerry Cross, East Malling Research

Sticky honeydew on leaves, branches and fruits which often turn black with sooty mould. Ants encouraged by the honeydew

This can be caused by aphids, but excessive amounts of sticky honeydew are often a result of infestations of pear sucker nymphs (*Psylla pyricola*) which are small (2mm long) insects, pale orange in colour with pinkish-red eyes, becoming increasingly darker orange in colour as they mature. These nymphs live and feed on pear foliage during the growing season. They are especially problematic in warm, dry weather. Rainfall can often wash the pest and associated sticky honeydew from the leaves.

Pear sucker nymphs
Photo: Jerry Cross, East Malling Research

* = *products available from The Organic Gardening Catalogue - www.organiccatalogue.com*

Solution: Low numbers of the pest can be tolerated, but it is advisable to pick off and destroy small colonies on shoot tips and blossom trusses when seen if possible, to prevent populations getting out of control. The insects can also be washed or hosed off relatively effectively.

In severe infestations, it may be necessary to resort to spraying with an organic insecticide – products containing Pyrethrum (eg Pyrethrum Insect Killer*) are likely to be most effective – particularly on young nymphs.

Pear sucker blackened shoot
Photo: Jerry Cross, East Malling Research

Blistering and blotches on leaves which gradually darken to black-brown in colour

This is likely to be caused by pear leaf blister mites (*Phytoptus pyri*), which are tiny gall mites that live in the foliage of pear trees. They breed prolifically, producing several generations during the summer, but only cause superficial damage to foliage and tree health and productivity is not usually affected, although severe infestations on very young trees can cause poor establishment. During feeding in spring, the mites secrete chemicals that cause blotches to appear on new foliage, which eventually turn black and the leaf dies in late summer.

Pear leaf blister mite damage on leaf

Solution: The only solution is to remove affected leaves and shoots by hand to prevent the mites spreading to other areas.

Black patches on the surface of young fruitlets

This is caused by the pear midge (*Contarinia pyrivora*) – the larvae of which feed inside developing pear fruitlets, causing them to swell, harden and turn black. If you open up an infested fruitlet, you will find several yellowish-white midge larvae feeding inside the affected area. Pear varieties vary in their susceptibility to the pest (eg Williams is very susceptible).

Solution: Remove and destroy any infested fruitlets as soon as you see them – this will help reduce the pest population, though it may be necessary to do this for at least two successive years. Damaged fruitlets usually drop to the ground early, making them harder to find. There are no effective spray products which can be used since the larvae are protected inside the developing fruitlet.

Common disease problems

Brown spots on leaves and fruit

As with apples, the likely culprit is scab, caused by the fungus *Venturia pirina* on pears. Some varieties of pear are more susceptible than others and the disease is most problematic if the weather during the early part of the growing season (April-June) is wet. All parts of the plant are attacked and in severe cases brown corky scab lesions can be observed on wood (wood scab) in addition to leaves and fruit. Infection on the fruit is superficial – once the skin is peeled, the fruit is perfectly acceptable for eating.

Pear scab on leaf and fruit

Solution: Use resistant varieties where possible, especially in areas which experience frequent rainfall. Do not store infected fruits. Prune the trees to encourage an open and airy habit, helping leaves to dry quickly after rainfall. Rake up and remove fallen pear tree leaves in autumn, to prevent disease carry-over.

* = *products available from The Organic Gardening Catalogue - www.organiccatalogue.com*

Blossoms and shoots wilt and turn black (as if 'fire scorched') - whole branches die back

Fireblight

This could be caused by the disease fireblight (*Erwinia amylovora*), which attacks a number of plant species including hawthorn, apple and pear – pears are particularly susceptible. Blossoms become infected with the disease during warm, wet weather in spring and the infection spreads down the shoot, forming cankers. If the bark is peeled away from an infected branch, there will be a foxy red-brown stain present. The shoot itself may be characteristically curled at the end – taking on a 'shepherd's crook' appearance. Infected fruits will quickly rot in storage.

Solution: If you see this problem, but it is only affecting a small part or branch of the tree, it may be possible to cut out the infected area, cutting well back below 30-60cm (1-2ft) of the stained part of the cut bark. Remove and dispose of the infected branch and make sure all pruning implements are cleaned and sterilised (eg with Citrox*) before you prune again. If most of the tree is affected by the disease, it is best to remove and dispose of it altogether.

Fruits developing brown patches and rotting on the tree and in store

Brown rot

There are lots of different fungi which cause fruit rotting, but the most common one is brown rot (*Monilinia fructigena*) which can develop whilst fruits are still on the tree. The fungus affects both apples and pears where infection enters the fruits via wounds or cracks caused by pest damage, abrasions or careless picking. The infection can easily spread to neighbouring healthy fruits in the same cluster. All varieties are susceptible. Infected fruits develop brown patches on their surface, which quickly spread in size, developing yellowish pustules from which spores are produced. Infected fruits eventually turn completely rotten, often drying out and persisting on the tree in a mummified state. The fungus sometimes grows along the stalk of the infected fruit into the spur and branch, causing a localised canker.

Solution: Pick off and destroy any infected fruits when first seen. This will help prevent the fungus spreading. Prune out cankers and mummified fruits remaining on the tree during winter pruning (see Chapter 2 for advice on what to do with diseased plant material). Do not store bruised, damaged or stalk-less fruit. Thinning the fruits in June will help prevent the spread of infection.

* = *products available from The Organic Gardening Catalogue - www.organiccatalogue.com*

Strawberries

Strawberries, a popular food with most children, are an easy fruit to grow and an ideal introduction to fruit growing. Children and adults alike will love picking the fruit when perfectly ripe, sweet and full-flavoured, either for eating fresh or for using in jams, smoothies and desserts. The fruits are also bursting with goodness in the form of vitamin C, fibre and folate (which helps memory and concentration – just the thing before a tough maths lesson!). The plants do not require a lot of space, are relatively quick to produce a crop, and can be grown virtually anywhere. In their simplest form, they can be grown in straight rows in a vegetable plot or fruit area, or on raised beds or ridges for improved drainage where the soil is heavy. They can be grown in pots, grow bags, window boxes (on their own or mixed with flowering plants), hanging baskets and specialised strawberry planters. They can also make attractive low growing perennial plants in flower borders, or used as edging plants – provided runners are removed to prevent the plants spreading where they are not wanted.

Varieties

There are two main types of strawberry – summer fruiting (June-bearers) which crop in June and July, and everbearing strawberries, which produce fruit in several flushes from late June through to autumn, with peak production during July and August. You may occasionally come across alpine strawberries (also detailed overleaf) and very rarely 'day neutral' strawberries, although the latter offer little benefit

Bolero (Photo: courtesy of East Malling Research)

Cambridge Favourite

over standard everbearing types and the flavour is not quite so good. **For the benefit of the school calendar, we recommend growing June-bearing varieties, as these will finish cropping in time for the long summer holidays.** All varieties are self-fertile, so it is possible to grow only one variety and still obtain a good crop.

Summer-fruiting strawberries (June-bearers)

These are the most widely available and popular type of strawberry, which produce fruit between early June and late July, depending on variety, over a period of a few weeks only. Once they have fruited, they will not fruit again until the following year (although a few varieties occasionally produce a small second 'flush' in autumn – so the season is all too fleeting. However, they produce the biggest, sweetest and arguably best-flavoured fruits. June-bearing varieties will fruit well for two years, producing a reasonable crop in their third year (although fruit size diminishes as plants become older) – after which it is advisable to start again with new plants. There is an abundance of summer-fruiting varieties to choose from, but we have selected some of the most reliable and easy to grow under organic conditions (see table below). For early crops under the protection of fleece, cloches, or in the greenhouse or sheltered warm balcony, choose early varieties such as Christine (new variety), Emily or Honeoye. Easy to grow mid-season varieties include the old fashioned but reliable Cambridge Favourite, Pegasus, Hapil and new variety Alice. Late season varieties which crop before the start of the summer holidays include Symphony and Florence.

Easy to grow varieties (with pest and disease resistance)

Summer-fruiting varieties	Picking time	Characteristics
Christine	Early June	A new variety which produces large, firm fruits which are sweet and juicy. Fruits do not bruise easily – so great for kids to handle!
Emily	Early June	Produces well-flavoured, high quality fruits. Plants are upright in habit and moderately vigorous. Fruit size can be quite small in the second year of cropping.
Darlisette	Early – mid June	A heavy yielding new variety with exceptionally sweet fruits of excellent flavour. Ideal for container growing.
Honeoye	Early – mid June	A reliable variety with well-flavoured berries. Plants are upright-growing and can do well in northern and western parts of the UK.
Sallybright	Mid June	A new variety which produces large fruits with an excellent flavour – great for jam. Plants are vigorous and upright growing, making picking easier.
Pegasus	Mid June	A reliable variety which produces high quality fruits with an excellent flavour. Grows well in heavier soils.
Hapil	Mid - late June	Produces heavy yields of large, glossy, sweet fruits with an excellent flavour. Does well on lighter soils and in drier conditions – good for containers. Upright growing habit.
Cambridge Favourite	Mid June – early July	A traditional and reliable variety, suitable for growing in containers. The fruits are ideal for making jam. High yielding with juicy orange-red fruits with an excellent flavour.
Alice	Mid June – mid July	Produces large, sweet and juicy fruits which are evenly-sized. It crops over a long period. Upright-growing habit.
Symphony	Mid June – mid July	Produces high quality bright red fruits with an excellent flavour. Grows well in northern and western parts of the UK – good for damper conditions.
Florence	Late June – end July	A reliable and vigorous variety producing large, firm, juicy red berries, which turn darker with age. Flavour is excellent.

Many varieties are available from the Organic Gardening Catalogue – www.organiccatalogue.com

Alpine strawberries

These produce small, dainty, sweet fruits (ideal for garnishes, decorating cakes or adding to delicate salads), on a little and often basis over the summer months and into autumn. The plants make reasonably attractive edging plants for beds and borders (with attractive white or sometimes pink flowers). They are great for container growing and mixing with flowering annuals since they are best cropped for one year only. Plants are best raised from seed. Fill a seed tray with multi-purpose compost and sprinkle the fine seed over it, lightly covering with a dusting of compost. Water gently and regularly, and leave in a cool greenhouse. Prick out the seedlings when they are large enough to handle and pot on into individual 8cm (3") pots. Harden-off in a sheltered area outdoors before planting out. Autumn-sown plants can be planted out in spring and cropped in summer. Spring-sown plants should be planted out in summer and cropped the following year. They tend to set their own seed liberally, so they can naturalise well if left to their own devices (especially if you leave a few fruits un-picked during the summer holidays!). Notable varieties include Alexandria, Baron Solemacher and the white-fruited 'White'.



Alpine (or wild) strawberries make compact perennial plants with dainty white flowers, followed by tiny red berries. They naturalise and spread - growing well in cracks and crevices.

Everbearing strawberries

Everbearing strawberries (sometimes called 'perpetual' strawberries) produce fruit over a long period from June until the first frosts, usually in several flushes. They are useful for extending the strawberry growing season into autumn, especially when given protection from the autumn weather using low tunnels or cloches. There are far fewer everbearing varieties than June-bearers. Some reliable and easy to grow varieties are listed below:

Everbearing varieties	Picking time	Characteristics
Bolero	June – Oct/ Nov	A moderately vigorous variety which produces high quality, firm, conical berries which have a good shelf life.
Everest	June – Oct/ Nov	A reliable variety which crops steadily through the season. Plants are tolerant of a range of soil types and upright in habit. Berries are dark red and firm with a good shelf life and flavour.
Calypso	June – Oct/ Nov	A very well-flavoured variety which produces firm, mid-red berries which tend to darken once ripe, so frequent picking is required. Produces several flushes of fruit in June and in late summer - autumn.
Malling Pearl	July – Sept	A vigorous variety which produces large, attractive, sweet and very juicy fruit.
Albion	June – October	A new variety with excellent disease resistance. Produces large, sweet, dark-red berries.
Flamenco	Mid July – Nov (peak early Sept)	Excellent for container growing or where space is limited. Produces high quality, sweet and juicy fruits over a long period.

Buying plants

Young, pot-grown summer-fruiting strawberry runner plants can usually be purchased in your local garden centre during spring and summer. After planting, they should give a good maiden (first) crop the following year (it is best to remove any flowers that form the same year after planting so that the plants establish well).

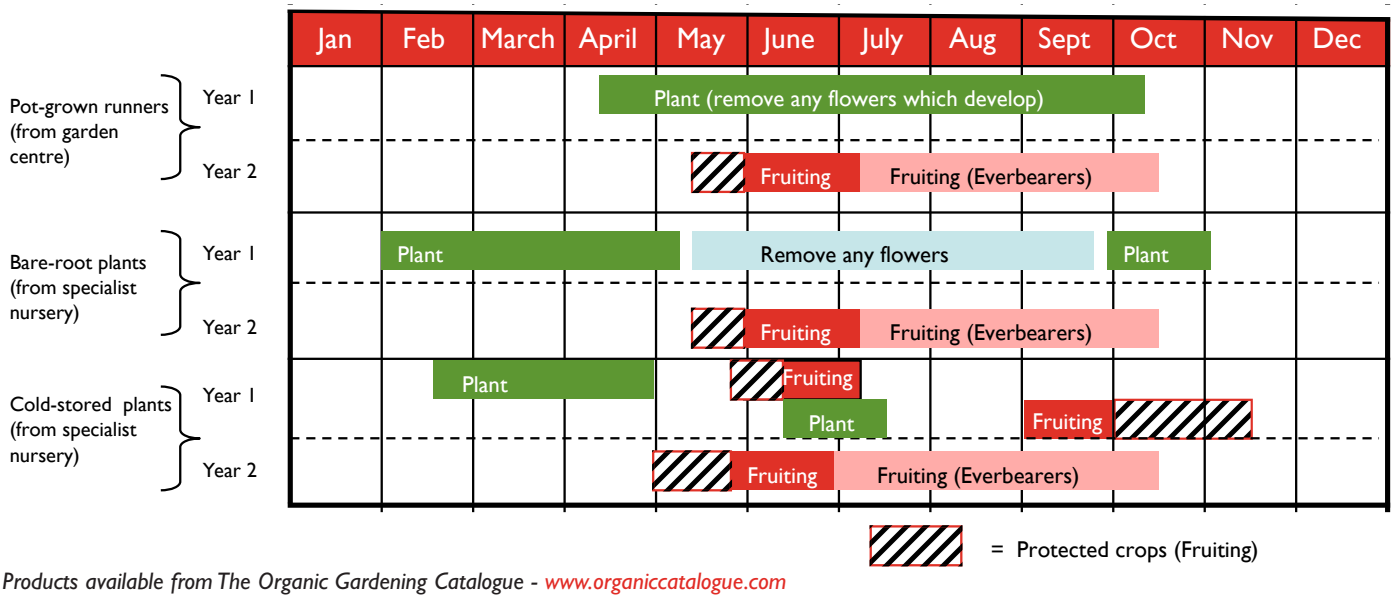
It is also possible to buy plants mail-order from specialist fruit nurseries, especially if you want to grow some unusual varieties. Many nurseries also supply commercial growers, and will have had their plants certified virus-free and true-to-type by DEFRA Plant Health Inspectors, so you can be sure the plants are healthy and trouble-free. (A few nurseries offer organically-raised plants). Nurseries usually supply freshly-lifted, bare-root plants between October and May. Order early (before October if you can) and get your plants into the ground as soon as possible - this will give them the best possible start. The plants should then produce a first crop the following year. Spring-planted plants will produce only a poor crop if allowed to fruit the same year so they should be de-blossomed during their first growing season – this means pinching out flowers and flower buds which may seem a cruel thing to do, but worth it in the long run. They should then establish well before cropping the following year.

It may also be possible to order more expensive 'cold-stored' plants (which tend to be larger, and have better yield potential) which are usually available from March to early July (again, early ordering before March is advisable since popular varieties tend to sell out quickly). If planted outside by the end of July, they will give a good crop two to three months later, and continue to crop well for another two to three years.

Commercially grown cold-stored strawberry crowns starting to grow after planting

Potted plants are available during the growing season from a variety of outlets

Strawberry planting and harvesting schedule



Products available from The Organic Gardening Catalogue - www.organiccatalogue.com

Commercially-grown strawberries growing on raised beds (left) and on the flat (right)

Sites and soils

Specialised planters (shown here growing herbs) can be used for strawberries

Choose a sheltered, sunny, warm site which is not in a frost pocket. Make sure the soil is well-drained – raised beds are ideal for strawberries. These can be as little as four to six inches high. Ideally, strawberries should be grown on a fresh site not previously used for strawberries or raspberries, as diseases such as *Verticillium* wilt can persist in the soil for many years. If this is not possible, allow at least a four-year break between crops on the same piece of land. With this in mind, they can be grown in a four-year rotation with vegetables, provided the site is free of *Verticillium* (occasionally a problem on potatoes, tomatoes, peppers and aubergines). Strawberries can also be used as attractive and productive ground-cover plants beneath other fruit trees, roses or shrubs, as long as the soil is not too dry and the area not too shady.

High nitrogen is not a good idea as it encourages leafy growth rather than fruiting. If your soil tends to dry out, improve it with leafmould, which is relatively low in nitrogen. Garden compost, green waste compost or a light dressing of well rotted manure can be used to improve poorer soils – dig this in at least one month before planting. In most cases, the plants will be in the soil for several years, so it is worthwhile spending some time getting the soil right before planting, by removing perennial weeds and large stones, in addition to adding compost or manure if required.

Planting

Plant bare-root plants as soon as possible after they arrive, or heel in to a sheltered, temporary place if the ground is not workable. Soak the roots of bare-root strawberry crowns in water for an hour before planting if possible, and water potted plants well before you transplant them. Set the plants about 30-40cm (12-16") apart, depending on their vigour (at the closer spacing for less vigorous varieties), in rows 75-90cm (30-36") apart. Using a trowel, dig a hole big enough to accommodate all the roots, which should be spread out, without bunching. Roots can be lightly trimmed if required. The crown of the plant should be positioned level with the soil surface (slightly exposed), but with no roots visible. (Be careful not to bury the crown too deep or it will soon rot). Back-fill with a mix of loose earth and compost, firm in and water well. Keep the plants weed-free (either by hand weeding regularly or by using mulch mats*) and well watered, particularly during establishment. An organic multi-purpose fertiliser can be applied after planting to help get the plants off to a good start.

Growing in containers

The planting principles above can be applied to plants grown in tubs, baskets and containers, although plants can be more closely spaced or inter-planted with flowering annuals. Two or three plants, for example, can be fitted into a large 25-30cm (10-12") pot, or individual plants can be grown in 15cm (6") pots. For grow bags, 6-8 plants can fit in one small (30 litre) growbag, or 10 plants for larger (40-45 litre) bags, provided the variety is not too vigorous. Roughly ten plants can be fitted into a 40cm (16") diameter hanging basket (five planted in the sides and another five on top). Specialised strawberry planters* can also be used.

The correct depth for planting a strawberry plant.

For container-growing, plant the strawberry crowns or plants in autumn or spring, depending on the type of planting material used. Autumn and cold-stored spring-planted crowns can give an early crop in May, given protection (see below). Use a good quality, organic and peat-free, multi-purpose compost, or soil-based compost with plenty of broken crocks in the base of the pot for good drainage. After planting, mulch the surface of the soil with chopped straw or a layer of bark chippings or gravel to stop compost splashing onto the fruits during watering. Place containers, pots and baskets in a sheltered, sunny position. Container-grown plants will benefit from a regular (at least weekly) feed, in addition to frequent watering. Any good plant food will do – but tomato feed is the best as it is rich in potash (potassium). Feed from the start of flowering until the first fruits begin to ripen. Everbearing varieties will benefit from feeding during every flush of flowers. If the plants are in good health, they can be kept and cropped the following year, before replacing.

Early crops under protection

Strawberries can be grown under protection (eg by using cloches, fleece or growing in a unheated greenhouse or polytunnel) – both in pots and in the ground, following the cultural advice outlined earlier. Protected plants will crop slightly earlier – usually in May if using an early-fruiting variety such as Christine. For early crops, container grown plants can be moved into position beneath a polytunnel or greenhouse from February onwards. Likewise, for plants growing in the ground, position cloches and fleece from February onwards and remove just before fruiting.


Strawberry flowers

Strawberry flowers need to be pollinated by bees and other insects to set fruit – so you will need to remove covers, or open the greenhouse doors, when the plants are flowering to allow insects access to the flowers.



A low fleece tunnel (left) and fleece cover on commercially-grown strawberry plants (right)

In comparison to other fruits, strawberries have a relatively low chilling requirement, but a period of cold is still essential if the plants are to grow well in spring. During winter, when the plants are dormant, try to ensure plants receive a good 'chill' on their crowns, before covering with cloches and fleece in February. Container grown plants can also be moved outside during winter (provided care is taken to prevent terracotta pots shattering in the frost – see below).

Care during the year

Keep the plants well watered during the growing season, but try to avoid getting too much water on the developing fruits, which can encourage diseases such as *botrytis*. Remove any unwanted runners which develop (baby plants produced on long shoots) by cutting these right back to the base of the plant. Once the fruits begin to ripen, place a mulch mat, bark chippings or straw beneath the plants to prevent the fruits becoming dirty – this will also help suppress weeds. Watch out for pest and disease problems and take appropriate action where necessary (see later section on pests and diseases).

A strawberry trial at RHS garden, Wisley. Plants have had polythene covers removed and are mulched with straw and protected from birds by a netted fruit cage.

Harvest

During cropping, the plants will need frequent picking, often daily in hot weather as they ripen very quickly. Pick when the berries are red all over. Pinch through the stalk just above the fruit with a finger and thumb to avoid handling the fruit which bruises very easily. Remove any damaged or rotten fruits promptly to discourage disease. Pick into shallow containers – try to avoid piling strawberries on top of each other as they will bruise and squash easily. Strawberries can be kept for a couple of days in the fridge. Some varieties also freeze well (wash and remove the stalks, then freeze individually on a tray, before bagging up and storing in the freezer until use).

Punnets of freshly-picked strawberries

Care of plants after harvest

When fruiting has completely finished, trim back the old leaves to 5cm (2") above the crown to allow fresh ones to develop. Do this in July for June-bearers and late summer-autumn for everbearers. This will also help prevent any diseases such as mildew carrying-over to the following year. Also remove the old straw mulch, if used. Give the plants a feed with general-purpose fertiliser (a handful of dry feed for every four plants should be enough – or liquid feed according to manufacturer's instructions). This will help build flower buds for the following year. If growing in containers (particularly terracotta), ensure these are insulated (eg with fleece or bubblewrap) during cold weather, so that the clay does not shatter after a frost, or move containers and baskets into a cold greenhouse during very cold weather. Keep container-grown plants moist, but do not allow them to become waterlogged in prolonged periods of heavy rain. After three to four years, fruit quality and size will deteriorate so it is best to replace your plants with new ones (or have a go at raising your own! – see below).

Propagating your own plants

Once your plants are well established it is easy to raise more plants from them – as long as your original 'mother' plants are healthy, pest and disease-free. You will notice that the plants start to produce long

trailing stems (stolons) in late summer. At the end will be a tiny plant (a runner), which may already show some roots. When these have three or four leaves, peg each into a small 8cm (3") pot filled with multi-purpose compost. Leave it attached to the 'mother' plant until the new runner has rooted into the pot. It can then be cut free from the 'mother' plant and grown on in its pot before transplanting to a new growing site the same autumn or in spring the following year.

Strawberry runners

Pests and diseases

Unfortunately, a few unwelcome garden pests will find your strawberries just as delicious as you do! Birds (particularly blackbirds) can be a nuisance as they are very partial to the ripening fruits - netting can be erected to deter them (make sure they cannot peck through it) or use suitable deterrents, such as bird scaring tape*, brightly coloured shiny CDs suspended on some string, or make and use a scarecrow. Other pest and disease problems are detailed below:

Common pest problems

Slugs and snails

These pests are particularly partial to strawberries – munching holes in the ripening fruits. Unfortunately, organic mulches such as straw and chippings can encourage them, as they provide an ideal dark, damp hiding place during the day. Most feeding damage occurs at night, but short of a night-time vigil to remove and squash the offenders, they can be dealt with relatively easily with home-made beer traps or proprietary traps. Cultivate the soil around the base of plants in autumn to expose eggs to predators. Protect plants in containers by applying a band of copper tape* around the rim. Biological controls (eg nematodes*) or an organically approved repellent or slug killer* can also be used.

Slugs on leaves (left) and fruit (right)

Twisted and distorted (sometimes sticky) foliage

The culprits here are aphids, which can often be troublesome as there are a number of aphid species which attack strawberry plants. The aphids secrete a sticky honeydew substance as they feed, spoiling the foliage and fruits and encouraging ants and the growth of sooty mould. Early treatment of pest hot spots is essential - rub off or remove infested shoots and leaves, use biological control agents* or encourage natural predators by growing wildflowers nearby. Insecticidal soap* can be used as a last resort.

Products available from The Organic Gardening Catalogue - www.organiccatalogue.com

Speckled, dry, crispy leaves which fall prematurely

Two-spotted spider mites and webbing on foliage. (image courtesy of East Malling Research)

This is usually caused by spider mites which are tiny (0.5mm) mites feeding on the foliage of strawberry plants. Sometimes, leaf edges may curl too. There are two species which can be a problem on strawberry; two-spotted spider mite (*Tetranychus urticae*) and tarsonemid mite (*Phytonemus pallidus fragariae*). They tend to occur in warm, dry weather and in severe infestations two-spotted spider mites can produce a kind of fine 'webbing' on the plant.

Solution: Several naturally-occurring predatory insects (eg predatory mites *Typhlodromus* and *Amblyseius* and the predatory midge *Feltiella acarisuga*) exist which can help to control mite populations naturally – encourage these by growing a good mix of wildflowers nearby. Some of these can also be purchased from biological control companies and the Organic Gardening Catalogue*. Otherwise, prompt removal of infested foliage (eg by removing old leaves after cropping, together with any mulch material such as straw) will help. Badly infested plants should be removed altogether.

Notches in leaves, plants wilting and detaching from roots

Vine weevil (adult)

The likely culprits here are vine weevils (*Otiorhynchus sulcatus*), which are a common pest of many plants, but have a particular fondness for strawberries, especially where straw mulches are used or where the plants are grown in containers. Adult weevils feed on the edges of leaves and blossoms causing 'notching' and larvae feed on roots within the soil. Close inspection of the soil and roots will usually reveal creamy coloured 8-10mm long larvae with brown heads. Adults are active from April to June, feeding mostly at night and sheltering around the base of plants, in cracks and crevices in the soil and also under debris and mulches during the daytime.

Solution: Growing a mix of wildflowers and rough grassy areas will help encourage natural predators such as ground beetles. Remove crop debris such as old leaves and straw mulches after fruiting and lightly dig over the surrounding soil to expose adults and larvae to birds. Use a biological control (eg nematode species such as *Heterorhabditis*) – available from biological control companies or the Organic Gardening Catalogue*.

Common disease problems

White powdery coating on leaves, which curl slightly, turning purple-red.

Foliage affected by mildew

This is caused by the powdery mildew fungus (*Sphaerotheca macularis*). Most of the varieties we have listed for growing have some form of resistance, but it can still be a problem in periods of active plant growth and high humidity (eg where plants are grown under protection).

Solution: Ensure crops grown under protection are well-ventilated. Allow sufficient spacing between plants so that foliage can dry off quickly after rainfall. Thin out congested leaves. Remove old leaves promptly after harvest. Do not over-feed with nitrogen as soft, sappy growth is more vulnerable to infection. Use the watering technique as outlined for *botrytis* avoidance (overleaf).

Rotting fruits which are covered in a grey powdery substance

This is likely to be caused by the fungus *Botrytis cinerea* (grey mould) which is usually more of a problem in damp weather – particularly during flowering and fruiting as the spores are often spread by rainsplash.

Products available from The Organic Gardening Catalogue - www.organiccatalogue.com

Solution: Space plants sufficiently and remove some of the leaves of vigorous varieties to improve air circulation and hasten leaf drying. Remove any rotting fruits, flowers or leaves as soon as you see them to prevent the infection spreading. Water plants in the morning rather than evening so that they have a chance to dry off. Try to water the soil, rather than getting leaves and fruits wet. Ensure plants growing under protection are well-ventilated.

Grey mould on fruit

Misshapen fruits

There are several reasons why fruits may be misshapen – although they are usually still perfectly good to eat. Inadequate pollination can be one cause. If your plants are consistently producing misshapen fruits, consider attracting pollinating insects by growing more wildflowers and providing artificial insect refuges (bug boxes*). Remember to roll back the covers of protected plants during flowering to allow access by pollinating insects.

The other main cause of misshapen fruits is usually capsid bugs – the tarnished plant bug (*Lygus rugulipennis*) and common green capsid (*Lygocoris pabulinus*) are the main culprits and can often be seen as fast-running green insects which feed on flowers and young fruits and shoots. Unfortunately, there is little that can be done to control capsids, although placing white sticky traps near the plants may help attract and trap them.

Misshapen fruits can be common

Cane Fruit

Raspberries, blackberries and hybrid berries are all 'cane' fruits – plants which bear fruit on shoots produced mostly from two-year-old long, woody stems or canes (apart from autumn fruiting raspberries which produce fruit on one-year-old canes). Like strawberries, they will produce a crop relatively quickly (within two years) after planting, and raspberries will often continue fruiting for ten years or more, so they are a great investment, especially when the fruits are so expensive to buy in the shops. Blackberries and hybrid berries last even longer – often 15-20 years or more! Most children love raspberries – and blackberries and hybrid berries can either also be eaten fresh (eg for 'snacking'), or used in baking to make delicious fruit pies (blackberry and apple is a traditional favourite), summer puddings or jams and smoothies. They are packed with goodness – blackberries in particular are bursting with antioxidants and vitamin C.

Raspberries are very upright in habit, producing tall, erect canes, although these can arch over with the weight of fruit and the degree of support required depends very much on variety. Blackberries and hybrid berries produce long, trailing or scrambling stems which need supporting – ideally against a wall, fence or on a post and wire framework. They can also make attractive features trained along other supporting structures such as archways and trellises. Blackberries and hybrid berries can be very thorny and difficult to manage without a stout pair of gardening gloves – however, it is usually the case that the thorniest varieties produce the best fruits, so it is worth giving them a go! Many varieties produce stunning white or pink-white blossom in spring and the foliage of several blackberry varieties turns a lovely colour in autumn.

Cane fruits are self-fertile, so if space is short you need only grow just one variety. In most cases (apart from early or late-fruiting varieties) most will produce the peak of their crop in August, during the school holidays. Therefore, do ensure someone is on hand to pick the fruits as they ripen during the holiday period! Cane fruits freeze extremely well, so they can be picked at their best for enjoying at a later date.

Left and right photos: Blackberries and hybrid berries can produce beautiful blossom in spring

Varieties

Raspberries

There are two types of raspberry – summer-fruiting, which produce vegetative canes (primocanes) during their first year before flowering and fruiting in their second year, and autumn-fruiting (primocane) varieties, which grow, flower and fruit all in one year and the stout canes tend to need less support than summer-fruiting varieties. In this respect, autumn-fruiting varieties are much easier to grow, although the fruits can be spoiled by wet autumn weather.

Summer-fruiting raspberries produce fruit from June until August (depending on variety) and the canes die after fruiting in their second year, with new canes being produced annually. The old canes are cut down straight after fruiting in late summer and the new ones tied to the supporting wires, ready for fruiting the following year. Fruits are produced on lateral shoots which arise mostly from the top half of the canes. Autumn-fruiting raspberries produce fruit from August until the first frosts (again, depending on variety). The fruited canes are left to over-winter, before they are cut down the following February, to make way for new ones to grow. Autumn-fruiting raspberry plants tend to produce fruits at the very top of the canes.

There are many varieties of summer-fruiting raspberry, some are more vigorous than others (and therefore more difficult to manage). The list below contains relatively easy to grow varieties with some pest and disease resistance. There are fewer varieties of autumn-fruiting raspberry, although a selection of popular and reliable varieties is listed overleaf.

Summer-fruiting varieties	Picking time	Characteristics
Glen Moy	Mid June – mid July	Canes are spine-free and leafy. Produces good yields of large, pale fruits. Early flowering – so can be susceptible to frost. Needs good soil.
Malling Minerva	Late June – mid July	A new variety which produces spine-free, compact canes which are easy to manage. Berries have an excellent sweet flavour, a good shelf life and are easy to pick.
Valentina	July	A new variety which has unusual apricot-coloured fruits! Canes are moderately vigorous, tall and upright. The fruits have a good flavour but are very soft.
Malling Jewel	July – mid August	An easy to manage reliable variety of moderate vigour. Produces good yields of high quality berries with a very good flavour. Growth is compact with lots of curly leaves which can hide fruit.
Julia	July – mid August	A new variety which has very good aphid and disease resistance. Fruits are large, attractive and easy to pick, though have a short shelf life. Canes are erect in habit and easy to manage, but very spiny.
Glen Doll	July – mid August	A new, easy to grow variety which produces short, sturdy, spine-free canes which do not require support on sheltered sites. Berries are very high quality and good for all uses.
Glen Lyon	Early – mid August	A new thornless variety which is heavy cropping, producing large glossy fruits of good flavour.
Octavia	Mid July – mid August	Produces upright, sturdy and slightly spiny canes. Fruits are large and firm with a good colour, flavour and shelf life. They also have fewer seeds than other varieties.
Leo	Mid July – mid August	A reliable variety which produces tall, spreading, slightly spiny canes and medium-large size berries which are easy to pick. High yielding. Cane numbers can be slow to build up in early years.
Gaia	Late July – mid Aug	A very disease resistant variety which is strong growing and vigorous. Canes are slightly spiny. Fruits are good quality and easy to pick with a good shelf life.

Leo

Malling Jewel

Glen Moy

Autumn-fruiting varieties	Picking time	Characteristics
Polka	Early August	A new Polish variety which can produce a crop in its first year and has a very long picking season. Heavy cropping with juicy red berries. Can do well on poorer soils. Very hardy, easy to grow and reliable.
Autumn Bliss	Mid Aug – late Sept	The most popular and widely available autumn-fruiting variety. Easy to grow and reliable, producing stout, slightly spiny and sturdy canes which are often self-supporting. Heavy cropping with medium-large size berries which tend to darken with age.
Himbo Top	Mid Aug – Sept	A new variety which produces strong canes which are less spiny than Autumn Bliss and quite upright in habit. Produces very large, sweet fruits and crops over a long eight week period. Very high yielding.
Autumn Treasure	Mid Aug – Sept	A new variety with spine-free canes which are upright and easy to manage. Produces long, conical berries which have a good shelf life.
September	Mid Aug – Oct	An old variety which produces vigorous, stout canes which require support as they tend to lean. Produces medium-sized, round fruits with a good colour and flavour.
Heritage	Late Aug – Oct	Produces vigorous, tall, erect and quite dense canes. Fruits tend to form at the very top of the canes and are easy to see and pick. The medium-large size fruits are well-flavoured and firm. Very heavy cropping.
Fallgold	Late Aug – Oct	An unusual golden yellow-fruited variety which produces moderate numbers of mostly spine-free canes. The fruits are very sweet, but can be crumbly unless plants are well watered. Fruit size and yields are good.
Joan Squire	Late Aug – Oct	A new variety which has the potential to be cropped twice in one year: the main picking period is in September, but the lower portion of overwintered canes can be retained to produce a crop again the following summer. A vigorous, spine-free variety with well-flavoured berries.

Autumn Bliss

Fallgold

Blackberries

Most varieties of blackberry fruit from early July until late August, although some can continue cropping into September and even October. Modern cultivated varieties produce much larger fruits than the blackberries you find in the wild, and many also have the added bonus of being thorn-free, although some can be very thorny indeed! Like summer-fruiting raspberries and hybrid berries, blackberries produce fruit on short laterals (side shoots), which grow out in early summer from buds formed on the previous year's canes. Once fruited, these canes die and are replaced by new canes from the base of the plant or 'stool'. Most have a trailing or scrambling habit, producing very long stems which need to be supported off the ground by a post and wire framework, or on tiers of wires running along on a wall or fence. If left to trail along the ground they tend to root into the soil (see later section on propagation). The stems of vigorous varieties can grow very long – so make sure you leave plenty of room (up to 4-5m) between plants! Less vigorous varieties can be more closely planted and even successfully grown in large containers (see later section on container growing). Both blackberries and hybrid berries need more room than raspberries, but a single plant is usually all that is required to give a good yield of anything between 10-25lb fruit per plant. There are lots of varieties to choose from. The list below gives a selection of blackberries which are easy to manage and mostly thorn-free.

Blackberry varieties	Picking time	Characteristics
Karaka Black	Early July – late Aug	A new variety which is moderately vigorous but slightly thorny. Very high yielding – producing very large conical fruits which are glossy, sweet and juicy with a mild blackberry flavour. Berries are very firm and have a good shelf life.
Helen	Early July – mid Aug	A moderately vigorous, spine-free variety which has a compact but trailing growth habit. Canes are easy to train and manage. Produces firm, conical fruits which are bright and well-flavoured.
Adrienne	Early July – mid August	A popular high yielding, vigorous variety which produces spine-free canes which are very long and trailing in habit – requiring a lot of space and support. Berries are long-conical in shape, large and well flavoured.
Waldo	Mid July – August	A popular thornless variety which produces large intensely black berries with a lovely flavour. Compact, moderately vigorous growth habit.
Loch Maree	Aug – Sept	A variety which produces unusual, attractive double pink blossom. High yielding with very sweet, moderately firm, juicy berries. Suitable for container growing.
Merton Thornless	Aug – Sept	A completely spine-free, compact variety which produces large fruits with an excellent flavour – like a real blackberry. High yielding. Can be grown in a small space or container.
Loch Tay	Mid July – mid Aug	A new variety which is semi-upright and thorn-free. Berries are sweet, aromatic and firm.
Loch Ness	Mid Aug – mid Oct	A vigorous, high-yielding variety which produces long, spine-free, semi-upright canes which are easy to handle. Growth habit is compact. Very winter hardy. Berries are large, bright and easy to pick with a very good flavour and shelf life.
Oregon Thornless	Early Sept – mid Oct	An attractive variety with parsley-shaped leaves, producing long vigorous canes which are mostly spine-free. Berries are medium sized, soft, round and similar to a wild blackberry. Yields are moderate - heavy.
Chester Thornless	Early Sept – late Oct	A vigorous and hardy variety which produces semi-upright, spine-free canes which are fairly compact and easy to manage. Fruits can be difficult to detach from their stalks. Berries are very well flavoured.
Triple Crown	Early Sept – late Oct	A hardy and spine-free variety with a semi-upright habit. Canes are easy to manage. Good fruit size and flavour – berries are very sweet but can be soft.

Blackberries make an attractive and productive feature trained against a trellis or lattice framework

Loch Ness

Hybrid berries

Hybrid berries are derived from crosses between raspberry, blackberry, dewberry and other *Rubus* species. They are less commonly grown than raspberries and blackberries, but they are very robust and easy to grow as they tend not to suffer from as many pest and disease problems as raspberries. They are a good alternative where conditions for raspberries are less than ideal, but they tend not to be as vigorous as blackberries, so will not take up as much room. Like blackberries and summer-fruiting raspberries, they produce fruits on short laterals which grow out on the previous year's canes. Most hybrid berries are thorny and moderately vigorous in habit, so will need space and a sturdy support framework – either with a post and wire support system, or stout wire framework against a wall or fence. Some varieties have a very long cropping season and although mostly too sharp to eat fresh, the fruits make particularly good jam, or can be used in summer fruit puddings and pies. Most are picked with the 'plug' or woody core still inside.

Hybrid berry varieties	Picking time	Characteristics
Tummelberry	Mid June – late August	Similar to a tayberry, but canes are more erect in habit and hardier – ideal for colder areas. Moderately vigorous and thorny.
Sunberry	Early July – late August	Produces very vigorous, long and spiny canes which are several metres in length. Canes need careful management and a system which separates old and young cane to make picking easier. Fruits are large, bright, glossy and dark red in colour with a loganberry-like flavour.
Tayberry	Mid July – mid August	A vigorous plant which produces long and spiny canes, although a thornless version (Buckingham tayberry) is available. Fruits are large and longer and more conical than a loganberry. Berries are juicy with a good flavour though core can be woody. Fruits are easy to pick and they freeze very well.
Loganberry	Mid July – mid August	Produces moderately vigorous, trailing, thorny canes. A thornless version (L654) is also available. Fruits are large, blunt-conical in shape, juicy and dark red in colour with a rich, sharp raspberry flavour. They are easy to pick and a popular choice for jam-making.
Boysenberry	Mid July – late August	Produces large numbers of trailing, spiny canes, although a thornless version is also available. Fruits are like a large blackberry – large, juicy, oblong in shape and dark purple in colour and taste like a wild blackberry. Very drought tolerant – ideal for sandy soils, but not particularly hardy.
Marionberry	Aug – Sept	Usually listed as a 'hybrid berry' but now thought to be a true blackberry. Canes are vigorous and very thorny. Produces large, black berries – similar to an elongated blackberry, but with a sharp loganberry flavour.

Loganberries

Loganberry flowers are produced on short laterals growing from the previous year's canes

Buying plants

Raspberry plants ordered from fruit nurseries are usually supplied as bare root short canes during the dormant period when plant growth has ceased (November – March) and are usually sold in bundles of five or ten. They are also available as potted plants year-round from garden centres, with a bundle of 5-10 plants growing in each pot. These potted canes should be split before planting by breaking open the bundle and teasing the roots of each cane apart. Plant individual canes according to the recommended spacing (see later table).

Top tip

Ensure you obtain plants which are certified virus-free from a reputable supplier since cane fruits, particularly raspberries, are prone to many viruses and diseases.

Blackberries and hybrid berries are also usually supplied from nurseries as bare-root plants during the dormant season, but are commonly available as single potted plants in 2-3 litre containers from a variety of outlets. If your bare-root plants arrive before conditions are suitable for planting, heel them in by digging a hole in a spare bit of ground and burying the roots to keep them moist, otherwise plant them out if the soil and weather conditions are favourable (not too wet, dry or frozen).

Sites and soils

- Choose a site in full sun or partial shade (where plants are shaded for no more than half of the day).
- The site should be sheltered from strong winds, as the canes can rock and easily break if blown about too much.
- A site which avoids late spring frosts is also a good idea – as late May frosts can affect flowering.
- Cane fruits will do well in most types of soil, though raspberries need a more fertile soil than blackberries and hybrid berries.
- Choose a site which has not grown fruit before.
- A well-drained, slightly acidic (pH 6.0-6.5), moist soil is ideal.
- Avoid planting on compacted, very heavy, wet soils or areas prone to waterlogging. If the soil is on the heavy side, with a high clay content, it can be improved by digging in plenty of organic matter (such as well-rotted manure or compost) to break up the soil before planting.
- Raspberries in particular can do well when grown on raised beds or ridges of soil, which encourage good drainage where the soil is otherwise heavy. Blackberries can tolerate heavier soils.

It is usual practise to grow raspberries in rows – this makes it easier to pick, support and weed the plants since they will soon spread to form a continuous row of canes. You can easily limit the spread of canes beyond the row by digging up and removing surplus cane (spawn) if it emerges where it is not wanted

(this is also a good way of propagating your plants). Blackberries and hybrid berries can be grown singly (on their own) or, if space permits, in short rows, although they can make very large plants so you will not usually need to grow very many!

Preparing the soil before planting

For raspberries:

If growing a row of raspberries, give them a good start by preparing a trench at least one month before planting. Dig out a trench in the soil about 45cm (18") wide and 23cm (9") deep, removing any weeds and large stones, and breaking up the soil with a spade or fork. Fork in a 7-10cm (3-4") layer of well-rotted manure or compost into the base of the trench, then backfill with soil (or a mix of compost and soil), breaking up any large clods of soil as you go. This will give the newly-planted raspberry canes a good start (remember, they will be in position for many years, so it is worthwhile spending time and effort preparing the soil in advance).

Summer-fruiting raspberries at Garden Organic's Ryton gardens – the soil has been improved with plenty of well-rotted manure

For blackberries and hybrid berries:

The same principle can be applied when planting blackberries or hybrid berries, although instead of a trench, dig a large, deep hole 0.6m x 0.6m (2ft x 2ft) and work a layer of compost or well-rotted manure into the base of the soil, before backfilling with a mix of compost and soil.

Planting

Planting can be done during Nov-March for bare-root plants and year-round for potted plants. Plant according to the recommended spacing (see table below). If planting bare-root plants, keep the roots moist by soaking in a bucket of water, or by covering with damp newspaper or sacking, before and during planting.

Dig a hole big enough to accommodate the root ball, spreading the roots out if possible. Position the canes to the correct depth and backfill with soil, firming gently as you go. Plant to the same depth (old soil mark) that the canes were in the nursery. After planting, apply a dressing of general fertiliser (eg seaweed meal) and/or organic mulch (well-rotted manure or compost) and water well. For raspberries, trim the cane to a bud 23-30cm (9-12") above the ground. Once the plants are established, with new growth arising from the base of the plant (or 'stool') trim down the old cane to ground level.

Top tip

Make sure you erect supporting frameworks before planting anything!

(See later section on support systems.)

Planting distances

	Plant spacing	Row spacing
Raspberries (standard vigour)	Single fence system: 40-60cm (16-24")	1.5-2m (5-6.5ft)
Raspberries (vigorous)	Single fence system: 60-80cm (24-31")	2-3m (6.5-10ft)
Hybrid berries and blackberries (low vigour)	Fan system: 1-1.5m Rope and weaving systems: 1.5–2.5m (5-8ft)	2.5m (8ft)
Hybrid berries and Blackberries (standard vigour)	Rope and weaving systems: 3-3.6m (10-12ft)	2-3m (6.5-10ft)
Blackberries (vigorous)	Rope and weaving systems: 4-5m (13-16ft)	3m (10ft)

Growing in containers

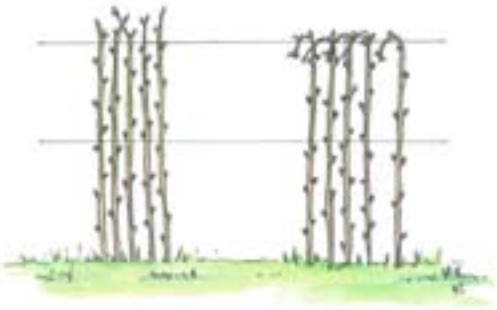
Raspberries can be tricky to grow in pots as they produce a lot of new cane (spawn) which will quickly fill and choke the pot, causing them to deteriorate in quality, unless the canes are regularly split and kept well fed and watered. Vigorous blackberries and hybrid berries are also unsuitable as they are difficult to manage. However, it is possible to grow low-vigour blackberries and moderate-vigour hybrid berries in containers. Pot-grown plants can be trained along a wall, fence, trellis or wigwam-like support, or simply supported by a post. See advice on 'container growing' in Chapter 2.

Support systems

Make sure these are put in place before you plant your raspberries, blackberries or hybrid berries.

Summer-fruiting raspberries

These need support during the growing season and especially during fruiting to prevent the canes bending and breaking with the weight of fruit. The time to tie in canes is during late summer or autumn, when the old fruited cane is cut down and new cane has reached a good height. The usual method of support is via a post and wire fence. There are various systems which can be used, but the simplest is the traditional or 'single fence' system, where a continuous row of raspberry canes are secured to a tier of wires, supported at intervals by a single line of posts. The number of supporting wires can vary according to the crop needs, but a standard arrangement of two tiers of wires running the length of the crop row at heights of 0.6-1m (2-3ft) and 1.4-1.8m (5-6ft) are usually provided. Use galvanised fencing wires of 12-14 guage (2-2.5mm diameter), attached to posts or fencing by vine or eye hooks, or simply wound around the posts and secured with nails. The wires are supported by stout posts 5-8cm (2-3") in diameter and 2-2.5m (6.5-8ft) in length, spaced 5-8m (16-26ft) apart along the crop row and driven into the ground to a depth of at least 0.5m (1.6ft). End posts can be stouter - 10-12cm (4-5") in diameter, and can be braced with additional buttress posts if necessary. Straining bolts can be used on posts at the ends of the rows if necessary to keep the wires taut.



Single Fence System; L: Canes trimmed above top wire R: Canes looped above top wire

The top wire is used to secure the top of the fruiting canes and helps space them out at 7-10cm (3-4") intervals, before trimming them back to a height of about 7cm (3") above the top wire in February – this removes any winter damage to the cane tips. Alternatively, if the canes are very long, they can be looped back down and secured back on to the wire, although this is fiddly and more time consuming as more time is spent tying-in canes. Use twine, clips or soft jute string to tie the canes into position. Canes can also be tied in to the bottom wire for added stability.

Double Fence System

An alternative system is a 'double fence' system (described for autumn-fruiting raspberries), where canes are more loosely supported between a parallel set of wires.

Autumn-fruiting raspberries

In sheltered situations, autumn-fruiting raspberries will need little, if any support. However, during fruiting, the weight of the fruit at the tips of the canes can cause canes to arch over, and they can also blow about in bad weather. In this case, it may be necessary to provide temporary supports during the cropping season (eg simply by gathering canes and securing them with twine or jute to a supporting post, or by providing a simple permanent post and wire framework). Autumn-fruiting raspberries tend to produce a lot of cane (spawn) so a double post framework or 'double fence' is a good system to use to keep canes supported.

This provides a parallel set of posts and wires either side of the crop row with the canes growing up in between them. Additional cross wires can be used at intervals if necessary, for additional support. The wires can either be supported by two posts running parallel at intervals along the crop row (which is a good choice in more exposed situations) or by crossbar posts.

It is also possible to plant raspberries in small clusters, eg two canes planted either side of a single supporting post. This is ideal where space is short, or you want to grow raspberries in a mix with other fruits and flowers. Canes can be secured to the post support by loosely tying in with twine or string.

Cross Bar Posts

Parallel Posts *Single Post*

Blackberries and hybrid berries

A traditional supporting framework using strong, stout posts and galvanised wires can also be used for blackberries and hybrid berries (follow the advice given for summer fruiting raspberries), although they also do well trained against a wall, fence, trellis or trained over structures such as archways and pagodas.

A hybrid berry trained along a one-way rope system on a wire framework against a fence

If using a post and wire framework, a tier of wires with the lowest set 90cm (35") from the ground and the topmost wire 1.5-1.8m (5-6ft) from the ground should be provided. Two tiers of wires may be all that is needed for hybrid berries such as loganberries, but more can be added if necessary. Blackberries vary between upright, trailing or climbing in habit and often need four or more wires for the canes to be tied in successfully. Given this basic framework, the long canes of blackberries and hybrid berries may be tied in as shown in the diagrams below. Select the best six-eight new canes for tying in from each plant every year. Surplus canes can be cut out at soil level.

A blackberry trained along a two-way rope system on a post and wire framework

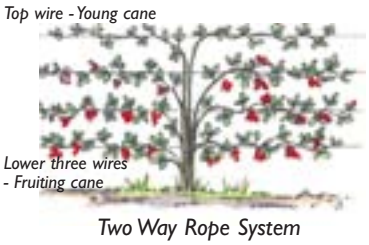
One-way rope system:

This is the easiest and least labour intensive method of training blackberries and hybrid berries. Fruiting cane is trained along wires on one side of the plant's base (stool). New cane is tied in along wires in the opposite direction. This helps separate old and new cane (limiting the transfer of diseases) and canes only have to be tied in once and fewer wires can be used.

One Way Rope System

Two-way rope system:

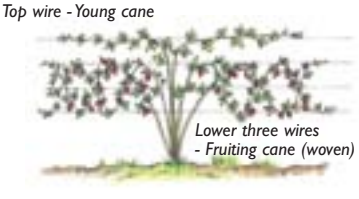
Fruiting cane is trained along wires either side of the stool, with new cane directed up through the centre and out along the top wires. Once the original fruiting cane has been removed, new cane is then lowered and tied into fruiting position. This system looks more attractive, but has the disadvantage that more time is spent tying in canes.



Two Way Rope System

Weaving system:

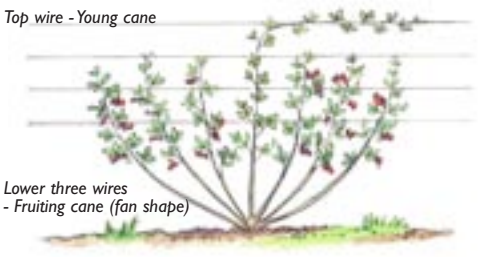
This is a good method of training very vigorous hybrid berries and blackberries which produce long, rambling and trailing canes, although tying in is best carried out using two people! Using a tier of four wires, fruiting canes are woven up and down and tied in between the supporting wires. This helps give good yields, display the fruit for picking and manage very long cane growth, but a lot of time is spent tying in canes. New cane is trained up through the middle of the support framework and out along the top wires. Once the old, fruited cane has been removed, the new cane is then woven into fruiting position and tied in again.



Weaving System

Fan system

This is a good method of training where space is short and works well with low-moderately vigorous varieties which produce rigid, upright canes which are difficult to train horizontally. Fruiting canes are tied to the supporting wires forming a fan shape (see diagram). If the canes are too long, they can be trimmed. The centre of the fan is kept open so that young cane can be trained upwards and outwards along the top wire. The disadvantage of this system is that, again, tying in canes is very time consuming.



Fan System

Care during the year

Winter

- Cane fruits are very hardy and need little attention during the winter, other than ensuring long canes are tied securely again their wires supports, to prevent them rocking or breaking in the wind.
- In February or early March cut down the old fruited stems of autumn-fruiting raspberries to ground level.

Spring

- Keep weeds down by hand weeding around the base of the canes (wear gloves when weeding around thorny varieties!). Try not to damage the surface roots of the canes as this can encourage suckering.
- New raspberry canes (spawn) will begin to grow from April onwards – if any spreads to where it is not wanted it can be cut off or dug up and removed to help keep the crop rows narrow and manageable.
- Cut off the old stubs from any canes planted the previous autumn to divert the plants' energy into new growth.
- Apply a mulch of organic compost, or straw in May to keep weeds down and help conserve soil moisture and nutrients. A dressing of organic general-purpose fertiliser can also be added to give plants a boost.


Raspberry spawn

Summer

- Thin surplus raspberry spawn if the canes are becoming crowded - cutting out surplus cane, leaving the strongest growing canes intact. Aim to leave about 12 canes per metre (3ft) of row for summer-fruiting raspberries, 12-10 per metre for autumn-fruiting raspberries and 6-8 canes per stool for hybrid berries and blackberries.
- For all crops, temporarily tie in new growth to the supporting wires, once it is tall enough, to prevent damage from wind.
- Keep and eye out for pests and diseases and water plants well in hot weather.
- The canes will start fruiting in their second year after planting.
- The fruits will need picking regularly in hot weather – often daily.
- Remove any damaged or rotten fruits promptly to prevent diseases taking hold.
- Unlike raspberries, blackberries and hybrid berries do not leave the woody core or 'plug' behind when picked, but the fruit should separate from the stalk cleanly, with a gentle pull.
- Ripe fruits are very attractive to birds, so the canes may need protecting with netting just before the

berries begin to ripen. If you can grow your fruit in a permanent fruit cage, so much the better! Kits for assembling fruit cages are available from a variety of outlets, or have a go at making your own one tailored to your needs (pegs, netting and frames are all available from the Organic Gardening Catalogue).

- After harvest, cut down the old fruited cane at ground level for summer-fruiting raspberries, blackberries and hybrid berries, and tie the new (current season's) cane in to fruiting position, ready for next year. Cut out any diseased or damaged canes completely.
- Provide additional supports for autumn-fruiting raspberries where necessary.

A fruit cage can make a useful and attractive feature

Autumn

- Harvest the fruits of autumn-fruiting raspberries regularly, removing any which are damaged or rotting.
- Protect fruits from birds using netting where necessary.
- After fruiting, leave canes of autumn-fruiting raspberries loosely supported before cutting down to the ground in February or March.
- Ensure all tying-in is completed for summer fruiting raspberries, blackberries and hybrid berries, removing and disposing of old fruited cane and crop debris.
- Lightly forking the soil around the base of canes will help expose over-wintering pest larvae to birds and frost.

Summer-fruiting raspberry canes tied in to fruiting position at Audley End gardens, Essex

Propagation

Cane fruits are very easy to propagate, but only healthy-looking canes should be chosen – do not propagate plants which are affected by virus or disease problems. Raspberries are very easy – simply dig up surplus canes in autumn (Oct-Nov) and re-plant to a new site.

For blackberries and hybrid berries – the long trailing stems readily root into the ground if not supported, but rooting can be encouraged by bending over a stem to soil level and burying the tip of it into the soil, to a depth of 15cm (6"), firming the soil gently to hold it in place. The shoot tip will root into the ground during the summer and can be left until late winter or the following spring. It can then be cut free from the rest of the stem (leave a 30cm (12") length of stem attached to it) and transplanted to a new location.

Pests and diseases

Small 'maggots' inside ripe fruits

These are larvae of the raspberry beetle (*Byturus tomentosus*), a common nuisance on all cane fruits, although autumn-fruiting raspberries tend to suffer less as they miss the main beetle season. The beetles can multiply rapidly and spread quickly. Adults (which are small, brown and difficult to spot) are active from April – September and fly about in search of white *Rubus* flowers, where they lay their eggs. The eggs hatch about two weeks later. The small (6-8mm long), yellow-brown larvae feed on the developing fruits for five to seven weeks, before dropping to the ground to pupate in the soil. The larvae over-winter in the soil before emerging as adult beetles the following spring.

Solution: Until recently, there was little that could be done to eradicate this pest without resorting to chemical sprays. Fortunately, a potent new pheromone trapping device has been developed and pheromone

traps are now available to lure and trap male beetles. Whilst this does not eradicate the problem altogether, it significantly reduces beetle populations – especially when used every year. Pheromone traps are available from the Organic Gardening Catalogue. White sticky traps can also be hung around the plants during April and May to trap adult beetles, but this has the disadvantage of trapping beneficial insects. During autumn and winter, shallow cultivate the soil around the base of plants to help expose pupae to frost and predators.

Raspberry beetle adult

Larva on fruit

Raspberry beetle pheromone trap

Crumpled and curled leaves which may be sticky and dirty with honeydew and sooty mould

Leaf distortion can be caused by viruses (see later advice), but the usual culprits here are aphids. There are many different species which can feed on raspberry plants – some can carry viruses, so are particularly unwelcome.

Solution: Control methods recommended for other fruit crops will work well for aphid infestations in cane fruits (eg targeting hot spots, cutting out infested shoots, encouraging beneficial insects, using soft soap as a last resort). Also try to keep cane numbers to a manageable level, so that infestations can be easily spotted and dealt with promptly. Light, airy, open canes will also be less attractive to the pest. Some success may be had using yellow sticky traps hung in the crop canopy to attract winged adults.

Holes in leaves

These are usually caused by the larvae of moths (there are several species which attack cane fruits), although damage is not usually serious and infestations are rarely major.

Solution: Removing old fruited canes, crop debris such as leaves, old mulches, etc, will help reduce over-wintering opportunities for the pest. Cultivating the soil around the base of the plants during autumn and winter will help expose pupae. Where infestations are small and patchy, pick off and destroy any larvae or affected shoots when seen. Earwigs are good predators of moth larvae and can be encouraged by providing artificial refuges such as old plastic cartons or bottles filled with straw (see Apple Chapter).

Early caterpillar damage on raspberry leaf

Fruits not ripening properly, or ripening unevenly

This can be caused by mites – there are two species which can be common on cane fruits. Blackberry mites (*Eriophyes essigi*) and the raspberry leaf and bud mite (*Phyllocoptes gracilis*). Both species feed on developing fruits causing uneven ripening or 'red-berry' where individual drupelets of the fruits remain red or green and fail to ripen properly. The tiny white mites over-winter beneath bud scales and old, dried-out fruits remaining on the stems. They emerge in spring, living and breeding on leaves before moving onto flowers as they open. It is very difficult to detect mites at any time of the year, although the foliage of infested canes may become slightly blotchy and distorted. Mite numbers can build up progressively each year until the problem is very bad.

Solution: Cutting out and removing fruited canes and crop debris will help prevent mites spreading to new canes. The problem can be tolerated to a certain extent, but where infestations are severe the best option is to cut ALL canes back to ground level. This will sacrifice next year's crop but should help eradicate the pest altogether.

Poor berry formation – crumbly or misshapen fruit

There are many causes of poor berry quality including hot weather, frost damage early in the season, wind damage, poor pollination, mite or virus problems. Try to eliminate problems caused by the weather (eg by providing adequate shelter, watering well in hot weather) and encourage bees and other pollinating insects into the area to help with pollination (either through the provision of wildflowers or insect boxes*).

Misshapen raspberries can be caused by a number of factors

Viruses: poor growth, crumpled and distorted leaves, leaf discolouration

There are many viruses that can infect cane fruits, particularly raspberries, and it is often difficult to identify the precise strains of virus or viruses involved. Symptoms usually include leaf discolouration (eg yellow mottling, spotting or vein yellowing) which can be easily confused with other problems such as mineral deficiency. Infected plants tend to become stunted and gradually decline in vigour, with poor yields and often crumbly fruit. Usually only isolated plants are affected as viruses take a little time to spread. Depending on the type of virus, it may be spread by air (via pollen), by aphids or by soil-dwelling nematodes. In worst case scenarios, there are several plant clinic services available which will be able to provide a diagnosis and suggest an appropriate course of action.

Canes affected by virus (right) and healthy (left) image courtesy of East Malling Research

Solution: There is usually little that can be done to save a plant once it has become infected with a virus. It is usually best to remove infected plants altogether. Growing a number of different raspberry varieties, particularly those with some virus-resistance, will help avoid total crop loss, particularly if they are not all grown together in the same place. Controlling aphids, which are important virus vectors, will limit the spread of some viruses. Where a virus has been caused by soil-dwelling nematodes, removing the plant and digging out a trench of soil 0.6m (2ft) wide by 45cm (18") deep from where the infected canes were growing may help limit the spread of nematodes to remaining canes.

Diseased canes: Poor growth, cane and/or leaf discolouration, canes wilting and dying off

Cane fruits suffer from a number of diseases – raspberries in particular are prone to disease problems. Symptoms of disease vary according to the causal organism, but the most common are listed below:

Spur blight (*Didymella applanata*)

Brown-yellow lesions arise on young leaves, appearing first along leaf edges. Later, violet-dark brown lesions appear on the lower portions of canes – these are most visible during August and September. Leaves fall prematurely. These lesions later turn a silver-grey colour during winter. There is no stain underneath if cane rind (or outer layer) is rubbed away.

Cane blight (*Leptosphaeria coniothyrium*)

This usually results from an infection gaining entry through cane splits or abrasions. In spring, infected canes are girdled and killed above the point of infection – either breaking bud very slowly or wilting later in the spring. Silver grey lesions (spores) are present in fruiting cane, but new canes appear unaffected at first. If the rind is scraped away from infected cane lesions a striped, brown stain will be present. The stems of infected blackberries have dark red-purple lesions, later turning grey.

Cane botrytis (*Botrytis cinerea*)

This fungus also causes mouldy fruit. Where canes are affected, it appears as pale brown lesions on young canes – often with a water-soaked appearance and usually centred around a leaf node. Grey or white patches develop in the affected areas in winter. The disease weakens canes and in severe attacks will girdle and kill the stem.

Botrytis (grey mould) on fruit

Cane spot (*Elsinoe veneta*)

This can cause defoliation, poor fruiting, wilting and cane death. Symptoms first appear as small, round, red-purple spots on new canes in late spring. Mature canes show as having sunken, silver-white, purple-edged lesions. The lesions may girdle causing the cane to dry out so that it appears cankered, brittle and splits easily.

Cane spot on blackberry

Rubus downy mildew (*Peronospora sparsa*)

This disease can severely weaken plants and cause the fruits to become dry and shrivelled. Symptoms first appear as purple-red spots on leaves which may form lesions and spread along the leaf veins. White-grey spore masses are later produced on the lower leaf surfaces with leaves becoming distorted and stunted in appearance. The leaf tissue is eventually killed off, resulting in brown-yellow patches on the leaves. Badly affected leaves drop early.

Purple blotch (*Rhabdospora ramealis*)

This disease affects blackberries and is usually a problem when conditions in spring are warm and moist. Symptoms can appear at any time during the growing season – first as dark green lesions on young canes near ground level, later turning reddish-brown in colour. The following year, on fruiting cane, these lesions expand rapidly, covering several leaf nodes, eventually causing buds and leaves on lateral shoots to wither and die off. This looks a little like late spring frost damage.

Rust

There are two common strains of rust fungus that attack cane fruits; yellow rust (*Phragmidium rubi-idaei*) which is mostly a problem on raspberries and blackberry rust (*Phragmidium violaceum*), which affects both wild and cultivated blackberries. Symptoms are usually small yellow-orange or yellow-red pustules which develop on the upper surfaces of infected young leaves. The disease is rarely a problem, but in severe cases, leaves can discolour and curl, before falling prematurely. Mild temperatures, humidity and leaf wetness encourage infection.

Yellow rust

Phytophthora root rot

This can be a problem in heavy, compacted wet soils, especially in wet, humid weather. Symptoms first appear in spring on both fruiting cane and young spawn. Canes wilt and eventually die and roots of affected plants are very dark-brown or black in colour. Improving soil drainage by growing on raised beds or ridges will help alleviate the problem.

Cane death caused by Phytophthora root rot

Preventing and reducing cane diseases

- Most diseases of cane fruits can be prevented, or at least minimised by good cultural practise.
- Ensure that the canes are in good health by feeding and watering the plants regularly.
- When watering, try to water the base of the canes to prevent the foliage becoming damp and humid – especially in hot weather as prolonged leaf wetness can encourage diseases such as Botrytis.
- Pick ripe fruits regularly and remove any diseased or rotting fruits promptly.
- Make sure canes are well supported against training systems so that the canes do not break or rub too much.
- Cut out infected canes as soon as you see them. (Remember to disinfect secateurs after use.)
- In severe cases it may be best to dig up and remove plants altogether, establishing new plants on a fresh site.
- Keeping the plants weed-free and cutting out excess canes to prevent them becoming overcrowded will help keep the canopy airy and open so that leaves dry quickly after rainfall.
- If the lower portions of the canes are very leafy, take off some of the leaves to let air and sunlight reach the base of the canes.
- Old fruited cane and any crop debris (eg old leaves, straw mulch, etc) should be removed promptly after harvest to prevent disease carry-over from old to new canes.
- Disease spread from old to new canes can also be minimised by using training systems which separate old and young cane.

Common mineral deficiency symptoms on raspberry plants

Cane fruits, particularly raspberries, can be sensitive to changes in soil pH, leading to mineral deficiencies. The table below outlines common foliar symptoms caused by mineral deficiency.

Deficiency	Symptoms	Cure
Magnesium (Mg)	Yellowing between leaf veins (veins remain green). Older leaves more affected, often leading to necrosis (leaf tissue death). Common in light, acid, sandy soil or where excess levels of potassium restrict its uptake or on calcareous soils.	Apply a dressing of magnesium limestone (helps improve Mg levels and raise soil pH). Magnesium sulphate (Epsom salts) and Dolomite limestone can also be used.
Iron (Fe)	Symptoms appear in young leaves first. Leaves yellow from the tips of the leaf downwards. Common in alkaline soils.	Use a foliar feed containing chelated iron, eg Sequestrene. A dressing of well-rotted farmyard manure will help lower soil pH.
Manganese (Mn)	Inter-veinal yellowing of leaves at some distance from the leaf tips (unlike iron deficiency). Leaf tips remain green. Common in alkaline soils.	Apply manganese sulphate in late spring/ early summer. A dressing of well-rotted farmyard manure will help lower soil pH.

Bush Fruit

The term 'bush fruit' covers a number of different fruits that all grow on small bushes - these include; blackcurrants, redcurrants, whitecurrants and gooseberries (which are discussed in this chapter). All these fruits are easy to grow and, once mature, even one or two bushes will give enough fruit to share between a class, so that everyone can take a few berries home. The fruits are very versatile and even a small amount of the sweeter varieties can be used as a topping for cereals, or for snacking and garnishes for cooking. Larger quantities can be used to make summer desserts such as puddings, pies, pavlovas, tarts, fruit juices, cordials and smoothies, jams and jellies, chutneys, yoghurts and ice creams. All varieties freeze well – so if you have too much, or can't use the fruit straight away, it can be kept in the freezer until it is needed (frozen fruit is best used within a year of picking). The berries are packed with health-giving properties and are extremely good for you.

Bush fruits are reasonably self-fertile, so you need only grow a single bush or variety if space is short. Bushes are very long-lived and can easily last for 15-20 years or more. They are also very easy to propagate from prunings and cuttings. The bushes can make attractive low-medium height hedging plants, or ornamental edging, or divider plants in a border since redcurrants, whitecurrants and gooseberries can also be grown in the form of cordons. Most varieties fruit from mid-June to late July, so will be ready for harvesting before the start of the school holidays at the end of July.

Gooseberry - Whinham's Industry

Whitecurrant - White Pearl

Varieties

Gooseberries

Gooseberries vary considerably by variety. Some are almost sweet (these tend to be the red-fruited 'dessert' varieties), whilst others are very tart (usually green-fruited 'culinary' varieties), although colours of the fruit can range from green, white, yellow or pink through to red. Culinary varieties usually need more sugar added to them when cooked, to balance their sharpness, but fully ripe dessert gooseberries need comparatively little. Gooseberries are one of the earliest of the soft fruits to ripen and can be harvested from mid June until late July, depending on variety. Red-fruited varieties can be picked early (whilst still green and hard) but will develop their sweetness if left to ripen on the bush. Yields can vary a lot, but a good yield of 2kg (4-5lb) or more per bush can be expected a few years after planting. If you want really big, fat berries, then it is worth thinning out fruits in late May and early June (this involves removing some of the surplus smaller berries so that berries are spaced about 2.5cm (1") apart along the branches of the bush). The rest are then left to grow on, swell and ripen. Thorny varieties can be difficult to pick – so a stout pair of gloves may be needed!

L: Gooseberries in need of thinning – removing the smaller ones will help the remaining fruits grow larger; R: Gooseberry bush - variety 'Jubilee Careless'

Top tip

It can be fun to try and grow a gooseberry whopper! Gooseberry growing is a serious business in counties such as Cheshire and Yorkshire where they have annual gooseberry shows with competitions for the heaviest gooseberry. See if you can have a go at growing gooseberries and hold competitions with neighbouring schools to see who can grow the heaviest berry! Thinning the fruits in late May will help the remaining berries to grow big and fat.

Fatties!

Some of the most popular varieties grown by gardeners are listed below. Unless otherwise stated, all varieties listed are resistant to American gooseberry mildew, which is one of the most troublesome diseases of gooseberry bushes.

Gooseberry varieties	Picking time	Characteristics
Rokula	Late June - early July	A dessert variety that produces round, dark red berries when fully ripe – although they can split easily after heavy rain. Bushes are moderately vigorous with a slightly drooping habit.
Invicta	Early – mid July	A green-fruited, culinary variety that is very heavy cropping. Bushes are large, vigorous and spiny. Susceptible to leaf spot.
Greenfinch	Mid July	A green-fruited culinary variety that produces smooth fruits – slightly smaller than other varieties. Heavy cropping. Bushes are relatively slow-growing but less spiny than other varieties and compact in habit, making them easy to manage.
Jubilee Careless	Mid July	A very reliable, green-fruited variety that produces medium-sized, oval berries which become paler when ripe. A very reliable variety, spiny, moderately vigorous and spreading in habit once established. Susceptible to American gooseberry mildew.

Gooseberry varieties	Picking time	Characteristics
Whinham's Industry	Mid July	An old-fashioned variety that is still popular today. Produces heavy crops of red berries. Bushes are vigorous, upright-spreading with arching branches, but rather slow growing. Can be grown on heavy or poor soils. Susceptible to American gooseberry mildew.
Hinnonmaki Red	Mid July	Produces heavy crops of large, well-flavoured, red berries. Plants are moderately vigorous and spreading in habit. Similar yellow- and green-fruited varieties (Hinnonmaki yellow and Hinnonmaki green) are also often available.
Pax	Mid July	A red-fruited variety that produces sweet, medium-sized berries. Bushes are moderately vigorous and spreading in habit – usually spine-free. Needs hard pruning in early years to produce a good bush framework.
Leveller	Mid July	An old-fashioned variety but one of the best for flavour. Produces large yellow-green fruits. Requires fertile, well-drained soil. Susceptible to American gooseberry mildew.
Martlet	Late July	A high-yielding, red-fruited variety. Bushes are moderately vigorous, forming a rounded bush with relatively soft spines. Berries are large, smooth and succulent.

Red-fruited varieties. L to R: Whinham's Industry, Pax, Hinnonmaki Red

Green-fruited varieties. L to R: Jubilee Careless, Leveller, Invicta

Redcurrants and Whitecurrants

Red and whitecurrants are related to blackcurrants, but have a very different growing habit. They are cultivated in the same way as gooseberries. Once mature, the bushes produce a large amount of fruit from mid-June to late July and an average yield of 4-5kg (9-11lb) of fruit can be picked from each bush. Fruits are produced in clusters on 'strigs' (which are rather like delicate, thin stems which dangle from the branches).

Whitecurrant strigs

Redcurrant flowers

The fruits taste rather acidic and tart when eaten fresh, so are generally cooked before eating and used in puddings, pies and summer desserts. Redcurrants also make delicious redcurrant jelly – which is a lovely accompaniment to many meat dishes. Whitecurrants are useful for mixing with other fruit to make it go further – eg in jam-making. It is also possible to buy pink currants – which are an intermediate between red and white types. They have a transparent skin and pink flesh and look very pretty. They are rather unusual and generally only available from specialist fruit suppliers.

The table below gives details of some of the most popular red and whitecurrant varieties available from nurseries and garden centres. All are easy to grow. Some varieties of redcurrant have resistance to powdery mildew, but whitecurrants generally have no notable disease resistance. However, well-grown bushes are usually vigorous enough to out-grow any disease problems.

Redcurrant varieties	Picking time	Characteristics
Junifer	Early July	An early-flowering variety which needs protection from spring frosts. Produces good yields of shiny red berries which are produced on long strigs and have a good colour and flavour.
Jonkheer Van Tets	Early July	Another early-flowering variety. Bushes are vigorous but branches can be brittle and need protection from strong winds. High-yielding, produces large berries on long strigs. Berries can split in wet weather. Resistant to mildew.
Laxton's No. I	Mid July	An old variety but still popular. Bushes are moderately vigorous and upright in habit with moderate yields. Medium-sized, bright red berries are produced on long strigs. Resistant to mildew.
Stanza	Mid – late July	Makes a small, compact bush which is not too vigorous. High yielding, producing dark red berries on short strigs. Slight resistance to mildew.
Rondom	Late July – early August	A high-yielding variety which is moderately vigorous and spreading in habit. Berries are tightly bunched and thick-skinned, fleshy and tend to be less juicy than other varieties. Resistant to mildew.

Jonkheer Van Tets

Laxton's No. I

Whitecurrant varieties	Picking time	Characteristics
White Versailles	Early – Mid July	The most popular and widely-available variety. Not particularly vigorous. Upright in habit and easy to manage. Produces high yields of large-sized, pale yellow berries on long trusses.
White Grape	Mid July	A moderately vigorous, upright variety which produces good crops of off-white, relatively large berries.
White Dutch	Late July	A moderately vigorous, spreading variety producing very heavy crops of creamy-coloured berries on long strigs. Berry flavour is not as good as other varieties.
White Pearl	Late July	Moderately vigorous and upright in habit, producing heavy crops of large, well-flavoured berries on long strigs. Berries are nearly transparent.

White Pearl

White Versailles

Blackcurrants

Blackcurrants are hardy plants and can be grown in cooler parts of the country. They are the easiest of the bush fruits to grow and prune. Blackcurrants are bursting with health-giving properties such as antioxidants and richer in vitamin C, weight for weight, than any other garden fruit, as well as being packed with lots of other vitamins, minerals and fibre. They are a very versatile fruit and can be used in summer puddings and desserts (eg pies and tarts), in ice cream and ice lollies, syrups, smoothies and juices (Ribena is a popular drink made from blackcurrants). They also make excellent jams and jellies. There are a great many varieties of blackcurrant to choose from, ranging from early varieties which ripen in July, through to late varieties which crop in August - September. A good yield from an established bush is about 2kg (4-5lb). Most have been bred for commercial production to make Ribena, but all are suitable for growing in the garden. Some of the more popular and widely-available varieties are listed below - most of these fruit in July, before the summer holidays begin. Most have good pest and disease resistance and are easy to grow organically.

Blackcurrant varieties	Picking time	Characteristics
Ben Gairn	Early July	An early-flowering and fruiting variety with a compact growth habit. Bushes are high-yielding, producing large black berries. Very resistant to reversion virus (see pest and disease section).
Big Ben	Early July	A new variety with good potential for organic growing. Bushes are moderately vigorous and spreading with good yields of large berries. Resistant to mildew and leaf spot.
Ben Connan	Mid July	A popular variety that produces high yields of very large, easy to pick, full-flavoured berries. Bushes are moderately vigorous and fairly compact. Resistant to mildew and leaf curling midge.
Ben Sarek	Mid July	A compact-growing variety which produces good yields of fruit, though branches can bend under the weight of the crop. Ideal where space is short. A hardy variety. Resistant to mildew and leaf curling midge.

Blackcurrant varieties	Picking time	Characteristics
Foxendown	Late July	A vigorous variety which produces erect plants. Yields are moderate – good. Berries are medium-sized, firm and easy to pick by hand. Resistant to gall mite and mildew.
Wellington XXX	Late July	An old-fashioned variety with very heavy crops and the best-flavoured berries. Bushes are vigorous and spreading in habit, but can be disease-prone.
Ben Hope	Mid August	A very high-yielding, vigorous variety producing tall bushes which need a sheltered site. Berries have a very good flavour. Good disease and gall-mite resistance. (See pest and disease section.)
Ben Tirran	Late August	The latest flowering and fruiting variety of the season. Bushes are vigorous, upright and slightly spreading in habit. Berries are relatively small but with a good flavour. Resistant to mildew.

Wellington XXX

Ben Sarek

Jostaberries and Worcesterberries

These fruits are relatively unheard-of, but are very easy to grow if you have plenty of space as they make large bushes. They are often grouped together as hybrids of a gooseberry and blackcurrant, but Worcesterberries are now thought to be a distinct species. They are a good choice for poorer soils or where pest and disease problems make cultivation of blackcurrants and gooseberries difficult.

Jostaberries produce heavy yields of large blackcurrant-like fruits in July. The berries have a high vitamin C content and a pleasant, mild blackcurrant flavour. Bushes are spine-free and very robust but need a lot of space – at least 1.8m (6ft) between bushes and they can grow to a height of 1.5-2m (5-6.5ft). The bushes may need a supporting stake in exposed situations. Jostaberry bushes are resistant to American gooseberry mildew, leaf spot and gall mite, although aphids may be an occasional problem. Birds are very partial to the fruits and bushes may need the protection of netting during fruiting. Pruning is very simple – in winter just cut back some of the young lateral (side) branches to 10-12cm (4-5") and remove some of the older wood, or any branches that are unwanted.

Jostaberries

Worcesterberries

Worcesterberries form vigorous, very large and thorny bushes which produce bumper crops of small, red-purple, smooth-skinned, gooseberry-like berries in July. They are a good choice for a medium-sized, informal hedge. Like Jostaberries, they require a spacing of about 1.8m (6ft) between plants and can grow to a similar height. Worcesterberries are cultivated and pruned in the same way as gooseberries. Bushes are resistant to American gooseberry mildew and other pests and diseases are rarely a problem.

Sites and soils

Bush fruits will grow in most soils, but they do best in moist, fertile, well-drained, slightly acidic soil (a soil pH 6.0-6.5 is ideal). Blackcurrants can do well on heavier clay soils. A site in full sun is ideal, although bushes will tolerate partial shade (where the site is in shade for part of the day). Many varieties flower early in spring, and can be prone to frost damage – so try to avoid planting bushes in sites where cool air collects, leading to frost pockets. A sheltered site is also ideal, since flowers and berries can be damaged by strong winds.

Buying and planting bushes

Pot-grown bushes (available from garden centres and nurseries) can be planted year-round, but bare-root, two- or three-year-old plants are available from nurseries during the dormant season (November – March). Organically grown fruit bushes are available, from November to February, from The Organic Gardening Catalogue (www.organiccatalogue.com).

Cordon-grown gooseberries, red and whitecurrants can be purchased ready-trained from fruit tree suppliers and garden centres, ready for planting against a supporting tier of wires (eg for training against a wall or fence). It is also possible to train your own plants using the techniques outlined in the 'pruning' section (see later).

Before planting, dig the soil over to at least the depth of a whole spade (or 'spit') and incorporate well-rotted farmyard manure or compost to improve soil structure, moisture retention, drainage and organic matter content. Remove any large stones and perennial weeds.

Potted gooseberry cuttings ready for planting out

Planting gooseberries, red and whitecurrants

Unlike blackcurrants, these should be planted at the same depth that they were in the nursery (ie to the old soil mark). Use the planting distances suggested in the table below as a guide. Whether planting container-grown plants, or bare-root bushes, dig a hole large enough to accommodate the root ball. Position the plant in the hole. Try and spread the roots of bare-root plants out a little (it sometimes helps to create a little mound of soil or 'tump' at the bottom of the hole so that the bushes can 'sit' on it in the hole nicely). Fill in the hole with a mix of soil and compost and firm down around the rootball. Apply a dressing of general-purpose fertiliser (eg seaweed meal or organic all-purpose fertiliser*) to the base of the bushes, or use an organic mulch of compost or well-rotted manure. Water the plants in well. Prune in winter (follow the advice for 'winter pruning young bushes' in the later section).

Recommended planting distances for gooseberries, red and whitecurrants

	Plant spacing	Row spacing
Bush	1-1.3m (3-4ft)	2-2.5m (6.5-8ft)
Single cordon	0.3-0.5m (1-1.6ft)	1.5m (5ft)
Double cordon	0.6-0.8m (2-2.6ft)	1.5m (5ft)
Triple cordon	0.8-1m (2.6–3ft)	1.5m (5ft)

Actual planting distances will vary with plant vigour and variety.

Products available from The Organic Gardening Catalogue - www.organiccatalogue.com

Planting blackcurrants

Blackcurrants fruit on stems produced the previous year, so a regular supply of fresh growth from below ground level is needed. To achieve this, blackcurrants are grown as 'stooled' bushes. The base of the plant is set a few inches below soil level; this encourages strong new growth to arise from the base each year.

Plant your bushes an inch or so deeper than they were in the nursery. Space them 1.5-1.8m (5-6ft) apart, depending on the vigour of the variety. Cut back all growth to a bud 3-5cm (1-2") above the soil surface to encourage new shoots to form from the base of the plant. The bushes can then be left to establish for two years without further pruning. Be sure to water the plants after planting, and continue to provide water during hot and dry weather (especially during establishment) since the bushes are quite shallow rooting.

Top tip

Growing in containers

Bush fruits can be successfully grown in containers, providing they are kept well-fed and watered. Choose a sturdy pot that is not likely to blow-over, as the bushes can become quite top-heavy with the weight of fruit in summer. Follow the advice for container-grown fruits given in Chapter 2.

Care during the year

- Mulch the bushes every spring to help conserve moisture. Use a rich mulch, such as compost or manure for blackcurrants – which are greedy feeders. These mulches can be used to encourage growth in all crops, or use a less rich material such as straw, leafmould, composted wood chip or woven geotextile plastic mulch where plants are already growing strongly. Green waste compost (which you can buy in bags) also makes a good mulch – but avoid mushroom compost as this is too limey (alkaline). Using a mulch will also help to keep weeds down.
- If you don't use a mulch, apply a handful of organic general-purpose fertiliser or seaweed meal* to the soil around the base of each bush in early spring and hand-weed when required.
- Thin gooseberry fruits in late May – early June, if you want to try and grow really big-sized berries. Thin to about 2.5cm (1") apart along the branches of the bush. The thinnings can be used in cooking. Other fruits do not need to be thinned.
- Summer-prune if required to reduce vegetative growth and make picking easier (see later pruning tips).
- Use netting or other suitable bird-deterrents to protect ripening fruits from birds if required.
- Water plants once or twice a week in dry weather, both before and after fruiting.
- Keep an eye open for pest and disease problems (particularly in spring) and take prompt action to deal with any infestations if necessary.

Straw mulch beneath a gooseberry bush

Commercially-grown blackcurrants mulched with plastic to keep weeds under control

Harvest

Gooseberries

It can be difficult to tell when some varieties of gooseberry are truly ripe. Often, a good indication is when they become most attractive to birds and you find you have to net the berries to discourage unwanted visitors! Green, culinary varieties will stay green and hard and should be picked according to the harvest time suggested by the variety description, but some varieties will start to mellow, soften and become paler in colour and become quite sweet when eaten fresh. Red-fruited varieties will turn a nice pink-red colour when fully ripe and sweet. Use gardening gloves when picking thorny varieties of bush, as the thorns can be very unpleasant. Wash and 'top-and-tail' the fruits before using, ('top and tail' by nipping the stalks and base of fruits off with your finger nails or a pair of scissors). Gooseberries freeze well but will be easier to use if you 'top-and-tail' the fruits before placing in the freezer.

Red and whitecurrants

These should only be picked when they have turned from green to red, white or pink, depending on the variety grown. It is much easier to harvest whole strigs of fruit, rather than individual berries, so try to leave the strigs until all the berries have turned red or white as picking individual berries can be a messy and squashy affair! Birds are particularly partial to ripe redcurrants, so you may need to cover your bushes with netting to prevent losing the crop. Wash and de-strig the berries before cooking or freezing. Redcurrants destined for making jelly can have the strigs left on – as the fruit will be strained anyway before turning into jelly.

Currants are thorn-free and easy for children to pick

Blackcurrants

Blackcurrants are ready for picking about a week after the berries have turned dark blue – black. Modern varieties tend to ripen all their berries at once – which makes picking easier. Berries on older varieties tend to ripen from the top of the strig downwards. Once ripe, the berries should hang well on the bush until picking, but will deteriorate in quality relatively quickly in hot weather. Wash and de-strig the berries before cooking or freezing.

Pruning

Gooseberries, red and whitecurrants

Redcurrants, whitecurrants and gooseberries produce fruit at the base of one-year-old laterals which are pruned in winter to help form spurs (rather like apples). Unlike blackcurrants, the fruiting wood does not need to be replaced each year. Whole branches are removed only if they become diseased, very old or overcrowded. Most pruning is carried out during winter. Summer pruning can be used to remove pest or disease hot-spots and to help keep the bushes light and airy. The aim of pruning bushes is to create an upright, rounded 'goblet' shaped bush with an open centre, supported on a short 'leg' of stem. A strong branch framework helps to support the weight of fruit.

Winter pruning young bushes

- Prune the lead (main) shoots back by about half the previous season's growth (new wood) to an upward or outward-pointing bud. New wood is identified as being lighter in colour (usually sandy-brown) than the darker, older wood.
- Prune lateral shoots (side shoots arising on the main branches) back to one bud unless they are required to make up the bush framework, in which case they should be treated as lead shoots and pruned back by half the previous season's growth.
- Prune out any dead, diseased or damaged shoots – cut right back to a main branch or fruiting spur.

Redcurrant (left) and gooseberry (right) bushes, grown on a short leg of stem

- Remove any unwanted shoot growth around the bottom 10cm (4") of the bush to create a small 'leg' of stem. Cut back any shoots crowding the centre of the bush to one bud.

Winter pruning established bushes

- Once full size is reached, the leading shoots of an established bush can be pruned harder. Most can be pruned back to within 8cm (3") of the previous summer's growth, or some may be left at full length if there is room.
- To encourage the formation of fruiting spurs, lateral (side) shoots should be pruned right back to one bud.
- Badly placed, dead, diseased, damaged, crossing or drooping shoots should be cut out.
- Continue to keep the base of the bush uncluttered by removing any suckers and shoots that develop.
- Branches may become unproductive after four-five years and can be replaced with suitably placed, strong growing young shoots. Thin out the growth at the centre of the bush if it becomes too thick.

Summer pruning

Summer pruning can help ripen fruit and reduce pest and disease problems, by opening the bush up to light and air, but it may not always be needed where bushes are growing well. Shorten lateral (side) shoots of the current season's growth to 8cm (3") or 5 leaves, during late June - early July. Lead shoots should not be pruned.

Cordons

Redcurrants, whitecurrants and gooseberries can also be grown as cordons. This is a popular way of growing them in a confined space or ornamental gardens, as they do not take up much room and make very attractive edging for borders, or trained against a wall or fence. Fruit is easy to pick and yields are usually high - about 0.5-1kg (1-2lb) per bush from a single cordon. Cordons also have the advantage that it is easier to spot and intercept pest and disease problems at an early stage. Berries ripen well in the sunshine and are kept off the ground and away from rain-splashed soil. Cordons also allow very good air circulation around the plant which helps to deter some pests and diseases.

Cordon gooseberries growing at Garden Organic's Ryton Gardens – although the leaves have been somewhat defoliated by gooseberry sawfly larvae (see pest and disease section)

Cordons are particularly suitable for managing vigorous varieties. However, cordons do require more time spent pruning and tying in and a supporting framework will need to be provided. A tier of wires spaced 30cm (12") apart, with the top wire set 1.5-1.8m (5-6ft) from the ground should be used. Strong growing varieties are suitable for training as double or even triple cordons, which are very attractive.

As with apples and pears, it is possible to buy ready-trained cordons where the bushes have already had their framework established by the fruit tree supplier – so the hard work has been done for you and you need only do some annual light summer and winter pruning. However, if you want to have a go at training a cordon yourself from a rooted cutting, follow the advice below:

Single cordons – starting from scratch

- One-year-old rooted cuttings should be planted during the dormant season (Nov - March).
- During subsequent years, every winter the lead shoot is shortened by up to half or one third of its new growth. All other side shoots (laterals) are cut back to two buds.
- As it grows upwards, the lead shoot is tied to the wire framework. When it eventually reaches the top wire it can be lightly trimmed back every year in winter to encourage fruiting spurs to develop further down the stem.

Establishing double or triple cordons

These can either be established from ready-trained nursery bushes, or grown from unpruned rooted cuttings for one season to produce shoots ready for training, as described below.

- Double cordons will require two strong shoots to be tied down in a horizontal position during the second year after planting. Triple cordons also require two shoots to be tied down horizontally, leaving one central, vertical shoot. Tying-down should be done during the summer when the growth is still supple and pliable.
- During winter, prune the horizontal shoots to an appropriate upright bud and the central shoots as for single cordons (prune to half the previous season's growth).
- The following year, the resulting upward-growing shoots can be trained up the wire framework and then managed in the same way as a single cordon.
- Once the cordons are established, side shoots may need spacing out and lateral shoots may need renewing every 4-5 years. In this case, vigorous young shoots should be trained in as replacements.

Summer pruning cordons

The pruning of laterals (side shoots) can be done each year just before harvest. This will help the fruit ripen and discourage diseases such as mildew and *botrytis*. Leader pruning should be carried out only during winter.

It is also possible to grow gooseberries as 'standard' bushes. These are grown on a long, straight 1-1.5m length stem, which is very ornamental. Red and whitecurrants are also occasionally grown as 'fans' against a wall. These are very attractive forms of growing, but it is best to buy ready-trained bushes which have had all the initial pruning already done for you. Once established, prune in the usual manner for gooseberry bushes (for standards) and cordons (for fans).

Gooseberry standards

Fan-trained redcurrants

Blackcurrants

Blackcurrants require no pruning for the first two years after planting (provided all shoots are cut down to a bud 3-5cm (1-2") above soil level immediately after planting). Once established, they can be pruned as outlined below:

Winter pruning in years three to four and after

- Cut out any stems that are more than four-years-old. As a general rule, a good balance can be maintained between first, second and third year wood by cutting out one quarter to one third of the older wood each year.
- New wood is identified by its light sandy-brown colour (and is generally the thickness of a pencil), whereas older wood is much darker – almost black/purple in colour and the stems become much thicker with age.
- Cut as near as possible to the base of the bush to stimulate strong new growth from below ground.
- If the bush is very congested, cut out the weakest stems to open it up to light and air. This will help

discourage disease. Also remove stems which are damaged, diseased or rubbing against or crossing others.

- Cut out low-lying stems as they are likely to trail on the ground when fruiting.
- To rejuvenate an old, neglected bush cut back <u>all</u> the stems to just above ground level and give it a good feed with well-rotted manure or compost mulch, or organic all-purpose fertiliser.

Blackcurrant stool before pruning (left) and after pruning (right) where some of the older wood has been cut out

Propagation

Currants and gooseberries can be very easily propagated from cuttings, using autumn prunings, by following the step-by-step advice below:

- Select a stem which is 25-30cm (10-12") or longer and not more than two-years-old, which is about the thickness of a pencil.
- Trim the top back by a few centimetres to a bud, and make a clean, straight cut in the base of the shoot, beneath a bud, removing any buds on the lower half of the stem.
- Insert the shoot into some well-drained soil in a spare corner of your growing area (or pot up into a deep pot of sandy-loam potting compost or sandy garden soil).
- Cuttings of red, whitecurrants and gooseberries should be pushed into the soil to a depth of 7.5-10cm (3-4").

Blackcurrant cutting should be buried deeper – leaving only two buds showing about the soil surface.

- Space the cuttings about 6" apart. They can then be left for a whole season, before transplanting to a new growing site the following autumn.

Common pest problems

Sticky, stunted, distorted foliage

As with other fruits, aphids are usually the culprits here. There are many species which affect bush fruits by sucking sap from the foliage, some of the more damaging species cause leaf distortion and stunting during spring and summer, leading to early leaf-fall, small fruits and weakened bushes. Foliage often becomes sticky and dirty with the honeydew secreted by the aphids (which attracts ants) and encourages the growth of sooty mould, making the leaves look very unattractive. Populations of aphids can increase very quickly in hot weather, so check your bushes regularly for signs of infestation and take prompt action to deal with any hot spots.

Solution: Recommendations for controlling aphids in other fruit crops will work well for currants and gooseberries (eg targeting hot spots, cutting out infested shoots, encouraging beneficial insects, yellow sticky traps and using soft soap as a last resort). Try to keep bushes well-pruned, so that they are light, airy and open.

Blackcurrant aphid
(Image courtesy of Jerry Cross, East Malling Research)

Small, oval, scale-like insects stuck to the bark of the bush, sometimes with a white cotton-wool like substance beneath them

Female scale insects on gooseberry branch

These are scale insects, of which there are several species such as Oyster scales (*Quadraspidiotus ostreaeformis*) and mussel scale *(Lepidosaphes ulmi*), woolly currant scale (*Pulvinaria ribesiae*) and brown scale (*Parthenolecanium corni*). Of these, the woolly currant scale is the most easily seen and identified as the females produces white, waxy egg masses beneath them in late spring. Most female scales are 4-6mm long, brown, roughly oval and convex in shape, resembling small shields (the males resemble small flies and only live for a very short time). The female scales spend their lives pressed against the bark of the bushes, often in clusters, and are often only noticed during pruning. They feed by sucking sap from the host plant, which can weaken the plant in severe infestations. The scales can also produce sticky honeydew, which attracts ants and the growth of sooty mould (as with aphids).

Solution: It is difficult to completely eliminate scales from bush fruits, though it is possible to physically remove scale colonies either with a brush or by completely cutting out branches where infestations are patchy. Low numbers of the pest can be tolerated and regular pruning of bushes will help remove old, rough-barked wood, which is an ideal home for the pest. Many naturally occurring species of beneficial insects including ladybirds and their larvae prey on scale insects and can be encouraged by growing a good mix of wildflowers and providing sheltering sites such as artificial bug boxes.

Tightly curled, twisted and rolled leaves on blackcurrants which fail to open

Curled leaves caused by the blackcurrant leaf curling midge
(Image courtesy of Jerry Cross, East Malling Research)

This is usually caused by the blackcurrant leaf curling midge (*Dasineura tetensi*) which is a common minor pest of blackcurrants. Open up an infested leaf or shoot (young growth tends to be more affected) and you will see the small (2mm long), creamy white or orange larvae, which live and feed within the shelter of these tightly rolled leaves, causing them to become crumpled and distorted in appearance. The larvae drop to the soil to pupate once mature, emerging as adult midges two weeks later. There are often several generations of the pest each year – the last generation overwinters in cocoons in the soil before emerging as adult midges in spring. Infestations on bushes are not normally serious, but severe infestations on young plants can delay establishment.

Solution: Light infestations can be tolerated, but where attacks become severe, picking off and destroying affected foliage will help reduce pest numbers. Lightly cultivating the soil around the base of the plants in autumn - spring will help expose cocoons and pupating larvae to predators. Encouraging beneficial insects will also help as the larvae are preyed upon by many beneficial species such as Anthocorid bugs.

Buds on blackcurrant bushes swollen but failing to open – eventually drying up

Swollen buds usually indicate the presence of blackcurrant gall mites – these are tiny (<0.25mm long) mites which live and breed on blackcurrants causing a condition known as 'big bud' (giving them the nickname 'big bud mite'). The mites can also spread reversion virus (see later). Infested buds begin to swell in summer, but do not usually become obvious until leaf fall, becoming fat, rounded and distorted. If you look carefully you may notice them during winter pruning, but the buds will continue to swell in spring and are most noticeable during this period. Almost all varieties of blackcurrant are susceptible, but Ben Hope has fairly good resistance.

Solution: Removing any infested buds and pruning out infested shoots will help limit the spread of mites

to new bushes since thousands of mites can be present in a single infested bud. Badly infested bushes should be completely removed and disposed of.

Leaves of gooseberry bushes defoliated (eaten away) – often very quickly

Gooseberry sawfly larva

Look carefully and you will see caterpillars (green at first, later with shiny black heads and raised black markings) – these are actually the larvae of gooseberry sawflies. They are a common pest on gooseberries and also occasionally feed on red and whitecurrants. They can defoliate a bush in a matter of days, giving it a skeleton-like appearance. The larvae hatch from eggs laid low down in the centre of the bush in spring. They begin feeding straight away - starting at the centre of the bush and spreading through it as they develop. At first, feeding damage resembles small holes but the larvae grow quickly and can strip leaves as they feed voraciously. Once mature, the larvae burrow into the soil to pupate. Adult sawflies emerge two-three weeks later. There are often several generations each year and larvae can be found on bushes between May and October.

Newly-hatched sawfly larvae feeding on a gooseberry leaf

Solution: Keep a close eye on your bushes during the growing season and remove and squash any larvae as soon as you see them. Pay particular attention to the centre of bushes from mid-April onwards. Larvae are almost completely green in colour at first and can be quite difficult to spot – they are usually found on the undersides of leaves. As they get older they become more noticeable – but most of the damage will have already been done. Birds such as blue tits are excellent predators of sawfly larvae and can be encouraged into the area by providing additional food (eg mealworms) in feeders near the bushes. Cultivating the soil around the base of the bushes in autumn and winter will help expose pupae to birds and ground beetles. A nematode mix (sold as Nemasys Grow Your Own Pest Control*) or nematode species *Steinernema carpocapse* (sold as Nemasys Caterpillar & Gooseberry Sawfly Killer*) is a safe and effective biological control treatment to use when the larvae are first seen. As a last resort, an organically-approved insecticide such as pyrethrum (Py Garden Insect Killer* or Scotts Bug Clear*) can be applied as soon as young larvae are seen.

Branches and shoots withering, failing to grow properly – looking sickly and limp

This can be caused by the currant clearwing moth (*Synanthedon tipuliformis*), the larvae of which burrow into the stems of currant and gooseberry bushes, feeding along the central stem tissue throughout summer and autumn. (On gooseberries, branch death can also be caused by the wood-rotting fungus, *eutypa* - see later.) The larvae remain inside the branches during winter, before biting their way to the surface of the bark in April or May, pupating in a silken cocoon near the exit hole before emerging as adult moths. The presence of larvae within a bush often goes unnoticed, except during winter pruning when hollow stems are discovered. Attacked shoots and stems are brittle and contain dark-brown or black pith.

Solution: Minor pest infestations can usually be tolerated and regular winter pruning to rejuvenate bushes and cut out old wood will help keep pest populations down. If you find a hollowed-out stem, try to cut it right back to healthy wood and remove and dispose of the affected branch or stem.

Holes in leaves

These are usually caused by other moth larvae – a number of species can feed on bush fruits, including winter moth (*Operophtera brumata*), currant pug moth (*Eupithecia assimilate*) and the brightly coloured,

striped magpie moth (*Abraxas grossulariata*). They are rarely present in large enough numbers to cause significant damage, but can delay the establishment of newly-planted, young bushes.

Solution: Usually, the most effective control is to examine the bushes carefully for caterpillars as soon as you begin to notice any holes in the leaves, and pick off and squash the offending pests! Removing old crop debris such as leaves and mulches in autumn, together with regular winter pruning will help reduce the number of over-wintering sites for the pests.

Lots of tiny 'pin-prick' holes in new leaves and shoots – especially on redcurrants. Leaves becoming crippled and slightly distorted.

These are usually caused by capsid bugs, which are also a common pest of strawberry plants. Redcurrant bushes are particularly prone to attack and the pin-prick holes in the leaves are caused by capsid nymphs feeding on shoots during the spring. Adults and nymphs are very active on warm sunny days and you may see fast-running, green little insects running about on the foliage. By June, adult capsids are able to fly about between plants. Over-wintering eggs are laid in autumn on the host plants, with young nymphs emerging the following spring.


Capsid damage

Solution: Unfortunately, flowering plants used to encourage beneficial insects tend to attract capsid bugs and control of the pest is very difficult. Some success may be had using white sticky traps positioned in the bushes. Infestations can usually be tolerated and, if in good health, attacked plants will normally out-grow the damage.

Common disease problems

White, powdery coating on gooseberry leaves and fruit.

This is American gooseberry mildew (*Sphaerotheca mors-uvae*) – which is often a serious problem on susceptible varieties of gooseberry and also occasionally on currants. It tends to be more of a problem in warm, dry summers – becoming most noticeable during and after harvest. Young, vigorous bushes are very susceptible to infection. The characteristic white powdery appearance of the fungus is due to the production of large quantities of spores which are dispersed to new plants during the growing season. Affected fruits can be covered in a felt-like mat and eventually turn brown. Severe infections restrict shoot growth and shoot tips may be completely killed. Leaves can become distorted and fall early.


American gooseberry mildew

Solution: Remove heavily infected shoot tips and berries and rake up and remove infected fallen leaves during summer and autumn, to help limit the spread of the fungus. Ensure bushes are kept well-watered and mulched or fed with organic compost or fertiliser – healthy bushes are more able to withstand infection. If the fungus continues to be a major problem, consider growing only resistant varieties.

Poor yields and low vigour in blackcurrant bushes

This can be caused by blackcurrant reversion virus, a common disease in blackcurrants which also occasionally affects redcurrants. The virus is spread mainly by blackcurrant gall mites (big bud mites) and can take several years to develop in plants and show any symptoms. It can be difficult to spot infected bushes – flower buds on reverted bushes look red and hairless in April (rather than the normal dull purple colour) and leaves become flatter in appearance, with fewer jagged edges, making them look more 'nettle-like' – although this can be very difficult to distinguish from healthy leaves.

Solution: It is best to remove reverted bushes, so that the virus does not spread to healthy bushes nearby. Even if only a small part of the bush looks affected, the virus will have spread throughout the plant, so dig it up and dispose of it.

Symptoms of reversion virus on blackcurrant flowers (right) and healthy flowers (left) (Image courtesy of East Malling Research)

Small orange powdery spots on undersides of blackcurrant leaves

This is blackcurrant rust (*Cronartium ribicola*) – a relatively common disease which can cause early leaf drop, and reduced vigour the following year, but is rarely serious and minor outbreaks are nothing to worry about. Rust tends to be more of a problem in cool, damp weather and symptoms first appear on the undersides of leaves in early summer. Varieties of blackcurrant vary in their susceptibility to infection – Ben Hope has good tolerance.

Solution: Ensure bushes are pruned annually to maintain an airy and open habit so that foliage can dry quickly after rainfall. If growth is congested in summer, remove a few leaves from the centre of the bush to help let air and sunlight in. Infected fallen leaves can be gathered up and removed in autumn, to limit disease-transfer.

Little black spots on gooseberry leaves – leaves yellowing and falling early

This is a leaf spot fungus (*Drepanopeziza ribis*) which affects currants and gooseberries. It tends to be a problem in warm, wet weather. The fungal spores are spread by rain-splash and symptoms appear on both the upper and lower leaf surfaces in May and June. Older leaves are usually attacked first and show small, dark brown spots, which may eventually join together, killing large areas of the leaf surface. Affected leaves tend to turn yellow, then brown and fall early – bushes can often lose all their leaves.

Leaf spot on gooseberry

Solution: The fungus overwinters on dead leaves, so raking up and removing fallen leaves in summer and autumn will help reduce levels of fungal inoculum. Try and keep the bushes weed-free and well-pruned to improve air circulation so that leaves dry quickly after rainfall.

Branch die-back in gooseberry bushes

Gooseberries can occasionally suffer from a wood-rotting fungus called *eutypa*, which also affects many hedgerow shrubs and grapevines. Wood which is more than two-years-old tends to be more affected, but it can be a major cause of branch die-back and death. The foliage of affected bushes turns yellow, then brown. A single branch may be affected but the fungus will eventually progress to the main stem, killing the whole bush.

Solution: Usually, the only option is to remove and dispose of affected bushes, though it may be possible to cut out individual branches beyond the spread of the fungus (if you cut through a branch, a cross section of infected wood reveals a yellowish, rotten tissue – keep cutting back until you reach healthy wood). Try to prune bushes during dry conditions and remove the prunings promptly. Make clean cuts when pruning – rough snags of wood can increase the risk of infection. Disinfect secateurs (eg with Citrox*) before further use.

Branch die-back in gooseberry bushes can be caused by Eutypa

Products available from The Organic Gardening Catalogue - www.organiccatalogue.com

Community aspects

A major part of the Food for Life Partnership is to get as many people as possible involved in growing and cooking their own food, whilst raising awareness of where food comes from, healthy eating and sustainability.

This section looks at ways in which the school and wider community can reconnect with the food they eat through growing fruit.

Fruit growing in the community

Today we can access fresh fruit all year round; we think nothing of buying strawberries in winter or apples that were grown in America. For many, fruit and sadly food in general has lost its special place in our society.

The steady erosion of our fruit culture has resulted in the loss of thousands of small orchards across the United Kingdom. Orchards that were once the heart of a village community and essential habitats for a large number of wildlife have been removed or neglected. Seldom do we think about the huge global supply chain, which consumes vast amounts of resources, in moving fruit across the globe. Consumers are offered a very narrow choice of varieties when purchasing produce such as apples and pears. This monoculture is not only bad for the environment but also consumers.

Growing your own fruit is an excellent way for pupils and the wider community to reconnect with the food they eat. Fruit makes a fantastic starting point for this and is a wonderful focal point for community engagement. Growing can occupy a very special part of a community's identity and hold special memories for people. Apples and pears are excellent fruit for schools to grow; they are relatively easy to grow and the vast number of varieties means that many may have local historical and geographical connections.

A familiarity and fondness for fruit offers many exciting opportunities for schools to celebrate seasonality and regional diversity. Growing unusual, historical or regional types of fruit can provide a multitude of learning opportunities that can be used to support wider learning across the curriculum and aid community engagement.

Orchards are a long term commitment, from planting to the joys of harvesting; growing fruit offers many opportunities for community engagement. In some communities orchards were the heart of the community and a focal point for celebrations. Traditionally orchards needed community involvement to thrive. People were needed to pick fruit, and maintain the trees and grounds; community members would even graze sheep or pigs in the orchard. Apples would be eaten fresh or set aside for storage. Some would be turned into juice and cider, others would be cooked and made into desserts or jams, depending upon the variety of apple being used. It was the utility and variety of apples that led to celebrations such as Wassailing and tree dressing. These are celebrations where the community comes together to give thanks to the apple trees and hope for a successful harvest. Schools are ideally placed to become focal points for such celebrations, as they are already hubs for community involvement, they have access to a wide section of the community and have the skills necessary to run and organise community events.

Using an apple press

Benefits of successful community engagement

Wassailing and tree dressing.

- Raises school morale.
- Strengthens ties between the school and the community.
- Aids revenue generation through the sale of plants, fruit and other goods.
- Results in offers of equipment or expertise.
- Provides practical learning opportunities for pupils.
- Allows pupils the opportunity to interact with the general public, thereby developing the confidence and communication skills that will stand pupils in good stead for later employment.
- Allows pupils to gain a sense of responsibility and pride in their new found horticultural knowledge and skills.

Engaging with the school community

Engaging with the whole school is a vital part of successfully changing food culture. A high level of pupil participation is particularly useful when growing fruit, especially when harvesting produce, and also enables schools to be more adventurous with community engagement.

Growing fruit is an ideal way for schools to engage with the pupils and in doing so provides them with many opportunities to acquire new skills and experiences. These skills and learning opportunities can be used to gain recognised qualifications and awards as well as support wider learning across the curriculum.

When planning an orchard there are many things that need to be considered. Size, layout, and variety and positioning of trees must all be taken into account. However, multiple uses are often overlooked. Growing space can be developed as an outdoor classroom. An amphitheatre layout is ideal as it can also be used for garden and community events. Having multiple site uses helps justify the cost and set-up effort.

If space is at a premium, consider growing fruit in containers. Strawberries are an excellent crop to grow if this is the case. They will grow very well in containers and are a popular summer treat.

Top tip

Avoid over reliance upon one member of staff or parent. This can be done by setting up an events committee or gardening group, with the aim of developing community engagement.

The school community is more than just teachers and pupils. Always make efforts to include non-teaching staff such as the school cook, site manager and office staff.

Some practical suggestions on how to engage the school community

Hold a fruit day	This could coincide with Apple Day, which is held annually in October. Fruit days have been very successful in schools with staff and pupils having an informative and enjoyable day. Dedicating an entire day is a big commitment but it can pay dividends by creating a 'buzz' around fruit, thereby laying the foundations for further projects.
Organise trip to an Apple Day event/local fruit producer	Apple Days are often held at gardening organisations, National Trust and English Heritage sites, and some fruit farms, making them ideal for school visits. Invitations can be extended to family members of pupils. As most Apple Day events occur on Saturday, no time from lessons is lost and many more parents are available to support the school.
Design a growing space	As a whole school, decide which fruits to grow and design a growing space or orchard. This has been done successfully in many schools by holding competitions to design the school orchard and growing spaces. In this way everyone feels involved from early on.

Hold an event	An orchard is a great venue for small scale events in the summer and autumn months. It is a wonderful place for inspiration and creativity and can bring learning to life.
Plant fruit where pupils gather	Plant fruit where pupils congregate at break times, etc. Encouraging them to join in with harvesting is a particularly good way of including pupils who would not normally have an interest in growing.
Grow crops for profit	Growing areas do not have to be about producing food solely for the kitchen. Grow crops for profit; this could be part of the Young Enterprise Scheme or school venture. This gives pupils opportunities to develop new skills and the potential to earn money for school funds.
Recognise hard work and enthusiasm	A common way to recognise pupils' achievement is with certificates and award ceremonies. Schools have used trips to gardens, garden centres and restaurants as ways of recognising pupil achievement. Such trips not only help engage pupils with growing but can also be linked to wider community involvement. It may be possible for some schools to offer qualifications in horticulture or use the school garden as a focus for award schemes such as ASDAN.
Hold competitions	Hold growing and produce competitions. Foster a sense of competition amongst pupils, which could be extended to the wider community. Many schools have inter-class vegetable competitions, eg for the largest potato or heaviest pumpkin.
Serve school grown fruit at meetings	Where possible serve fruit grown at the school at meetings, gardening club, and in the school canteen. This reinforces healthy eating messages, highlights school growing and allows pupils to enjoy the 'fruits' of their labour.
Invite final year primary pupils	Invite pupils in their final year of primary school to plant a tree or fruit bush in their new secondary school. Having something familiar eases 'transition' for pupils as they settle into their new school and, of course, they have time to see their tree fruit as it grows. Schools involved could also share the cost.
Fruit mapping	Research varieties traditional/specific to the region and map where fruit is currently grown in the local area.
Adopt a tree	Local farms may be happy to allocate a tree or trees to a school if growing space in the school is limited.

Engaging with the wider community

Cultivating fruit offers special opportunities to engage people with food growing and food culture in school. Schools have an advantage when engaging with the community as they have access to a variety of facilities and also benefit from being a community hub. They are regularly in contact with sections of the community through parents' evenings and open days. Such events provide opportunities to promote growing and food culture, secure assistance with larger jobs, as well as advertise forthcoming events.

Effective community engagement can benefit schools in a number of ways. Closer community ties provides many learning opportunities and fostering good relationships can also result in offers of equipment, labour or funding. Such offers are of immense value and can really help a school firmly establish its orchard and growing spaces.

No two schools or communities are alike therefore, the way a school chooses to engage with its wider community will vary. Some schools may wish to engage on a small scale through regular gardening and food groups. Others may want to hold larger seasonal food and growing festivals that involve the whole school and local food producers.

Whichever route is taken consideration needs to be given to factors such as staffing, funding, promotion, socio-economic factors, ethnicity and religious beliefs. It is vital to give thought to health and safety, and child protection when planning any event. Schools must take time to conduct a risk assessment and develop contingency plans to ensure successful engagement. For more guidance on this see the 'Community Engagement' booklet, on the schools' pages of the Garden Organic website at www.gardenorganic.org.uk

There are a number of organisations that can assist schools. Most councils in the UK now have Community Officers who can help support schools with community engagement. There are also regional and national fruit groups with specialised knowledge and equipment. It is well worth the school forging links with such groups, as they may be able to offer support with fruit events and the development of an orchard.

One of the largest and most widely known orchard groups is called Common Ground, a charity founded on the principles of celebrating and saving old varieties of British fruit along with the associated customs. This is done through celebrations that inform, empower and inspire communities to become involved with local fruit growing. With this aim in mind, Common Ground www.commonground.org have held a number of campaigns and produced resources that support organisations and individuals in becoming involved with local food production.

Preparation for tree planting.

Apple variety identification.

'Planting Day' at Bolsover C of E Junior School.

Some practical suggestions on how to engage the wider community

Attend local shows	Attend local produce shows, farmers' markets and other similar events. This gives pupils a chance to see what other growers are doing and gain growing advice and ideas for new crops.
Develop links	Develop links with the local garden centres. This could result in discounts on equipment and seeds or even the chance to receive surplus stocks for free.
Become involved in a community orchard	Become involved in a community orchard by sponsoring a tree and assisting with harvesting and maintenance. Community orchards are becoming more popular. See Common Ground at www.commonground.org.uk

Basic principles of community engagement

Due to the diversity of schools and communities there is no guaranteed formula for successful community engagement but there are some basic principles to take into account. Below are the four most important aspects to achieve good community engagement.

1 Know your community

A good knowledge of the community pays dividends.

- Allows schools to forge links with local growing and food groups, providing many opportunities to actively participate in changing food culture, both in and out of school.
- Can result in offers of free seeds, plants, tools, advice, and assistance with strenuous or specialist activities.

- Allows for targeted communication, saving money and time.
- Helps schools decide upon the style and methodology of community engagement.

Researching and engaging with the community can provide many learning opportunities for pupils. This can be done through conducting surveys of the local community, parents and pupils. Older pupils could contact local food and growing groups to find out about fruit growing in the area.

The history of a community can make very effective learning and engagement opportunities for pupils to explore. It can reveal many interesting varieties of fruits, vegetables and foods particular to specific regions. The Black Worcester Pear, for example, is an old variety of pear with strong links to Worcestershire, it even appears on the counties emblem. Growing such crops not only identifies a school with a particular place or community, but also ensures the continuation of older varieties and increases biodiversity.

Knowledge of the community allows events to be developed that are appropriate and unique. This uniqueness is something that can be celebrated, allowing schools opportunities to make successful and lasting links with the whole community. This is easily done through production of regional fruit and other food crops.

The following are points to consider when studying the community.

- Is there a high level of ethnic diversity?

  A diverse community can afford schools many opportunities to celebrate and study the diversity of food culture. Provided this is done sensitively and with respect, it can strengthen community relations in and outside the school.

  It provides a number of learning opportunities and real experience of different cultures for pupils of all ages and abilities promoting understanding and tolerance.

  An event could be timed to be part of a religious festival, eg donation of fruit produce for a harvest festival at a local church.

- Are there any businesses or organisations in the community that would have an interest in working with the school in growing fruit?

  Partnerships with local allotments, fruit farmers and interest groups could result in offers of equipment, access to valuable skills and experience, and even opportunities to grow fruit on unused land. One way of doing this would be to develop an orchard with the local allotment association. Allotment holders and the school could share the responsibility of upkeep and harvesting produce. Potentially such links could develop into small social enterprises that generate money for the allotment association and school through sale of produce.

  Some businesses and organisations may consider sponsoring trees for schools to grow. Display plaques on the trees in recognition of sponsorship, as people are more likely to participate if their contribution is recognised.

  Schools could consider sponsoring fruit trees at a community orchard or agricultural project. This could assist with conserving old orchards, which are also important habitats for wildlife.

2 Plan your community engagement

A well thought out community engagement strategy is vital for success and can be used as a foundation when planning for internal and external events.

Consider the following when planning an effective community engagement strategy.

- How is the school going to engage with the community?

Top tip

Good community engagement is a continuous process.

People should be regularly up-dated regarding what the school is doing and how they can participate.



Ideally the school should try and use a number of methods.

For schools that are planning an orchard a popular choice is to ask for help with tree planting.

Some schools have extended gardening and cooking clubs to include parents and grandparents. This passes on skills and encourages change in food culture at home.

Many schools have regular fêtes or fairs; these events are often established and are typically well attended. They could easily be adapted to have a fruit focus or theme and incorporate plant sales, food tasting, as well as growing, cooking and composting demonstrations. Activities such as food miles and sustainability could be included at the event as a way of highlighting the importance of the school orchard and growing areas. These larger events also offer the opportunity for the school to invite local food producers who could be charged a nominal fee for a stall thereby increasing school funds.

Think about seasonality when planning a fruit event, eg hold a strawberry day in summer or an apple day in autumn. This reinforces the concept of seasonality and allows learning and events to take place throughout the year.

Another option is for pupils to attend local food and growing events. Selling/swopping produce at such events allows pupils to develop many skills, raises the school's profile and gives the opportunity to promote its forthcoming events.

- Who needs to be involved to ensure success?

  Start by gaining the support of the senior leadership team, governors, parent teacher associations and key parents and catering staff. Having their support means that changing food culture in and out of school becomes a priority. They will provide leadership and may have experience that could be of advantage when developing events.

  Ask for advice and support from sources outside the school, eg local fruit enthusiasts could support schools by providing equipment and advisory services. Organisations such as 'Common Ground' have produced resources that support fruit events.

- What difficulties might occur and how can they be avoided?

  Care of the fruit, eg watering, harvesting and pest and disease management can be an issue when the lead gardening teacher or teaching assistant is absent. Ensure that a rota is put in place so that these tasks are shared.

  Do not rely on one person to make sure things get done. Spread the workload across different groups such as the events committee, garden club members, etc.

  It is essential to have a plan for events that sets out who is responsible for the different tasks, risk assessment, refreshments, layout and contingency plans, eg what to do in the case of bad weather or if someone is injured. This ensures the smooth running of the event.

3 Promotion

Promotion is key to successful community engagement. People need to know about what the school is doing and why.

It is very important that promotion should be discussed in the planning stages of community engagement, thereby creating a driving vision that can direct and enhance engagement and promotions. Good promotion can make an event and will impact upon the success of gardening and growing groups. High-quality promotion of events, groups and their successes will help schools in changing food culture.

The school needs to take every opportunity to inform parents and the wider community about its activities in food and food culture. Start with notice boards at school, the school website and school newsletter. Produce promotional handouts to give away with purchases when selling goods at market.

Larger events can be publicised by conducting letter drops, putting up posters in the local community and contacting the local press.

The Internet offers many lines of communication for schools to use. Join a social network website to advertise the school event and gardening group. The Food for Life Partnership website allows schools to write blogs and network with other schools across the regions. The Partnership has also provided a press release template that could be used to help spread the message of changing food culture through fruit.

Consider inviting local dignitaries such as the Member of Parliament, Mayor or local councillors to food and growing events. This not only increases press interest, thereby increasing the likelihood of coverage, but also forms a link with people who have an important role within the community.

4 Be proactive – get out there and engage with your community!

Community engagement is about being actively involved with the community. This is a major element to getting the community on board with growing or planting projects. Schools need to be proactive in becoming involved in the local food and growing culture.

Growing fruit is something that anyone can do, in almost any space. To help build people's confidence in growing and preparing/cooking fruit the school could run workshops, activity stalls, regular gardening groups and drop-in sessions. This not only engages pupils but also parents who may believe that growing fruit is beyond their skill.

Remember, community engagement is a continuous process and it is vital that people are regularly contacted and updated. This can be done through e-mails, newsletters or even a simple notice board on the allotment shed.

Case studies

The following case studies are just two examples of the excellent work that is being carried out by schools in changing food culture and reconnecting with the food they eat through growing fruit.

Bartley Green School, West Midlands

Bartley Green School is a specialist technology and sports college serving the lively suburban community of Bartley Green, Birmingham. The school has a positive attitude and has overcome many challenges to achieve success in changing their food culture. More fresh food is now prepared in the school kitchen and school meal uptake has increased. Pupils have the opportunity to grow fruit and vegetables in the school's garden under the guidance of the school gardener who also works at a local feeder school.

Teaching staff have developed innovative lessons and resources that are linked to growing, cooking and eating. The Head of Design developed lessons in which pupils built hand tools, many of which are used in the school garden. Tools were also built and sold as part of the Young Enterprise scheme. In Art, pupils made 'insects' using compostable materials and wire for support, these were placed in ornamental beds next to

reception. Ornamentals have also been planted in the shape of the school logo.

As part of the BBC's 'Tree o'clock' campaign, the school planted a small orchard. The campaign was used as a 'hook' to help engage pupils and the wider community. A variety of fruit trees were planted in specific places to represent an outdoor classroom thereby making the best use of space. A number of totem poles, that were part of a previous art project, have been converted into seating.

Attendance was good, people from all sections of the community helped with a variety of tasks. The local press and pupils from years 5 and 6 of the feeder primary schools were also invited to the event. The pupils enjoyed their experience of tree planting and it allowed them to see what could be involved when they joined their potential new school.

There was a positive atmosphere at the event, which was attended by the local Member of Parliament and people of all ages from younger pupils to grandparents. They all worked together with support from school staff.

The school catering staff provided a variety of refreshments including vegetable soup, baked potatoes with a selection of toppings, and tea and coffee. This gave the school a chance to show its appreciation to people for the time they had given and allowed pupils, parents and staff to meet in an informal way. Thus making the school a more friendly and approachable place for parents to visit.

Bolsover C of E Junior School, Derbyshire

Bolsover is a newly built school in a former mining village near Chesterfield. All staff at the school, including the catering team, share a commitment to changing food culture.

The school cook runs cooking clubs for parents and pupils, which are very well attended. She also assists with catering for school events, eg for 'Fruit Day' she prepared fruit cocktails etc, and on 'Planting Day' prepared fresh soup for the volunteers.

The school held a 'Fruit Day', which was dedicated entirely to fruit using this as a focus for learning and activities.

The day started with a whole school assembly during which the pupils were told about plans for the school to have an orchard. They were taught about the different types of fruit trees and also other types of fruit such as strawberries, raspberries, etc that can be grown in the UK. To encourage the children to feel a part of the process they were each asked to draw a plan for the proposed orchard, a competition was then held to decide the winning design.

Learning for the day was planned around fruit, and the planning and planting of the orchard. This allowed

Orchard design

Fruit salad

Tree planting at Bolsover C of E Junior School.

subjects such as maths, English, geography, science, art, history and citizenship to be covered in an innovative way.

A local fruit expert also attended the event, he gave a short talk about apples and made freshly pressed apple juice using a portable press. A schedule had been drawn up for pupils in their class groups to visit the school hall to listen to the talk and try some of the fresh apple juice.

At the end of the day pupils and their parents were invited to look at the orchard designs, take part in apple activities and games, taste the fresh apple juice, and enjoy the healthy snacks prepared by the school cook. People were able to learn about the huge variety of apples.

Planning was the key to the success of this event. The schedule for the whole day was planned and set out in a booklet, which was given to all staff.

The school also held a very successful 'Planting Day'. A large variety of fruit trees were planted the length of the school field, and 100 raspberry canes, 100 strawberry plants and a selection of fruit bushes were planted in the growing area.

The Big Lottery Fund supports projects that improve health, education and the environment.

The Soil Association is the UK's leading environmental charity promoting sustainable, organic farming and championing human health.

The Focus on Food Campaign is the leading food education support programme for the teaching of cooking in the UK's primary and secondary schools.

The Health Education Trust is the national charity dedicated to initiating and supporting work with children and young adults to encourage the growth of healthy lifestyles.

Garden Organic is the UK's leading organic growing charity, dedicated to researching and promoting organic gardening, farming and food.

Garden Organic is the UK's leading organic growing charity, and is dedicated to researching and promoting organic gardening, farming and food. We are driven by an enduring passion and belief, founded on over 50 years of research and practice, that organic methods provide a healthy, sustainable life for us all.

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The Food for Life Partnership is a network of schools and communities across England committed to transforming food culture. The Partnership is led by the Soil Association with the Focus on Food Campaign, Garden Organic and the Health Education Trust. Together we work to revolutionise school meals, reconnect young people with where their food comes from and inspire families to cook and grow food.

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