

The Principles of Organic Gardening

The Natural Way to Grow





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Garden Organic (formerly known as the Henry Doubleday Research Association) is the UK's leading organic growing charity. We have been at the forefront of the organic horticulture movement since 1958, with over 20,000 members across the UK and overseas.

Dedicated to promoting organic gardening in homes, communities and schools, the charity encourages people to grow in the most sustainable way, and demonstrates the lasting benefits of organic growing to the health and wellbeing of individuals and the environment. For more information please visit www.gardenorganic.org.uk.

To create **The Principles of Organic Gardening**, we have adapted some of the organic farming standards and made them suitable for the domestic grower. The organic rules for farmers are held by other organic bodies, such as the Soil Association or IFOAM (International Federation of Organic Agricultural Movements), and they are an integral part of the farmer's certification as organic. These guidelines are for gardeners, however, and they are a voluntary code of practice. Following them does not permit the sale of produce to be labelled as organic.

This booklet can also be used as a guide towards the self-declaration as an organic gardener.



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Introduction

The Natural Way to Grow

The essence of organic growing is to work within natural systems and cycles. The basic principle is that the soil is as important as the plants it supports.

If you are interested in growing organically, we hope this booklet will help and inspire you. You may have a garden, or an allotment; perhaps you are creative with pots and containers on a balcony? This guide is for the novice as well as the experienced grower, young and old, urban and country dwellers.

You are part of a growing movement across the UK – one that supports healthy soils, encourages wildlife, and gives the satisfaction of harvesting fruit and vegetables free from toxic chemicals.

Why Organic is Important

There is no doubt that growing and gardening does you good. The fresh air and exercise helps your health and the pleasure of witnessing nature and the joy of your growing successes all help to increase your well-being. And if you grow **organically** there are extra benefits. Your efforts support the natural environment by respecting and connecting with nature; you will enjoy fruit and vegetables that contribute to a healthy diet, and you are naturally adopting a more sustainable lifestyle.

So What is Organic?

Organic growing doesn't just mean avoiding the use of chemical weed killers and pesticide sprays. It is more exciting, challenging and satisfying.

It is using natural ways to promote a complete, healthy, productive and sustainable growing environment. It involves feeding the soil, encouraging wildlife, and working creatively alongside nature when managing pests and diseases.

There are a number of principles behind organic growing, but these five are the most important for gardeners. They arise from years of practice and scientific study.

1. BUILD AND MAINTAIN SOIL HEALTH.

The soil is full of life, which supports healthy plant growth. It also has good structure, for plant roots to penetrate and take up nutrients.

2. ENCOURAGE BIODIVERSITY.

Different life forms such as plants, insects, birds and mammals all have a role in creating a resilient growing system. This variety of different species, all working together, encourages a healthy interdependency between plants and wildlife.

3. USE RESOURCES RESPONSIBLY.

The organic grower uses resources sustainably, with minimum damage to the planet.

4. AVOID USING HARMFUL CHEMICALS.

Toxic chemicals used to kill weeds, diseases and pests can damage the health of your growing area, and all the life-forms within and beyond it.

5. A HEALTHY GROWING AREA.

Keeping your growing area in good health, rather than just pest and disease free, is at the heart of organic growing. A diverse and vigorous growing system, good hygiene, and close observation all help prevent problems.



How This Guide Works

These guidelines describe the principles behind organic gardening – helping you to understand what to do and what to avoid. However, this is *not* a growing advice booklet. For practical organic growing advice, see *First Steps in Organic Growing* booklet, or visit the Garden Organic website, gardenorganic.org.uk, where you will find links to numerous growing advice pages.

Many of us are on a growing journey, learning as the seasons pass, and hoping to move towards being as organic as possible. The signposts on the route all point to learning to embrace and trust the five principles. This booklet is written to help you. We have used a traffic light system, so that each technique is given the green, amber or red light.



Best practice. This should be your first choice, as an organic grower.

These techniques embody the organic principles. They are based on years of research and proven best practice. You will be working alongside nature and enhancing the natural environment.



Also acceptable.

Although not 'gold standard', this is still good practice, and you are thinking the organic way.



Acceptable, but not for regular use.

Sometimes the organic ideal simply isn't possible. In these sections, we offer the next best alternative. Many of these techniques are acceptable as a one-off or temporary measure, particularly in pest and disease management.



Not acceptable in organic growing.

These are things which should be avoided. They can either be bad practice, or even worse, cause harm to the natural environment.

Build and Maintain Soil Health



A healthy soil is the basis for growing healthy plants and food. The organic way of feeding the soil, rather than the plant, ensures the best results for flowers, fruit and vegetables.

The earth you grow in should be teeming with life – worms, fungi, bacteria and other microscopic creatures. These help create its **structure** and **fertility**; key components for creating the right environment for plants to root well and gain nourishment. If you look after your soil organically, you will be supporting the activity of these vital creatures, and improving their diversity. Crucially, you will be avoiding activities that disrupt or harm the soil's rich ecosystem.

The four main methods to build the perfect soil are:

- **Add compost and other bulky organic materials** – this not only adds nutrients but also helps create a good structure for plant roots to penetrate.
- **Minimise digging** to avoid disturbing the complex soil life.
- **Plan your planting** to make best use of the soil's nutrients and to avoid build-up of pests and diseases.
- **Grow certain plants**, such as **green manures**, which hold nutrients in the soil and can help suppress weeds.

In this section, we apply the organic principles to:

- **Soil cultivation techniques** – get to know your soil and how to manage it
- **Soil improvers** – using homemade compost and manures
- **What plants grow in** – using homemade and commercial off-the-shelf mixes, seed and potting compost
- **Fertilisers, liquid feeds and tonics** – what to add and when

Soil Cultivation Techniques

Getting to Know Your Soil and How to Manage It

The first rule of organic growing is to understand the soil you are working with – is it light, sandy and doesn't hold water? Or is it heavy, clay and prone to soginess? Is it alkaline or acid? Once you know your soil (and there are many soil testing kits available) you can improve its structure and fertility naturally.



FOR ADVICE ON:

1. How to manage your soil, go to www.gardenorganic.org.uk/managing-your-soil
2. Green manures, go to www.gardenorganic.org.uk/green-manures
3. Planning your planting, go to www.gardenorganic.org.uk/planting-plan-and-crop-rotation
4. No Dig technique, go to www.gardenorganic.org.uk/no-dig-method



BEST ORGANIC PRACTICE

- **Apply homemade compost.** This improves the soil's structure, its biological activity and its fertility. For how much and when, see **Appendix 1** on p. 53.
- **Keep the soil covered**, either with growing plants, or an organic **mulch** or **green manure**. This protects and improves the soil, so that it is not left bare for weeds to flourish or valuable nutrients to be washed away.
- **Don't try to change the soil too drastically.** It is better to grow plants best suited to your soil type, rather than pump the soil with unnecessary acid or alkaline substances.
- **Minimise digging.** Digging disrupts the complex systems of life within the soil. It is possible to follow the '**No Dig**' technique, which uses an organic mulch to suppress weeds, avoiding the need to dig.
- **Grow green manures.** These plants can improve soil structure, and some will increase its fertility by capturing essential nitrogen.
- **Rotate your vegetable crops.** Plan your planting year after year, to grow a succession of different vegetables in the same area. This prevents the build-up of diseases in the soil and uses added nutrients most effectively. See **Crop Rotation**.



ACCEPTABLE, FOR OCCASIONAL USE

- **Digging to clear the ground.** It is best to minimise digging, which disrupts the complex soil life systems. However, this can be one way to clear a patch of persistent weeds.
- **General digging in winter months.** Again, it is best to minimise digging, but clay and heavy soils may be dug to leave them exposed to frost to help break them down.
- **Using black plastic sheets as a mulch to clear weeds.** These deprive the soil of light thus starving the weeds. They should be removed as soon as the job is done. (See **Weed Management** on p. 34).



NOT ACCEPTABLE IN ORGANIC GROWING

- **Using too much manure and fertilisers.** These can give the soil too many nutrients such as nitrates and phosphates. This encourages excessive growth that is more vulnerable to pests and disease. For suggested amounts to apply, see **Appendix 1** on p. 53.
- **Unnecessary digging.** Too much digging destroys and disturbs the complex soil life systems.



Soil Improvers

Using Homemade Compost and Manures

The best way to improve the soil is to use garden compost, leafmould or well-rotted manure. These are bulky materials, unlike a granular or liquid fertiliser, which will improve the soil's structure as well as its fertility.

They are generally made from 'waste' materials – such as kitchen vegetables and garden waste, as well as manure (farm animal waste).

Recycling plant and animal wastes in the soil imitates the recycling of nutrients carried out in nature. As they are high in plant fibre, they provide vital food for the complex life within the soil. The composting, or rotting, process is important. It reduces or destroys any germ carrying bacteria; destroys weed seeds; and makes the material easier to handle and apply. This composting process can take anything from 6 weeks to 12 months to complete.

For advice on how to make compost go to www.gardenorganic.org.uk/compost

There are two types of 'bulky' soil improvers – those made from **plant waste**, such as homemade compost and leafmould; and those made from **animal waste**, such as farm animal and poultry manures.

For advice on how and when to apply them, see **Appendix 1** on p. 53.

Using bulky organic soil improvers, such as homemade compost, underpins all five organic gardening principles.



It builds and maintains soil fertility and encourages soil biodiversity. It uses natural resources responsibly, avoids the use of toxic chemicals, and keeps the growing area healthy.

Plant Wastes

Plant fibre is a vital food for the complex soil life that builds and maintains the soil structure. Vegetable waste, leaves, straw, hay, green plant cuttings and weed leaves are all examples of plant waste. It is important they are composted or left to rot down before use. This process can destroy some of the diseases, and makes the materials easier to handle and apply.

Note: raw materials should be sourced as locally as possible. This prevents excessive transportation and the risk of plundering natural resources from far away.



FOR BEST ORGANIC PRACTICE, USE:

- **Homemade, well-rotted compost** made from materials in your own garden/allotment/ growing plot. This includes well-rotted weeds and plant residues, kitchen waste, low grade paper and card, other compostable household waste, plus shredded woody prunings, lawn mowings, comfrey leaves and other fresh green materials. For how much and when to apply see **Appendix 1** on p. 53.
- **Leafmould**. Made from your own autumn leaves.
- **Worm compost**. Sourced from your own **wormery**.
- **Green manures**. These plants are grown and turned into the soil to improve its nutrients and structure.



ALSO ACCEPTABLE

- **Compost materials, sourced from other places**, such as: straw and hay (from organic sources), shredded prunings, bracken and hops.
- **Composts made from municipal green waste** and other materials, with a recognised organic symbol or conforming to **PAS 100** standard.
- **Autumn leaves from local parks, cemeteries and other traffic free areas**. Seek permission first if in doubt. *Do not* gather leaves from natural woodland.
- **Chipped and shredded wood and sawdust** that has not been treated with preservatives.
- **Composted bark**, from Forest Stewardship Council (FSC) forests, preferably local.
- **Mushroom compost** from certified organic sources.
- **Biochar and other charcoals**. As a soil additive its use should be limited, due to the energy used in its production and the potential to use non sustainable wood sources.





ACCEPTABLE, FOR OCCASIONAL USE

- **Straw and hay from non-organic, non-intensive systems.** But check with supplier to avoid some dangerous persistent weedkillers, such as **aminopyralids** and **clopyralids**, which can contaminate the soil for many years.
- **Off the shelf, bagged growing mixes, certified organic.** Although they are labelled 'compost', they are not the same as your own homemade compost. Make sure it is a soil improver, and not for a more specialist use such as for seeds and cuttings (see **Growing Mixes** on p. 14). Never use those which include peat. See **Peat** in *Not Acceptable* below.
- **Mushroom compost from non-organic mushroom producers,** stored under cover or composted for six months before use.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Peat.** The extraction of peat causes the loss of an ancient habitat, vital for supporting local and often rare life systems. It should never be used. Filtered or recycled peat has been reclaimed from rivers/streams running out of peat land. Some argue that this is still damaging to the natural environment (see **Growing Mixes** on p. 14).
- **Leaves and leafmould collected from woodlands.** This depletes the woodland's natural resources.
- **Any materials contaminated with potentially toxic elements.** Some grass cuttings, from farmland or municipal parks, have been treated with the pernicious weed killers such as **aminopyralids** and **clopyralids**. Their toxicity persists even through the composting process. Check first with your supplier.

Topsoil

If your garden topsoil is inadequate or non-existent you may want to add to it. Use bought in topsoil, conforming to **BSI standards**.



Animal Wastes

Recycling animal wastes imitates nature's own way of recycling nutrients. It is the basis of organic soil fertility. Animal waste is usually in the form of straw-based manure, from horses, cattle, pigs, sheep and chickens. Organic farms recycle manures on their own farm, to keep their organic system 'closed' and completely organic. If you have one near you, however, and they have some spare, this is perfect for use in your growing area.

Like plant waste, the manure should have been well rotted down for at least six months or longer. This stabilises the elements and destroys many of the pathogens that cause diseases.



FOR BEST ORGANIC PRACTICE, USE:

- **Well-rotted manures and bedding from your own poultry and animals,** including herbivorous pets such as rabbits and guinea pigs.
- **Well-rotted straw-based horse, cattle, pig, sheep and goat manures** from local organic systems. See **Appendix 1** on p. 53 for how much and when to apply.



ACCEPTABLE, FOR OCCASIONAL USE

- **Well-rotted livestock manures, from non-intensive systems** i.e where animals are free range.
- **Poultry manures** from non-intensive egg and meat-producing systems i.e free range.
- **Organic or free range chicken manure pellets.**



NOT ACCEPTABLE IN ORGANIC GROWING

- **Products containing human sewage.**
- **Manures from intensive 'factory' farming** – these conditions can lead to high use of drugs and disease.
- **Domestic animal waste,** such as cat and dog faeces and litter.
- **Compost activators containing artificial fertilisers.** Activators can help your compost break down, but if they are based on artificial fertilisers they are not suitable for an organic system.
- **Fresh manures** – unless manure is well rotted, i.e for at least 6 months, the nutrients haven't stabilised and pathogens and weed seeds will not have rotted down sufficiently.

Growing Mixes for Pots and Containers

If you are growing in pots or containers there are a variety of growing mixes you can use. Seeds, for instance, need free-draining material with few nutrients. Mature plants and hungry vegetables need more nutrients, and for as long as possible. The best organic practice is to make your own soil and compost mix, but if you are buying bags from garden centres, make sure the contents are peat free and certified for organic use. See p. 48 for which containers to use.



BEST ORGANIC PRACTICE

- **Make your own growing mix.** This can be a combination of homemade garden compost, top soil (loam), leafmould, sand and/or grit.



ALSO ACCEPTABLE

- **Commercial, off-the-shelf bagged mix, with organic symbol or certified for use in an organic system.** Some include filtered or recycled peat products – do be sure to check certification. See **Peat** in *Not Acceptable* opposite.
- **Commercial growing mixes** which contain the materials listed in the green **Soil Improver** section on p. 11.
- **Fertilisers and minerals**, added as part of the mix. Check they are sourced from those listed in the next section.



ACCEPTABLE, FOR OCCASIONAL USE

- **Top soil** bought in from a sustainable source.
- **Seaweed products** are often used to add nutrients and help the mix hold moisture, but make sure it is sustainably sourced.
- **Sulphur.** This is used to increase the soil's acidity (i.e lower its pH value).
- **Horticultural sand and grit.** Used to help free drainage in the mix, prevents clogging.
- **Vermiculite and perlite.** Used in the growing mix to help with aeration and water penetration.
- **Coir.** Used to create the right soil texture.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Peat.** The extraction of peat causes the loss of an ancient habitat, vital for supporting local and often rare life systems. It should never be used. Filtered or recycled peat has been reclaimed from rivers/streams running out of peat land. Some argue that this is still damaging to the natural environment. Check the certification.
- **Growing media that contains materials not approved in these guidelines and isn't certified organic.** This includes non-organic fertilisers.

FOR ADVICE ON:



1. Making compost, go to www.gardenorganic.org.uk/compost
2. Making your own growing mixes, go to www.gardenorganic.org.uk/peat-free-growing
3. Growing in containers, go to www.gardenorganic.org.uk/container-growing

Fertilisers

Organic Fertilisers

Fertilisers, which can be granular, liquid or fungal, are not the same as the bulky homemade compost, discussed on p. 10. On the whole, organic growers don't need fertilisers as their soil is in excellent condition. Think of it as giving a healthy person unnecessary extra vitamins. However, organic fertilisers can be used where a soil deficiency occurs which cannot be remedied otherwise.

Fertilisers suitable for use in an organic garden are of plant, animal or mineral origin. Most of them are waste products; however, the mining and/or shipping of some of these products can have an adverse environmental impact. Choose one with a recognised organic symbol.

Plant Based Fertilisers:



BEST ORGANIC PRACTICE

- **Home grown nettle, comfrey and other leaves** dug into the ground in a **planting trench** or added as a **mulch**. (For plant based liquid feeds, see overleaf.)
- **Wood ash**, from wood not chemically treated, and recycled through the compost heap.



**ACCEPTABLE, FOR OCCASIONAL USE**

- **Dried seaweed** – check that it is from a recognised sustainable source.
- **Fertilisers based on plant waste products and extracts**, such as comfrey, lucerne, cocoa shells, and *Kali Vinasse* (a high potash fertiliser made from plant material).
- **Mycorrhizal fungi**. If your soil is truly deficient, then these may help as a spot treatment when planting.

**NOT ACCEPTABLE IN ORGANIC GROWING**

- **Soot**. Contains fine particles which can readily enter the lungs and irritate the skin. It contains phenols, hydrocarbon aromatic compounds – and is a known carcinogen.
- **Calcified seaweed**. This is usually sourced from coral beds, thus destroying a natural and rare habitat.

Animal Based Fertilisers:**ACCEPTABLE, FOR OCCASIONAL USE**

- **Meat, blood, bone, hoof and horn meals**.
- **Chicken manure pellets**, from organic sources only, with a recognised organic symbol.
- **Wool based products**.

**NOT ACCEPTABLE IN ORGANIC GROWING**

- **Guano and urea**. Harvesting the former from seabirds or bats can have disastrous environmental consequences. The latter is usually artificially created as a growing fertiliser.

Mineral Based Fertilisers:

These can supply important trace elements to your soil, and help raise the pH (making it less acid.) See **Appendix 2** on p. 54 for a full list of **Mineral Based Fertilisers** and **Materials to Provide Trace Elements** which are acceptable (and not acceptable) in organic gardening.



Liquid Feeds and Tonics

Organic liquid feeds provide nutrients in a more readily available form than composts and fertilisers, but do little to encourage soil flora and fauna. For this reason, in organic gardening they are only used on plants growing in a restricted environment such as a container – seed tray, pot, growing bag, hanging basket etc – or in a greenhouse or polytunnel soil border. As always, in organic growing, the major supply of nutrients should come from the compost or soil in which the plants are growing.

**FOR BEST ORGANIC PRACTICE, USE:**

- **None** – your soil is in excellent condition and able to support healthy plant growth!

**ALSO ACCEPTABLE**

- **Homemade liquid feeds** made from comfrey leaves, nettles and other plant wastes.
- **Liquid feeds made from manures from your own livestock**.
- **Liquid from a wormery/worm compost**.
- **Liquid feeds based on plant products that are certified organic**.
- **Liquid seaweed extract and bacteria based stimulants**.

**ACCEPTABLE, FOR OCCASIONAL USE**

- **Liquid feeds made from farm animal manures** (see **Animal Wastes** on p. 13 to check what is acceptable).
- **Commercially available, organically certified, liquid feeds based on animal by-products**.
- **Products containing trace elements to correct deficiencies** that cannot be corrected in any other way.
- **Products containing waste material from the organic fishing industry**.

**NOT ACCEPTABLE IN ORGANIC GROWING**

- **Fish waste products**, unless from an organic source. Much fish farming is highly intensive and uses chemicals to control diseases and water quality.
- **Products containing artificially produced nutrients**.



Encourage Biodiversity



Simply put, 'biodiversity' means many different life forms. For the gardener, this can be done in three simple ways:

Growing different types of plants, so that a variety of flowers, vegetables, trees and shrubs are all present.

Providing habitats and food for wildlife such as birds, insects and mammals. They are not only a delight to look at, but each species has its role in maintaining a natural balance.

And feeding the soil life. A healthy soil is full of bacteria, fungi, microbes and creatures which create the right environment for plants to thrive, releasing nutrients and creating good soil structure.

With this variety of different species, all working together, the organic grower encourages a healthy interdependency between plants and wildlife. This, in turn, creates a resilient growing area.

The benefits of encouraging biodiversity:

- **Helps manage pests and diseases.** Varying your planting, whether vegetables, fruit or flowers, helps prevent the build-up of soil diseases. You will also create a variety of food sources and shelter for birds and insects. Encouraging this wildlife into your garden will help control many pests. Birds and insects eat aphids for example; frogs and ground beetles eat the slugs.
- **Supports soil life.** Adding well-rotted natural materials, such as homemade compost, will feed the tiny soil microbes and other life forms, such as worms. These soil creatures help create a better soil structure, as well as digesting waste matter and secreting nutrients.

In this chapter we look at:

- **Ways to build a biodiverse system**
- **Encouraging wildlife**



Ways to Build a Biodiverse System



BEST ORGANIC PRACTICE

- **Create a fertile, biologically active soil.** Add composted organic materials to enrich soil life. (See **Soil Cultivation Techniques** on p. 8)
- **Grow a mix of different plants to provide food, shelter and habitats for wildlife.** Grow flowers, shrubs and vegetables which flower (and seed) at different times to provide food for insects and birds. This also creates diverse areas for shelter and nesting.
- **Leave some 'relaxed' areas.** Don't be too tidy – leaves under a hedge, old wood piles, weeds or longer grass, will feed and shelter wildlife.
- **Recognise that weeds (in the right location) can bring something positive to your garden.** Some provide food for pollinators.
- **Create diverse areas, such as long grass, bushes, hedges and ponds.** These will encourage a mix of wildlife, including beneficial insects (hoverflies, ladybirds etc), hedgehogs, toads, frogs and birds.
- **Some pests are always present.** Don't exterminate them. For instance, aphids and slugs are a necessary food source for valuable predators such as birds and ladybirds.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Use of weedkillers and pesticides which contain toxic chemicals.**
- **Extensive use of hard surfaces (paving, gravel or decking) which reduces the amount of growing areas.** Not only does this prevent soak away for rainwater, it also deters natural lifeforms and reduces habitats.
- **Monoculture planting.** This is where just one species is planted extensively, to the exclusion of other diverse species. Examples include growing rows of bedding plants which all flower at the same time, or just one type of vegetable throughout the growing area. This limits the food sources or habitats for wildlife, and does little to enhance soil life.

FOR ADVICE ON:

1. How to manage your soil, go to www.gardenorganic.org.uk/managing-your-soil
2. How to grow an organic lawn, go to www.gardenorganic.org.uk/organic-lawn
3. How to encourage wildlife into your garden, go to www.gardenorganic.org.uk/wildlife-gardening
4. Creating a garden pond, go to www.gardenorganic.org.uk/creating-pond



Encouraging Wildlife

Birds, insects, small mammals and amphibians not only add to the biodiversity of your growing patch, but also many of them act as predators on pests such as slugs, snails and aphids. As a result, there is no need for toxic chemicals. Whether you grow in pots in a backyard, a window box or an allotment, it's exciting to know that you can encourage all sorts of wildlife – from a moth to a bat, a robin or a bumble bee.



BEST ORGANIC PRACTICE

- **Grow a mix of different plants to provide food, shelter and habitats for wildlife.** Flowers, shrubs and vegetables should all be grown, to provide food for insects and birds. This also creates diverse areas for shelter and nesting.
- **Grow a variety of flowers, which bloom and seed at different times.** Flowers support insect and bird life. They can provide nectar for butterflies and bees; leaves for caterpillars and beetles; stems for insects to hibernate in; night scent to attract moths; as well as seed heads as a source of food for birds during winter.
- **Grow trees and shrubs.** If you have the space, plant trees and shrubs. They provide a rich larder of leaves and fruits, shade and shelter, as well as perching and nesting areas.
- **Look after the birds.** Provide suitable habitat for them to nest and perch. Feed them in the winter, and make sure they have access to water. Check RSPB guidelines.
- **Create a garden pond.** This creates a suitable habitat for amphibians such as frogs, toads and newts to breed, and provides water for birds.
- **Create nesting areas for insects.** You can create sheltered conditions for aphid-eating ladybirds and pollinators such as bees and hoverflies to overwinter.





Use Resources Responsibly

Reduce, reuse and recycle is an important part of organic growing. This efficient use of materials and energy helps to maintain the natural environment and conserve resources. Where possible, the organic grower uses natural resources, such as wood and plant material, and sources them locally, to reduce their energy footprint.

If there is a need for a non-natural resource, such as plastic, then consider the following:

- **Can I buy a plant-based product instead?**
- **Is it sturdy enough so it can be repaired or reused?** Plastic pots, compost bins and wheelbarrows are good examples of this.
- **How do I dispose of it at the end of its life?**

Sometimes it is a positive challenge to be an organic grower, one where you can use your consumer power, particularly at garden centres, to encourage organic practices. There are also some organisations which promote careful use of resources in manufacturing. Look out for the *Made Aware* standard, for instance, promoted by LOFA (Leisure and Outdoor Furniture Association). It endorses businesses that seek ways to improve the environmental and ethical impact of their products.

All resources are finite. Waste should be avoided. For instance, the capture of rain water is invaluable, instead of using precious mains water. Indeed, some natural resources should *not* be used, like woodland leaf litter, either because they are scarce, or because they are important within their natural habitat.

In this section we look at the organic principles on the use of:

- **Water**
- **Energy**
- **Wood**
- **Plastic**
- **Growing containers**

Water



BEST ORGANIC PRACTICE

- **Collect as much rainwater as possible.** By not using mains water, you can reduce your personal water footprint significantly.
- **Grow drought tolerant plants** if your soil is light and free draining.
- **Maximise the water holding capacity** of soil by adding organic matter (see **Soil Improvers** on p. 10).
- **Mulch (cover) the soil** to reduce water loss, using organic materials (see **Mulches**, p. 36).
- **Keep digging to a minimum**, to prevent moisture loss and avoid disrupting the rich soil life.
- **Sow or transplant just before rain is forecast**, rather than just before a spell of dry weather.
- **Careful watering**, means using water only to get plants established. Shrubs, trees and perennials rarely need watering.
- **Apply water to the soil rather than foliage.** If water hits the leaves of the plant before the soil, much can be lost (and wasted) through evaporation. Water that is directed into the soil will penetrate straight to the roots. It is therefore better to use a drip irrigation system rather than a sprinkler.
- **Do not mow in very dry conditions.** Leaving the grass a little longer helps preserve moisture in the soil. Most lawns will recover after a temporary drought.
- **Allow weeds such as clover and yarrow to grow in a lawn;** they are less susceptible to drought, and will stay green in dry weather.
- **Apply water in the evening or at night** to minimise losses through evaporation.
- **Fill newly-created ponds with rainwater**, and be careful during construction to prevent leaking membranes.



ACCEPTABLE, FOR OCCASIONAL USE

- **Use 'grey' water, from baths, sinks and showers, to water non-food plants.** This is a useful way of recycling water, but excessive soap and detergent could build up in the soil.
- **Commercially available fibrous mats.** Used in container growing to hold water. Reusable.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Wasteful use of water**, such as lawn sprinklers. Lawns will nearly always recover from a period of drought.

FOR ADVICE ON:

1. How to manage your soil, go to www.gardenorganic.org.uk/managing-your-soil
2. How to grow an organic lawn, go to www.gardenorganic.org.uk/organic-lawn
3. Creating a garden pond, go to www.gardenorganic.org.uk/creating-pond



Energy

Organic principles encourage careful use of energy – whether it is the use of power tools, heating or machines. Where possible you should use sustainable energy sources – such as solar or water power, and be mindful of ‘embedded’ energy in a product’s manufacture, packaging and transportation.

✓ BEST ORGANIC PRACTICE

- **Use manual, rather than powered, tools** e.g. push lawnmower, shears, lawn rake.
- **Buy second hand, or sturdy, long lasting tools** and recycle and repair tools where possible.
- **Use solar energy** for lighting garden paths and sheds, running water pumps, and greenhouse ventilation.
- **For climate control in the greenhouse** use manually controlled vents, insulate, and use a lean-to back wall to store solar heat. Grow plants that suit the season to reduce requirement for heating. If you can access sufficient manure, use it in a **hotbed** for raising seedlings.
- **For stakes and supports**, use woody growth from the garden.

✓ ALSO ACCEPTABLE

- **Use fleece** to protect plants in greenhouse or cold frame from frost.
- **For any heating** use ground source heating systems or solar hot water panels.
- **Use A++ appliances** such as fridges, when needing to store produce.



⊂ ACCEPTABLE, FOR OCCASIONAL USE

- **Petrol and electrically powered tools** only until they can be replaced by alternatives. Where possible share their use with other growers.
- **Plant-based oils** where engine or lubricant oils are needed as they are fully biodegradable. However, they are often made from monoculture plant sources which are damaging to the environment.
- **Gas, electricity and other fuels** from non-renewable sources to heat greenhouses and equipment. Only use when essential and with care to minimise losses.

✗ NOT ACCEPTABLE IN ORGANIC GROWING

- **Inefficient and wasteful use of fossil fuels** such as patio heaters.

Wood

Wood has many uses for the gardener: to build sheds, fences, compost bins, support structures, bed-edging or garden furniture, or to make attractive containers. Check the source of the wood. Is it local, sustainable, or reclaimed? There are few wood preservative treatments for use in an organic garden (see **Appendix 4** on p. 56). To minimise the need for them, choose the most appropriate timber for its use. Hard woods will resist rot longer than soft woods. Use a metal ‘foot’ for timber stakes.

✓ BEST ORGANIC PRACTICE

- **Your own supply** – for stakes and plant support, use wood cut from your own garden or allotment.
- **Careful wood choice** – choose species of wood more resistant to rotting.
- **Minimise replacement** – accept that the wood will rot eventually, and replace it as necessary.

✓ ALSO ACCEPTABLE

- **Organically grown timber**, preferably local.
- **Sustainably sourced wood** that has been bought in, preferably from local sustainable sources.
- **New timber from sustainable sources**, with an accredited mark to prove it. These include Forest Stewardship Council (FSC), Programme for the Endorsement of Forest Certification (PEFC) or the Soil Association (SA) woodmark. UK or European produced timber is preferable, as it has lower transport miles.
- **Reused, second-hand/reclaimed timber**. However, it can be difficult to know if it has been treated with preservatives, other than linseed oil.
- **Reuse scaffolding boards** for raised beds. Make sure they have not been treated with creosote or other preservatives.
- **Use linseed oil** for treating wood.

~ ACCEPTABLE, FOR OCCASIONAL USE

- **Synthetic 'wood' alternatives**, made from recycled materials such as plastics (see **Plastics**).
- **Wood that has had treatment that doesn't include chrome and arsenic**. There are more environmentally sound treatments available, either as preservatives or paints. Check online for their availability, and see **Appendix 4** on p. 56.

✗ NOT ACCEPTABLE IN ORGANIC GROWING

- **Wood from unsustainable forests**, particularly from tropical regions. Forests absorb the planet's carbons, helping to offset global warming. Virgin tropical rainforests are increasingly rare and need to be preserved.
- **Wood treated with creosote**, such as old railway sleepers. Made from tar and other chemicals, creosote is potentially carcinogenic, and can leach out into the soil and water.
- **New and reused wood treated with copper chrome arsenic** pressure treatment.

Plastic

In principle, organic growing involves using non-renewable resources, such as plastic, as little as possible. And its use should have minimal impact on the environment. However, any gardener will encounter plastic at some stage – from pots to polytunnel, wheelbarrows and watering cans. The longevity of plastic as a medium can be an advantage (plastic tools, such as wheelbarrows, require minimal replacement and maximum reuse) and there are arguments for using recycled plastics, as they keep the plastic out of landfill, where they rarely decompose.

Ideally, you should try to *reduce* the amount you use, always *reuse* it if possible, and check that it can be *recycled*.



✓ BEST ORGANIC PRACTICE

- **No use of plastic.**

✓ ALSO ACCEPTABLE

- **Plastic-like material, that is completely biodegradable**, and has been produced from plant substances.

i Explanations of **highlighted** words can be found in the Glossary on page 50





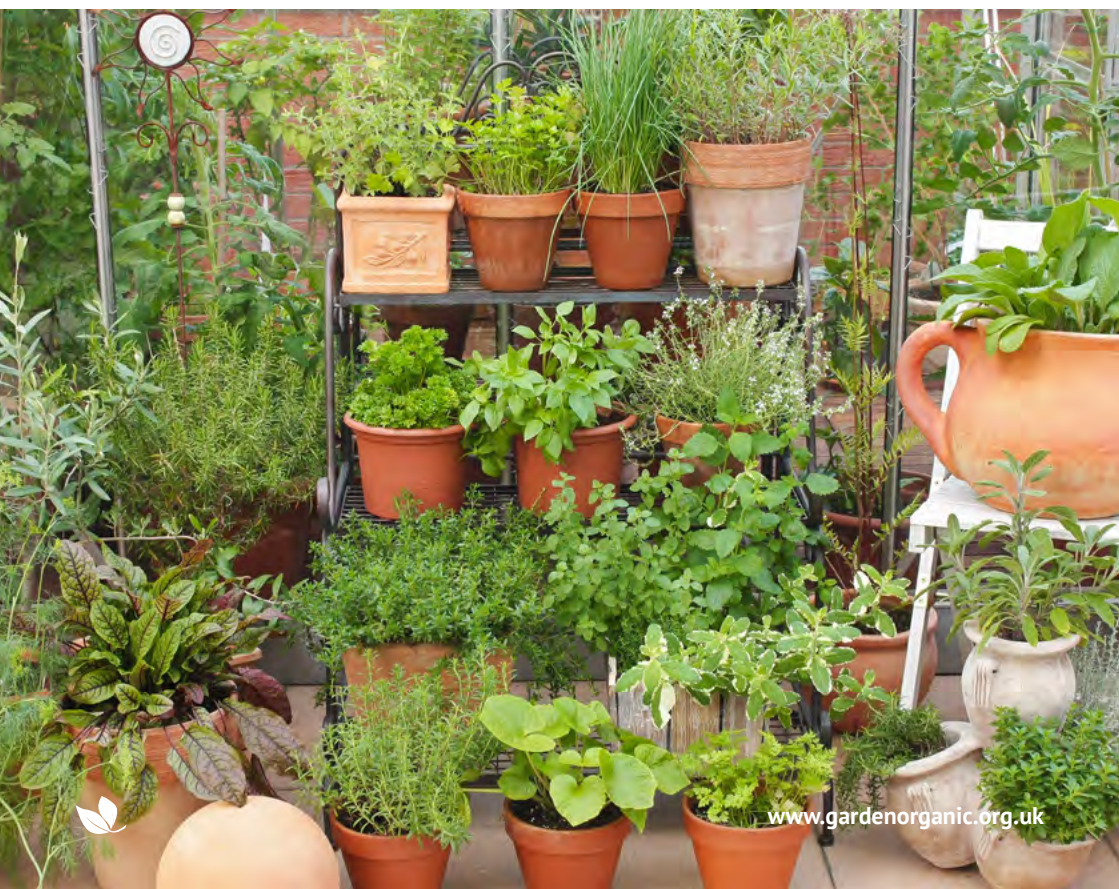
ACCEPTABLE, FOR OCCASIONAL USE

- **Reuse of plastic containers for growing in**, especially those made from recycled plastic, this includes plant pots. Food and drink containers, sacks and crates can all be used as containers so long as they are certified as 'safe' i.e do not leach chemicals. (See Appendix 3, **Plastics You Can Plant In** on p. 55)
- **Use of plastic sheets for mulch**, provided their use is not permanent. (See **Weed Management**, p. 36)
- **Use of plastic netting or mesh** as a barrier for pests.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Styrene**, used in meat and bakery trays and styrofoam containers. This is a potential carcinogen. Also polystyrene chips.



Growing Containers

Many of us grow vegetables and flowers in containers – from hanging baskets to balcony boxes. Where possible, make your own growing mix (see **Growing Mixes** on p. 14). Here are the guidelines for container construction, following the organic principles of sustainability (reduce, reuse and recycle).



BEST ORGANIC PRACTICE

- **Homemade paper pots**, and wooden trays (see back for sourcing wood).
- **Hanging basket liners made from recycled, biodegradable materials** such as moss from your lawn, long grass cuttings (hay), or a pure wool garment.



ALSO ACCEPTABLE

- **Reused plastic** pots and trays, preferably from recycled plastic, clay pots.
- **Reused wooden** trays and boxes, made from sustainably sourced and certified wood.
- **Commercially available biodegradable** hanging basket liners.
- **Commercially available pots and containers made from paper, plant wastes and other biodegradable material**, excluding peat.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Tyres**, unless lined first. It is thought that tyres will leach various toxic chemicals into the soil as they degrade when in contact with sun and water.
- **Styrene**, used in meat and bakery trays and styrofoam containers. This is a potential carcinogen. Also polystyrene chips.
- **Pots made from peat**. See **Peat** on p. 15.
- **Moss gathered from the wild** for hanging basket liners.



Avoid Using Harmful Chemicals

To many people this is the most obvious organic gardening practice – avoid using toxic chemicals. In truth, if you follow the other four principles you will naturally find that you neither need nor want to use harmful chemicals in your growing area. However, persistent pest and weed problems may tempt you to reach for the poison. Here are two main reasons why not:

- **Pesticides and weedkillers can also destroy other life forms.** We know that neonicotinoids (that are used to kill insects) also affect bees and other pollinators, and toxic weedkillers can harm soil-life and create residues in the soil.
- **These chemicals can cause serious pollution** – either in their manufacture, or from their own residues.

The organic gardener will tolerate, not obliterate. For instance, some weeds – such as dandelions – are beneficial to pollinators. Others, such as nettle leaves, provide nutrients for the compost heap and can be used to make an organic plant feed. Insect pests, such as aphids, are food for beneficial insects such as hoverflies and ladybirds. And even the slug is nutritious for thrushes and ground beetles.

In this chapter we look at:

ORGANIC WEED MANAGEMENT

- **Clearing weedy ground** i.e in a new allotment or garden
- **Ongoing weed management** – in beds, paths and lawns

MANAGING PESTS AND DISEASES

- **Physical methods** – barriers, covers, general maintenance
- **Sprays and powders**
- **Rodent control**

Organic Weed Management

Weeds compete for light, water, nutrients and space with 'desired' plants. They also rapidly appear in any bare soil. However, weeds also bring biodiversity to a garden and some can be vital to the survival of butterflies, bumblebees and other wildlife. Here below are many ways of preventing, and managing, weeds, so that they grow where you want them to.

Clearing weedy ground

If you are taking on a new allotment or garden, clearing weedy ground is inevitable. There are no organic weedkillers that clear the ground of perennial weeds – and sadly some weeds you may be unlucky enough to live with, such as marestail. However there are other methods, such as digging out and **mulching**, that can help you clear weedy ground. Although slower than the 'quick fix' of chemicals, a mulch can also feed the soil – supplying nutrients and giving it a better texture. Different mulches are described below.



BEST ORGANIC PRACTICE

- **Cover the ground with a mulch** (see overleaf for types of mulch).
- **Dig out weeds by hand**, especially those with long, sustaining roots such as bindweed and dock.
- **Use chickens to grub out weeds**. But beware, they can also grub out precious plants!
- **Mow or cut weeds** which don't have long, sustaining roots. The foliage can be added to the compost heap.
- **Accept that some weeds may be of benefit to the garden**, such as dandelions and nettles. If left to grow where they won't compete with your chosen plants, they provide habitats and food for beneficial insects, and their foliage provides nutrients for the compost heap.



ACCEPTABLE, BUT NOT ADVISABLE

- **Use a rotavator to dig the ground over**. However, this not only destroys the soil life and structure, it doesn't clear a whole weed root system such as couch grass or bindweed.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Use of weedkillers** containing chemicals, such as glyphosate formulations like Roundup, Weedol etc.

FOR ADVICE ON:



1. How to clear a growing area, such as a new allotment or veg patch, using mulches, go to www.gardenorganic.org.uk/organic-allotment-growing
2. Weeds and how to manage them, go to www.gardenorganic.org.uk/weed-management
3. Glyphosate, go to www.gardenorganic.org.uk/glyphosate-debate



Mulches for weed clearance or control

BEST ORGANIC PRACTICE

- **Light-excluding fabrics** made from paper, wool, hemp and other natural materials. This starves the weeds of light. If you add any recycled plant materials such as leaves, grass cuttings, straw and compost underneath, you will improve the soil nutrients and structure.
- **Cardboard and newspaper.** These also exclude light.

ACCEPTABLE, FOR OCCASIONAL USE

- **Permeable synthetic materials.** These are usually sheets of polypropylene, polyethylene or other polycarbonates, for temporary ground clearance, long-term plantings and for laying under paths, driveways etc.
- **Impermeable synthetic materials,** such as black polythene – for *temporary* ground clearance and to contain invasive root systems.
- **Carpet made from natural fibres, with natural plant dyes.**

NOT ACCEPTABLE IN ORGANIC GROWING

- **Any materials from unsustainable sources.** This includes natural materials, such as leaves, moss and plants taken from woodland.
- **Carpet made from artificial fibres.** The dyes can be toxic and leach into the soil.

FOR ADVICE ON:

1. How to clear a growing area, such as a new allotment or veg patch, using mulches, go to www.gardenorganic.org.uk/organic-allotment-growing
2. Weeds and how to manage them, go to www.gardenorganic.org.uk/weed-management



Ongoing weed maintenance

Prevention is the best method to keep on top of weeds, certainly to stop them from spreading and setting seed. Here we look at weed prevention in beds, lawns, paths, drives and other hard surfaces.

In beds:

BEST ORGANIC PRACTICE

- **Plant using close spacing (where appropriate);** **intercropping** and **undersowing** will prevent bare soil where weeds can germinate and grow.
- **Grow ground cover plants,** including **green manures,** which also prevent bare soil.
- **Clear perennial weeds thoroughly** before planting perennial plants.
- **Hand weeding,** hoe, dig out.
- **Cover bare soil with a mulch** (see opposite for types of mulches).
- **Create a stale seedbed.** If you are sowing in a bare patch of land, let weeds germinate first, remove, then sow.

NOT ACCEPTABLE IN ORGANIC GROWING

- **Use of weedkillers** containing chemicals, such as glyphosate formulations like Roundup, Weedol etc.

In lawns:

BEST ORGANIC PRACTICE

- **Accept a certain level of 'weeds' in a lawn** and recognise their benefits for soil and pollinators.
- **Choose appropriate varieties of grass seeds** for location and use.

NOT ACCEPTABLE IN ORGANIC GROWING

- **Use of weedkillers** containing chemicals, such as glyphosate formulations like Roundup, Weedol etc.

In paths, drives and other hard surfaces:



BEST ORGANIC PRACTICE

- **Construct paths, driveways and other hard surfaces well**, to prevent weeds growing through from below, or taking hold on the surface.
- **Hoe gravel.**
- **Reduce shade from plants** to discourage algae and moss growing on damp, hard surfaces.
- **Clean with a stiff brush.**



ACCEPTABLE, FOR OCCASIONAL USE

- **Pressure wash.**
- **Use a thermal/flame weeder.**
- **Weed killing sprays containing fatty acids**, such as pelargonic acid, as the active ingredient.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Use of weedkillers** containing chemicals, such as glyphosate formulations like Roundup, Weedol etc.

FOR ADVICE ON:

1. How to grow an organic lawn, go to www.gardenorganic.org.uk/organic-lawn
2. Glyphosate, go to www.gardenorganic.org.uk/glyphosate-debate
3. Weeds and how to manage them, go to www.gardenorganic.org.uk/weed-management



Managing Pests and Diseases

The idea of a healthy garden, rather than one which has pest and disease free plants, is at the heart of organic growing (see **A Healthy Growing Area**, p. 42). Prevention rather than treatment is the organic principle. Be observant and check your plants regularly and as often as possible.

Having a healthy growing system will prevent many pests and diseases. Biodiversity, having many different species in your garden, helps to create this resilient system. Plants, animals, birds and soil life all work together to manage pests and diseases – birds will eat aphids, insects will pollinate plants and earthworms will help break down the soil, releasing nutrients. The use of toxic chemicals can seriously damage and disrupt this complex interdependency of wildlife (see **Encourage Biodiversity** on p. 18).

In this section we look at the organic principles behind managing pests and diseases using:

- **Physical methods**
- **Sprays and powders**
- **Rodent control**

Physical Methods



BEST ORGANIC PRACTICE

- **Encourage biodiversity.** See p. 18.
- **Check plants regularly**, squashing or picking off pests and infected foliage as they occur.
- **Shake the plant** or dislodge pests with a sharp jet of water.
- **Learn about the life cycle of pests and diseases** to help develop strategies to combat them.
- **Learn to tell the difference between creatures** that can harm plants and those that will not.
- **Cabbage root fly mats**, preferably homemade from recycled felt or cardboard.
- **Dry matter against slugs.** A barrier of suitable dry matter, such as grit, wool, oats, copper bands etc. may be used to deter or dehydrate slugs.



Explanations of **highlighted** words can be found in the Glossary on page 50

**ACCEPTABLE, FOR OCCASIONAL USE**

- **Biological agents that help control pests.** These are natural controls, such as nematodes, that can be purchased for controlling specific pests.
- **Barriers to cover crops** and protect them from pests such as carrot fly, cabbage white butterfly and birds. These include **cloches**, that can be homemade from reused plastic bottles and recycled window glass, and **horticultural fleece, fine mesh, netting and wire**. As these are often made of materials such as types of plastic, be sure to keep for reuse.
- **Electric fencing** – to prevent rabbits, foxes and deer.
- **Fruit tree grease and grease bands** – to prevent insect infestation.
- **Yellow sticky traps, without added pesticides.** For use in greenhouse, coldframe or conservatory only.
- **Slug traps baited with beer or other attractants.** Make sure their edges are raised slightly above ground so as not to drown ground beetles and other helpful insects.
- **Commercial granules (slug pellets)** that are organically approved, and contain **ferric phosphate** only, never metaldehyde. Use sparingly.

**NOT ACCEPTABLE IN ORGANIC GROWING**

- **Use of toxic chemicals to destroy pests**, such as poisons, insecticides and slug pellets containing metaldehyde.

FOR ADVICE ON:

1. Pest and disease management, go to www.gardenorganic.org.uk/pests-and-diseases



Sprays, Powders and Pellets

There are a few pesticide sprays that can be used in organic growing, but they are not harmless, and it is good practice to keep their use to a minimum, since they can still disrupt the natural ecosystem, and may harm other creatures. It is advisable to use only those products containing the 'active' ingredients listed opposite.

If you find yourself having to use pesticides regularly, despite using the other strategies suggested, then consider growing something different, or putting the plants in a different place.

**ACCEPTABLE, FOR OCCASIONAL USE**

- **Commercially available plant oils, plant based products and starches** which affect the pest, not necessarily the plant i.e they can cause the pest to asphyxiate, or lose its protective covering. *Note, use only products certified for organic growing. However, some may have been certified in other countries, and therefore not legal for organic use in the UK i.e those containing neem oil.*
- **Commercial slug pellets** that are organically approved, and contain **ferric phosphate** only, never metaldehyde. Use sparingly.
- **Natural pyrethrum products** (pyrethrins extracted from *Chrysanthemum cinerariaefolium*)
- **Microbes and microbial extracts.** For example, *Bacillus thuringiensis* (Bt), which is only available to professional growers.
- **Fatty acid sprays.**
- **Potassium bicarbonate** for the treatment of powdery mildew.
- **Sulphur** – used as a tonic to prevent black spot in roses.
- **Diatomaceous earth.** The dust from diatomaceous earth is used as an insecticide, causing insects to dry out and die.

**NOT ACCEPTABLE IN ORGANIC GROWING**

- **Any active ingredient/product not registered with hse.gov.uk/pesticides**
This includes homemade pesticide sprays, those made from washing up liquid, chilli powder or any other household products.
- **Copper based fungicides.** Organic farmers have to apply for special permission to use this.

Rodent Control

**ACCEPTABLE, FOR OCCASIONAL USE**

- **Mouse and rat traps.**
- **Rat and mouse poisons**, approved by the HSE Pesticides Guidance, used in tamper-proof bait stations.

**NOT ACCEPTABLE IN ORGANIC GROWING**

- **Any active ingredient/product not registered as a poison with hse.gov.uk/pesticides**



A Healthy Growing Area

Keeping your growing area in good health, rather than just pest and disease free, is at the heart of organic growing. Creating a diverse and vigorous growing system, good hygiene, and close observation all help prevent problems.

To achieve a healthy growing area, you should:

- **Keep your soil in good condition.**
- **Source healthy plants which are well suited to where they will grow.**
- **Be observant** – often problems arise from failing to spot the first signs of disease. Frequent and early intervention prevents problems escalating.
- **Practise good hygiene.**

In this section we look at:

- **Keeping plants and soil in good health**
- **Sourcing plants, seeds and bulbs**
- **Cleaning tools, greenhouses and polytunnels**
- **Healthy growth in pots and other containers**



Keeping Plants and Soil in Good Health



BEST ORGANIC PRACTICE

- **Create a fertile, biologically active soil.** Add composted organic materials to help reduce soil pests and diseases, and to encourage strong plant growth. (See **Soil Cultivation Techniques** on p. 8).
- **Start with healthy plants.** Seeds, tubers, plants, fruit bushes, shrubs should all be organic in origin and show no signs of disease. (See **Sourcing Your Plants** on p. 46).
- **Grow plants that suit the location and soil type.** Plants won't thrive if they are not in their ideal habitat e.g. plants that are acid loving in an alkaline soil; those that need full sun or good drainage in a shady, damp area. A weak plant is prone to pests and diseases.
- **Choose varieties with some resistance to pest and disease.** With ever-improving organic plant breeding this is certainly possible.
- **Grow a mix of plants.** This not only provides food, shelter and habitats for wildlife but also helps prevent diseases spreading.
- **Choose sowing and planting dates to avoid specific pests and diseases.** If you plant out tender young green shoots too early, for instance, it can make them susceptible to pests such as aphids. Allow them to mature and harden off before planting out.
- **Plan your planting to include crop rotation.** Avoid planting the same vegetable family in the same place each year. This not only prevents build-up of diseases, but also makes the best use of the soil's nutrients.
- **Keep a good airflow around plants.** To prevent the spread of diseases, prune trees and bushes to create space between branches; keep greenhouses and polytunnels well ventilated; and give space around pots and containers.
- **Careful watering.** Make sure plants are watered sufficiently – neither too much or too little. Always apply water to the soil rather than the plant foliage to prevent moist conditions where diseases can thrive.

FOR ADVICE ON:

1. How to manage your soil, go to www.gardenorganic.org.uk/managing-your-soil
2. Planning your planting, go to www.gardenorganic.org.uk/planting-plan-and-crop-rotation



Sourcing Plants, Seeds and Bulbs

Growing your own plants from saved seeds and cuttings is ideal. It is now possible to add to your varieties by using commercially available organic seeds, plants, bulbs and tubers. If you can't get any at your local garden centre, be sure to ask them why – and whether they can start stocking them. Also check if the soil/compost any plant is grown in is certified organic, without peat and without added pesticides. Very often garden centres will buy in plants with neonicotinoids added to the soil to prevent pests. These chemicals will be taken up by the plant and then affect pollinating insects.

Often specialist nurseries take greater care over the soil and where they source their plants. It is worth seeking them out and checking if their soil is peat and pesticide free.



BEST ORGANIC PRACTICE

- **Home saved seed and plants**, from disease-free parent plants. Helpful guidelines on seed saving are at www.gardenorganic.org.uk.
- **Home grown 'swapped' seed and plants from another organic grower**. Be cautious that you don't inadvertently import disease or pernicious weeds.
- **Seeds, tubers, sets, bulbs, and plants with an organic symbol** from an approved organic certification body.
- **Container grown plants in a peat-free mix**, with an accredited organic symbol.



ACCEPTABLE, FOR OCCASIONAL USE

- **Seeds, tubers, sets and bulbs from non-organic sources**, if unavailable as organic. But check *Not Acceptable* below.
- **Container grown plants and cuttings** without an accredited organic symbol. However, check they are in a peat-free growing media.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Plants taken from the wild**. This can destroy natural habitats and deplete natural specimens.
- **Genetically modified seeds and plants**.
- **Container grown plants that have pesticides within the growing mix**. Check with the supplier, as the soil often contains neonicotinoids, which are used to kill insects.
- **Seeds, bulbs, sets and tubers treated with fungicides**. Check with supplier, or be sure to source organic materials.

Cleaning Tools, Greenhouses, Polytunnels, Pots and Containers

Keeping your growing equipment clean helps prevent diseases multiplying.

Green houses and polytunnels should be washed and wiped down annually, both inside and out. This prevents a build up of dust or algae on the outside, which stops clear sunlight entering, and helps destroy overwintering pests and diseases. Any empty pots and containers should also be checked and rinsed to clear overwintering snails and pests.

Keeping your tools clean will prevent transmission of any disease. This combination of good hygiene methods, and checking your plants regularly, means you won't need unnecessary chemicals.



BEST ORGANIC PRACTICE

- **Hot water/steam** and scrubbing of all working areas.



ACCEPTABLE, FOR OCCASIONAL USE

- **Pressure-washing**
- **Wash with natural plant essences, including citrus juices**. These are available from organic suppliers such as *The Organic Catalogue*.
- **Use natural cleaning products**, such as vinegar, bicarbonate of soda.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Use of domestic cleaning liquids such as bleach**. They contain strong chemicals which are poisonous to wildlife.



Growing in Pots and Containers

If you enjoy growing in pots and containers, you can still follow the organic gardening principles. Think about what your containers are made of (see **Use Resources Responsibly** on p. 22) and be aware that anything growing in a restricted environment will always be more reliant on additional watering and feeding (see **Fertilisers and Liquid Feeds**, p. 15). Plants could also be more prone to pest and disease (see **Avoid Using Harmful Chemicals** on p. 32).



BEST ORGANIC PRACTICE

- **Use an organic growing medium**, ideally home-made compost/soil mix, which provides the correct nutrients for the plant.
- **Use homemade paper pots, wooden trays, recycled non-plastic food containers.**
- **Hanging basket liners made from recycled, biodegradable materials** such as moss from the lawn, hay, or an old pure wool jumper.
- **To clean containers, use steam, hot water, or a high pressure hose.**
- **Maintain a good airflow** between plants, to prevent diseases spreading.



ALSO ACCEPTABLE

- **Commercially bought organic peat free growing medium.**
- **Commercially available biodegradable hanging basket liners.**
- **Reused plastic pots and trays, clay pots** (see **Use of Plastic**, p. 29 and **Appendix 3**, p. 55).
- **Commercially available pots and containers made from paper, plant wastes and other biodegradable material**, excluding peat.
- **Composted organic materials and fertilisers for addition feeding** (see **Soil Improvers** on p. 10).



ACCEPTABLE, FOR OCCASIONAL USE

- **Use organic liquid feeds**, and other organic tonics, only when necessary.
- **Reused food stuff cans** – except those with a chrome lining.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Tyres as a container for growing food crops**, unless lined first. It is thought that tyres will leach various toxic chemicals into the soil as they degrade when in contact with sun and water.
- **Moss gathered from the wild** for hanging basket liners.
- **Hydroponic systems.** These use no soil, just water with fertiliser in solution. This goes against the fundamental premise of organic growing, which uses biologically active soil.
- **Pots or growing mixes made from peat.** The extraction of peat causes the loss of an ancient habitat, vital for supporting local and often rare life systems. It should never be used. Filtered or recycled peat has been reclaimed from rivers/streams running out of peat land. Some argue that this is still damaging to the natural environment.

FOR ADVICE ON:

1. How to grow in containers, go to www.gardenorganic.org.uk/container-growing
2. How to make a soil/compost mix for container growing, go to www.gardenorganic.org.uk/peat-free-growing
3. How to make comfrey liquid feed, go to www.gardenorganic.org.uk/comfrey





Glossary

BSI standard: Established in 1901, the BSI is the world's first National Standards Body. It writes and endorses standards for business trading and practice, ranging from health and safety to environmental management and internet security. Many organic products, such as commercial composts, should embody BSI standards.

Clopyralid: is a herbicide (weed killer) used for the control of broadleaf weeds, especially thistles and clovers in lawns. Unfortunately it is known for its ability to persist, even in dead plants and in compost. Therefore it can affect plants which have been dressed by the affected compost. **Aminopyralids** are used by farmers as herbicides and are similarly persistent.

Crop Rotation: is a method of changing where you grow individual vegetables from year to year. It helps maintain good soil structure, ensures an efficient use of nutrients, helps to control weeds, and prevents a build-up of pests and diseases. See www.gardenorganic.org.uk/planting-plan-and-crop-rotation

Fungicide: Fungi are the main cause of disease in vegetable crops. They include blights, mildew etc. A fungicide is a chemical which kills fungi.

GMOs: Genetically Modified Organisms – plants or living objects which have been genetically engineered in a laboratory. See www.gardenorganic.org.uk/gmos-genetically-modified-organisms

Green Manures: Green manures are plants which are grown to benefit the soil. They can improve soil fertility, by holding valuable nitrogen, and improve the soil structure by giving it better drainage or water retention. They also can suppress weeds and attract beneficial insects. They are sometimes called 'cover crops'. See www.gardenorganic.org.uk/green-manures

HSE Pesticides Guidance: This is the website of the Health and Safety Executive, which authorises pesticides, as well as guidance on how to use pesticide products safely. It also gives information about controls over pesticide residues in food. See www.hse.gov.uk/pesticides

Hot bed: This is usually made from a pile of decaying organic matter, such as well-rotted farmyard manure, which gets hot naturally from the metabolism of the microorganisms in the decomposing pile. They are usually made in a coldframe or greenhouse, where you can use this 'free' heat to start growing early in the year.

Intercropping: Growing more than one crop on an area, for example, planting lettuce beneath runner beans. Intercropping, under-sowing and catch crops are all ways to help improve soil structure and to prevent bare soil which allows weeds to flourish. See www.gardenorganic.org.uk/catch-crops

Leafmould: is made from rotted down autumn leaves. It is dark in colour and crumbly in texture. Often used as a soil improver, it helps break up clay soils in particular. It can also be used as a mulch. To make leafmould, see www.gardenorganic.org.uk/leafmould

Mulch: To mulch is to create a layer on top of the soil which will exclude light and some moisture. Mulches can be made from natural materials such as straw, newspaper and cardboard, grass cuttings, bush prunings, wood chips, bark, and manure. Sometimes a sheet of plastic membrane is used, particularly in weed suppression – some membranes are more permeable than others.

No Dig: This is a method of cultivation which requires a great deal of surface mulch made from well-rotted manure or compost – and patience. In principle, by avoiding digging you will not be disrupting the soil ecosystem, or exposing it to weed seeds. Instead the existing weeds are in darkness, under the mulch, which causes them to weaken and die. See www.gardenorganic.org.uk/no-dig-method



Glossary continued

Non-intensive systems: Intensive agriculture, also called factory farming, raises animals indoors under tightly controlled systems – often with extensive use of drugs and hormones. Non-intensive systems give the animals access to natural resources, out of doors, and respects their natural behaviours.

PAS 100: This is the national compost benchmark, *BSI PAS 100* stands for the British Standards Institution's Publicly Available Specification. It's a way of defining the quality of the compost. See www.wrap.org.uk/content/bsi-pas-100-faqs

Pathogen: A bacterium, virus, or other microorganism that can cause or carry disease.

Perlite: A mineral which can be added to soil to help aeration and drainage. Like vermiculite (see below) it holds water but doesn't become soggy.

Planting trench: This is a trench, about two spade heads deep, which is filled with fresh kitchen vegetable waste. When it is two thirds full, the soil is replaced on top. It supports 'hungry' crops such as runner beans. As the beans grow, the waste will rot and provide moisture and nutrients for their roots.

Stale seed bed: A useful weed control technique which involves creating a seedbed some weeks before seed is due to be sown. This allows any weed seeds that have been disturbed during cultivation to germinate. They can then be hoed off before sowing of the actual crop is carried out.

Vermiculite: A mineral which has the unusual property of exfoliating or expanding into worm-like pieces when heated (the name vermiculite is derived from the Latin 'vermiculare' – to breed worms). Vermiculite in potting compost gives a very light open compost, which holds water well.

Wormery: This is a self-contained unit that is ideal for disposing of kitchen waste. Worms and waste are kept in something as simple as a bucket or, more often, in a sequence of boxes, piled on top of each other. The worms feed on the waste. As raw vegetable and fruit waste have a high water content, the concentrated nutrient rich liquid released by the worms drains into a sump or drainage tray. This can be used as a plant feed.

Appendix 1

How and When to Apply Bulky Soil Improvers

Although adding bulky waste to the soil is a good thing, it is important not to 'overdose' it with nutrient rich manures and composts. This can be a wasteful use of resources, encouraging excessive growth that is more vulnerable to pest and disease attack.

Organic farmers follow strict rules on how and when to apply manure. For instance, a winter application onto the fields will provide too many nutrients, such as nitrates and phosphates, which can leach out of the soil in heavy rains and cause run-off which will pollute water bodies.

We have adapted these rules for farmers in the chart below, to give the organic gardener an understanding of best practice of how much, and when, to apply the following:

Soil Improver	When to Apply	How much per year (approx.)
Compost – garden, homemade	Spring, summer or early autumn	1 x wheelbarrow load per 5 sq. metres
Compost – from local authority, using domestic green waste such as clippings and lawn mowings	Apply at any time	1 x wheelbarrow load per 3 sq. metres
Worm Compost	Apply in spring, summer or early autumn	1 x wheelbarrow load per 10 sq. metres
Leafmould	Apply at any time	In a layer 2-3cm deep
Manure – straw based animal manures (except poultry)	Apply when well-rotted, in spring, summer or early autumn	1 x wheelbarrow load per 10 sq. metres
Manure – poultry bedding material	Apply when well-rotted, in spring, summer or early autumn	1 x wheelbarrow load per 20 sq. metres



Appendix 2

Mineral Based Fertilisers

These can supply important trace elements to your soil.



ACCEPTABLE, FOR OCCASIONAL USE

- **Natural forms of calcium carbonate and calcium/magnesium carbonate**, including ground limestone, chalk, marl and magnesian limestone (dolomite). Use for raising soil pH, and as sources of calcium and magnesium.
- **Calcium sulphate (gypsum).**
- **Ground rock phosphate.**
- **Aluminium calcium phosphate**, where soil pH is over 7.5. (Cadmium content must be less than 90mg cadmium per kg phosphate)
- **Rock dust (stone meal)**, if a by-product of quarrying.



NOT ACCEPTABLE IN ORGANIC GROWING

- **Calcified seaweed**
- **Slaked lime**
- **Soluble chemical fertilisers**
- **Quicklime**
- **Guano, urea**
- **Chilean nitrate**

Materials to Supply Trace Elements



ACCEPTABLE, FOR OCCASIONAL USE

- **Rock dust and stone meals** if by-products of quarrying.
- **Seaweed meal and liquid seaweed extracts.**
- **Sulphur dust or chips.**
- **Calcium chloride solution**, for treatment of bitter pit in apples.
- **Manganese sulphate.**
- **Borax** (for boron deficiency).
- **Epsom salts**, for acute magnesium deficiency.
- **Fertilisers and liquid feeds** containing boron, copper, iron, molybdenum, cobalt, selenium, zinc, sodium.



Appendix 3

Plastics You Can Plant In

There are 7 types of plastics commercially processed and sold. The following are the kinds that are safe to use for planting.



PETE



HDPE



LDPE



PP

PETE or PET bottles. Used for most clear drinks bottles. However, many of these are designed for single use, and therefore can break down with continued use and exposure to light or heat. They have also been found to leach chemicals if exposed to high temperatures.

HDPE (high density polyethylene). Used for opaque milk and water bottles.

LDPE (low density polyethylene). Used in food storage bags and squeeze bottles.

PP (polypropylene). Used in rigid containers, including some flower pots, baby bottles, yoghurt pots, cups and bowls.



OTHER

This code is for miscellaneous types of plastic which don't fit in the above categories.

The following are **NOT** safe for planting in:



V

Polyvinyl Chloride (PVC). Used extensively as a rigid light plastic – from water pipes to wheelbarrows. Constant exposure to heat will cause chemicals to leach. PVC often has chemicals called 'phthalates' added to make it more durable and flexible. Research has shown that phthalates affect our natural hormones, and can lead to reproductive abnormalities.



PS

Polystyrene. Used in food and beverage takeaways, non-cardboard egg cartons and CD/DVD cases. Long term exposure to small quantities of styrene can cause neurotoxic and carcinogenic effects. Styrene is classified as a possible human carcinogen by the International Agency for Research on Cancer (IARC).

Appendix 4

Wood Preservatives

Creosote: Banned in the UK from July 2003. Do not use materials treated with creosote or use up old supplies. Dispose of old supplies safely, contact your local authority to arrange disposal. The substitute 'Creocote' is unsuitable for use in organic systems.

Pressure treated timber: This has been impregnated with chemicals under pressure to ensure full penetration into the wood. Copper chrome arsenate (CCA) treatments that used to be commonly used are now banned for products for domestic use. Safer alternatives include Tanalith E[®], made from a copper and organic biocide (triazole) formulation, and Wolmanite, which contains copper and boron (see below).

Boron compounds: Boron compounds appear to have a low toxicity to humans and the environment. Very soluble in water, so for outdoor use boron is applied in the form of glass rods, inserted into pre-drilled holes in the timber. Timber pre-treated with boron compounds can be purchased, but due to the compound's solubility in wet soil it is only suitable for use above ground or indoors. Liquid borax timber preservatives can also be painted on, for indoor and outdoor use. Glycol borates and impregnated glass rods are only licensed for professional use.

'Natural' preservatives: Plant based wood preservatives are claimed to be safer to use than the traditional chemical materials. We do not have the information to support or refute that claim. Wood pitch and other products extracted from timber have the potential to be as harmful as coal-derived creosotes. Raw linseed oil and tung oil have been used in the past to treat timber outdoors. But they do not prevent mildew.

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About Us

Garden Organic is the authority on all organic gardening matters.

Since 1954 we have researched, promoted, campaigned for and supported organic growing. We provide practical advice – from seed to harvest, from soil preparation to slug management. Visit www.gardenorganic.org.uk/growing-advice for inspiration and advice.

Research. Formerly known as HDRA (the Henry Doubleday Research Association), Garden Organic works in partnership with Coventry University – The Centre for Agroecology, Water and Resilience (CAWR), based at Ryton Organic Gardens.

Education. Our education programmes help teachers and school professionals to develop gardening projects that teach children where their food comes from, develop their scientific and environmental awareness and encourage them to eat more fruit and vegetables.

Healthy communities. Gardening and growing can help reduce stress, increase well-being, and provide non-pharmacological support for those in challenging circumstances. Garden Organic works with care providers, prisons and schools. We have over 500 Master Gardeners across the UK, who support individuals to grow food in their gardens, allotments, windowsills, workplaces and other community growing spaces.

Our heritage. At Garden Organic, we are dedicated to preserving our valuable organic heritage. We run The Heritage Seed Library which conserves local vegetable varieties that are not widely available. We work with sister gardens across the UK to support and promote organic growing.

How to Support Us

Garden Organic's goal is simple – to get more people growing organically. You can help by becoming a supporter. Either by a donation, or by becoming a member. Benefits include on-hand advice and support from our experienced team, free access to affiliated gardens and up to date news on organic gardening issues.



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Organic growing doesn't just mean avoiding the use of chemical weed killers and pesticide sprays. It is more exciting, challenging and satisfying.

It is using natural ways to promote a complete, healthy, productive and sustainable growing environment. It involves feeding the soil, encouraging wildlife, and working creatively alongside nature when managing pests and diseases.

This guide outlines the fundamental principles behind organic gardening. Five simple guidelines which will inspire you to reconnect with nature, adopt a more sustainable lifestyle, and enjoy the benefits of healthy fruit and vegetables. It is for the novice as well as the experienced grower, young and old, urban and country dwellers.

“Easy to understand and clearly laid out, this is the go-to guide for anyone wanting to understand the thinking behind organic gardening.”

CHRIS COLLINS

TV gardener and Head of Horticulture,
Garden Organic



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