

B5.1 Practical gardening techniques



The previous section introduced how to start your garden. This section looks at the detail of growing plants, starting with sowing seeds and moving towards harvesting. There are a few guidelines to follow, but a lot is done by feel and experience. As with B4, every topic has an Activity suitable for pupils and the community (numbers 18-32). See the DVD.

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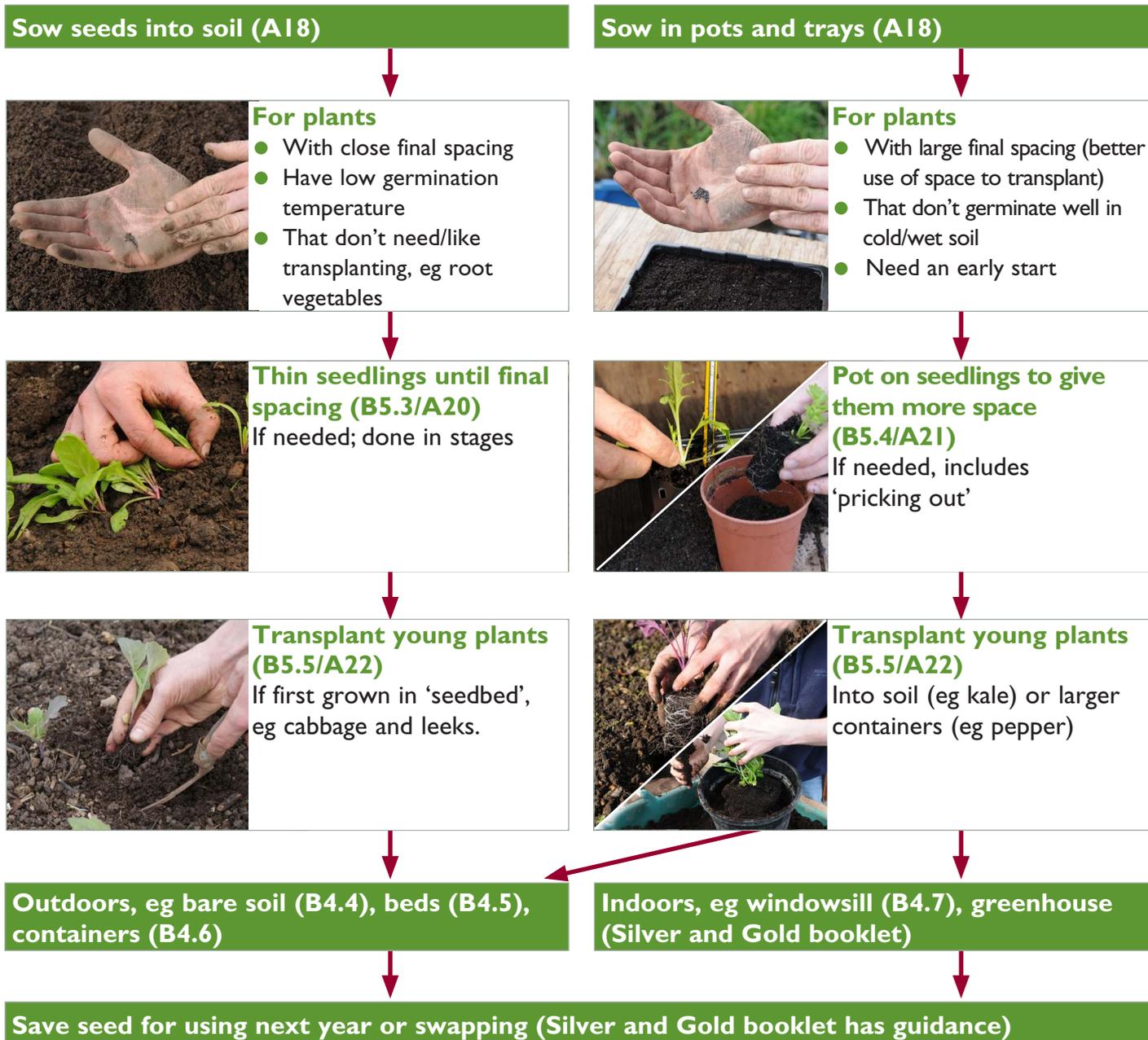


B5.2 Sowing seed



Growing plants from seed is one of the most important and rewarding techniques for gardeners to learn. Once mastered, sowing seed is an easy and cheap way of producing all sorts of plants quickly, whether vegetable, herb, edible flower, 'green manure' or even fruit. This section has an overview of techniques and A18 has step by step instructions.

Seed sowing guide



Choosing seed varieties

Start with good quality seed, ideally organic. Buy new each year or use seed saved by fellow gardeners. Choose plant varieties that suit the following.

- Your available sowing and harvesting times, taking into account school holidays (see B4.11)
- Pest and disease resistance (see B5.10)
- Flavour, type and reliability of variety

Try the seed selection from the Organic Gardening Catalogue (www.organiccatalog.com) and other reputable suppliers.

See also suggested varieties on each Food Growing Instruction Card

What seeds need to germinate

- 1 Temperature** Wait until the recommended month for sowing indoors or out (see seed packets and Food Growing Instruction Cards). You can also check the soil temperature using a soil thermometer.
- 2 Moisture** Soil or compost should be moist, but not wet. Seed won't germinate when dry, while too much moisture may cause them to rot and encourage fungal diseases.
- 3 Light** Many seeds will germinate in either dark or light conditions. Once germinated, seedlings need good light or they will become pale and straggly.
- 4 Sowing depth** Generally, cover large seeds with sieved compost or soil no deeper than twice their size. Very small seeds should be left uncovered or with a thin layer of vermiculite (very fine mineral rock).
- 5 Soil or compost** Use organic, peat-free potting compost or a well-prepared soil with crumbly surface 'tilth' (see A18).

Top tip



Labelling

Always label and date your seeds when sowing inside and out. Also keep a garden notebook. It's easy to forget what you've sown and you might want to grow the same variety next year.

Top tips



Seed sowing

- Try again if seed doesn't germinate first time, checking instructions.
- Only use fresh or well stored seed (see Silver and Gold booklet).
- Have fun and experiment with different seeds.
- Follow instructions on seed packet and Food Growing Instruction Cards.



Health & Safety

Be careful when handling seed, compost and soil, washing hands afterwards. Ensure appropriate adult supervision.

See also *Health and Safety Guidelines (Section B3.3)*

Activities on DVD

- A18 Sowing seed
- A19 Making a paper pot

Further information

- Food Growing Instruction Cards
- Silver and Gold booklet (seed saving guidelines)
- Poster – Seeds and young plants



B5.3 Thinning seedlings



After sowing seed, you may have more seedlings come up than you need. A few extra plants are useful in case of losses by pests and diseases or when unsure about how many plants you need. Too many seedlings though, growing too close together, produce weak plants. The surplus needs to be removed, using a simple technique outlined below and in A20.

Why thin seedlings?

Seedlings restrict each other's growth when overcrowded. They stretch up to compete for light, making straggly plants rather than short, strong ones ready for potting on (B5.4) or transplanting (B5.5). The trick is to thin seedlings before they compete too much so you're left with the right number of vigorous plants capable of producing a crop.

The process of thinning

Thin in stages, leaving the sturdiest and most vigorous seedlings at the correct spacing. It also helps to practise good seed sowing (A18) so enough germinate as a back-up, but plants aren't wasted unnecessarily.

Sometimes gardeners are reluctant to remove healthy seedlings. Luckily, you'll see the benefit once the remaining plants grow on strongly. Thinnings can be eaten or added to the compost heap.



Thin seedlings in pots and trays to leave one remaining seedling (eg cabbage) or sometimes more if leafy salads (eg loose-leaf lettuce). See A20.



Thin seedlings growing in the soil in stages (eg beetroot). Continue until they have enough space to grow to maturity or are transplanted. See A20 and 22.



Harvest thinnings of salads like lettuce and some root vegetables like delicious baby carrots. Harvest every other seedling, leaving those on either side to grow on.

Health & Safety	Wash hands after handling compost and soil. <i>See also Health and Safety Guidelines (Section B3.3)</i>
Activities on DVD	A20 Thinning seedlings
Further information	Food Growing Instruction Cards



B5.4 Potting on seedlings



Seedlings grown in pots and trays sometimes need potting on before being transplanted into their final location in a container (B4.6) or the soil (B5.5). This in-between stage gives seedlings the extra space and compost they need to continue growing strongly. Two similar techniques are explained here: 'pricking out' and 'potting on'. See A21 for step by step details.

Pricking out

This technique moves seedlings from one small container to another, usually from pots or 'seed-trays' to larger pots or modular trays where seedlings can grow on individually rather than in clumps. This is done before seedlings become overcrowded and while still small so the roots aren't too entangled.

Many gardeners choose not to prick out, preferring to sow seed direct into pots or modular trays to save time and the risk of damaging seedlings. However, this extra stage is useful on the following occasions.

- When unsure of the likely germination rate, eg where poor germination in modular trays would leave a lot of wasted space.
- For getting as many seedlings as possible, where every seedling is needed and grown on.
- When there isn't space to sow direct into modular trays, eg where the space for raising plants is already full.

Potting into larger pots

This technique gives seedlings in their own pots or modular trays more space to grow, eg pepper and tomato plants need re-potting several times. This builds up the plant's strength before transplanting into a large final container or into the soil (A22). Potting on may also be necessary if there is delay in transplanting (to keep plants growing strongly).



Pricking out salad seedling into modular tray

Top tip



Replacing losses

Pricking out is also useful for filling gaps in trays.



Potting on cabbage seedling

Health & Safety

Wash hands after handling compost and soil.

See also *Health and Safety Guidelines* (Section B3.3)

Activities on DVD

A21 Potting on seedlings

Further information

Food Growing Instruction Cards



B5.5 Transplanting young plants



After thinning and potting on seedlings (B5.3 and B5.4), you should be left with vigorous young plants ready to transplant into their final location in the soil or a container to grow to maturity. You might also be transplanting bought plants. A22 has detailed instructions for transplanting. See also A11 for further tips about containers planting.

Why transplant

Transplanting suits plants that need large spacing, eg cabbage plants can be transplanted into the soil from pots or a seedbed when 10cm tall to 30-45cm apart. This is rather than sowing seed direct into their final location. In this way, transplanting allows you to make the most of available space, eg you can grow quick maturing crops such as radish or raise other plants before you need the soil/space for containers for the transplants. Transplanting doesn't suit crops that need very close spacing or longer root vegetables, where sowing direct and thinning is usually best instead (see A20).

How to transplant

The trick with transplanting is to minimise 'transplant shock' by being gentle. You should also harden off plants to gradually acclimatise them to the new growing environment, eg from a windowsill or greenhouse to the colder outdoors (see A22). Without this step, plants may be damaged by the sudden change in growing conditions, sometimes slowing growth for several weeks or even dying.



Into final containers, eg herbs, pepper (A11/A22)



Into the soil, eg broad beans, pumpkins (A22)



Into soil from a seedbed, eg leeks, cabbage (A22)

Health & Safety	Wash hands after handling compost and soil. Be careful when lifting heavy trays and pots. <i>See also Health and Safety Guidelines (Section B3.3)</i>
Activities on DVD	A11 Planting in containers A22 Transplanting young plants
Further information	Food Growing Instruction Cards Silver and Gold booklet (planting instructions for trees)



B5.6 Watering plants



Good watering is an essential gardening skill. It's important to use the right amount of water, at the right time, for most benefit to your plants. This is good organic gardening – using this precious resource wisely when plants need it most. A few tips make your time spent watering really count. A23 helps you set up a rota.

When plants need most water

- Seeds** Need water to trigger germination by soaking into the seed coat.
Tip: Keep compost in pots and trays moist. Water seeds in the soil at sowing and again in dry weather (A18).
- Seedlings** Will quickly stop growing without moist compost or soil.
Tip: Water especially after thinning and potting on (A20 and 21).
- Young plants in pots** Keep compost moist. May need daily watering in hot weather and when in a greenhouse or on a windowsill.
Tip: Big plants in small pots dry out more quickly. 'Re-potting' into a larger pot helps (A21).
- Young transplants** Easily dry out when first transplanted outdoors or into containers, reducing growth and ability to 'establish' quickly.
Tip: Water well before transplanting (A22) and thoroughly in dry weather, eg every 2-4 days (see Top tip).
- Bigger plants in containers** Rely on you to keep the compost moist as the roots cannot spread into the soil.
Tip: Smaller volumes of soil dry out more quickly. Use larger containers (eg half barrels) and a mix of topsoil with compost when potting for drainage and moisture retention (A11).



Top tip

How to water plants in the soil

Watering with large amounts, less often, is better for plants growing in the soil. This encourages plants to search for water deep into the soil, making them tougher and more independent. By contrast, watering little and often is not good practice (eg daily). This encourages shallow roots and vulnerable plants that need more water from you in dry weather. Remember that a wet soil surface can hide a dry soil beneath!



When to water established plants in dry weather

Flowering	Eg pea, bean, potato, sweetcorn.
Fruiting	Eg pea, bean, sweetcorn, courgette, marrow, tomato.
Edible leaves	Eg lettuce, spinach, summer cabbage. Tip: plants can otherwise grow slowly or 'bolt' (flower prematurely)
Roots or bulbs	Eg carrot, beetroot, onion, radish. Tip: every one to two weeks so roots don't 'split' when it rains by taking up too much water and expanding too quickly. Too much water produces excess leaves with no extra yield.
Rarely necessary	Eg Brussels sprout, broccoli (sprouting), winter cauliflower, spring cabbage.



Useful watering techniques

- Water in the morning or early evening (less water is lost to evaporation).
- Conserve moisture by adding organic matter to soil, eg compost (see B4.4).
- Water beneath leaves to wet the soil. Wet leaves can be scorched in sunny weather.
- Water seedlings with watering cans or hoses with 'rose' ends.
- Collect and use rainwater, eg install water butts for sheds. This reduces the environmental impact and cost of using mains water.
- Remove weeds as these compete with plants for water.
- Water more often in windy weather as plants will dry out in these conditions.
- Keep compost moist, never wet. Check after watering, eg compare the weight of pots or remove the odd pot to see if the root ball is moist throughout.
- If compost in pots is very wet and smelling bad, carefully remove compost from around roots and re-pot (see A21).
- Check if outdoor containers need water even after rain. Dense foliage and 'rain-shadows' from buildings can stop water getting to the soil.
- Submerge dry wilted pot plants in a bucket of water for an hour.
- Plants also wilt when too wet or if attacked by root rots or soil pests.

Health & Safety	Be careful when carrying heavy watering cans and moving hoses. Follow Manual Handling guidance (B3.4). Take care when surfaces are wet and may be slippery. Follow the school policy for using 'caution' signs as required. <i>See also Health and Safety Guidelines (Section B3.3)</i>
Activities on DVD	A23 Setting up a watering rota
Further information	B4.11 Holiday care of the garden Silver and Gold booklet



B5.7 Making compost



Making compost is 100% natural and remarkable, decomposing ‘biodegradable’ organic matter such as vegetable peelings into a rich soil improver and fertiliser. Compost helps plants grow better and saves resources and the environment. The following pages tell you how to make the most of this exciting process.

Why compost?

Compost helps plants grow better

- Improves soil structure and water retention when dug in or spread over the soil (see A9).
- Feeds plants with essential nutrients, boosting yield and natural defences against pests and diseases (see B4.4 and B5.10).

Compost saves resources

- Cuts down the amount of time spent watering, with better water retention.
- Reduces the need to buy soil improvers and potting mixes.

Compost helps the environment

- Reduces waste going to landfill.
- Removes the need for peat-based composts.

Where to compost?

You can use a bin or simple heap on the ground. A bin is usually easier, keeping the composting materials neat and manageable. If using a container, it should have a lid to keep rain out and heat in. Choose a strong design that can hold the contents and can be lifted away or opened to remove the finished product. Whatever container you buy (or make your own), consider the following general guidelines for its location.

- Sunny or part-shaded.
- Easy access for the garden.
- Enough space for enough bins (you might want several!).
- Away from water courses (to avoid water pollution by possible leaching of plant nutrients).
- Direct on to soil or grass.
- Onto a hard surface like concrete, first adding a 5cm layer of compost or soil at the bottom for import of micro-organisms that will help decomposition.



Homemade compost bin with removable side



Adding to a ‘cool’ heap in a bought compost bin



Harvesting compost ready for use



Freshly added 'green' and 'brown' materials



Materials being decomposed by living organisms



Handling lovely compost after sieving

How to compost

The composting process is simple, though a few hints and tips will help avoid problems. As a general rule, if a material will rot, it will compost, but some items are best avoided (see next page).

Simply add compostable materials bit by bit to a bin when they become available. This is called 'cool composting'. If you save up the material and add it all at once, this is 'hot composting', and is generally a little quicker. Most important are the living organisms that perform the composting process. They have very similar needs to ours: food, air and water.

Food It is important to put roughly equal proportions of 'greens' (wet, sappy material) and 'browns' (dry material). See next page for materials. Adjusting the proportion of greens to browns can solve many composting problems.

Air Effective composting requires plenty of air, traditionally added by turning compost. However the mix of greens and browns gives the heap some structure and maintains the air spaces within it, reducing any need to turn. Good materials for this include corrugated cardboard, egg boxes, scrunched-up paper, etc.

Water Water is essential for making compost, but too much or too little will both inhibit the composting process. Test the moisture content by taking a handful of compost and squeezing it - it should feel as damp as a wrung-out sponge. If it is too dry, leave the lid off when rain is forecast; if it is too wet, add some more brown material.

The finished compost

A 'cool' bin can take 12-18 months to produce mature compost, but the end result can be just as good as from hotter composting (ready in 6-12 months).

After six months, keep checking the material at the bottom of the bin. When the material has turned to a rich, dark brown substance and smells beautifully earthy, the composting process is complete. Leave this for a month or two to mature before using.

You can use your ready compost in small amounts or wait until the whole bin has composted. If the upper layers of the bin are not fully composted, remove the finished compost from the bottom, and return the still decomposing layer to the bin to continue composting.

You might like to have three bins in a busy garden with lots of decomposable waste. Start by adding material to the first; once full, start the second and so on. By the time you're filling the third, some material in the first bin should be ready.



Three compost bins with material at different stages of decomposition in each.

Suitable materials for composting

Mix the following

Greens (usually nitrogen-rich; they 'activate' the process, but decay to a smelly mess when alone) 😊

- Soft green plants
- Grass clippings (in moderation)
- 'Annual' weeds (eg chickweed)
- 'Perennial' weed leaves, and roots after 12 months in a plastic sack (eg dandelion)
- Raw vegetable and fruit peelings
- Comfrey and nettle leaves (especially good 'activators')
- Tea bags (non-nylon), tea leaves, coffee grounds
- Urine (diluted with water 20:1)
- Horse and cattle manure, poultry manure and bedding



Browns (usually carbon-rich; best cut-up or scrunched first; decay too slowly when alone) 😊

- Cardboard, eg cereal packets, egg boxes
- Kitchen paper (non-nylon)
- Waste paper, junk mail, magazines, newspaper. Add material in moderation; ideally recycled to make new products.
- Hay, straw, shredded paper, wood shavings. Add material in moderation
- Bedding from herbivorous pets
- Woody plant shoots, tough hedge clippings (in moderation)
- Fallen leaves (or compost these separately to make 'leafmould')
- Wood ash (in moderation)
- Natural fibres (eg 100% wool/cotton)

DO NOT compost

- Meat, fish, cooked food, bones, cat litter, dog faeces, coal and coke ash, disposable nappies, glass and tins.
- Any material you're unsure about. Send to your local authority green waste recycling facility (if of living origin, eg Christmas trees) or dispose of in municipal waste (eg crisp packets).
- Cling film, foam or plastic packaging, glossy magazines (latter where cover cannot be torn, showing plastic coating rather than compostable 'clay' coating).
- Seeds, as most survive cool heaps and grow when you use the compost (ie weeds). Seeds rarely survive hot heaps.

Top tip

What to do with diseased plant materials?

Local authority municipal waste: anything you're unsure about and any soil-borne diseases (eg clubroot).

Cool heap: diseases that need living tissue to survive are fine (eg potato blight foliage).

Hot heap: diseases that survive on dead plant material are fine (eg grey mould).

Health & Safety	Compost is safe to handle with garden hygiene rules. Cover open wounds, wash hands and keep tetanus vaccinations up to date. Handle bulky and heavy material carefully. <i>See also Health and Safety Guidelines (Section B3.3)</i>
Activities on DVD	A24 Yes, no, maybe compost game A25 Reduce, reuse, run-around
Further information	Silver and Gold booklet Poster - Making compost Garden Organic home composting www.homecomposting.org.uk Recycle Now www.recyclenow.com/home_composting/ Community Composting Network www.communitycompost.org 'All about compost' by Pauline Pears and Charlotte Green. ISBN 0855328681



B5.8 Digging



Digging is a traditional pastime for gardeners, turning over the soil before planting. This can improve soil structure, but isn't always necessary. Sometimes digging can cause more damage than good. The following tips should help you decide as and when to dig. A26 has step by step instructions. See A2 for ideas for making digging a gardening day with the community.

Advantages of digging



- 1 Quickest way to add organic matter like compost. This improves soil structure and adds nutrients, especially on new sites.
- 2 Quickest way to add other materials, eg horticultural grit to improve drainage in very heavy clay soil (see A9).
- 3 Quickest way to reduce soil compaction (eg adding air and breaking up lumps). The soil becomes easier to work and roots spread further in looser soil.
- 4 Quickest way to remove lots of weeds rather than using 'light-excluding' mulches, though harder work (see B4.8).
- 5 Turning over the soil exposes soil pests to natural predators, eg 'leatherjackets' are eaten by birds (see B5.10).



Disadvantages of digging



- 1 Can damage the soil structure, especially when soil creatures are already 'lively' in cultivated areas, eg it destroys the network of earthworm tunnels and decaying roots that improve drainage.
- 2 Causes soil compaction if the soil is dug when too wet. If dug too dry, excess moisture is lost.
- 3 Organic matter breaks down quicker if dug in compared with lying on the soil surface as 'mulch'.
- 4 Digging is hard work and potentially bad for your back.
- 5 Buried weed seeds can come to the soil surface where they then germinate among new plants.

Top tip



To dig or not to dig

Once you've reduced soil compaction, you may not need to dig every year. Soil improvers like well-rotted manure can be laid on the soil surface as a 'mulch' for earthworms to take into the soil, while compaction is reduced by not treading on the soil (see B4.5 for growing in beds).

Health & Safety

Digging is a strenuous activity. Take regular breaks, digging only for short periods. Wear steel toe-capped boots.

See also Health and Safety Guidelines (Section B3.3)

Activities on DVD

A26 Digging

Further information

B4.4 Building soil fertility

Silver and Gold booklet about no-dig gardening



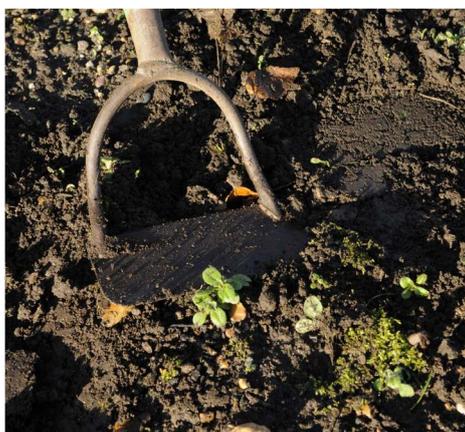
B5.9 Weeding made easy



Weeds grow quickly to take water, nutrients, space and light away from other plants, slowing growth and reducing harvests. They are any plants growing where you don't want them. Weeds can also host pests and diseases, eg potatoes left in the soil after harvest can grow in spring and may infect new tubers with the disease 'potato blight'. Fortunately, weeds are easily controlled, especially after the soil is initially cleared (B4.8).

Easy weeding tips

- Start early in the year. Weeds start growing as soon as the soil is warm enough in spring.
- Weed frequently, while they are still small. Larger weeds take longer to remove. A weeding rota may help (see A23 for ideas).
- Disturb the soil as little as possible. This stops too many 'dormant' weed seeds coming to the soil surface where they can then germinate.
- Always remove weeds before they set seeds to prevent more growing in the future.
- Avoid bare soil. Weeds will quickly colonise. Cover the soil with a mulch (see B4.11) or plant 'green manures' (see Silver and Gold booklet).
- Leave some weeds, as they provide valuable food and habitats for beneficial creatures. Others look good and add nutrients to the compost heap.



Hoeing off annual weeds. The technique takes a bit of practice, but is well worth learning (See B3.2 for tips).



Digging out annual weeds. Shake off excess soil. Any of the fibrous roots left in the soil won't regrow.



Digging deeply to remove as much root of perennial weeds as possible. Any left can regrow and need digging again.

Health & Safety	Be careful when handling weeds. Many have sharp, rough, or sticky growth and the rootball can be heavy. Follow guidelines for garden tool use (B3.2). <i>See also Health and Safety Guidelines (Section B3.3)</i>
Activities on DVD	A27 When is a weed not a weed?
Further information	B4.8 Removing weeds and grass



B5.10 Controlling pests and diseases



At some point, pests and diseases will attack your plants. Some problems are obvious like slugs, but others far smaller, like bacteria. Many problems need no attention, while others can quickly ruin your crop. In any case, prevention is far better than cure. Fortunately there are many clever solutions organic gardeners use which don't rely on artificial chemicals that can damage the environment.

Defining the problem

Both pests and diseases can attack plants from roots to flowers, including produce in storage. Several things can attack a plant at once and problems can transfer. Plants generally become disfigured and lose vigour and crop quality. Unfortunately, nothing is safe.

However, damage is not always as bad as books on pests and disease may make you think. While there are a lot of potential problems, every garden is different. You'll soon learn to identify and deal with the main offenders. Of course, sometimes it's best to give in graciously and not grow an especially troublesome crop!

Top tip



Pests and diseases

'Pests' are animals, particularly insects, that damage plants. They may eat, nibble, suck sap and tunnel into plants.

'Diseases' are other living organisms ('pathogens') that damage plants, particularly fungus, bacteria and viruses. They can rot, discolour, wilt and kill plants.

Essential control methods

Inspect your plants often for any problems and act immediately, if any control is needed. It's much simpler to 'pinch out' the growing tip of one broad bean plant with 'blackfly' than deal with a row of infested plants. Also try traps, barriers and destroying infected material. For rabbits, you may need a fence of 'chicken wire', eg 1.2m high with a further 30cm buried, angled outwards to stop them burrowing underneath.



Young brassicas, eg cabbage, are vulnerable to 'cabbage root fly'. Stop the fly laying eggs at the stem base with 10cm tough fabric disks.



Pick off caterpillars of cabbage white butterfly (even better if you spot the eggs). Remove similar pests with jets of water or rubbing between fingers.



Check your plants regularly for anything suspicious, but don't assume all creatures are harmful, eg some may be beneficial.

Top five ways to prevent pests and diseases

- 1** *Grow vigorous plants*

Strong plants are far more resilient to attack. They have in-built defences to protect themselves, but this capacity is heavily reduced when plants are 'stressed', ie when growing in poor conditions. It's the gardener's job to limit this stress with the following.

 - Providing the right soil (B4.4), vigorous seedlings (B5.2), enough water (B5.7), etc. Be careful not to overfeed plants though, as excess fertiliser will produce weak 'sappy' growth prone to pest attack.
 - Growing plants in their preferred conditions, eg courgettes will grow badly unless in a sunny spot in fertile soil. Don't bother with crops that need growing conditions you just can't provide. See details on seed packets and Food Growing Instruction Cards.
- 2** *Encourage natural predators*

Work with nature using simple methods to achieve a balance between pests and predators over time. Attract diverse wildlife to your garden, including natural predators for pest control. You can feed birds, grow 'attractant' flowering plants, build habitats, and so on. See B5.11 and A28-31, as well as Silver and Gold booklet for more ideas.
- 3** *Grow resistant varieties*

Building on the natural defences of plants, a great selection of 'resistant' varieties have been selected to be tolerant to specific pests and diseases, eg lettuce 'Fristina' is less susceptible to fungal 'downy mildew' (white leaf coating). See varieties in the Organic Gardening Catalogue (www.organiccatalog.com).
- 4** *Avoid contamination*

Basic hygiene is simple and very effective at preventing problems spreading. Try the following.

 - Regularly clean tools, boots, pots/containers, sheds/greenhouse shelves, etc. This is especially important if handling infected materials. Try organic cleaners like citrus extract disinfectant. See the Organic Gardening Catalogue (www.organiccatalog.com).
 - Clear away diseased material, but don't compost, as many problems can survive the process and infect plants when the compost is used. See B5.7 for details and exceptions. Also don't save seeds from diseased plants.
 - Monitor plants that come into the garden (bought and gifts). Don't accept any plants with problems.
- 5** *Provide defences*

Don't give pests and diseases the opportunity to attack. There are a number of prevention methods for specific crops worth trying BEFORE growing for the first time, such as barriers and scarers (see the next pages). Ask local gardeners in the community for advice. Use the school newsletter, website and your gardening event days to gather ideas and invite help (see A1 and 2).





Most gardeners love to hate slugs and snails. They can ruin weeks of work overnight. Organic slug pellets are available (based on 'ferric phosphate'). Wash hands after applying.



Surround plants with barriers of sharp material to deter slugs and snails, eg sharp sand, egg shells, grit. Regularly top-up barriers, especially after heavy rain.



Protect young plants from slugs and even caterpillars with mini 'cloches' made from plastic bottles with the top and bottom removed.



Remove 'thinings' (A20) so the scent doesn't attract pests, eg carrot root flies. Also sow thinly (A18) or transplant (A22) to prevent need for thinning.



Fungal 'powdery mildew' on courgette leaves, often because plants are too dry. Rarely affects yields; 'mulch' with compost to conserve moisture (B4.11).



Carefully sow seed (A18) to miss the breeding time in pest life cycles, eg early and late pea sowings will help avoid 'pea moth'.



Grow plants in different places to prevent build up of soil pests and diseases; practise 3-4 year 'crop rotation'. See Silver and Gold booklet.



Alter soil pH to deter diseases, eg 'potato scab' is less severe in acid soils and 'clubroot' on cabbages in alkaline soil.



Expose soil pests like 'leatherjackets' larvae to birds by lightly turning over the soil (A26) and removing mulches in winter (B4.11).



Block access to low flying pests to plants (eg 'carrot root fly') with fine mesh or 'horticultural fleece' over plants or 60cm high barrier.



Egg-laying adults of sap-sucking whitefly are attracted to yellow sticky traps. These sometimes help control other pests.



Birds eat lots of pests, but others can damage crops. Deter birds with light-reflecting CDs or other scaring devices.



Over-watered seedlings can easily rot (eg fungal 'grey-mould'). Remove infected plants and repot others with fresh compost if needed (A21).



Block access to flying pests by covering plants, eg fine mesh to stop 'cabbage white butterfly' and netting to protect fruit bushes from birds (ie 'fruit cage').



Protect seeds (eg peas) from mice and squirrels with 'chicken wire'. Protect seedlings from mammals with hazel and birch sticks.

Health & Safety	<p>Follow usual garden hygiene when handling infected plant material, eg wash hands, cover open wounds and wear gloves if necessary. Ensure adult supervision at all times, especially if using any specific control measures involving products.</p> <p style="text-align: right;"><i>See also Health and Safety Guidelines (Section B3.3)</i></p>
Activities on DVD	<p>A28 Friend and foe game</p>
Further information	<p>B5.11 Attracting wildlife</p> <p>Silver and Gold booklet (more examples and clever solutions)</p> <p>'Garden Organic Guidelines' (see DVD)</p> <p>'Pests - How to Control them on Fruit and Vegetables' by Pauline Pears and Bob Sherman. ISBN 1844481565</p> <p>'RHS Pests and Diseases' by Andrew Halstead and Pippa Greenwood. ISBN 1405341777</p> <p>Organic Gardening Catalogue www.organiccatalog.com</p>



B5.1 | Attracting wildlife



Encouraging wildlife to your garden is another foundation of organic growing. Wildlife includes organisms in the soil (B4.4) and the diverse creatures above. They all interact together; some unwelcome, others pollinating flowers and helping to keep pests under control (B5.10). It's easy to attract wildlife by understanding these interactions and offering inviting homes.

Understanding wildlife interactions

Your organic garden is part of an 'ecosystem' that goes beyond the school fence. Here every creature has its place and the population is balanced, ie eating others or being eaten. You can take advantage of this balance to reduce pest populations by encouraging natural 'predators' (eg ladybirds) to feed on 'prey' (eg 'blackfly').

The first step is not using artificial pesticides that can harm the beneficial creatures. For example, sprays to kill 'aphids' can also kill the hoverfly larva that would otherwise eat up to 50 aphids a day and 1000 in a lifetime (each). The next step is to actively encourage more beneficial creatures (see over).

Note: there are some pesticides approved for use by organic gardeners, eg those based on natural vegetable oils. These may still harm beneficial creatures, and remain a LAST resort for targeted application on badly infected plants. Prevention is far better, eg growing healthy plants and resistant varieties (see B5.10).

Top tip



Achieving a balance

Unlike pesticides, predators will not kill all prey (pest). This would leave nothing for them to feed on.

Instead you'll always have some pests, but these keep predators alive until you need them to protect your prize crops. Achieving a balance is about limitation of pest damage, not obliteration. If pests aren't causing trouble, leave them alone!



Slug-pellets can harm natural predators like hedgehogs, beetles, birds and frogs (those based on 'ferric phosphate' are safe).



Bird eats lots of pests, such as aphids overwintering in tree branches. Attract birds by feeding with nuts, hanging up 'fat balls' and growing plants with seeds and berries.



Encouraging beneficial creatures

A few wildlife friendly areas in your garden will quickly encourage the population of diverse creatures to increase. Do be patient though; you might have to wait for natural pest control to gain momentum, especially if pesticides have been used before.

Actively encourage wildlife by meeting their needs. You can also introduce predators to control specific pests (sold as 'biological control'), eg a tiny parasitic wasp to control 'whitefly' in greenhouses.

Meeting wildlife needs

Food and water

Grow flowers that attract and feed beneficial insects, eg fennel, pot marigold, native hedgerows, etc. Have something flowering all year round, especially in spring to feed adults emerging from hibernation. The Silver and Gold booklet has more details about such 'attractant plants'.

Water also attracts a wealth of wildlife, eg damp areas, bowls of water, bird baths and ponds.

Habitat and shelter

Wildlife needs safe, sheltered areas to feed and breed. Habitats include compost heaps, mulches, undisturbed soil, sheds, hedgerows, long grass, log piles, and among crops and green manures.

Avoid being too tidy, leaving some plant debris until spring before clearing. This will provide invaluable hibernation sites over winter for beneficial insects, eg ladybirds and lacewings.

See A29-31 for examples of habitats to make.



Community event day, making wildlife shelters to encourage beneficial insects.



Hoverfly feeding: their larvae eat aphids.



Native hedgerow for year round shelter.

Health & Safety	While most garden wildlife is fairly harmless to humans, be careful of anything you're uncertain about, or don't recognise, and larger animals found dead or diseased. Ensure adult supervision at all times. Wash hands after handling any living or dead creature and soil; cover open wounds and wear gloves if necessary. <i>See also Health and Safety Guidelines (Section B3.3)</i>
Activities on DVD	A29 Ladybird house A30 Apple bird feeder A31 Lacewing hotel
Further information	Silver and Gold booklet (attractant plants)



B5.12 Harvesting and storing



Harvesting fresh organic food is one of the most exciting gardening jobs. It's a great feeling to eat produce straight from the garden, with only a short walk to the school kitchen or cooking lesson. This section has lots of easy harvesting tips for vegetables, fruits, edible flowers and herbs. The principles of storing produce are introduced with more details in A32.

Top ten harvesting techniques

- 1 Handling gently** Snap or cut off produce from plants, eg beans, pea pods, cucumbers, courgettes. Pulling roughly can easily damage plants.
- 2 Digging carefully** Dig up plants like carrots and leeks after first loosening the soil with a fork. Be careful not to damage produce with the fork prongs.
- 3 Harvesting young** Don't aim for giant carrots and massive marrows. Vegetables often taste better when young, eg kale becomes bitter, radishes woody and beans stringy with age.
- 4 Picking before frosts** Harvest produce from plants that will be killed by cold weather before frosts in autumn, eg pumpkin, courgettes, outdoor tomatoes.
- 5 Picking flowers** Pick edible flowers like nasturtium when they're just open and fresh. Pick regularly to encourage more flowers.
- 6 Picking herbs** Pick from strong growing plants. Remove no more than a third of the total growth. Leaves usually taste better before flowering starts.
- 7 Picking salad leaves** Cut seedlings to 2.5cm when 10-15cm tall (plants regrow). Also cut outer leaves to leave the growing tip or remove whole 'head' of compact central leaves when firm.
- 8 Removing tubers** Carefully remove all tubers like potatoes and Jerusalem artichoke; any left in the soil may regrow in spring as 'volunteer crops' (ie weeds). They may also carry diseases.
- 9 Testing fruit ripeness** Pick most fruits when they develop ripe colours, eg strawberries. Others break away easily from the stalk when ready, usually with a slight twist or tilting, eg tomatoes.
- 10 Rescuing harvests** Harvest what you can if a crop is ruined by bad weather or pest and disease attack. Some plants will survive, or it can be better to try again next year.





Harvesting essentials

- Harvest when produce is tastiest.
- Check plants often for produce; plants grow very quickly in good weather.
- Try not to delay harvesting; flavour can quickly reduce and produce may be attacked by pests and diseases.
- Experiment with extending the harvest season and storage (see below).
- Leave long term crops like asparagus and fruit bushes to 'establish' before harvesting. They need to develop strong roots and top-growth for a year or two. Taking produce too early can weaken plants, while well-established plants can crop well for years.

Extending the harvest

Sowing seed regularly

Sow seeds regularly of the same plant for a 'succession' of harvests, ie where each batch of plants will be ready a few weeks later than the previous. Try with carrots, kohlrabi, salads, summer cabbage, salad onion, peas, radish, etc.



Providing warmth

Protect and advance growth at the start and end of the growing season with 'cloches' (portable structures to cover plants, like mini greenhouses). See Silver and Gold booklet for details. Bring pots of herbs indoors for winter use.



Squeezing in extra

Make the most of your available space, eg sow seed of quick maturing crops like radish between slower growing cabbage plants. See Silver and Gold booklet for more ideas.



Eating young

Harvest young plants as 'thinnings', eg baby carrots, beetroot, kohlrabi, salads, etc. Leave alternate plants to grow larger (A20).



Keeping plants producing

Pick regularly, sometimes daily, from plants like beans, peas, edible flowers, and courgettes. If they are left, plants will often stop producing.



Leaving stumps

Leave stumps of some vegetables, eg miniature cabbages and lettuce will regrow; more if you cut crosses into stems 1 cm deep.



Ripening the last produce

Cover 'tender' plants (those killed by frost) with 'horticultural fleece' during the first light frosts in autumn. This will protect plants and help ripen the remaining produce, eg runner beans, tomatoes, courgettes, etc.





Proud pupils after harvesting their own leeks and parsnips



Only storing the best produce, checking for good and bad apples before storage in shallow trays



Top three storage techniques

- 1 **Protect from damage** Only store produce in excellent condition from strong healthy plants. Always handle produce carefully to avoid damage or bruising. Rots can otherwise spread and ruin all the stored produce.
- 2 **Store in right place** Choose a place that suits the particular produce you're storing (A32). Stored produce generally needs good air circulation and consistent temperature. Garages and garden sheds are suitable (if insulated to be frost free), together with basements, cellars and unheated rooms.
- 3 **Frequent health checks** Check stored produce regularly, preferably weekly. Remove anything overripe or showing signs of rot. If lots of your produce is failing, check that the storage conditions suit the crop (A32).



Top tip

Further facts

See Food Growing Instruction Cards for harvesting details for specific crops.



Health & Safety

Only eat plants that you're sure are safe. Always check with adults before trying.

See also *Health and Safety Guidelines (Section B3.3)*

Activities on DVD

A32 Storing produce

Further information

Food Growing Instruction Cards

Poster - Harvesting and storing

School Term Time Garden Planner (part of the 'Food for Life Partnership Mark: an introduction pack')