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# INTRODUCING GROW NORTH

## Transition Black Isle – Grow North

It is possible to grow a very wide range of fruit and vegetables in the Black Isle, providing food over an extended season. It's been done well for many years – until we all started shopping at supermarkets and forgot how to feed ourselves. Recently both nationally and locally the demand for growing space has increased greatly, with the demand for allotments in Scotland having grown by 40%. At the same time, more gardeners are trying to grow their own - sales of vegetable seeds to gardeners has increased 60% - mirrored at garden centres on and near the Black Isle. But whilst many more people would *like* to grow a significant part of their own food, most do not actually know how to. And many that do try, fail to achieve their aim and so end up frustrated and out of pocket.

This lack of ability to 'grow-your-own' seems to be due to a number of factors, including lack of knowledge; lack of practical skills; no relatives with the experience to call on; poor access to key resources, and working in isolation. On top of this the 'help' that is out there to 'grow-your-own' - from gardening books to makeover TV programmes – is mostly directed to growing conditions in the south of England, and are not suited to northern Scotland.

Transition Black Isle aimed to tackle the lack of 'grow-your-own' skills in a structured and comprehensive way by conducting a pilot year of knowledge and skills transfer and sharing, with a group of 50 families on the Black Isle. The resulting grow-your-own project, "Grow North" ran from May 2010 to February 2011. The project offered Black Isle residents an exciting opportunity to learn about growing from experts in a series of practical training sessions. The project was possible thanks to funding from the Scottish Government's Climate Challenge Fund.

The project attracted a mixture of new growers and those with some experience. During the year, Grow North combined guest speakers, practical sessions, and visits to established grow your-own-gardens, as well as providing seedlings and plants that course participants could take home. Participants enjoyed learning together and time and again people cited the social aspects of Grow North as part of its appeal.

The project was co-ordinated by Sheila Wickens, who is a keen organic grower. Sheila has previously worked both for the local authority and for the community sector in promoting aspects of sustainable living such as recycling, composting and washable nappy use.

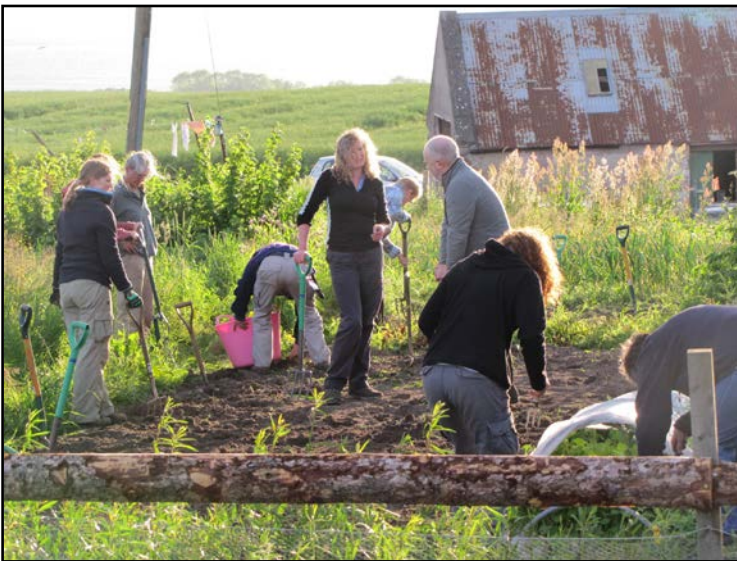
The programme of training was split into "core" training, which covered seasonal gardening tasks for each month, and "specialist" topics such as composting and pests and diseases. The course began with topics covering aspects of getting started, such as how to plan your garden and testing your soil. Throughout the year, other topics such as watering your crops, irrigation options, feeding your plants, successional sowing, and companion planting, were tackled, as were preserving and storing garden produce and introductions to fruit, herbs, and protected growing.

## Grow North Study Gardens

Three study gardens were a key part of the course, and participants were able to visit these gardens for the monthly “core” training sessions, and to see the gardens develop through the seasons. The study gardens are located at two TBI community gardens at Loch Na Mhoid, near Muir of Ord, and Netherton Farm, near Culbokie. The third site was at the Black Isle Leisure Centre in Fortrose.



Loch Na Mhoid Community Garden, by Muir of Ord



Culbokie Community Garden at Netherton Farm

Transition Black Isle received funds for establishing and developing community gardens. The community garden project and Grow North were closely related projects, encouraging and supporting people in producing their own food. These would be for 10 – 12 local participants, and have the capability of providing them with at least half of their vegetable and fruit consumption all year round. The community gardens that were established during 2010 will have a lifetime of at least 5 years. Each of the community gardens has a selection of tools

available, and has had a polytunnel erected for the use of the community growers and for Grow North.

The garden at the Black Isle Leisure Centre in Fortrose, while not a community garden with regular visitors, proved to be an excellent study garden. It was surprisingly productive and weed free. All the growing space here was in outdoor beds, pots and grow-bags, as there was no polytunnel or greenhouse.



Grow North at the Black Isle Leisure Centre, Fortrose



## Grow North Tutors

### Sheila Wickens

For some years now Sheila has been committed to all aspects of sustainable living, and has a wide range of experience working in raising awareness of waste. Prior to coordinating Grow North Sheila had done some other free-lance work, including conference co-ordinator for HEN, on the theme "Growing Food – Growing Communities" and for RoWAN providing expertise on preservation of fruit & vegetables. Sheila has experience of organising projects and creating learning resources. Sheila has a keen interest in growing fruit and vegetables and has been a member of Garden for 10 years. Sheila also has a great interest in the preservation of food, including jams, chutneys, bottling, and dehydrating, freezing and wine making.



**Audrey Litterick** is a self-employed environmental consultant, working UK-wide, mainly through the small company Earthcare Technical, which specialises in the science and practice of organics recycling and the application of organic materials (such as composts and anaerobic digesters) to land. Audrey originally trained in horticulture and is a passionate advocate of small-scale and local food production. She is an enthusiastic and committed trainer and regularly runs courses for crofters, gardeners and small-scale growers on horticultural cropping.

As Master Composter Project Officer, **Katy Kitchingham** was happy to talk compost! The Master Composter Project was delivered by RoWAN - Waste Action across Ross and Cromarty and Inverness from Sept 2008 to Oct 2010. It then evolved into the Zero Waste Volunteer Project, supporting a network of local, trained volunteers in promoting other waste reduction campaigns as well as home composting. For more information, contact 01349 867063 or [zerowastevolunteers@rowan.org.uk](mailto:zerowastevolunteers@rowan.org.uk).



### Daniel Ross

Following in his father's footsteps, Daniel has a keen interest in horticulture, and has worked for many growers including here on the Black Isle, as well as in Fife, Lothian and Northumberland. He also maintains his own croft. In addition to teaching Grow North sessions, Daniel has been teaching horticulture at a local farm ('farm to work').



**Les Bates** has many talents; including forest gardening, willow sculpture and creative writing and poetry. With his wife Sheila, he runs Croft 7 <http://www.croft7.com> providing garden design advice. Les has helped develop many orchards in the local area, including an orchard at the Beauty Centre. Since relocating from Kirkhill to Torridon, Les is now employed to manage and develop the 59 acres of garden grounds of The Torridon Hotel <http://www.thetorridon.com/> including the 2 acre Kitchen Garden, supplying herbs, fruit, flowers and vegetables direct to the Hotel kitchen and restaurant. Les is also actively involved with Reforesting Scotland.

**Duncan Ross** has run the herb nursery at the walled garden at Poyntzfield organically since 1976. The nursery specialises in popular, unusual and rare organic/biodynamic herb plants and seeds (including Scottish natives). In addition he grows unusual native herbs / edibles like Oyster plant and Rock Samphire. Duncan also teaches organic herb gardening at the Royal Botanic Garden Edinburgh. Duncan has published three booklets about herbs; the next on the Herbs of Japan should be printed soon! See [www.poyntzfieldherbs.co.uk](http://www.poyntzfieldherbs.co.uk) for all the latest information. Duncan is also a keen fiddle player, and says that playing music in the house or to the plants is all the same!



**Maggie Wormald** has a background and training in Rural Studies and Agriculture and is now involved in rural training and education. This includes apprenticeships and work based learning and work as local coordinator for the Royal Highland Education Trust “taking the classroom to the countryside”. Maggie is a keen gardener having been involved in growing vegetables and fruit organically for over 25 years. She has a poly tunnel and productive garden on the Black Isle. Maggie enjoys helping people become enthusiastic about growing and using their own produce in a sustainable way and realising how satisfying and rewarding this can be.

**Maggie Sutherland** and her company The Natural Vegetable Co are located on the southern edge of Inverness at Torbeck. Maggie produces a range of fresh organic vegetables year-round, growing both outdoors and in large polytunnels. This is now their sixth growing season as The Natural Vegetable Co, and Maggie supplies her customers both through a vegetable box scheme, and at markets. Produce is also delivered to local hotels and restaurants. The Natural Vegetable Co is a Soil Association registered organic producer committed to natural horticultural production. Maggie has previously taught on the Apprenticeship scheme run by Highlands and Islands Local Food Network. Maggie also keeps pigs.





## Growing in the North of Scotland

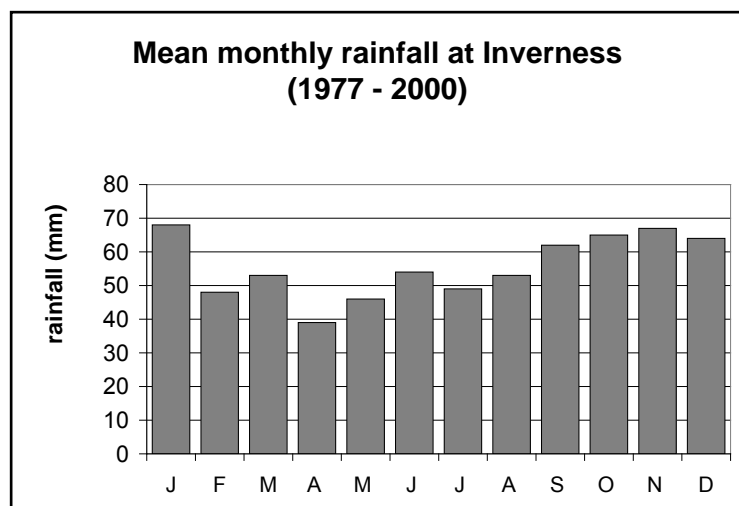
The UK may be a small island, but there are climatic variations between the south and north, (as well as the east and the west) which can mean that as growers, what you can grow and how you grow will be different from one extreme to the other. Unfortunately, most gardening books and magazines tend to be written by people who are geographically based in the south. The good news is that with a bit of know how, you can successfully grow lots of different fruit and vegetables in the north for much of the year. By being aware of the conditions required for germination and then growth, you can make better decisions about when and where to sow and plant particular crops, so you don't just blindly follow the seed packet instructions.

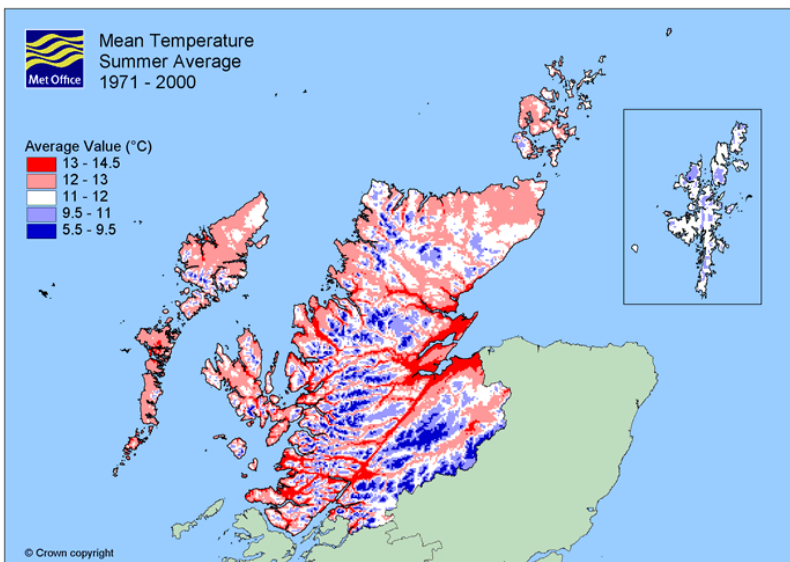
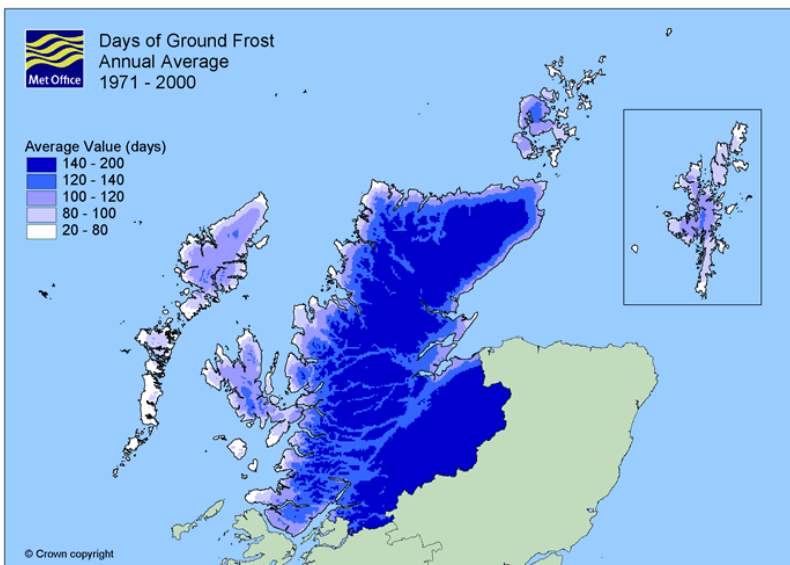
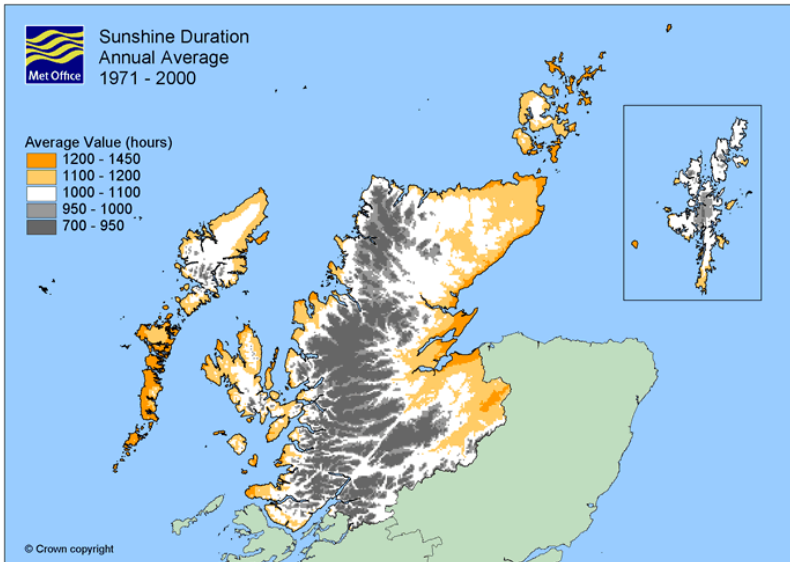
There are not hard and fast rules about what can and can't grow here on the Black Isle. However there are some fruit and vegetables that will struggle, such as peaches, nectarines and apricots, figs, melons, kiwis, almonds, and walnuts. Other crops such as sweet corn may not always do well outside, but can give an excellent crop if conditions happen to be right for them. Even in a polytunnel or greenhouse, you may struggle to get a great crop of aubergines. However this doesn't mean that they can't be grown here, or that you shouldn't try if you want to, and the same goes for the more exotic fruit listed above. There are climatic variations even within the Black Isle, and you will see differing levels of success for some of these more marginal plants in different locations – e.g. a Muir of Ord fig has yet to produce fruit in 6 years, whereas one in Fortrose performs well each year. This can show us clearly the difference that a good sunny aspect or a more sheltered location can make. Remember that altitude too, can also make a difference, whether it means slightly later frosts, or more exposure to wind.

In order to grow crops which are at the edge of their range of tolerance, a balance must be struck between the length of growing season and the number of growing degree-days the crops require from sowing to harvest. Growing degree-days refer to the cumulative temperature across the season a plant requires in order to reach fruition. For example, tomatoes in the north of Scotland, due to the relatively low summer temperatures, require a longer growing season to reach the required growing degree days. However of course, the outdoor growing season is relatively short and extra effort is required to deal with this, such as late winter sowing indoors and planting out under cover (or a sunny window ledge). For crops which require a shorter number of growing degree-days to reach harvest (such as runner beans) the growing season start date becomes the main consideration. And sowing may start later than further south in the UK to avoid later frosts.

### The Growing Climate in the Black Isle

The Black Isle's location as a peninsula, bordered by sea to the east and higher ground elsewhere means that this part of the Scottish Highlands is protected from some of the harshest weather that the region as a whole can offer. For much of the Black Isle, the proximity to the sea has an ameliorating effect on temperature extremes, with fewer frost days in spring and autumn than other more inland regions.





As for rainfall, the Black Isle is relatively dry for the Highlands with annual totals in the region of 600 to 1000mm compared with almost 2300mm at Kinlochewe. The dry climate is a consequence of the region falling within the rain shadow of some of the most mountainous landscape in the UK. With a prevailing south-westerly Atlantic airflow, much of the moisture content of the maritime weather systems dominating the climate of the Scottish Highlands is released over the uplands to the south and west, leaving relatively dry air to descend upon the Black Isle. In general, autumn and winter are the wetter parts of the year, with April and May being the driest months. (See graph on previous page)

Since the sea and uplands have such an impact on the

climate of the Black Isle, it is perhaps unsurprising to find that there are wide variations in climate across the peninsula. The west of the Black Isle including Muir of Ord and Tore can be characterised as more 'continental', in that winters are colder and summers are warmer than the more 'maritime' parts of the region such as Fortrose and Cromarty. The west is also wetter on the whole due to the general west-east rainfall

gradient of Scotland. For growing vegetables, these differences mean that there is no one single Black Isle growing climate and crops that may do well in Cromarty may struggle in Muir of Ord and vice versa. Similarly, sowing, planting out and harvest dates will differ across the region.

An indication of the local growing climate of the Black Isle in relation to the rest of the

Highlands, along with a demonstration of the variation across the peninsula is shown in the above maps of sunshine duration, days of ground frost and mean summer temperature produced by the UK Meteorological Office.

### **Growing season length: past, present and future**

A useful indicator of a region’s growing climate is its growing season length. As its name suggests, this indicator is used to quantify the effective length of season available for growing outdoors. The growing season is defined as the period which starts on the fifth day in a row which has an average daily temperature of 5°C or greater and ends on the fifth day in a row with an average temperature of 5°C or less. According to the Handbook of Climate Trends in Scotland produced by the Scotland & Northern Ireland Forum for Environmental Research, the growing season length in Northern Scotland, including the Black Isle, is currently around 245 days. This compares with around 270 days for coastal western Scotland, 280 around Berwick upon Tweed, and over 310 days for parts of Kent in S.E. England.

An analysis of the rising temperatures over the past 50 years indicates that growing season lengths in the Scotland have increased by upwards of 4 weeks in all regions. In Northern Scotland the start of the growing season has, on average, moved from early April in the 1960s to mid to late March and now ends in late rather than early November.

Looking forward, the most recent climate projections for the UK (UKCP09) indicate that the growing season will continue to lengthen in the Black Isle, approaching 270 days on average by the 2050s. Such a change in growing season could be expressed as that of the Black Isle adopting the growing climate of the Scottish Borders.

	N. Scotland	E. Scotland	W. Scotland	Scotland
Increase in growing season length	31.1	32.5	36.7	33

Table 1 Changes in growing season length (in days) from 1961 to 2004.

It is clear that in many aspects, the Black Isle climate is suitable for growing a wide range of garden produce. Proximity to the seas ensures that for many parts of the region, winters aren’t overly harsh and spring and autumn frosts are reduced. The shelter from rain-bearing Atlantic weather systems provided by the neighbouring uplands ensures sufficient sunshine and reduces the prevalence of water-logged soils and damp-related pests and diseases.

The Black Isle has a range of local climates from west to east and from coast to hill so general recommendations on optimum plant varieties, planting times and yields are hard to produce. Similarly, it is clear that the climate has been changing and may well continue to do so. As such, each grower may wish to consider adapting general advice on growing to their own local conditions and be prepared to adapt to conditions as they change.

### **Reference**

Barnett, C., J. Hossell, M. Perry, C. Procter and G. Hughes (2006) A handbook of climate trends across Scotland. SNIFFER project CC03, Scotland & Northern Ireland Forum for Environmental Research, 62pp.

# GROW NORTH TOPICS

**Planning your Garden**

**Watering your Garden**

**Mulching**

**Irrigation Systems and Holiday Watering Options**

**Feeding Your Plants & Home made Fertilisers**

**The Kitchen Garden in Summer**

**Composting at Home**

**Composting with Worms**

**Enjoying your First Garden Produce**

**Preserving your Food – Jams, Chutneys, Drying and Bottling**

**Preserving your Food - Freezing and Storing**

**Preserving your Produce – Recipes**

**Improving your Soil**

**How to Have the Best Producing Winter Vegetable Garden**

**Notes on Polytunnels session with Maggie Sutherland**

**Notes on Fruit session with Les Bates**

**Notes on Pests Diseases and Disorders session with Audrey Litterick**

**Sustainability in Gardening**





## Planning your garden

Whether you made a New Year's resolution to cut your carbon footprint, or you are feeling some pressure on your food budget, now is the perfect time to try growing some of your own vegetables. You don't need a lot of space, or expensive kit to get started – and it doesn't need to take up a lot of your time.

### Finding a space

First of all you'll need to find some space for your vegetable patch. Most vegetables and fruits need a sunny spot, so think about which areas of your garden get the most light during the spring and summer (the peak growing times). Perhaps there's a section of lawn that you could dig over, or room on the patio for a raised bed or some containers. Maybe you could grow some vegetables in your flower beds instead of splashing out on bedding plants – there are some varieties that look very ornamental. Remember to look at your vertical spaces, for example runner beans would look lovely clambering up a pergola, and you can train fruit bushes against walls and fences. Try starting off with a small space, and think about expansion plans next year once you've got the hang of it.

### What tools to buy

You will need a set of tools to start off with. It is worth considering second hand tools (e.g. try car boot sales or the Freecycle network). There are cheap tools available at many DIY shops or gardening centres, but you may find that they are heavier, not as good, or that they break more easily than higher quality tools. You will need a spade, a fork, a rake, a hand fork and a trowel; a hoe is very useful but not totally essential. It is also worth thinking about getting some gardening gloves. You will also have to consider watering your plants. You will need a watering can, and perhaps also a hose, depending on where your source of water and plants are in relation to each other. A wheel barrow is particularly useful if you have a lot of soil, manure, gravel to move around. If you opt for fruit bushes, some secateurs could be handy, or a good sharp knife would do. If you have fruit trees, you may need to invest in some loppers for pruning.

### Choosing crops

There are two golden rules when you're starting a new kitchen garden. The first is that you should only grow things that you're going to eat. It doesn't matter what the latest trend in vegetables is, or what exciting new varieties are listed in the seed catalogues – if no one in your family likes turnips, sprouts, or even carrots, then you're wasting valuable space by growing them. Make a start by listing what you and your family like to eat.

The second rule is not to try to grow everything at once. You need to be realistic about how much space you have. Being self-sufficient in potatoes may be a pipe dream unless you have a very large garden, but it's easy to grow enough herbs and salads to last you all summer. A handful of home grown strawberries or raspberries will be a treat on summer days, cherry tomatoes do well indoors on window ledges, or outside in containers and hanging baskets (if you choose suitable outdoor varieties, such as Red Alert) and if you've got a sunny spot or a greenhouse then red hot chilli peppers are fun and very attractive.

If you keep grocery receipts, or just have a good memory, you can use this as a guide for how much of a given item your family eats in a week or month. Then, extrapolate to the year. For example, if you buy a 5-pound bag of onions every couple of weeks, then this would be 10 pounds a month, which gives you a total of 120 pounds a year. Then you need to calculate how many to plant to give a yield of 120 pounds.

Remember that during the summer it is easy to have a great variety of crops available, but at other times of the year, you might not have so much coming in from your garden. Plan to preserve some of your crops, to last you throughout the year. Tomatoes, for example, can be made into sauce, salsa, dehydrated - or all three! Freezing is also an option for preserving your produce, and it is easy and safe. You can freeze berries, tomatoes, and basically any vegetable (blanching first, usually). For more information see the topics on Preserving your Produce.

Courgettes are easy to grow and can provide huge harvests even when grown in a container. Don't grow more than two or three plants unless you're planning on feeding the whole street!

Potatoes are a wonderful crop for a new grower and much loved by many vegetable gardeners. If it is your first year growing food, then it is a good idea to grow a few potato plants. They help to break up the soil, ready for growing other crops and are relatively easy to grow.



Round courgette



Raspberries in summer

Runner beans are also a great vegetable to make a start with. They are easy to grow supported by a wig-wam of canes. They will give you a continual crop through the summer until the frost start in the autumn time, and their nitrogen fixing nodules will help improve your soil.

Finally, consider the timing of harvest - late summer crops like peppers, aubergines, courgettes and tomatoes are deservedly popular, but will need polytunnel / greenhouse space. Remember you can reuse the space for a succession of crops through the year, so aim for spring, summer, autumn and winter crops.

With some careful planning you can intercrop (growing another crop in the space between the rows) and catch crop (a fast-growing crop that is grown simultaneously with, or between successive plantings of a main-crop. Planning on graph paper can help avoid overcrowding later.

To help decide how many plants, or how large an area to sow for particular plants, here are two US web-based resources which may be helpful. You will need to scroll down to “How Much to Plant” on the second link.

- <http://www.humeseeds.com/seedneed.htm>
- <http://pubs.ext.vt.edu/426/426-331/426-331.pdf>

## Water and compost

The last couple of years have been very wet during the summer months, but the weather is unpredictable and it's always worth installing a water butt or two in the garden. Fixed to the down pipe from the guttering, they collect water when it rains that is great for watering thirsty plants and washing cars. It's something to think about in the spring, before the weather really warms up.

When you start your new vegetable patch you might need to buy in some top soil or some potting compost, but if you start a compost heap at the same time then next year you will have your own compost – completely free. The Waste Aware Scotland Home Composting Campaign has now ended, so your best option is to look for a compost bin at your local garden centre or DIY shop. If you're handy then you can build your own out of wood.

Add garden waste, vegetable kitchen waste, cardboard and newspaper as and when you have them – and they'll turn into compost over several months. If you only have a patio then investigate wormeries, which turn kitchen waste into compost and don't take up much space.

Starting a new vegetable garden might seem like a daunting task. Even planning an established garden every year might seem like a hit-or-miss proposition. What should you consider in choosing a site for a new garden? How can you create a yearly plan for your garden that will increase your chances of success?

## Choosing a Site

If you're planning a vegetable garden your first question is probably: “Where is the best site for my garden?”

To pick a good location, consider:

- **Sun** - Choose a site that gets at least 6 hours of sunshine a day. Check how sunny your proposed vegetable plot will be at different times of day. Remember that the angle of the sun is lower in the spring and autumn and may affect how the garden is shaded by nearby trees.
- **Water** – Your garden will need at least 2.5 cm (1 inch) of water per week. You should also consider how far from a water supply your patch will be to avoid having to carry water further than is necessary. If you are going to use a hose, make sure it will reach your intended site. Too much water isn't good, however: avoid a site with poor drainage.
- **Air Circulation** – Your site should have good air circulation, especially important for wind-pollinated crops such as tomatoes and sweet corn. Too much wind is a detriment, however: it can reduce yields, cause erosion, result in moisture loss and topple tall crops like sweet corn. In this case, consider wind breaks.

- **Slope** – A flat site is best. Soil erosion is a problem with sloping land. A slope can be used to advantage, however, if it's kept planted. On a south-facing slope, soil warms up faster in the spring: a boon for early crops. Also, the site could be terraced.
- **Convenience** – Try to situate the garden close to the house. Kitchen gardens – just outside the back door – are handy. When you need an ingredient for dinner, it's just steps away.
- **Drainage** - The patch should be as level as possible. This not only allows easier maintenance but avoids drainage problems. The bottom of slopes can become very wet and boggy. Frost pockets can also develop at the base of slopes.

## How Large Should the Garden Be?

If you plan to plant a garden that will provide you with all of your vegetables, ideally you should plan on 5 square meters (50 square feet) per person. But don't despair if you have a small property (or none at all!). Even a small plot can produce big yields with a little planning, and vegetables can even be grown in pots on a sunny balcony or patio. Unless you have a lot of time to garden, don't plant a larger garden than you can realistically care for. A smaller, well-tended garden will be more productive and more satisfying.

## Planning and Organisation

A good garden begins with a plan. Make a fruit and vegetable plot plan of your garden using graph paper and a pencil. Using removable Post-it notes with crop names on them makes it easy to try out plans before committing them to paper. Save your plot plans from year to year. This helps keep track of what was planted where so that you can rotate your crops appropriately. Keep a diary so you can learn from year to year and improve your garden. Keep information about what soil



Carefully planned growing area

amendments you've used, what the weather was like (in particular how much rainfall), planting dates, days to harvest, disease and pest problems and the solutions you've tried and how well they've worked. Also keep track of how much you watered and fertilized (what and when). You may want to keep a garden log for planting dates and varieties, as well as your successes and failures. A good garden journal can help you improve your garden with each successive year.

An online vegetable plot planning tool is available from [www.Growveg.com](http://www.Growveg.com). It costs £25 per year. You can set up the plan for the garden. If you use GrowVeg.com's Garden Planning Tool then each vegetable has a coloured circle around it indicating the plant family it belongs to. It also remembers what you planted in previous years and shows you which areas to avoid, making crop rotation simple and intuitive. Toni at Loch Na Mhoid had tried this tool, and has been pleased with it.



Culbokie Community Garden use another site, <http://www.plangarden.com/share/#> which you can access the garden plan by entering the postcode IV7 8JH. This tool costs \$20US per year or \$36US for 3 years, and at present has a free trial for 45 days.

Another similar online vegetable growing planning tool is Harrod Horticultural's garden planner <http://gardenplanner.harrodhorticultural.com/> which is £15 per year.

## Layout / Planting systems

- **The traditional vegetable garden**

Growing crops on one large patch of soil is a system that still works well for those gardeners who have the time and the space to do it. This is the system that is used at the Culbokie Community Garden at Netherton Farm. You will need to dig over and clear the space of weeds, before incorporating as much compost and leaf mould as possible. It is a good idea to include paths through the centre of your plot that are wide enough for a wheelbarrow.

- **Permaculture**

Permaculture focuses on the sustainable use of your land and working in harmony with nature. Permaculture methods are based on the adage: Reduce, Reuse, Recycle. Working with this system can cut down on your carbon footprint. The idea is to plan your garden for easy access and minimum labour, and to grow food without using chemicals. You should observe the **sunny** areas, the **sheltered** spots and the direction of the prevailing **wind**, and then decide on the growing methods that will work best for those conditions. Permaculture also involves minimising wastage, using systems such as water butts, compost bins and wormeries.

- **No-dig**

It is easy to understand why people developed a no-dig method of gardening! The argument is that digging is hard work, can cause light soils to dry out rapidly and spreads weed seeds. However, the no-dig technique is really only suitable on soils that are already well aerated. For maximum success with this method it is advisable to create narrow beds, between boards at least 15cm high, held in place with pegs hammered into the ground. Several layers of newspaper are spread over the soil and a mulch of straw, sawdust and grass clippings added. This needs to be watered well before spreading a layer of compost, finished off with about 6cm of soil, which is the layer into which you plant your seeds. The soil level will drop as the layers of mulch rot down, but your beds can be topped up with compost, as required.

- **Raised Beds**

Raised beds work on the same principle as the no-dig techniques, but tend to be deeper – they are basically large boxes of soil and compost. You can construct them from permanent materials such as bricks or railway sleepers, or from wooden crates or boards. Raised beds are filled with rich compost which is higher than the surrounding ground and therefore remains dryer. This avoids the problems of poor soil and bad drainage. Although more of your garden is taken up in paths between beds, these do allow easier access to plants and prevent soil becoming compacted by being walked on. The deeper soil can often compensate for the lost space. If you plan well in the initial

stages, you can incorporate systems for covering your beds with cloches, to provide warmth and protection in cold weather. Some commercially available raised-bed systems include holes into which hoops fit, allowing you to easily cover the whole bed with fleece or netting.

- **Square Foot Gardening**

This system is particularly effective where space is at a premium. You divide a specially prepared deep raised bed into one foot modules, planting each of your crops into this area. This method is particularly suited to salad crops and miniature varieties of vegetables. Close planting produces a micro-climate in which weed growth is suppressed. The crops are easy to reach from all sides, making it a very accessible way to grow produce directly outside your kitchen door.

- **Containers**

If you are short of space, most vegetables can be grown in pots and even fruit bushes and trees can grow in pots.

### **Lay out Summary**

- Before choosing a planting method, consider the size of your plot and the quantities and varieties of vegetables you want to grow.
- Consider how to protect your crops from harsh weather and rotate vegetables each year to prevent build up of disease.
- Permaculture principles can help you work with the garden you already have, creating a sustainable productive garden.
- Raised beds solve the problems of poor drainage, waterlogged or poor soil and allow easy access to plants.
- Square foot gardens are ideal for easy-access crops raised near to your house.

Combine any of the above methods, to create a system that suits you best.

### **Other Considerations:**

#### **Wildlife / pets**

If you have wildlife (or pets) in your area, consider how you plan to keep animals out of the garden. Fencing may be necessary.

#### **Time and effort.**

Consider how much time and effort you want to devote. Tomatoes, for example are popular plants, but they need staking and training,



Rabbit-proof fencing around outdoor vegetable beds

protecting from blight and only crop for a few weeks in late summer. Therefore just a few plants giving fruits of the best flavour might be enough. In contrast runner beans and courgettes crop abundantly over a long period.

### **Preparing the growing areas**

The first task would be to use a spade or strimmer to skim off any top growth. Mark out the vegetable beds which will then need to be well dug over and as many weeds as possible removed. You should try to remove all roots of weeds such as docks, thistles, dandelions, buttercups, brambles, nettles etc. Gloves, long sleeved tops and long trousers should be worn when clearing the patch. Not only can some plants sting but the sap of many plants can irritate or burn skin especially when the sun is shining.

Depending on what the land had been used for previously you may need to remove rubble and any large stones.

Digging will improve the soil structure - if you dig in autumn or early winter the frost will help break down lumpy soil which can then be dug again in early spring. The first lot of digging could be heavy going. Don't rotavate weed infested soil as this will only chop up the roots and cause more weeds to grow - Once dug the patch should be levelled and the beds marked out.

The soil may benefit from an application of manure. If so make sure that you can obtain a load from a safe supply, as much damage can be done to your crops if manure is contaminated with weed killer. (For more information about this, please see the Grow North Topic on Soil Improvements.) Always wear gloves when handling manures. Alternatively you could use compost either bought or home-made. You can also add bone meal or fish blood and bone meal to feed the soil.

### **Growing in a Protected Environment.**

You may wish to include a structure to provide a protected growing environment.

#### **Greenhouse**

This is usually the most expensive form of protected environment and care should be taken in the siting of any such structure, whether large or small. Greenhouses are normally of aluminium frame although those with wooden frames can be just as robust and are more aesthetically pleasing. A sheltered site is required in exposed areas and structures

should not be sited where there is a danger of wind-borne debris causing damage to the structure e.g. under large trees – panes of glass can be costly to replace. A small greenhouse can provide the ideal conditions for propagation of seeds whereas larger greenhouses are ideal for growing such crops as tomatoes, cucumbers etc. The environment inside a greenhouse can be very cold in winter but very hot in summer. You may control the environment to adjust for this with ventilation, and some people may choose to add a heat source during the winter.

#### **Polytunnels**

Polytunnels offer the opportunity to extend the traditional seasons as crops may be sown earlier and/or later to give an extended season. Outside temperature fluctuations

do not impact so greatly on production under polythene, except when there is severe frost. It is possible to produce crops under polythene throughout the growing year although light levels and temperature fluctuations can be a factor in more northerly locations.

The following illustration gives some idea of the beneficial effect of a polytunnel construction on temperature:-

Weather	Outside Temperature (°C)	Tunnel Temperature (°C)
Dull	13	19
Bright	21	33

This increased temperature is not the only benefit of polytunnels, as they also offer protection from wind and rain, increase in humidity (beneficial to some crops) and, with new plastic cover developments, up to 90% or more light transmission.

### **Siting a Polytunnel**

As with a greenhouse, it is important to identify the right location for a polytunnel and, in exposed areas, consideration should be given to providing shelter for the structure itself to minimise wind damage. This could take the form of an earth bank, erection of suitable windbreak fencing which should have a porosity of approx. 50% to avoid the creation of damaging turbulence; tree shelter, especially of quick growing willow, has been proven to be effective but care should be taken against the possibility of twigs breaking off and perforating/damaging the skin. Any windbreak construction 2m high can provide useful protection to a polythene tunnel. When siting the polytunnel and any windbreak, consideration should be given to avoiding shade, especially if the tunnel is to be cropped in the winter. To avoid this situation, it is recommended that a windbreak should be four times its height away from the tunnel.

Tunnels should ideally be constructed to run up and down a slope to take advantage of air movement, but if this is not possible, a North–South line should be adopted to avoid uneven exposure of the plastic cover to the sun.

### **Size & Construction**

There is an adage that whatever size you decide upon, you will afterwards always wish you had gone for a bigger tunnel!! However, with the limitations of site, climatic conditions and finance, you should consider what is best for your needs and location. Larger tunnels can be cheaper per area covered, but ventilation difficulties, especially in narrow structures, can cause problems. Narrow tunnels are cheaper but can be inconvenient with restricted inside working area and a large wasted area. Straight sided tunnels give more working area and ventilation can be achieved with louvres or doors/windows at both ends as well as a number of different side ventilation options e.g. wind up/roll up curtain sides, mesh sides etc

Installation or close proximity to a water supply is essential and there are a number of options available for irrigation systems i.e. overhead, under-soil etc.



## Watering your Garden



Watering newly planted out courgette plants

Watering your vegetable garden seems simple enough: if it is dry, water it. But how much water is enough - and how much is too much? What time of day is best to water? When are the critical times to water to ensure a successful crop?

### **How Much Water Does My Garden Need?**

The rule of thumb is to make sure your garden gets at least 2.5 cm (1 inch) of water weekly. Use a rain gauge, a tin can, or other straight-sided container in the garden to keep track of rainfall and provide additional water as needed.

Some crops can get by on less than 2.5 cm of water per week, but this is a good general guideline. Aside from rainfall, many other factors come into play when determining how much water is needed. If it's cloudy, you can reduce watering, as there's less evaporation. When it's hot and dry, you'll need to water more.

Soil type also affects watering needs. Clay retains water well, while sandy soil retains it poorly. A good loam is well-balanced to hold moisture while providing adequate drainage. With clay soils, water takes longer to seep in, so slow watering is required to avoid forming puddles. Clay soil may become waterlogged. With sandy soil, water drains though quickly, so more frequent watering is required.

Once you've got the minimum watering needs of your garden taken care of, consider the needs of individual vegetables. According to Cornell University researchers, in good garden loam, 2.5 cm of water will penetrate to a depth of 38 cm (15 inches). This is fine for brassicas, sweet corn, lettuce, potatoes, radishes and spinach, which need to be

watered to a depth of about 30 cm (12 inches). Some crops need more water, however, for optimal growth. Beans, beetroot, carrots, cucumbers, peas, peppers and courgettes do best when watered to a depth of 45-60 cm (18-24 inches). Pumpkins and squash should be watered to a depth of at least 60 cm (24 inches).

Your vegetable garden will have a lot of 'cultivated', loose soil which can easily be damaged or eroded by heavy watering - including heavy rain. Gentle watering with the correct nozzle or rose is important. If you have not had enough rain, and need to water your vegetables, then make sure that they are thoroughly watered. It is the roots that need the water - not the foliage.

To meet the watering needs of all the plants in your garden without wasting water, you may want to use a combination of watering devices.

### **Too Much Water**

While lack of water isn't good, neither is too much water. Over watering can promote disease and encourage slugs and snails. It can also compact soil and wash away minerals. Too-frequent watering promotes shallow roots, making plants less drought-resistant. Deep roots seek out water during dry spells and are more resilient. One sign that your plants are getting too much water is yellowing and droopy leaves.

### **Time of Day to Water**

The best time to water is early morning. This is especially good in warm weather as it protects the plants from drying mid-day sun and keeps them from wilting. If you can't water in the morning, the next-best choice is late afternoon, so that plant foliage can dry out before sunset. Wet foliage overnight encourages fungal disease, a risk especially in damp climates. Don't water in the middle of the day when the sun is the hottest. This not only wastes water due to rapid evaporation, but hot sun on wet plants can damage leaves and fruit.

### **How Often to Water**

Water deeply and less often, rather than watering a little more frequently. One suggestion is to water an established garden every six to ten days, watering 15-30 cm (6-12 inches) deep, in the absence of adequate rainfall. The best way to determine if water is needed: use a trowel and dig into the soil. If the soil is dry to a depth of 15-30 cm (6-12 inches), it's time to water. Water to the depth of the plants' roots, as outlined above. Drooping plants are an obvious sign it's time to water. If your plants are wilting, you've waited too long - a wilting plant is under stress. But drooping leaves may also be a sign of insect infestation or disease. If your plants are still drooping after a good soaking, lack of moisture may not be the problem.

### **Watering by Stages of Growth**

Plants need water for photosynthesis and respiration, as well for absorbing nutrients. For vegetables, watering is more critical at some stages of the plant's development than at others.

Seeds and seedlings need diligent watering. Newly-seeded beds should be moist but not soggy. Water with a fine mist to avoid washing away seeds.

Transplants should be watered thoroughly after planting, especially important during dry weather. Plants can experience shock due to root damage when transplanting: a good watering helps them adjust.

Many vegetables need special attention to watering during two periods: when they're flowering and when fruiting. A critical time for watering legumes and sweet corn is when plants are flowering (in the case of corn that means when the tassels and ears are forming). A critical time for watering tomatoes and squash is when their fruit is developing. When peas and beans are forming pods and when sweet corn ears are filling out, they need attention to watering as well. Leafy greens and roots require steady watering throughout their growth.

Peas, beans, tomatoes, sweet corn, cucumbers and marrows will need extra water in dry periods. Make sure that your watering is thorough. Don't simply moisten the foliage. A drench occasionally is far better than a regular sprinkle!

With root crops, be careful not to give them too much water, which promotes leaf growth but hinders root growth and can also cause roots to split.

Vegetables that produce edible fruit, pods and seeds also shouldn't get too much water before they flower. This results in lots of leaves and shoots, but fewer flowers and consequently, lower yields.

### **Conserving Moisture**

Conserving water is not only good for saving money, it's also good for the environment and saves time spent watering.

Reducing watering Requirement:

- Addition of plenty of organic matter into your soil will help retain moisture in the soil for longer periods.
- Mulching with organic materials will help to conserve moisture.
- Hoeing - but just the top inch or so - will give a fine loose mulch which will help to stop the soil water from evaporating.
- Plant leafy crops a little closer and generally cover the soil with foliage, rather than planting at wide spacings. Although you will have more plants, the 'cover' of the soil will reduce evaporation.
- Remove weeds - as they will compete with vegetable plants for the moisture supply
- If high winds are a problem, a windbreak can be a good idea: drying winds can cause moisture loss

Understanding the principles of effective watering can end the guesswork of when and how much to water, increasing yields and saving time and money in the process.

### **Other references:**

- [http://www.gardenorganic.org.uk/todo\\_now/watering\\_vegetables.php](http://www.gardenorganic.org.uk/todo_now/watering_vegetables.php)
- [http://www.gardenseeker.com/vegetables/vegetable\\_plot/watering\\_vegetables.htm](http://www.gardenseeker.com/vegetables/vegetable_plot/watering_vegetables.htm)

## Mulching

Mulching is one of the most important ways to maintain healthy garden plants. Mulch is any material applied to the soil surface for protection or improvement of the area covered. Mulching is really nature's idea. Nature produces large quantities of mulch all the time with fallen leaves, needles, twigs, pieces of bark, spent flower blossoms, fallen fruit and other organic material.

### Benefits of Mulching

When applied correctly, mulch has the following beneficial effects on plants and soil:

- Mulches prevent loss of water from the soil by evaporation.
- Mulches reduce the growth of weeds, when the mulch material itself is weed-free and applied deeply enough to prevent weed germination or to smother existing weeds.
- Mulches keep the soil cooler in the summer and warmer in the winter, thus maintaining a more even soil temperature.
- Mulches prevent soil splashing, which not only stops erosion but keeps soil-borne diseases from splashing up onto the plants.
- Organic mulches can improve the soil structure. As the mulch decays, the material becomes topsoil. Decaying mulch also adds nutrients to the soil.
- Mulches prevent crusting of the soil surface, thus improving the absorption and movement of water into the soil.
- Mulches prevent the trunks of trees and shrubs from damage by lawn equipment.
- Mulches help prevent soil compaction.
- Mulches can add to the beauty of the landscape by providing a cover of uniform colour and interesting texture to the surface.

### Types of Mulches

There are basically two types of mulches: organic and inorganic. Both types may have their place in the garden. An organic mulch is made of natural substances such as bark, wood chips, leaves, pine needles, or grass clippings. Organic mulches attract insects, slugs and the birds that eat them. They decompose over time and need to be replaced. Inorganic mulches, such as black matting, gravel, pebbles, black plastic and landscape fabrics do not decompose. However they can harbour slugs and also frogs (which may eat the slugs!)

### Mulch Materials

#### Organic Mulch Materials

Your garden waste can be recycled as mulch with the advantage of retaining the nutrients found in these organic materials.

#### Grass Clippings

The best use for grass clippings is to leave them on the lawn. Grass clippings will decompose rapidly, adding nutrients back into the soil. A two-inch layer of grass clippings provides weed control if they are not full of weed seeds. Use grass early in the season before seeds form. It is best to build up the layer gradually using dry grass, not fresh clippings, to prevent the formation of a solid mat. Be careful not to use clippings from lawns that have been treated with herbicides.



## **Hay and Straw**

Never use hay for mulch since it contains too many weed seeds. Straw is not very ornamental and is best for a vegetable garden. Straw will improve the soil as it decays.

## **Leaf mould**

Leaf mould has a tendency to form a crust, preventing water from penetrating into the soil. It is better to use leaf mould as a soil improver than as a mulch.

## **Leaves**

A 2- to 3- inch layer of leaves provides good weed control. It is best to shred the leaves coarsely, using a shredder or your lawn mower. Whole leaves have a tendency to blow away, while finely shredded leaves do not allow water to penetrate. Oak and beech leaves help to acidify the soil for acid-loving plants. Leaves are usually easy to get, attractive as a mulch, and they will improve the soil once they decompose. After the leaves decompose, dig them into the soil and add a new layer of mulch on top.

## **Pine Bark**

A 2- to 3- inch layer of pine bark is good for weed control. Pine bark makes an attractive mulch, usually dark coloured mulch. It can be purchased in various particle sizes, from shredded to large-sized particles, called nuggets. Large pine bark nuggets float in water and may not stay in place during a heavy rain. They may also attract termites and other insects.

## **Pine Needles**

A 2- inch layer of pine needles makes an excellent mulch for acid-loving trees and shrubs. This mulch is very attractive and allows water to penetrate easily.

## **Bracken leaves**

Gather bracken leaves before the spores form (before end of June) and use these as a mulch around your plants.

## **Shredded Hardwood Mulch**

This mulch is good at suppressing weeds. It does not wash away easily. It decomposes relatively slowly, and it is very attractive.

## **Wood Chips**

This material contains bark and pieces of wood of various sizes and makes an attractive mulch. A 2- to 3- inch layer of wood chips provides good weed control. Small wood chips decompose very rapidly using nitrogen from the soil, which needs to be replaced by nitrogen fertilizer. Wood chips may attract termites and other insects.

## **Cardboard & Paper**

This can be used as a base layer in mulching, with another organic material added on top. Corrugated cardboard attracts worms, which seem to enjoy the glue between the layers. If you are using paper to create a layer, this should be built up of a few sheets –

but not too much. If the paper is layered too thickly, it can become much less permeable, and a mulch needs to allow free movement of air and water.

### **Inorganic Mulch Materials:**

#### **Gravel, Pebbles and Crushed Stone**

These materials are permanent and are best used for permanent plantings such as foundation plants. A 1- inch layer of small rocks will provide good weed control. Do not use them around acid-loving plants since the rocks may add alkaline elements and minerals to the soil. These materials reflect solar radiation and can create a very hot landscape environment during the summer months.

#### **Black Plastic**

Black polyethylene film is very effective in preventing weed growth. It also holds water in the soil. Therefore, plastic is not recommended for poorly-drained areas as it may cause the soil to remain too wet, which could result in root disease problems. You may have to cut holes in the plastic if water does not go through it. There is a permeable black plastic available that has small holes in it to help with drainage. If exposed to sunlight, black plastic is broken down fast, losing its effectiveness as a mulch. However, if cover the black plastic with a layer of wood chips or pine needles this will reduce heat absorption and mask its artificial appearance.

#### **Woven Ground Cloth / Matting**

Woven plastic fabric ground cloth / matting are available in various lengths and widths. Unlike plastic films, woven materials allow water and air to move through them. They are very effective in controlling most weeds, although some grasses may grow up through the holes in the fabric. Landscape cloth / matting needs to be fastened down so it will not be pushed up by perennial weeds. Keep an eye out for slugs which can hid under the matting! Better moisture, temperature and weed control will be obtained by adding several inches of another mulching material on top of the landscape cloth.

#### **Where to Use Mulch**

Mulching is a very important practice for establishing new plantings, because it helps to conserve moisture in the root ball of the new plant until the roots have grown out into the surrounding soil. The growth rate and health of trees and shrubs



Marigolds grown through woven matting at Poyntzfield

increases when there is no competition for water and nutrients from weeds. Mulch also helps to prevent tree trunk injury by mowers and trimmers. Mulch entire beds of shrubs, trees, annuals, herbaceous perennials and ground covers.

Mulch can also be used to cover trails, driveways, and play and natural areas. Light-weight mulch such as dried grass clippings, pine needles and straw can be used temporarily to cover low-growing tender plants to protect them from frost injury.

### **When and How Often to Mulch**

The best time to mulch new plantings is right after you plant them. Around established plants mulch is best applied in early spring. This is when plants are beginning to grow and before weed seeds start to germinate.

How often mulch needs to be replenished depends on the mulching material. Grass clippings and leaves decompose very fast and need to be replenished frequently. Inorganic mulches such as gravel and pebbles rarely need replenishing. As the plants grow and fill in the bed areas, less and less mulch is needed.

### **How to Apply Mulch**

Before applying any type of mulch to an area, it is best to weed and water the area. Spread a layer of mulching materials over the entire plant bed. Keep mulch 2 to 3 inches away from the stems of woody plants. This will prevent decay caused by wet mulch and rodent damage during the winter. Keep mulch 6 to 12 inches away from the walls of buildings.

Newly planted trees require a circle of mulch 3 to 4 feet in diameter. Maintain this for at least three years. Do not pile mulch against the trunk. For established trees in lawns create a circle of mulch about 2 feet in diameter for each inch of trunk diameter. Increase the size of the mulched area as the tree grows. Try to apply the mulch at least 6 to 12 inches beyond the drip-line of the tree. Because the root system can extend two to three times the crown spread of the tree, mulch as large an area as possible.

### **How Deep to Mulch**

The amount of mulch to apply depends on the texture and density of the mulch material. Many wood and bark mulches are composed of fine particles and should not be more than 2 to 3 inches deep. Excessive amounts of these fine-textured mulches can suffocate plant roots, resulting in yellowing of the leaves and poor growth. Coarse-textured mulches such as pine bark nuggets allow good air movement through them and can be as deep as 4 inches. Mulches composed of grass clippings or shredded leaves should never be deeper than 2 inches, because these materials tend to mat together, restricting the water and air supply to plant roots.

## **Mulch Problems**

### **Mulch Toxicity**

Though mulch benefits plants, "sour" mulch can quickly damage plant tissue and lower the soil pH causing injury or death. Bedding and low-growing woody plants are most easily damaged. Symptoms include yellowing of the leaf margins, scorching or dropping of leaves and occasionally entire plant death. Although it may be several days before symptoms appear, spreading sour mulch can damage plants immediately.

Sour or "acid" mulch is caused by poor handling or storing of mulch resulting in anaerobic (without air) conditions. Mulch piles need to "breathe" to prevent anaerobic conditions from occurring. In the absence of air, microbes in the mulch (mostly bacteria) produce toxic substances such as methanol, acetic acid, ammonia gas, and hydrogen sulphide gas. Sour mulch smells like vinegar, ammonia, sulphur or silage. Good mulch smells like freshly cut wood or has the earthy smell of a good garden soil. Another way to determine if mulch is sour is to test its pH. Toxic mulch will have a pH of 1.8 to 2.5.

To prevent mulch from turning sour or to cure sour mulch, you need to turn your pile once or twice a month, more frequently if the pile is very wet. Do not let the pile get larger than 4 feet thick in any dimension if you are not turning the pile regularly. A good aeration will eliminate the toxic compounds in 24 hours, but to be safe allow three days.

### **Slime molds**

Slime molds are another type of nuisance fungus. They first appear as bright yellow or orange slimy masses that may be several inches to a foot or more in diameter. They are harmless but unsightly. Some fungi in mulches produce toad stools (mushrooms), and some of these are toxic to humans. It is a good idea to destroy them when small children have access to the mulched area.

### **Other references:**

Henry Doubleday Research Association (Now called Garden Organic) – scientific paper reviewing mulches as weed control:

<http://www.gardenorganic.org.uk/organicweeds/downloads/a%20review%20of%20weed%20control%20mulches.pdf>

## Irrigation Systems & Holiday watering options

There are many options for irrigation systems which can help save you time watering your garden, and help with periods where you are away from your garden for a few days at a time.

Many irrigation systems are designed for polytunnels and greenhouses – as these covered growing areas will not benefit from any rain and also the atmosphere is usually much hotter inside and soil will dry out much faster. If your plants are not kept well watered in the heat of your polytunnel / greenhouse then they will provide low yields at best, and will die at worst. Therefore attention must be paid to how you will water your polytunnel / greenhouse plants regularly. If you are going to be away on holiday, you may find the best option is to ask someone to come and water your plants regularly. If you have plants in containers, and a hot, dry spell is forecast, you may wish to move the containers to a shady area. If you wish to have some more automated systems to help, then here are some other options to consider:

### Capillary Matting / Watering

Here plants are sat on top of a thin mat made of cotton or polyester which holds a few litres of water per square metre. Water is sucked up from the mat by the soil which then results in the roots getting wet as required. You can water the mat by hand (rather than watering the plants themselves) or the mat can be hung into a water reservoir a few inches below, and it will suck up water until it is saturated or the reservoir runs dry.

### Soaker pipe

Lay-flat and perforated hoses that allow water to seep along the length, may be attached to either mains supply or to a water butt. You would want to have the tap turned on for a period to give the soil a good soak and then turn off again. This may work well with a timer. You may find that they are not easy to move about without damaging plants.

### Dripper irrigation systems

Connecting to either mains or water butts, this uses a system of pipes which you lay around your planted area, and then place pegs with drippers into the soil close to your plants. Many types of these are available, and many dripper systems allow you to adjust the flow of water at each point to match the needs of the particular plants.



Clay peg dripper irrigation system in polytunnel



## **Plastic Bottle Dripper spikes**

There are simple dripper spikes available which require an old drinks bottle to act as a reservoir. You place the spike into the ground, and water is gradually released into the soil. Alternatively, you can pierce holes in the lid of a used drinks bottle and submerge this into the ground – and experiment with the size of hole needed to give a good rate of flow

## **Reservoir bags**

Large plastic bags are available which can be filled with several litres of water. These can then be hung up inside your greenhouse or polytunnel, and connected to pipes and drippers to keep your plants well watered. These are useful if you have plants in areas which are not near to your water butts or mains supply.

## **Water Timer**

A Garden water timer can be used with any drip irrigation system to water the plants at specific times of day and for set durations. It is connected directly to the hosepipe which is in turn connected to your mains supply (or to a water butt). This can also be used to refill the reservoir of water used by capillary matting systems leaving you able to leave your greenhouse unchecked for many days safe in the knowledge that everything should be fine. Very simple and very complex timers are available from £10 to many hundreds of pounds.

## **Solar timers**

As with the timers above, it is possible to get a device to fit to your mains or water butt which will switch on and off according to day light.

## **Suppliers**

Here are just a selection of websites where irrigation products are available (search “irrigation”, “drippers”, “holiday watering”, “watering systems”):

- <http://www.twowests.co.uk>
- <http://www.dobies.co.uk>
- <http://www.harrodhorticultural.com>
- <Http://www.gfonic>
- <http://www.primrose-london.co.uk/>
- <http://www.simplycontrol.com>
- <http://www.greenhousesensation.co.uk>

## **Feeding your Plants & Home made Fertilisers**

Caring for your soil in general, is important, which is one reason why making your own compost to add to improve your soil is so great. Other options for helping the health of your soil include applications of farmyard manure, seaweed, wood ash, and planting green manures. Healthy soil means healthy plants – and more abundant and nutritious vegetables!

As a general rule of thumb for feeding your plants, plants at the fruiting stage will need potash rich feeds (e.g. comfrey, nettle soups, seaweed) and plants producing “greenery” will need nitrogen rich feeds (e.g. manure).

Homemade fertiliser is of course organic and the best for your plants. When your fruit trees are just about to fruit or when your vegetables are just sprouting, your plants will appreciate the extra bit of food you are giving to them. All you need is a container that holds water. The size of the container depends on the size of your land and the amount of vegetables you are growing. A small area only needs something like a 5 litre bottle whereas a large area can have a bath! There are many ingredients you may wish to consider, ranging from nettle leaves, comfrey leaves, wood ash, sheep droppings, urine and seaweed. You can add many of these directly onto the soil as they are, or you can create a liquid feed, which may be rather smelly, but makes it easier for the plants to absorb the nutrients.

### **Wood ash**

Wood ash from a bonfire, woodstove or fireplace (but not coal or charcoal) adds potassium and some phosphorus, and usually has about a 0-1-3 (N-P-K) ratio. Ash is rich in calcium and potassium, which are vital to healthy and strong plant growth.

### **Manure**

Well-rotted manures from organically-raised cows, horses, and chickens can add nutrients to garden soil. Be sure not to apply manure and lime at the same time, which will create ammonia gas and waste beneficial nitrogen. Cover your manure, and leave it to “ripen.” Wear rubber gloves when handling fresh manure. Don't put fresh manure around growing plants.

It's possible to have perfectly healthy soil without the addition of animal materials. Recent E. coli outbreaks traced to commercially-produced vegetables have led many organic gardeners to avoid the use of animal manures.

### **Poultry Manure Fertiliser**

If you are a backyard poultry keeper, the chances are that you already benefit from the addition of poultry manure and bedding in your compost heaps. However, have you considered making a liquid organic fertiliser from poultry manure? All you need to do is collect together around half a bucket or container full of poultry manure, and then fill the remaining half with water. Leave to 'stew' for around 3 or 4 weeks before using. This concentrate will need to be diluted - for every half a litre of concentrate, you'll need to add 10 litres of water.

## Organic Fertilisers

If you don't have enough compost, or your soil needs a lot of a particular nutrient, organic fertilisers may be your best bet. Organic fertilisers include plant-based products such as seaweed meal, and animal-based products such as blood, fish, and bone meal. The UK Soil Association does not recommend using seaweed or peat for ecological reasons.

### Urine

Every day, gardeners across the world flush away a valuable and sustainable source of fertilizer for their plants - urine. Urine is a good source of nitrogen and other minerals and, providing it is used correctly, is completely safe. Using urine as a fertilizer saves money, fossil fuels (used extensively in the production of chemical fertilizers) and water (no need to flush!).

- Keep it separate. The golden rule with urine use is to keep it separate from other bodily wastes. Urine is clean and needs to be kept that way.
- Use it fresh. We all know that stale urine smells. That's ammonia, and it's made from nitrogen. The smellier your collected urine, the less nutritious it will be for your plants, as well as being unpleasant to apply.
- Always dilute. Urine is too strong to be used neat on plants. Dilute at least 5:1, and it can be diluted up to 10:1 for use on tender plants and seedlings.

### Nettle / Comfrey Liquid Manure

Nettle / comfrey liquid manure is an organic and free plant feed which can be easily made in any garden. All you need is a container (preferably with a lid, as this gets smelly) some young nettles and / or comfrey leaves and some water. Nettles have deep roots and as they grow, they bring up trace elements from the deeper soil which are essential to plant health but which are often lacking in regularly cropped top soil.



Plastic bin with homemade comfrey fertiliser or "tea"

The liquid manure can be started in the spring when the young nettles begin to appear and can be continued throughout the summer and early autumn to give a valuable plant/soil feed throughout the main growing seasons. It is a good idea to contain the leaves in a mesh of some kind, so that when you come to use the fertiliser (which will need to be diluted) you don't clog up the rose of your watering can with rotted down solid bits of plant.

Other good plants to add are borage and green leafy vegetables such as beetroot leaves and Swiss chard. When the water begins to evaporate over time, just add more

water as you need to. Add more plant cuttings every three months. If you have a large garden its great to have a designated area for nettles and comfrey. If not, nettles are readily available for free in woods, parks and disused areas. Avoid picking them from by the roadside because of pollution.

The liquid manure takes about three to four weeks to 'mature' - and it does 'mature' to give a fairly earthy smell, so you may want to place the container somewhere out of the way.

More nettles & comfrey and, if necessary, water can be added to the container throughout the season.

**Other references:** For detailed fact sheet about comfrey, please see:  
<http://www.allotment.org.uk/vegetable/comfrey/comfrey.PDF>

## The Kitchen Garden in Summer

### Successional sowing

Successional sowing is the practice of sowing a small amount of the same vegetable in succession during the growing season. This should provide a continuous supply while avoiding gluts. You use succession sowing for things that you don't want to eat all at once or for vegetables that you cannot store long term - e.g. lettuce. You wouldn't want to eat a couple of dozen lettuce within a couple of weeks – so if you spread the sowing, you spread the harvesting. This works best for crops that don't require a long growing time. You can also make use of different varieties, to extend your harvest. This is commonly done with potatoes - so first earlies, second earlies, and maincrop varieties would be planted a few weeks apart to give you a continuing harvest during the season.

Here is a list of suitable crops for successional sowing:

- **Beets** (beetroot, chard and perpetual spinach) - Make monthly sowings beginning in early to mid spring and continue until mid summer.
- **Lettuce** - Sow every two weeks or so, starting in spring.
- **Calabrese broccoli** - Make monthly sowings from mid spring to early summer.
- **Spinach** - Sow every three weeks or so, starting in early spring and continuing until mid Summer.
- **Peas** - Sow throughout the spring.
- **Small radishes** - Sow every two weeks from early spring to early autumn.

Garden Organic have a very useful fact-sheet entitled “Banishing gluts in the vegetable garden” which is available online.

<http://www.gardenorganic.org.uk/factsheets/g6.php>

### Gluts from the Garden

If you do find yourself facing gluts from the garden, then there are many great resources with suggestions of recipes and ways and means of preserving, a few examples are listed below.

#### Web:

[http://www.overthegardengate.net/garden/herbs/glut\\_recipes.asp](http://www.overthegardengate.net/garden/herbs/glut_recipes.asp)

#### Books:

- The Boxing Clever Cookbook by Jacqueline Anne Jones & Joan Kathleen Wilmot
- What Will I Do with All Those Courgettes? by Elaine Borish
- What Will I Do with All Those Root Vegetables? by Elaine Borish
- Too Many Tomatoes, Squash, Beans, and Other Good Things: A Cookbook for When Your Garden Explodes by Lois Landay & Laura G. Myers
- How to Store Your Garden Produce: The Key to Self-sufficiency by Piers Warren
- Home Preservation of Fruit and Vegetables by Fish & Food Ministry of Agriculture



## Composting At Home

Composting is a biological process during which naturally occurring micro-organisms, bacteria and insects break down organic materials such as leaves, grass clippings and certain kitchen scraps into a soil-like product called “compost”. It is a form of recycling, a natural way of returning needed nutrients to the soil.

By composting kitchen scraps and organic garden waste at home, you can conserve valuable landfill space normally used to dispose of this material. When this material goes to landfill it will break down, but as it is mixed with other materials and compacted, it rots anaerobically – without air. This means that methane gas is produced, rather than carbon dioxide. Methane is thought to be about twenty times a more potent greenhouse gas than carbon dioxide. Composting is practical, convenient and can as it is done in situ; there are no transportation costs to you, the local authority, and to the environment too.

By using compost you return organic matter and nutrients to the soil in a form readily usable to plants. Organic matter improves plant growth by helping to break heavy clay soils into a better texture, by adding water and nutrient-holding capacity to sandy soils, and by adding essential nutrients to any soil. Improving your soil is the first step toward improving the health of your plants. Healthy plants help clean our air and conserve our soil, and of course if these are fruit and vegetable plants, you can expect a better yield.

### How to Compost.

Composting is easy. You can compost in your garden by saving garden waste (e.g. leaves, grass clippings, prunings and twigs) and certain kitchen and meal scraps by preparing them properly and placing them in a compost pile. Just follow these easy, basic guidelines:

#### Choose the right materials

##### Do Compost

- Fruit and vegetable scraps
- Egg, peanut and nut shells
- Stalks, stems and vines
- Coffee grounds and filters, tea bags
- Bark
- Wood ashes (in limited amounts)
- Manure (horse, cow, chicken & rabbit)
- Garden clippings
- Leaves
- Grass clippings
- Apple cores and citrus rinds
- Scrunched up newspapers
- Cardboard (egg boxes, toilet roll tubes)

##### Do Not Compost

- Meat and fat
- Fish
- Poultry
- Bones
- Dairy products
- Plastic or synthetic fibres
- Diseased plants
- vegetable oils
- Dog and cat faeces
- Weeds which have gone to seed
- Invasive weeds
- Nappies (unless they are fully biodegradable)

Anything that was once alive will compost, but not everything belongs in a compost pile. In general, do not compost foods containing animal fats (such as meat, bones, cheese, grease and oils); plants infected with disease, invasive weeds, weeds that have gone to

seed, or dog and cat faeces. Garden trimmings, like leaves, grass clippings, prunings, garden debris, and most kitchen scraps make excellent compost.

### **Select and prepare a site**

First, choose a place in your garden to start your compost. It doesn't really matter if it is in the sun or shade, but a place that receives a little of both during the day would be ideal. Put your bin on a level, well-drained spot to allow water to drain out. Make sure worms can get in from below to help break down the contents. What's more important is that it is somewhere convenient to use. Then, decide what sort of container to use for your compost. There are many different options, and it's really personal preference which one you choose. You can choose to:

### **Build your own compost bin.**

Enclosed bins will typically have a neat appearance, help keep out pests, and hold in heat and moisture. You can assemble wooden stakes and chicken wire into a simple round enclosure; construct a wooden bin out of reclaimed timber or old pallets; or even drill holes in the bottom and sides of a rubbish bin.

### **Purchase a compost bin.**

You can get a ready-made compost bin from a garden centre or DIY / hardware store, or look in a mail order garden catalogue. There are many designs and models with different storage capacities, available, either made from plastic or from wood. Some models, such as the Green Johanna, are designed to accommodate cooked food, as the composting process is faster as it is more insulated than other plastic models.

### **Starting your compost heap**

It is not uncommon for gardening literature to state that a compost heap should be built up in layers, and many keen gardeners will insist that this is the correct way to build a heap. However, it is not necessary to build up your compost heap in layers. The basis for this advice is mainly to help the gardener attain the correct balance of 'greens' and 'browns', which is important in any compost bin. In reality, the waste of the average household may not be produced in sufficient quantities to allow layering to be carried out. This does not need to be a problem. Instead of using layers to measure equal volumes of greens and browns, why not just balance each bucket of kitchen waste with a bucket of cardboard or straw for example. In fact, because the bacteria in the compost need both greens and browns to prosper, the closer together these two types of material are the better.

One other thing to bear in mind is that a layer of twigs or branches at the bottom of a compost bin or heap can be a great way of helping to achieve a vertical flow of air through the material.

Make sure you keep your "greens" and "browns" properly balanced. If your compost is too wet, add more "browns". If it's too dry, add some "greens". Ensure there is enough air in the mixture. Adding scrunched up bits of cardboard is a simple way to create air pockets.

'Greens' (they rot quickly and provide important nitrogen and moisture):

- Fruit and vegetable peelings,
- Teabags;
- Plant prunings; and
- Grass cuttings.

'Browns' (they rot more slowly, provide fibre and carbon, and create air pockets):

- Cardboard egg boxes;
- Scrunched up paper; and
- Fallen leaves.

### **Keep it moist**

The pile should be kept moist, but not soggy, about the consistency of a wrung-out sponge. If it's not moist, it won't decompose.

### **Give it air**

Oxygen is essential to the organisms breaking down the materials. Fluff the pile with a garden fork or a special tool for the job – composting aerator (pictured - check gardening catalogues) every time you add material. If you can manage to do a more aggressive turning in the spring and autumn (so that the compost is turned completely inside out and upside down), you can usually get finished compost in one year. Less frequent turning results in slower composting.

### **Observe your compost**

As composting takes place, heat is generated. Don't be surprised if you see steam rising from the compost in the warmer months. This means the conditions for decomposition are at their best. If your compost heap is properly prepared, contains no animal fats and is turned periodically, it should not attract pests or create odours.

### **Test whether the compost is ready**

Decomposition will be complete anywhere from three months to two years depending on the materials used, the size of the pile, and how often it is turned. Your compost will most likely be ready in around 6-9 months to a year. Finished compost is dark brown, almost black in colour, has a spongy texture and a pleasant earthy smell.

### **Use the compost**

About one month before planting, apply 1-3 inches of the finished compost and work it into the top four inches of soil. Compost can also be used in the garden as a top dressing or mulch throughout the summer. Screened through a ½" sieve, compost can be used to create a potting compost mix by combining equal parts of compost, soil and leaf mould / coir. Large particles can be put back in the compost bin.



Compost Aerator

## Compost Troubleshooting

<b>Symptom</b>	<b>Probable Cause</b>	<b>Suggested Remedy</b>
The compost heap has a bad odour	Not enough air or too wet	Turn pile thoroughly
The centre of the compost heap is dry	Not enough water	Moisten materials while turning pile
The compost heap is damp and warm in the middle, but nowhere else	Pile is too small	Collect more material and mix old material into a new pile
The pile is sweet smelling, but still will not heat up	Lack of nitrogen	Mix in a nitrogen source such as fresh grass clippings, fresh manure, and urine.

## Composting with Worms

### Worm Composting / Vermicomposting

Composting is a natural process in which organic matter decomposes into a dark nutrient rich soil improver. In a natural setting, decomposition happens slowly, with the work being mainly done by microbes, bacteria and fungi, which breakdown organic matter into compost. Larger creatures in the soil such as worms, slugs, centipedes play a relatively small role. When we do normal composting at home or at school, we speed up this natural process by ensuring that the conditions are just right for the microbes to work efficiently. This means we need a good balance of carbon and nitrogen rich materials, the right moisture levels, and plenty of oxygen available in the form of trapped pockets of air, this can be aided by regular turning.

Composting with worms or “vermicomposting” concentrates the amount of worms to the point where they become the major players in the decomposition process. Microbes still play a role but are now overshadowed, so to speak, by the worms. As the worms burrow through the bedding and other organic matter they create the air spaces necessary for efficient decomposition. Therefore, turning is not required. Proper moisture levels must still be maintained and the right combinations of carbon and nitrogen materials must still be kept up. When proper conditions are created, composting with worms is simple, clean, and odour free. Worm composting is essentially an efficient method of turning ordinary organic kitchen food waste into nutrient rich products – either as a liquid feed or as compost, depending on the design of your wormery. Unlike garden composting, in which heat builds up, it is a cool process and works by the addition of food waste on the little and often basis. The end product is also far more nutrient rich than that from a common or garden composter.

There are many different styles of wormery, which you can either buy or make, and depending on style can be used either inside or outdoors. But first, more about worms!

### About worms

Worms are native to the UK and have a diet of dead organic matter. Their bodies are made up of rings or segments that shrink and stretch to help worms move through the ground. They do not have eyes, ears, teeth, lungs or legs but they do have five hearts. The main body parts are the mouth, head end, tail end, saddle and bristles. Setae (bristles) are tiny hairs that cover each segment to give the earthworm grip as it slides forward. Earthworms are composed mostly of water and have no bones. Earthworms take soil and organic material in through their mouth. This material then passes through the body and emerges through an opening in the tail end as castings. These castings make great fertiliser. Worms are hermaphroditic, which means they have both male and female reproductive organs. When worms mate they swap sperm to fertilise their eggs, which they lay in the soil.

They are prolific breeders and will produce a small amber-like bead that will hatch 3 to 5 baby worms. In three months these babies will mature and also reproduce. Worms have varying life expectancies and can live from several months to ten years.

Earthworms breathe through their skins and are very sensitive to sunlight so they must stay out of direct heat or light. They need to stay moist and like to come out on warm,



damp evenings. They are resilient and if they lose their tail or a chunk of their rear end they often recover to re-grow the lost part. Worms are great for the soil and help to increase the air and water content. They also help to “turn” the soil by taking down organic matter from the top and mixing it with the soil below. Their burrowing also creates natural drainage and air pockets.

## **Worm Farming**

Don't try to dig up worms from your garden for worm composting. You will not find enough to make the system work and most likely you will find species not suitable for vermicomposting. Two types of worms that make great composters are *Lumbricus rubellus* (also known as red wiggler, brandling, or manure worm) and *Eisenia foetida* (the tiger worm).

The red wiggler worm prefers the top five centimetres of soil, especially where there are lots of dead leaves on the ground, these worms are the ones generally found in cowpats and horse manure.

The tiger worm has red and yellow stripes on its body and prefers to work in surface areas under rotting vegetation, manure and in compost. They often wriggle vigorously when they are in your hand.

## **How to make a home for worms**

Several commercial wormeries are available and there are some details at the back of this pack on some of the retailers. However, it is easy and usually cheaper to find a suitable container for vermicomposting. There are some designs available that you can use, or providing you understand what conditions the worms need to do well, you can design your own wormery. First you need a container – it can be plastic, wood or metal. Do some creative recycling and use an old bathtub, wooden box, drawer, barrel or plastic bin. Wooden containers provide good insulation but plastic containers are lightweight and convenient.

You should ensure that you include a lid in your wormery design to give the worms the dark environment that they prefer and to protect your wormery from predators attracted to the food waste. Old carpet, hessian or some plywood can make a good cover. The tighter the seal on the lid the more likely your bin staying on the moist side. It is important that there be a large surface area for the worms to do their work. You may wish to measure your organic waste for a week or two first to find out how much waste you generate to ensure that you get the right size of wormery for your needs. In the book *Worms Eat My Garbage*, Mary Appelhof suggests providing one square foot of surface area per pound. The container depth should be between eight and twelve inches. She also suggests that the correct ratio of worms to food waste should be: for one pound per day of food waste, use two pounds of worms (roughly 2000). If you are unable to get this many worms to start with, reduce the amount of food waste accordingly and let the worm population steadily increase.

As usual there are different views on how much your worms will eat, some references state they will eat half their body weight per day, whereas others say up to their whole body weight per day. However you will generally find that these figures are only true in optimum conditions – gradually you will find a rate at which the worms will work through the food you give them.

When designing your wormery, you may wish to include some ventilation holes – particularly if you have opted for a plastic container. It is not recommended to punch holes in the bottom unless you plan to put a tray underneath. Some of the commercially produced bins have a drainage collection area at the bottom – sometimes with a tap for extracting the liquid.

Drainage is important in your wormery - some designs include the use of gravel and/or coarse sand in the bottom. Look at the different designs in the web links section.

Mesh or netting can be used also to separate the worms from the drainage medium and to protect your wormery from predators such as toads, frogs, mice, birds, rats, moles and hedgehogs.

In the early days after you have set your wormery up is vulnerable to extreme temperatures – full midday sun or severe frost. However as the wormery fills, it effectively self insulates against most normal temperature fluctuations.

### **Pick a Place**

Whether you have decided to keep it indoors or outside, you will need to locate your wormery where it will not freeze or overheat e.g. in a kitchen corner, laundry room, garage, patio, or in your garden.

### **Bedding & Other Materials to Add**

Bedding is the material you put in your bin for the worms to live in and move around in, they will also eat this material. The bedding should generally be high in carbon, examples of good bedding materials are brown leaves, paper, cardboard, shredded paper egg cartons, napkins, paper towels wood shavings and sawdust. All bedding materials should be shredded, light, fluffy, and moist. Shredded paper tends to mat down so it is best to use a combination of the above mentioned materials and any wood products should come from untreated timber. It is always best to mix and moisten your bedding materials before placing them into the worm bin. If you find your bin is too moist, simply add dry bedding materials to absorb the excess moisture. Don't forget to change your worm bedding every three to six months.

A worm's skin must be kept moist to enable it to absorb oxygen (it doesn't have any lungs), therefore the bedding must be damp. It should feel similar to a wrung out sponge when a handful is squeezed. If the worm bin is too wet or too dry the worms will suffer and possibly die. Experiment if you don't quite get the moisture content right first time.

Worms have a gizzard, so a handful of soil, compost, or grit on the brown leaves will provide the "roughage" they need for digestion. This only needs to be done when you are setting up the bin with new bedding. Adding compost or brown leaves also introduces microbes and larvae from the outside environment.

Worms also need calcium for reproduction. Finely crushed eggshells are a good source and, if available, should be added regularly. If eggshells are not available then a little calcitic lime (lime made from calcium) or rock phosphate can be sprinkled over the bedding on a weekly basis.

If you take good care of your worms you should never have to buy any more. Don't worry about too many worms! All populations are self-limiting – the worms will restrict their breeding to match the available food and the size of their enclosure.

### **What do worms like to eat?**

Earthworms will eat anything naturally organic as long as it can be broken down and is kept damp (they cannot eat dry food). Worms will eat organic kitchen waste such as fruit and vegetable peelings, left over food as well as newspaper, compost, dead leaves, crushed egg shells, vacuum cleaner dust, rolled oats, weeds, waste from vegetable juicers, and shredded cardboard packaging. Well-composted animal manures are also a great food source for earthworms, however chicken manure should be avoided. It is best if the food is in small pieces, so you may wish to chop it up before feeding it to your worms – remember that they have no teeth! They will be able to eat the food more quickly if it is presented to them in small chunks. Worms don't particularly like acidic foods such as oranges, lemons, grapefruit, tomatoes and strong-smelling foods such as onions and garlic. If conditions become uncomfortable they'll climb out of their wormery to escape!!

Some other things that definitely don't belong in a wormery are plastic bags, bottle caps, rubber bands, sponges, aluminium foil and glass. Also avoid putting in lots of grass mowings – this would generate too much heat for the worms comfort as it decomposes! (Some experts advocate adding small amounts of meat or fish to the wormery. However be aware, these types of food may attract pests).

You do not have to feed your worms everyday but it is best to bury food as soon as you have it rather than leave it sitting around getting mouldy and attracting fruit flies. It is better to under feed than over feed your worms.

### **Harvesting Finished Vermicompost**

The volume of materials in your wormery will be reduced by up to 90% during the process of decomposition. The vermicompost will look, smell, and feel like rich dark soil. It is dense and will accumulate in the bottom of the bin. Worms will not survive too long a period in pure castings as this is essentially their waste products and will eventually become toxic to them so ensure there is enough material in the wormery to allow them to move out of the castings. Worms are very sensitive to vibrations and light. Most of the time we keep worms in the dark but occasionally when we want to separate the worms from the compost they produce we use this aversion to light to our advantage. Place your bin in bright sunlight or under a bright lamp. The worms will start to move downward away from the light. Remove the worm free top layer of compost with your hands or a small scoop. As the next layer of worms is exposed to the light, they will continue to move to the bottom of the bin. When there is almost nothing left but worms in the bottom refill the bin with fresh moistened bedding and start the composting process all over again. Remember to put back any worms that may have been inadvertently scooped out. Use a similar technique if you have a smaller wormery, or when you want to harvest worms when there is still plenty of fresh bedding and food scraps in the wormery. Scoop out the compost, and place it in a pile or several piles (depending on how much you have) on a few sheets of newspaper in a well lit room. As the worms bury down to escape the light, scoop off the compost. Continue until you reach the bottom of the pile and the worms, then put the worms back.

## Using Vermicompost

Worm compost is extremely rich in nutrients; it also tends to be very moist and can be used like any other type of compost but perhaps more sparingly-

- Mix one part vermicompost with two parts potting soil for houseplants.
- Spread a thin layer as a top dressing on potted plants.
- Add a handful to the bottom of the hole when transplanting.
- Sprinkle a 1/4 inch into seed row when starting seeds.
- Place vermicompost into a burlap bag and soak in water over night. Use the compost "tea" as a tonic for your plants.

## Worm Composting Trouble Shooting

If something goes wrong, you miss the signs and notice the worms are not thriving you could end up with a smelly waterlogged mess to sort out – but even a messy failed wormery can readily be restored to excellent status with a little care!

Problem	Cause	Solution
<b>Worms are dying</b>	Food and bedding all eaten	Harvest compost, add fresh bedding and food
	Too dry	Add water until slightly damp
	Extreme temperatures	Move bin so temperature is between. 5-25 degrees C
<b>Wormery attracts flies</b>	Food exposed (overfeeding)	Add fresh layer of bedding & stop feeding for 2-3 weeks, avoid adding rotten food, which may have fly larvae present
	Non-compostables present	Remove problematic items from wormery
<b>Unpleasant smells</b>	Waterlogged	Add some fresh dry bedding; check that your ventilation holes are not blocked.
	Food exposed/over feeding	Add fresh layer of bedding or add a newspaper or card barrier on top Stop feeding for 2-3 weeks
<b>Worms are escaping</b>	Perhaps there is too much citrus fruit waste, tomatoes or smelly food stuffs like onions or garlic.	Avoid adding so much acidic items.

## Useful Resources

### Books:

- *Worms Eat Our Garbage – Classroom activities for a better environment*, Mary Appelhof, Mary Frances Fenton and Barbara Loss Harris, 1993
- *Worms Eat My Garbage (2nd edition)*, Mary Appelhof, 1997
- *Composting with worms – Why waste your waste*, George Pilkington, 2005

### Web links:

- <http://www.urbanext.uiuc.edu/worms/index.html> - An American site following the Adventures of Herman the Worm.
- <http://www.wormdigest.org> - US site - lots of articles about worm composting, including a young person's guide to worm composting, and "the mighty worm" (in the most popular sections)
- <http://www.wormwoman.com/acatalog/index.html> - An American website which is subtitled – "Mary Applehof's site for worm composting resources" from the author of the book "Worms ate my garbage" and "Worms eat our garbage". Video clips are available on this site Watch a worm's five pairs of hearts beat or see a baby worm hatch from its cocoon and see inside of a worm bin, as well as some articles about composting with worms.
- <http://www.queensbotanical.org/compost/vermi.html> - Queens Botanical Gardens vermicomposting site – plenty of details on composting with worms.
- <http://www.cityfarmer.org/wormcomp61.html> - Information on worm composting from Canada's Office of Urban Agriculture.
- <http://homepage.mac.com/cityfarmer/PhotoAlbum23.html> - City of Vancouver offers residents living in apartments information on indoor worm composting – a slide show is available on this site showing a simple plastic box vermicomposting system
- <http://www.dnr.mo.gov/env/swmp/worms/Worm1.htm> - Plans for building a wooden box worm farm
- <http://www.angelfire.com/mb/bjl/makingfarm.html> - Instructions on how to make a worm composter out of polystyrene fruit boxes
- [http://www.nrc.govt.nz/environmental.education/school.information.packs/worm\\_farming.shtml](http://www.nrc.govt.nz/environmental.education/school.information.packs/worm_farming.shtml) - A New Zealand School's site with a schools information pack on worm composting - lots of details on the different styles of wormery that have been used by schools (some of the pictures have been used in this pack).
- <http://www.huttcity.info/council/services/works/rubbish/worm-text.html> - A New Zealand local authority site on worm composting

### Suppliers of wormeries and worms:

- <http://www.originalorganics.co.uk/>
- <http://www.greengardener.co.uk/>
- <http://www.wigglywigglers.co.uk/>



## Enjoying your First Garden Produce

### Harvesting your Produce

There is no specific time of the year when you should begin harvesting your produce as fruit and vegetables become ripe and ready to harvest at different times of the year. Climate, variety and also the particular season are other factors that have an impact. It is worth noting that the quality of fruit and vegetables does not improve after harvest in most cases, although tomatoes can be picked before they are fully ripened and left to ripen indoors. If you pick things too soon, they are likely to be too tender and this will impair the flavour. However, if you leave it too late, not only will this affect the taste but the produce may become mushy or tough.



A September Garden Harvest

### Time of Day to Harvest

In general, try to harvest during the coolest part of the day – either early morning or late afternoon. Harvest when crops are dry. If you're harvesting a vegetable for fresh eating, pick it just before meal time as this preserves its flavour and nutrients. The sugars in the vegetable start turning to starch within minutes of harvesting. Pick an ear of corn and pop it straight into the cooking pot, for example, for optimum sweetness. If you're harvesting a vegetable for preserving, harvest it as soon before processing as possible.

### Pick Early and Often

Many vegetables should be picked young, when they're at their sweetest. As vegetables mature, their sugar turns to starch. Root crops can become bitter and woody if grown too large. Check days to maturity and expected root size of each variety to gauge the best time to pick root vegetables.

With many vegetables, the more you pick, the more they'll produce. Fruiting vegetables such as cucumbers contain the seeds for the next generation. As soon as there are enough mature seeds, the plant gets the signal to stop producing fruit. If you keep picking the fruit while its seeds are still immature, the plant is tricked into thinking it needs to keep producing more fruit to propagate itself.

### Don't Let Them Bolt

When the heat of summer hits, the natural tendency of cool-weather crops such as flowering brassicas and leafy greens is to reproduce and go to seed, or "bolt". Pick these vegetables before they bolt, as when they do, they can taste bitter.

## Summarised A – Z of harvesting

There are differences between different varieties, meaning that a general rule of thumb may be a good starting point, but it will be useful for you to consult gardening books, online references, and of course the information on the seed packets of seeds to see any specifics for the varieties that you have grown.

- **Asparagus:**

Begin harvesting when spears are 6-8 inches tall and about as thick as your small finger. Snap them off at ground level and new spears will continue to grow. Stop harvesting about 4-6 weeks after the initial harvest, to allow the plants to produce foliage and food for themselves.

- **Aubergine:**

Slightly immature fruits taste best. The fruits should be firm and shiny. Cut rather than pulling from the plant.

- **Beans (green):**

Pick before you can see the seeds bulging. They should snap easily into two. Check daily as it doesn't take long for beans to go from tender to tough

- **Beetroots:**

You can harvest and eat the green tops that you thin out of the rows. Beetroots are really a matter of personal preference when it comes to the right size for harvesting. They are ready any time after you see the beetroots shoulders protruding at the soil line. Remember you can eat the leaves of any thinnings you take out.

- **Broccoli:**

We eat the unopened flower buds of broccoli, so check frequently, especially as the weather warms up, to ensure you don't let the flower heads bloom. It may not reach the size of head that you can get in the supermarket. Harvest when the buds are about the size of a match head.

- **Brussels Sprouts:**

The sprouts will mature from the bottom up. You can begin harvesting once the sprouts are at least an inch in diameter. Harvest by twisting off or cutting the sprout from the stem. Sprouts come in both early and late varieties so there's the possibility that you may start picking in September right through until March.

- **Cabbage:**

The cabbage head will feel solid when gently squeezed. Cabbage needs to be harvested when it reaches maturity or it will continue to grow and split open.

- **Carrots:**

Do not be fooled by the tops which can be quite bushy but the carrots themselves are quite small. Gage size of the of the carrot top in the soil, looking for when the diameter looks right for your variety. If the diameter looks good, chances are the length is fine too. But you will need to pull one to be certain. Carrots can be left in the ground once mature. A light frost is said to improve and sweeten the carrot's flavour. When harvesting, drench the bed with water first, making the carrots easier to pull.



Freshly harvested carrots

**Cauliflower:**

As with broccoli, your home grown cauliflower heads will probably never match supermarket size. Harvest when the head looks full and while the curds of the head are still smooth.

- **Corn:**

About 3 weeks after the silks form, they will turn dry and brown. The kernels should exude a milky substance when pricked.

- **Cucumber:**

Cucumbers race to the harvest with courgette. Check daily and harvest them young. Timing and length will vary with variety. The fruits should be firm smooth. Over ripe cucumbers can be very bitter or pithy, even before they start to turn yellow.

- **Onions:**

Onions can be dug once the tops have ripened and fallen over. Allow the onions to dry in the sun. Bolting is a very common problem with onions. Bolting is when the onion suddenly puts up a central stalk that develops a seed head. Once started the only thing to do is to cut the stalk off an inch or two above the bulb. Use these first as they will not store well.

- **Parsnips:**

Parsnips taste best if they are left in the ground until after a frost or two. They can be left in the ground over the winter and harvested in the spring. In cold areas, they should be mulched for the winter. When the foliage on a parsnip starts to die, it's ready to pick.

- **Peas:**

The pea pods should look and feel full. Peas are ready when the pod is well filled but there is still a little bit of space between each pea. Peas are sweeter if harvested before fully plumped. Peas really need to be tasted to determine if they are sweet enough.

- **Potatoes:**

'New' potatoes can be harvested when the tops start to flower. Carefully dig at the outer edges of the row. For full size potatoes, wait until the tops of the potato plants dry and turn brown. Start digging from the outside perimeter and move in cautiously to avoid slicing into potatoes.

- **Pumpkins:**

Once the pumpkins have turned the expected colour and the vines are starting to decline, they can be cut from their vines. Don't leave them out if a hard frost is expected.

- **Radishes:**

Radishes mature quickly. You will see the shoulders of the bulbs popping out of the soil line. If left too long, they will become tough and eventually go to seed.

- **Spinach:**

Spinach goes to seed quickly. Harvest by cutting at the soil line before you see a flower stalk beginning to shoot up.

- **Tomatoes:**

Harvest tomatoes when they are fully coloured and slightly soft to the touch. Gently twist and pull from the vine.

- **Turnips:**

The turnip shoulders should be about 2 inches in diameter at the soil line, when ready. Overripe turnips become woody.

## Harvesting Herbs

Harvesting your crop is one of the most satisfying things about growing herbs.

Taking a bunch of freshly harvested herbs to use for cooking in the kitchen is a real joy. However it's important that, when picking your herbs you do not hamper further growth of the plant by picking too many leaves and preventing the plant from being able to function properly.

Each herb you pick and how you pick it will depend on what you want to use it

for. If you just want a few leaves to add to a salad or a sauce you should just pinch each leaf off with your fingers, rather than take the whole stem. This will leave sufficient leaves in place for the plant to continue photosynthesising (making and providing food for the plant so it can produce more tasty leaves). However, if it is the end of the season and you want to harvest the whole plant to preserve for winter use (such as to make pesto out of basil), cutting the plant at the base of the stems or digging it up completely is recommended.



Chives, mint and chamomile

## Tips for Picking Herbs

The time of day and time of season can affect the quantity of oil present in the leaves of your herbs. The oil present in the leaves can determine the flavour intensity of the herb and its nutritional content or medicinal value. Therefore, to achieve the maximum flavour of the herb, follow these simple tips:

- Harvest your herbs on a dry day, in the late morning after the dew has evaporated.
- Harvest your herbs before the plants flower (the energy it takes to produce the flowers can reduce the oil content in the leaves and the existence of flowers can slow or stop the further production of leaves).
- Remove any flower heads from the plant to ensure it keeps producing as many leaves as possible.
- Harvest your herbs on the same day you intend to use them, preferably just a couple of hours beforehand. This preserves their freshness.

It is also important to ensure that your herbs are in tiptop condition before you harvest them. If you pick the leaves off before the plant has had time to establish, it could damage the plant and hamper its growth. The following tips will help you maintain healthy plants that will lead to bigger yields in the long term:



- Make sure your herbs have time to develop into healthy, robust plants before you pick the leaves off them.
- Never cut more than a third of the plant in one go and give the plants time to grow back before you harvest them again.
- Pinch the leaves off with your fingers or use sharp scissors. Always ensure the cut is clean and never cut the leaves.
- When harvesting plants for their flowers, (such as lavender), cut them just before they start to wither.
- Annual herbs, such as basil and coriander, should be 'pinched back' when harvested. This means you should only take leaves from the growing tips of the plants. This ensures that the plant will produce more leaves, produce fewer flowers and will lengthen the life of the plant.
- When picking chives, always cut leaves at the base of the plant. This will encourage new growth.

Harvesting herbs is easy and rewarding. Once harvested, rinse them in cold water and use as quickly as possible. This will ensure they retain all of their flavour and colour.

### **References**

- <http://www.herbexpert.co.uk/PickingHerbs.html>
- <http://www.safegardening.co.uk/PreparingStoringFruitVegetables.html>
- <http://www.vegetableexpert.co.uk/ManagingTheHarvest.html>
- <http://www.omygarden.net>



## Preserving your Food – Jams, chutneys, drying and bottling

### Food for thought

Not so long ago it was common practice for people to preserve lots of food, using a variety of techniques from bottling to jam and chutney making. The convenience of more pre-prepared / value added food in shops and supermarkets, as well as fruit and vegetables being readily available out of season, has perhaps led us as a society away from DIY food.

However, there seems to be something of a resurgence in home made produce, and there are lots of great reasons to give it a go. For one thing it can be great fun, and give rise to lots of opportunities for family activities (e.g. visiting a fruit farm to gather fruit to make jam, or watering the tomatoes in the greenhouse and helping to make them into chutney). Preserving your own food is also empowering. You can make your jams and sauces just how you like them, to that they are just as sweet, sour, salty or spicy as suits your taste. You can also choose your ingredients according to your own set of ethical choices, so your food can be low in food miles, fair trade, organic or pesticide free. If you are able to preserve excess food, for example your garden glut of tomatoes, or your colleague's wind fall apples (or even shop bought goods when they're in season and cheaper or simply of reduced price) you can enjoy these foods throughout the year, and reduce the amount of food that needs to be wasted. These home made products can be used in place of shop bought goods, and help to save some money too. They also make great gifts!

### Top tips

You will need to strike a balance between changing what you cook and eat to the sorts of goods that you can make, and making the sorts of home produce that you are more likely to eat. It may take a while to get this right!

Don't pick more fruit than you can process – it leads to wastage

Take bags and tubs with you when you go out for a walk, in case you find some good berries!

Keep your jars together with their lids both in storage and while cleaning and sterilising prior to use. Some jars may have lids of similar size to others but may not make such a great seal as with their original lid.

Using Certo or preserving sugar to add in extra pectin can dramatically speed up jam making time – often a godsend if you are doing this in the evening, and you want to get to bed!!

### A Simple how-to:

There follows a brief description and simple guide to the following methods for home preserving: Jam, chutney, drying and bottling. You will need to find recipes to follow to get started; however there are a great many books on the topic and online references where you will find a range of recipes.

For both jam and chutney, a stainless steel pan that is large enough to contain all the

ingredients is essential. If you become keen it may be well worth investing in a preserving pan. Brass, copper or iron pans should not be used as they react with the vinegar and give a metallic flavour to the chutney. Aluminium also reacts with acidic fruit and may pose a health risk as it builds up in the brain. Stainless steel pans are best for jam making.

## **Jam**

Making jam is the ideal way to preserve the taste and nutritional value of summer fruits so that they can be enjoyed throughout the year

Jam contains two essential ingredients; fruit (which provides pectin) and sugar (which preserves the fruit.)

Pectin is important to the jam's set: low-pectin fruits like strawberries need extra pectin (in the form of lemon juice, liquid pectin such as "certo" or pectin-enriched preserving sugar) to reach a spreadable consistency.

When choosing fruit, select pieces that are perfectly ripe and unblemished – they'll have the best levels of pectin and the finest flavour. If the fruit needs washing, make sure you dry it thoroughly, because excess water can prevent the jam from setting or cause mould on the finished jam.

The most important thing to remember is that the pan, spoon, and jars used must be scrupulously clean to prevent bacteria from getting into the jam and spoiling it. Making jam with 1 - 2kg of fruit at a time is ideal - more than that and it is difficult to get the jam to set because it cannot be boiled fast enough. 2kg of fruit is enough to fill 6 standard sized 450g jam jars.

The fruit should be placed in the pan and simmered in a pan for around half an hour – this helps to draw out the pectin. The sugar can be added at this point (often equal the weight of the fruit) or some recipes will suggest adding earlier as sugar hardens fruit. For example, if you are making jam from soft fruits such as strawberries, you should mix the fruit with sugar from the start as this will help prevent the fruit from disintegrating when heated.

Any froth/scum which accumulates on the surface of the mixture can be skimmed off carefully while boiling. Some recipes suggest adding a knob of butter to the pan of jam to reduce the scum.

To determine if your jam is ready to take off the heat and put into jars, you will need to test for set. There are a number of ways to do this, but the simplest is by using a cold saucer and teaspoon. Use a teaspoon to put a small amount of jam onto the saucer. Leave it for a few seconds and then push the jam with your finger. It will wrinkle on the surface when the jam is ready. If not, try again in a minute or two with a fresh saucer. The other way to test for set is the temperature test. The jam is ready when the temperature registers 105°C (221°F) on a sugar thermometer. Simply immerse the thermometer in the jam shortly before the specified cooking time is completed, keeping it away from the base and the sides of the pan. Leave in position until the temperature has been reached. Boil a little longer if necessary.

When your jam is set, turn off the heat and prepare some sterilised jam jars. To sterilise

first clean them in soapy water, then you can either use a sterilising solution such as dissolved campden tablets or VWP powder, or place your jars into a moderate oven for 10 minutes.

Pour the finished jam into jars using a sterilised funnel or large spoon. It may help to seal your jam by adding a waxed paper disk at this point, before sealing with the lid.

Cool the jars at room temperature, and wipe clean before labelling.

## **Chutney**

Chutneys originated in India – the name derived from the Hindu word chatni – but are now a very popular preserve all over the world. They are made from fruits or vegetables, or a mixture of the two, which are chopped, cooked, mixed with spices, vinegar and other ingredients and reduced to a smooth pulp.

Favourite fruit chutneys include spicy apple (perfect for eating with crackers and cheddar), mango or apricot (a great accompaniment to Indian foods), and the old-fashioned marrow jam (great in a sandwich). You might also wish to try green tomato chutney and plum chutney – both fruits are easily available in-season. Homemade chutney is a wonderful Christmas gift (perfect for eating with cold cuts) so make lots when the ingredients are cheap.

The scope of chutneys is endless and the combinations and permutations can be varied according to personal taste and the ingredients available. They can be sweet, sour, hot or mild. Once you've mastered the basics of making chutney, and picked up a few traditional recipes, you can play around to create a classic recipe of your own.

Unlike jam making, windfall apples, green tomatoes and other end-of-season fruit such as rhubarb can be used as there is no worry about the setting qualities. Dried fruit such as raisins, dates, and sultanas are commonly used.

A big advantage to both fruit and vegetable chutneys is that they improve with age and, if properly stored, will remain in good condition for years.

The sugar and vinegar usually balance one another out – you'll note that most recipes include numerically equal amounts (100g sugar to 100ml vinegar) – to achieve that characteristic sweet and sour chutney flavour. Generally whole spices are preferable in chutney-making than ground ones which can give a muddy appearance to the chutney. Bruise these and tie them up in a muslin bag and cook with the other ingredients. However, some recipes call for a mixture of both whole and ground spices to give the best flavour.

When is it ready? Unlike jam, you don't test for a set when making chutney. It is ready when, if you draw a wooden spoon across the pan, a channel is left for a moment before the chutney refills the space. Don't forget that in its warm state, the chutney is a lot more fluid than it will be after cooling.

The success of a good chutney is that it should be relatively smooth in texture and have a rich mellow flavour. To achieve this it requires long, slow cooking and then, ideally, it should be left to mature for at least three months.

## Drying

Drying is a method of food preservation that works by removing water from the food, which prevents the growth of micro-organisms and decay. Drying food using the sun and wind to prevent spoilage has been known since ancient times. We all probably use dried food, without thinking about it, such as dried herbs, raisins, soup mixes, pasta and noodles. Drying will never replace canning / bottling and freezing because these methods do a better job of retaining the taste and appearance of fresh food. But drying is an excellent way to preserve foods that can add variety to meals and provide delicious, nutritious snacks such as fruit leathers. One of the biggest advantages of dried foods is that they take much less storage space than canned / bottled or frozen foods. Another advantage is that once dry, you have no on-going electricity costs in keeping your fruit and vegetables preserved as with storing in a freezer. It is thought that dried foods can maintain more of their nutritional value than frozen or canned / bottled foods.

You can dry fruit such as plums (to give prunes!) and apples (dried apple rings if you wish) berries (to use in baking) and fruit leathers. Some fruits can also be honey dipped (dunking in a solution of honey and sugar before drying) to increase sweetness. You can find recipes for creating your own dehydrated camp food, providing compact, light weight food that is easy to carry in a backpack. You can also dry vegetables to enjoy as a snack or add to soups and stews. With the removal of the water, the flavour is concentrated, which can add to the appeal of foods, such as dried tomatoes, dried mushrooms etc. If dried food is kept in air tight packaging, it will keep indefinitely.

The most obvious place for drying food is in the oven. The heat should be on a low setting – around 60° C on an electric oven. If using a gas oven for drying, turn the dial to 0 or ¼ - the lowest flame possible. It will probably also be necessary to prop open the oven door to assist the drying process providing some ventilation. With solid-fuel oven, the heat maintained after cooking sessions can be utilized. This may mean that the drying process is not continuous and has to be carried out over several days but this should not affect the quality of the finished product. In the summer months it may be possible to dry some food by the sun, and you will find plans for creating simple home solar dryers in books or online. Although you may find that here in the Highlands, we are limited in the days when there are sufficient hours of sun and the humidity relatively low when it would be successful. You may wish to partially dry some food resting on a non-stick sheet on a sunny window sill inside, and finish off perhaps in the oven. You can also dry your food in a specialist food dehydrator, which is handy if you are wishing to dry a large quantity of food at a time. A food dehydrator is a small electrical appliance for drying foods indoors. It has an electric element for heat and a fan and vents for air circulation.

For drying purposes, vegetables are best picked when slightly immature, whereas fruit should be left to ripen thoroughly. In general, the faster the food is dried, the better the result, however, this shouldn't be at temperatures which are too high resulting in cooking the food. You can chop your food into slices and lay them out to dry, shred finely, or puree, to create dried leather. A good non-stick surface (such as silicone baking sheets) to place your food on while drying should prevent it getting stuck on.

## **Bottling / canning**

Bottling / canning is a method of preserving by heating in a sealed container. Food is preserved in the jar as a vacuum is created, so the food doesn't need sugar or vinegar to help preserve it, although often. It is the homemade equivalent to tinned food. To ensure that it will keep, the fruit has to be heated sufficiently so that micro-organisms, enzymes and yeasts that are naturally occurring in fruit are destroyed. There are two types of vacuum jar that can be used – a screw topped jar with a rubber seal built into the lid (e.g. kilner), and a clip jar, with a separate rubber ring gasket (e.g. le parfait). These rings should only be used once, since they tend to stretch and deteriorate during use.

Fruit is often bottled in a sugar syrup, which helps to maintain colour and adds to taste. You can vary the strength of the syrup according to taste, but often 400g sugar per 1 litre water is used. It is also possible to bottle fruit in fruit juice, or wine. Spices such as mustard seeds, cloves, allspice, coriander seeds and black peppercorns can be added. You may also create sauces such as a tomato / ragout sauce, which do not contain sufficient sugar or vinegar to preserve the food, which can be stored by bottling.

Bottling should be carried out with care, as lack of quality control in the process may allow ingress of water or micro-organisms. Most such failures are rapidly detected as decomposition within the jar causes gas production, which may lead to a hissing sound as gas escapes. There are more likely to be problems with the reintroduction of bacteria and associated toxins (an extreme example being botulism) with bottling vegetables, so it is recommended to bottle just fruit at home.

Processing the bottles may be done on the hob or in the oven. The hob method is known as the water-bath method of which there are two main variations, the quick water-bath and Pressure Cooker. A false bottom is recommended with each method so that the jars are not in contact with the base of the pan as the heat rises.

The oven method involves placing the jars with syrup or juice in a pre heated oven and leaving for the required time according to the recipe you are following – different types of fruit will need different times. Place the lids on top but not the clips or screw bands. Put the bottles 2 inches (50mm) apart on a baking tray or tin lined with newspapers (in case any liquid boils out during processing) on the centre shelf of the oven.

With both methods, after the bottles have been left for 24 hours and are completely cool, it is necessary to ensure that a complete vacuum has been formed during the processing and that no air is in the bottles. Remove the clips or screw-bands, lift the bottles carefully by the lids and, if these are tight and secure, the seal is complete.

## **Preserving your Food - Freezing and Storing**

August, September and October can be busy months for the gardener, stocking up for the rest of the year. You may find that you have a "glut" of one thing or another and as though you have to be giving your vegetables away, as you have more than you can eat. However, there are ways that you can preserve your garden produce to last you longer. These notes describe, methods where little processing of your crop are used, so that your vegetables are suitable for use in a form that is close to how they might be if freshly harvested.

## Freezing

The ideal is to eat fresh from the garden, but the fact is you'll always have a surplus and it is nice to eat your favourites out of season. Some things are unsuitable for freezing such as chicory, cucumber, endive, kale, lettuce, radishes, and Jerusalem artichokes. Other vegetables, such as potatoes and other roots are best stored in other ways, but you can freeze if you wish. Freezing is one of the easiest ways to store the surplus and retains taste and vitamins.

Successful freezing depends on how quickly you can reduce the temperature of the food. Slow freezing may not make the food inedible but will affect flavour and, more importantly, nutritional value. Fast freezing halts bacterial growth instantly and produces very small ice crystals, which causes less damage to the cell structure of the food. Before you commence preparing food for freezing you should turn your freezer on to its super or fast setting – preferably 3 hours or so before. This just keeps the motor running and drops the temperature as low as possible. When the food goes into the freezer it will cause the temperature to rise as the food cools. The super setting ensures the food already there remains at optimum temperature and the food being frozen cools as quickly as possible. Do not try to freeze too much in one go – never more than 10% of the freezer capacity at a time. Also, the colder the food when it goes into the freezer, the less work the freezer has to do. You could consider pre-cooling your produce in the fridge down to about 5 degrees before freezing.

To get your food to store well in the freezer you need to blanch it. This is essential with most vegetables. Blanching destroys certain enzymes and bacteria whilst helping to preserve the colour, texture and flavour of the food. It also helps retain vitamin C. The method is really quite simple. You need to put the food into boiling water and raise its temperature as fast as possible. You need at least 6 pints of water per 1lb of produce. You also need a blanching basket. This is just a sieve to hold the produce together. So, plunge into the water which needs to be back up to a rolling boil in 1 minute or less. If you can't do that – blanch smaller portions. Different vegetables will have slightly different recommended times for blanching, varying between 2 minutes for peas and beans, and 45 minutes of beetroot. Details for how long to blanch each vegetable can be found in books such as those in the reference section, or online.

After this you need to get the temperature down as fast as possible and stop the cooking process. You could try plunging into a bowl of cold water for 5 seconds or so to kill the heat then transfer to a second large bowl of water with ice cubes in it, changing the water in the first bowl each time to keep it as cold as possible.

When the food is cold, remove from the water and drain or dry off. You can freeze by either packing either straight into freezer bags or laying out on baking trays first, so that smaller items don't just clump together when frozen.

## Drying and cold storage

With some care, you can enjoy your own produce year round using no technology or electricity at all. Drying and cold storage are easy and inexpensive ways to preserve and for storing vegetables. Onions, garlic, and chilli peppers are usually dried. Squash, potatoes, apples and root crops are best kept in cold storage. When storing vegetables you need to sort out the damaged or any showing signs of rot and use these first as if they rot, the rot will spread and ruin your whole crop. It is a good idea to regularly check



your stored produce to keep an eye out for any that are starting to spoil, so that it doesn't spread to the rest.

### **General Guidelines for storage:**

- Plant vegetable varieties bred for winter keeping.
- Don't wash vegetables before putting into cold storage - use a brush to remove soil.
- Remove tops off root vegetables.
- Check vegetables in cold storage frequently and remove any that are spoiled.

Choose your location and preservation method for storing vegetables based on the vegetable's preferred temperature and humidity, as listed below:

- Cool and dry: onions, apples
- Cool and moist: root crops, potatoes, cabbage
- Warm and dry: squash, pumpkins, dried chilli peppers

### **In-ground "clamp" Vegetable Storage**

Roots, tubers, and bulb vegetables require little effort to store. Some vegetables - including beets, carrots, parsnips, Swede, celeriac, and turnips - can be left in the ground until you want to use them. Cover with a 1-2 foot (30-60 cm) layer of mulch such as straw or hay, which will trap air and won't become saturated with water, an easy way of storing vegetables. You can also use wood chips or leaves if you remove them before they decompose in the spring. The upside of in-ground storage is that it's easy. The downside is that vegetables can be damaged if it's too cold or too rainy, and harvesting is difficult to impossible if the ground is frozen. Potatoes are not suitable for in-ground storage.

### **Cold Storing Vegetables**

Storage spaces in the home can approximate old-fashioned root cellars. Your "root cellar" should be a cool, dry, dark space, such as a cool cupboard, shed or garage. Optimal cold storage temperatures are 7°-10°C. The best storing vegetables for root cellaring are beetroot, carrots, parsnips, potatoes, pumpkins, Swedes, turnips and squash.

As a type of cold storage, some vegetables store well packed in layers of damp sand or sawdust in wooden boxes, or plastic buckets. Beets, carrots, parsnips, Swedes, kohlrabi, and turnips can be preserved this way. Place boxes where they will be stored - they're heavy when full - and alternate layers of vegetables and layers of damp sand.

### **Storing Potatoes**

When you first harvest your potatoes, you should leave them out in the sun for a few hours to dry off and allow the skin to harden a little. After this, brush off any excess soil and check for damage. Sometimes it is hard to tell as a little hole on the surface can indicate a network of tunnels and even a live slug hiding in the potato so check as carefully as you can. Any forked, slugged or suspect potatoes should be put to one side and used as quickly as possible. Unlike other root crops, potatoes should preferably be stored above 5° C as below that the starch turns into sugars, which can give them a sweet taste. The optimum temperature range is between 5 and 10° C. The most

important point when storing potatoes is to exclude light. Prolonged exposure to light will cause greening of the potato. Partially green potatoes are still edible – just cut off the affected parts. You can store potatoes in paper sacks but leave the neck slightly open to allow excess moisture to escape.

### Storing Onions and Garlic

Leave onions in the ground until the stalks fall over and are almost completely dry. Dig up the onions and dry in the sun - on a screen to hasten the process - for one to three weeks. Braid the dried onion stalks and hang up the braided bundles. Another vegetable storage method for onions is to cut the stems off to 1/2 inch (1.25 cm), put



Onions drying before storing

the onions in a mesh bag, and hang them up. Dry and cure garlic as for onions. Cut tops and roots both to 1/2" (12 mm), put in net bags and hang. Garlic can either be stored at room temperature or in cold storage at 32°-40°F (0°-4.5°C). Beware of temperatures between 5°-11°C which will cause garlic to sprout.

### Storing Apples and Pears

Early varieties of apple and pear are best eaten straight away rather than stored, while the later varieties can be kept in a cool, dark place, wrapped individually and loosely (not sealed) in paper to keep each from its neighbour. Specialist apple racks are available, but shallow boxes or a chest of drawers will do the job, kept somewhere cool.

### Preserving your Produce – Recipes

It is important to think about what sorts of things you actually will eat and use. There is little point in making oodles of jam, if you don't eat much of the stuff, unless you wish to give it as presents. You will probably find it is a process of learning by trial and error, as the sorts of things that you can create yourself may not just like everyday goods from the supermarket. For example, one less successful creation from my own experience was elderberry ketchup – which was made and rarely used. One great success, however, was making a mango-style chutney using locally grown cherry plums. Please see the separate notes on methods of preserving, covering jams, chutneys, drying and bottling. In these notes some simple, pleasing recipes are detailed. These could form useful staples in your food cupboards, replacing the need for some shop-bought goods, such as canned tomatoes, passata sauces, stir-fry sauces and cordial / squash.

- Berry Cordials / juices
- Tomato passata sauce
- Chinese style plum sauce
- Mango style cherry plum chutney
- Spiced tomato and sweet corn relish

### **Berry Cordial**

You can make a delicious cordial or syrup from many types of berry, throughout the summer and autumn. Place your fruit in a pan and bring quickly to the boil. Boil the fruit for about a minute, then turn off the heat, and crush the fruit with a masher, or wooden spoon. To separate the juice from the pulp, use a scaled jelly bag, and strain overnight. Extract as much juice as you can. Then add the sugar – 350g for each pint of juice extracted, stirring well until the sugar is dissolved. Heat up your syrup / cordial, and bottle into clean, sterile bottles. If you wish to store this for longer than a few weeks, you may wish to further heat treat the bottled cordials, either in an oven or in a water bath.

### **Tomato passata sauce**

The versatile sauce makes a great basic ingredient, meaning that you can enjoy local tomatoes for more of the year, and you have a ready-made tasty sauce to have with pasta, to spread over your pizza base, or to create a tomato-based curry. The quantities and ingredients may vary according to what you have available.

Tomatoes  
Onions  
Garlic  
Pepper  
Courgettes  
Fresh herbs

Chop up your tomatoes and place in a large pan on the heat, and reduce the liquid down. Add in courgette, and pepper if you have these and wish to include them in your sauce. Reducing may take sometime. If you are doing large quantities, you may wish to use more than one pan to increase your surface area, as this will speed the process up. Lightly fry your onions and garlic, which can be added to your tomato pan(s). You can also consider oven roasting some of your tomatoes, onions and garlic, as this can give a sweeter, richer flavour. Use a food processor or hand blender to purée your sauce. When it has reached a consistency that you are happy with, then it is time to turn off the heat, and start to ladle it into clean, sterile jars. At this stage only loosely fit the lids. As this sauce does not contain high levels of sugar or vinegar to preserve it, a bottling process is required to ensure that it is well sealed. Place the jars on a backing tray, which should then go into the oven set to just less than 100° C, so that the contents don't boil over. After 45mins – 1 hour, remove from the oven, and tighten the lids (wearing oven gloves!).

## **Chinese style plum sauce**

This is nice to add to stir-frys, or for dipping.

6 lb plums  
4.4 lb sugar  
A little oil  
3 onions, chopped  
2 - 3 bulbs of garlic, chopped (depending on size) - lots of cloves, anyway!  
2 large chillies, chopped  
5- 6 "thumbs" of ginger, grated  
3 - 4 teaspoons of Chinese 5 spice  
1/2 pint vinegar

Combine the plums (stoned) and the sugar and heat in a large pan, stirring until the juices of the plums mix with and dissolve the sugar.

Bring it to a rolling boil, and scoop off any scum.

Then turn the heat down, and cook slowly, reducing the fluid, and letting the fruit & sugar caramelise. (May take 2 - 3 hours!)

In a separate pan, fry the onion, and then after a few minutes, add the chopped garlic, chillies and grated ginger, and Chinese 5 spice.

When the plum mix has reached a consistency that you are happy with (I was looking for something fairly jam like), add in the fried onion and spices and pour in the vinegar.

Mix up the contents of the pan, and keep on the heat for long enough for the vinegar to be brought up to temperature too.

Pour or ladle into clean, sterile jars!

## **Mango-style Cherry Plum style chutney**

3 lb stoned cherry plums (or ordinary plums)  
5 table spoon salt  
9 cups water  
1 lb sugar  
2 ½ cups white wine vinegar  
2 inches fresh ginger, chopped  
6 cloves of garlic, crushed  
2 tbsp hot chilli powder  
1 cinnamon stick  
1 cup pitted dates  
1 cup raisins

Place the stoned plums in a bowl. Add the salt and water and set aside in a cool place for 24 hours. Place the sugar and vinegar in a heavy bottomed saucepan and bring to the boil, stirring until the sugar is dissolved. Strain the plums, and discard the juice.

Add the plums to the sugar vinegar syrup. Add the remaining ingredients, and bring to the boil, stirring frequently. Reduce the heat and simmer, stirring occasionally for about 1 ½ hours until the chutney is very thick. Remove the cinnamon stick, and ladle the chutney into clean, sterilised jars and secure the lids.

## Spiced tomato and sweet corn relish

1.5 kg Tomatoes, chopped  
1 cob of sweet corn  
440g Sugar  
2 large onions, chopped  
2 cups vinegar  
1 tbsp vegetable oil  
2 – 3 cloves garlic  
2 teaspoons cumin seeds  
1 teaspoon fennel seeds  
1 teaspoon fenugreek seeds  
1 teaspoon black onion seeds  
1 teaspoon brown mustard seeds.  
Juice of 1/3 a Lemon

Combine tomatoes and onion in a large saucepan and add sugar and vinegar. Bring to the boil and simmer, stirring frequently for about 40 minutes or until mixture is reduced and thickens slightly.

Combine the spices, and fry in vegetable oil. Stir the spices into tomato mixture; add the corn and simmer, stirring for 2-3 minutes until mixture thickens.

Spoon into clean, sterilised jars and seal when cool.

Leave out the sweet corn to make a delicious spicy tomato relish.

## References

### Web

- <http://www.storingandfreezing.co.uk/healing-vegetables-for-winter.html>
- [http://www.allotment.org.uk/allotment\\_foods/Storing\\_the\\_Surplus\\_Potatoes\\_and\\_Root\\_Vegetables.php](http://www.allotment.org.uk/allotment_foods/Storing_the_Surplus_Potatoes_and_Root_Vegetables.php)
- [http://www.allotment.org.uk/allotment\\_foods/Storing\\_the\\_Surplus\\_Freezing.php](http://www.allotment.org.uk/allotment_foods/Storing_the_Surplus_Freezing.php)
- <http://www.vegetableexpert.co.uk/StoringAndPreservingCategory.html>
- <http://www.storingandfreezing.co.uk/storing-fruit-vegetables-for-longer.html>
- [www.self-sufficient.co.uk](http://www.self-sufficient.co.uk)
- [www.fruitexpert.co.uk](http://www.fruitexpert.co.uk)
- [www.allotment.org.uk](http://www.allotment.org.uk)
- [www.storingandfreezing.co.uk](http://www.storingandfreezing.co.uk)
- <http://seasonalcooking.suite101.com>

### Books:

- AFRC Institute of Food Research, 1989, Home Preservation of Fruit and Vegetables
- Piers Warren, 2003, How to Store Your Garden Produce
- Phyllis Hobson, 1994, Making and Using Dried Foods

## Improving your soil

### Farmyard Manure

As ground becomes vacant you can dig it over and spread farmyard manure over the surface. Remember to enquire about your supply of manure, to avoid problems of manure contaminated with weed killer. For more details please see this link:

[http://www.gardenorganic.org.uk/organicgardening/herbicide\\_damage.php?dm\\_i=4UO,6RPJ,JJZTV,GS0E,1](http://www.gardenorganic.org.uk/organicgardening/herbicide_damage.php?dm_i=4UO,6RPJ,JJZTV,GS0E,1)

Leave the soil roughly dug in large clumps and the worms will break these up as they get the manure. The freezing and thawing of water in the soil will cause the soil to break up finely so becoming easier to handle in the spring.

### Leaf mould

If you don't have a cage for your leaf mould and want to make it, get started at the beginning of the month to be ready when the leaves arrive. There are many reasons why leaf mould is good for the vegetable garden including: improving soil structure, increasing soil water retention and it also encourages earthworms. If you have 1 or 2-year old leaf mould ready to use, apply as a mulch for winter coverage of bare soil.

Garden Organic has a useful fact sheet:

[http://www.gardenorganic.org.uk/factsheets/making\\_leafmould.php](http://www.gardenorganic.org.uk/factsheets/making_leafmould.php)

### Green Manures

Even into October, it is not too late to sow certain green manures for a winter cover crop, especially if the soil remains warm for a few weeks. A green manure will mop up any residual fertility from the soil, preventing loss of nutrients over winter from heavy rainfall. It will also protect the structure of the soil and add fertility in the case of leguminous types that have the ability to 'fix' nitrogen from the atmosphere.



Sowing green manure after crops have been harvested and ground cleared

Once an area has been cleared of crops, weed it and rake it level. You can start sowing green manures once rain has soaked the soil, or irrigate well if the weather is dry. Some will survive the winter while others may be killed by the frost - though the dead plants still provide some protection for the soil.



You should also consult your crop rotation plans before sowing a green manure. Several green manures are legumes, so should be kept in the pea and bean section of the rotation, and remember that also mustard is a green manure from the brassica family. This fact sheet may be a useful guide:

<http://www.gardenorganic.org.uk/factsheets/g3.php>

## **Seaweed**

Seaweed has been used as a soil improver for centuries, particularly in coastal areas. Seaweed contains several useful plant nutrients, including nitrogen, potassium, phosphate and magnesium. There are dried and liquidised forms available from garden centres and seaweed is a common additive to fertilisers, both organic and non-organic. You may wish to take advantage of our location and apply fresh seaweed, rather than opt for the processed seaweed products. Although seaweed is salty, the salt is not usually present in sufficient amounts to damage crops or soil, and the salt will in any case leach out readily with rainfall as it is highly soluble. You have different options available – digging in, using as a mulch or adding to your compost. If dug in fresh, then seaweed is used like any other soil conditioner, digging it in to one or two spades' depth below the surface and using up to a barrow load per square metre (if you have this much available). If placed on the compost heap, fresh seaweed should be mixed in with woody or fibrous material (prunings or paper for example). It can become rather slimy and gelatinous on its own or when mixed only with kitchen waste or lawn clippings. Fresh seaweed can be used as mulch, but it often becomes rather slimy and smelly as it decomposes on the soil surface, so is perhaps better dug in if this is likely to be a problem.

## **References**

- <http://www.vegetableexpert.co.uk/growing-vegetables-month-month.html>
- <http://apps.rhs.org.uk/advicesearch/Profile.aspx?pid=301>

## How to Have the Best Producing Winter Vegetable Garden

The first step in starting the best producing winter vegetable garden for your location is finding out where you can grow vegetables during the winter months. Gardeners in northern climates generally have the most success with the use of cold frames or greenhouses to extend the season. To get the best results with your winter vegetables, you may need to plant your vegetables on the south side of a building where they will not only receive more sunlight, but also some protection from winter winds.

Timing is critical when you are planning your winter vegetable garden. It is important to know the first average frost date for your location. Once you know when to expect your first hard frost, you can then determine how long it takes for your chosen vegetables to mature. Typically, you will find this information on the back of your seed packet. If you are purchasing seedlings, check for a tag that tells you the days to maturity for that variety of plant. If the vegetable you have chosen says that it takes 90 days to maturity, simply calculate the date that would be 90 days before the first hard frost in your location to give your last planting date. This can be extended a bit if you live in a warmer microclimate, such as by the coast, or if you grow under cover (polytunnel, cloches, and greenhouse).

There are certain vegetables that are best suited to a winter vegetable garden.

### 90 Days to Maturity

- Beet
- Carrot
- Parsnip
- Globe onion
- Brussels sprouts
- Cabbage
- Cauliflower

### 60 Days to Maturity

- Early carrot
- Leek
- Turnip
- Kohlrabi
- Early cabbage
- Swiss chard

### 30 Days to Maturity

- Radish
- Leaf lettuce
- Spinach

Some of these vegetables, like parsnips and Brussels sprouts, actually have a better flavour if allowed to be touched by a light frost. Root vegetables can be harvested very late into the winter if they are protected by heavy mulch, such as straw.

## **Extend the Season**

### **Cloches**

You can extend your growing season by using some simple tools of the trade. Cloches are a great example. These portable, mini-greenhouses fit over an individual plant to keep it warm and protect it from the harsh elements. Keep in mind that on sunny days you will need to open it up and allow some of the heat to escape.

You can make one easily by making an arch with some half inch PVC pipe that is long enough to reach from one side of your garden spot to the other, and cover with some clear plastic. You will need to take care in securing the plastic to ensure that it will withstand any winter winds.

### **Raised Beds**

Raised beds also can help to extend your growing season. The soil in a raised bed is warmer, especially if you use old tires to build your raised bed. The black tires will absorb the sun's heat, allowing vegetables to survive longer in the winter as well as being a great way to start early in the spring. It is important to note, some do not like to use tires to plant vegetables out of concern for chemicals seeping into the soil. Some studies say the amount is negligible. You will need to do the research and decide for yourself if this is a good option for you.

### **Greenhouses and Polytunnels**

Here are some of the ways you can successfully grow crops all year round in your greenhouse or polytunnel.

- **Protecting From Frost**

If you want to grow crops all year around in your polytunnel or greenhouse you'll need to take measures to protect your plants from frost. Even half hardy plants left to overwinter in an unheated greenhouse may still be susceptible to frost damage. There are a few options you can choose from to protect from frost in your greenhouse; firstly, you can insulate the greenhouse with clear bubble wrap. This not only insulates the greenhouse glass and helps to trap heat, but also allows light to filter in, which is especially important as the autumn and winter nights draw in. Some people opt for greenhouse heaters, but these will add to the cost, and carbon footprint of your growing. You may also choose to give plants in your polytunnel or greenhouse additional protection, using fleece, or a clear plastic cover.

- **What Can I Grow All Year in My Greenhouse?**

Remember you'll need to opt for half-hardy and hardy varieties of fruit and vegetables to grow through the winter. In early winter, you can already start thinking ahead to next season by planting early carrots. Rather than growing in pots or straight into the ground, try growing them in grow bags that have been used during the previous growing season. If you're after continuous cropping of carrots, you can sow another row of carrots around mid-winter. Early to mid winter is also a great time to get your module seed trays out and start sowing a variety of salads and leaves – little gem lettuces, Winter Density or Bubbles lettuce are all potentials.

### **References**

[http://garden.lovetoknow.com/wiki/Best\\_Producing\\_Winter\\_Vegetable\\_Garden](http://garden.lovetoknow.com/wiki/Best_Producing_Winter_Vegetable_Garden)

<http://www.greenhousegrowing.co.uk/growing-crops-year-round-your-greenhouse.html>

## Notes on Polytunnels session with Maggie Sutherland

### Why choose a Polytunnel?

- Extend the season
- Over-wintering crops
- Grow crops that can't grow outside
- More economical to purchase than a greenhouse
- Better retention of heat than a greenhouse
- Less weather damage (i.e. no broken panes of glass)
- Multi-cropping – e.g. toms in soil from May to October, then cabbage Oct – following spring, all in the same ground
- Propagation
- Avoids pests e.g. flea beetle on brassica salads

### Buying a polytunnel

There are lots of options to consider for your polytunnel, from the size, to the style. Being aware of factors for where you should site it should help identify where in your garden you could put one up.

### Sizes

Minimum sizes about 6 x 8 ft - £220 approximately - if you have the space, and funds, aim to go larger than this. A 3m x 6m polytunnel would be big enough to grow food for two people, and a 5m x 10m can feed a family of six. The widest size you can get is 10 meters. The recommended hoop spacing here in north of Scotland is 5 ft, whereas further south in the UK 6 feet would be fine. This relates to the winter gales that we experience here.

### Covers

There are different types of cover available, including clear, and thermal anti fog. This is treated so condensation doesn't drop down on crops, which is good for reducing risk of fungal infections, or blemishes (e.g. tomato leaves).

Polytunnel covers usually are guaranteed for 5 years, and can last for 5 to 10 years. They do require cleaning yearly (inside and outside), to help keep them in optimal condition for letting light in, and for hygiene and reducing risk of infection.

### Crop bars

Crop bars are an option to consider. These are useful for supports for taller plants and can strengthen the structure, but they will add to your costs.

### Base rail or dig in

There are different options for attaching the plastic cover to the frame. Generally it is cheaper to buy a dig in style, as there are extra materials required for the base rail. The base rail can give a neat, tight cover, and is easier to replace.

## Things to Consider

- 
- Site – not too much shade, some shelter so not too exposed
- Proximity – you don't want to have a long way to go to get to your tunnel
- Growing styles – direct in to the soil / raised beds (can harbour slugs) think about your drainage when deciding
- Services – water & electricity.
- Ventilation – doors / side vents. Good ventilation is important to stop build up of pest and diseases, and fungal problems related to dampness. Open the doors up in the summer time. If there is a chance of frost, make sure they are closed.
- Winter sun. Sun goes from east to west, so you want to position your tunnel with the length facing south, to maximise sun.



Polytunnel in early summer

## How to Construct Your Tunnel

- Foundations need to be put in for your hoops
- Ridge purlins (if you have a larger tunnel and wish the extra support along the ridge)
- Timber door frame & door to be constructed for each end
- Unroll plastic cover. Start at the centre bay, fit and work the plastic out. There are some good videos of this online, so it is worth a look.
- Fix the cover temporarily at the door frame.
- Fix the plastic cover properly – again starting in the centre bay and working out to the ends.
- Finish off the cover at the door frame, working pleats/ folds into the plastic around the door frame.



Covering the Polytunnel at Culbokie Community Garden

## **Propagation**

Tomatoes need a longer growing season than other common crops, so start these off in February. Maggie Sutherland recommends a heated propagator, with temps of 21 – 25 degrees C. They will also need light, so that the seedlings don't become "leggy".

Sow cucumbers later – they don't need such a long season, and can wait till it warms up slightly.

You can buy or build your own propagator, using polystyrene to help insulate, and sand then a soil warming cable, then a further covering of coarse sand.

Using a propagator and growing in a tunnel, you can have kohlrabi and spring unions ready for May, as well as snowball turnips and radishes. Dwarf peas can be ready even sooner.

Have benches or tables to keep plants and seedlings off the ground where they could be frost damaged.

## **Salad Leaves & rotations**

Salad leaves can give a quick crop, but remember the plant families to make sure you get a good rotation in your tunnel.

Brassicas: rocket, mizuna, mibuna, mustard, landcress, Chinese cabbage, pak choi  
Non – brassica salad: lettuce, chicory, corn salad, sorrel, spinach, claytonia, leaf Amaranth

Maggie Sutherland uses a 7 year rotation.

## **Ground Cover**

Matting – keeps soil warm and moist

Can be reused – same crop each year, if you make holes for planting through at the right spacing, just move it to the next site for the same crop.

Maggie tip is to carefully burn holes, rather than cutting to avoid fraying or over-large holes.

## **Irrigation**

Tomatoes, fair better with water direct to the soil, rather than sprayed so that it goes on the leaves. A drip irrigation system works well for tomatoes, therefore. They will need plenty of feeding, such as comfrey and wood ash.

## **Other irrigation options**

- Overhead
- Drip
- Sprinklers
- Misty spray
- Side spray
- Hose
- Watering can

All but the last two options can be operated along with a timer for automated watering. The misty spray and side spray can be moved around.



Maggie struggles with bell peppers, but has had success with sweet long pointy peppers. Prolific cropping, seeds from Organic Gardening catalogue.

### **Fertility, pest & disease control**

As with your outdoor crops, you will need to take steps to keep your soil fertile, and to minimise risk of pest and disease occurring.

- Farmyard manure
- Home made compost
- Comfrey feeds
- Garden centre products
- Seaweed feeds (e.g. maxi crop.
- Complimentary planting

### **What to Grow in Your Polytunnel**

- Tomatoes and cucumbers will do well. For cucumbers look for “midi” varieties – prolific and sweet. 4 – 5 fruits per plant each week in season
- Tagetes (marigold family) are grown in the tunnel as part of companion planting to offer some protection against white fly.
- Salad crops
- Strawberries
- French climbing beans suit polytunnel e.g. blue lake (purple one black...)neckergold – all organic varieties
- Barlotti beans – two plants per support cane
- Squashes – “Uchiki Kuri” - small winter squash, with onion like shape, orange and tasty and “little gem”– light green, nice to stuff.
- Maggie has given up on growing aubergines commercially, as the crops are never great here.

## Notes on Fruit session with Les Bates

Explore the range of fruit available and learn about the factors which influence fruit selection, such as root stocks, flowering groups and compatibility, and learn how to care for them during establishment.

### Recommended books:

- Miles Irving – Foraging Guide
- Creating a Forest Garden: Working with nature to grow edible crops - Martin Crawford
- Woodlanders - Ian Edwards & Sara Hunt
- The Natural Garden Handbook Caroline Foley
- The Fruit Garden Displayed – Harry Baker
- Crofting Agriculture: Its Practice in the West Highlands and Islands - F. Fraser Darling

### Recommended websites:

- 
- Local Food Network for Scotland – <http://nourishscotland.ning.com/>
- Children's Orchard – <http://www.childrensorchar.d.co.uk/>
- Commonwealth Orchard – <http://www.commonwealthorchard.com/>
- Plants with Purpose - <http://www.plantswithpurpose.co.uk/>
- Appletreeman - <http://plantsandapples.co.uk/>

### Edible Fruits

There are some fruits that you would struggle to grow well here, unless you had a heated glasshouse, such as nectarines, peaches, kiwis and so on. There are however plenty of fruit types that you can grow well here, such as apples, blackcurrants, gooseberries, strawberries, raspberries. There are many plants which produce edible fruits and leaves, and what we grow to eat is very much a cultural habit. Les is enjoying the attention that many plants are currently receiving as “new super foods”, such as goji berries, as this is bringing a wider range of plants into the limelight. There are many besides the current faddy favourites, which Les recommends for our gardens.

An example is Amelanchier which has many names, including “June berry” and “shadbush”. This produces small black berries, slightly smaller than blackcurrants. It is a coastal plant, and grows in early successional habitats. It is often selected for gardens as an attractive shrub, grown for its flowers and the show of colours in the autumn.

Another edible berry is Aronia, also known as chokeberry. Juice from these berries is astringent and not sweet, but high in vitamin C and antioxidants. The berries can be used to make wine, jam, syrup, juice, soft spreads, and tea.

Cherry plum is a large shrub, or small tree, which produces delicious small-sized plums, which is great in jam and chutney. The cherry plum is originally from Asia and a nice addition to a hedgerow. It flowers early in the spring.

## Choosing your Fruit Trees

### Rootstocks

Fruit trees are propagated onto rootstocks. The rootstock is the most important factor in determining the vigour and eventual size of the tree. The difference in size can be quite dramatic. For example an apple tree on a very dwarfing rootstock may grow to an eventual height and spread of only 5 ft (1.5 m) while the same variety of apple on a vigorous rootstock grows into a large tree over 20 ft (6.5 m) in height and spread. The choice of rootstock is therefore very important as it will determine the suitability of the tree for the position and the form in which you intend to grow it.

Les recommends M26 as a rootstock that will produce a tree that is not too big, and not too small for a smallish garden - about 10 ft (3 m).

### Pollination

Some fruit trees are self-fertile and will produce a good crop on their own. Most however, require or will benefit from a pollination partner. The pollination partner must be a different variety of the same fruit species which flowers at about the same time and is compatible in other respects. Many suppliers will list a pollination group for any given tree, to help you determine compatibility. Some suppliers (e.g. Keepers Nursery) will offer further assistance in selecting compatible, with a “show suitable pollination partners” option for each fruit tree in the online catalogue. Crab apples flower longer, so are often selected as pollination partners.

Les recommended:

- John Downie
- Harry Baker – big purple / pink flowers, nice leaf colour, big apples (for crab)
- Wisely Crab – white flowers

### Age, size and form

Generally, fruit trees are supplied as one and two year old trees old trees. Older fruit trees become increasingly difficult to transplant. One year old trees are referred to as maidens. Depending on the variety some have branches (to use the technical term are feathered maidens) while others have little or no branching (maiden whips). Maidens have had little or no formative pruning. Two or three year old trees usually have a well developed branch structure and have had some formative pruning towards a form appropriate to their respective rootstock. It is also possible to purchase trees trained into specialised forms such as fans, espaliers and cordons.

Bare-rooted trees and bushes are cheaper to purchase than container grown fruit, and it is generally considered the best way to plant fruit trees. You should plant bare-rooted trees and bushes while they are dormant, from November to March, outside that time you would need to purchase container grown plants.

When you are purchasing your fruit trees at nurseries, check the plant for damage from cans or supports. Check also for the shape, especially for an older, more expensive tree.

## Suppliers

Les recommends Ardfearn Nurseries, as a local supplier for a variety of fruit. They buy in their fruit from growers in Cambridgeshire, so trees and bushes will be available as soon as the supplier is able to move them from the ground (i.e. when growth has stopped, and the ground conditions are good). Fruit trees need a cold period for the right length of time. Climate change bringing us warmer wetter winters will gradually change the conditions that we have, and may reduce the cold period, making fruit trees available from nurseries later.

Les also suggests J Parkers <http://www.jparkers.co.uk>, however you should check what rootstocks they have and make sure it is what you are looking for, as they seem to be moving towards dwarfing rootstocks rather than M26.

<http://www.butterworthsorganicnursery.co.uk> John Butterworths Organic Nursery in Ayrshire was unusual in that it is located near Ayr, rather than the south of England, where many other fruit nurseries are. The aims of Butterworths were to produce suitable varieties, (historic and modern) of fruit trees that do well in more difficult parts of Britain, i.e. the North, West and higher altitudes. Unfortunately, John Butterworth has retired from the nursery now, although it is still possible to get in touch with enquiries.

## Focus on Apples

### Top ten Apple varieties in Scotland

The following are known to do well over a wide area, though there will be others on which further information is still being gathered. It should be noted that more Scottish varieties probably could be identified or recorded.

### Eating Apples (E)

Charles Ross, Discovery, Ellison's Orange, James Grieve (except NW) Worcester Permain

### Cooking Apples

Bramley's Seedling, Emneth Early, Grenadier (except NE) Lord Derby, Howgated Wonder (except (NW, NE)

- **Charles Ross (E)**

A mid season apple, very useful in Scotland. Keeping through October – January. Description: Attractive round to conical, orangey- red over yellow. Firm juicy flesh. Origin: Peasgood's Nonshuch x Cox's Orange Pippin – in 19<sup>th</sup> Century from Newbury in Berkshire. Named after a Scottish Head Gardener at the garden.

- **Discovery (E)**

Very successful in most Scottish regions. A good early fruit (September) but short term keeper.

Description: orange to brilliant crimson. Very tasty acidic / sweet flavours. A hardy disease resistant tree. Popular with organic growers.

Origin: Worcester Permain x Beauty of Bath (?) in 1949 from Essex, by Mr Drummer.

- **James Grieve (E)**

Well known throughout UK. Possible preference to east coast. Season September – December.

Description – round to conical, red over yellow, sharp flavour. Useful pollinator for other apple varieties can be prone to scab, so good pruning management is important.

Origin: Edinburgh in 1890s named for a Mr James Grieve of Dickson's Nursery.

- **Worcester Pearmain (E)**

Very successful in most Scottish regions, comparable to Discovery in many attributes. Description: frost resistant crimson bloom, reddish fruits, very sweet. Does well ripening on tree. Tip bearer, so not very suited to espalier form. Origin: from Devonshire Quarrendon, in 1870s, attributed to a Mr Hale in Worcestershire. Used to be grown commercially in Clyde Valley.

- **Bramley's Seedling**

Best of all cooking apples, does well in most Scottish regions. Description: vigorous partial tip bearer. Prefers sheltered drier situation, scab can be an issue in wet seasons. Origin: the original tree is still growing in Nottinghamshire, from seed planted by MaryAnne Brailsford in 1810.

**Good fruit varieties for growing in Black Isle**

- **Apples**

Charles Ross, Ellison's Orange, Discovery, Laxton's Fortune, Worcester Pearmain, Grenadier, James Grieve, Bramley's Seedling

- **Pears**

Conference, Williams Bon Chrétien (cordons)

- **Cherry**

Stella



Delicious dessert apples



Victoria plums

- **Plums**

Victoria, Czar, Merryweather, Damson

**Espaliers**

The term espalier refers to the way fruit trees are trained to grow against a wall. It makes the tree easier to prune and the fruit easier to pick. This decorative method was often used traditional walled kitchen gardens and is perfectly suited to growing fruit in the smaller garden. It can also be used as an

attractive separation or screen between different parts of a garden. Perfect for the small garden, an espalier tree has branches trained horizontally on either side of the stem to make a compact, but productive tree.

Many varieties are suitable to grow in this way, but it is a good idea to check before you purchase. You can also buy a ready-trained tree at garden centres or from catalogues during the winter time. You can also buy espaliered trees in pots at garden centres which are available all year round. These are perfect for growing where space is limited.

In the espalier system, the tree comprises a central stem and horizontal fruiting branches. It is very important to train the tree correctly in order to achieve a tree that produces good fruit on all the horizontal branches for the next 20 years or so. Do not train the branches until the sap in the tree is running vigorously, i.e. from around mid-May.

In the first year of training, you will form the first tier of the espalier, and therefore you will create a tree with three branches: the two side branches, and the upward leading branch. In mid-May, tie the two lower side branches to an angle of about 60 degrees (from the horizontal). At this stage, you can remove all other competing branches from the tree, so that growth will be concentrated in the three branches you need.

Wait until the second week of August, and only then, lower the two side branches to the horizontal. If you lower the branches to the horizontal position too early in the growing season, the upright vertical leading branch will absorb all the nutrients and the first tier of the espalier will be too weak in future years.

During the last week of August, remove all surplus upright growth from the espalier frame work. Then cut a notch in the upright branch above the first horizontal tier, at a height corresponding to where you would like the next tier to be formed the following year. This is usually about 18 inches above the first tier. The depth of the notch should be about a third of the thickness of the upright branch. It stimulates the tree to produce branches at exactly that point.

The following year, build the next layer of the espalier, following the same routine as the previous year. The following August, establish the final tier of the espalier, selecting two branches and training down to a 90 degree angle. The tree should be fertilized with either a tree feed such as "Growmore", or a home made feed such as comfrey and / or nettle.

During the growing season (May-October), keep the area under the tree canopy free from weeds and from grass in particular. Only prune in the winter once the tree is in full production and therefore is in need of spur replacement.

### **Protecting trees with natural insecticide & fungicide**

Elder spray kills aphids, small caterpillars and is useful as a fungicide for mildew and (blackspot on roses), or scab on apples roses. The toxic agent is hydro-cyanic acid, so in preparing the spray use an old saucepan. Gather 450g (1 lb) leaves and young stems of elder prefer-ably in spring when the sap is rising. Place in the saucepan and add 3.3 litres (6pt) water. Boil for half an hour, topping up as necessary. Strain through old tights and use the liquid cold and undiluted. It will keep for three months if bottled tightly while still hot.

Apple tree scab: Grow any member of the onion family around the base of the tree. Chives work the best. You can also make a tea from chives and use as a spray on your apple trees to help protect from scab.

To protect your trees against codling moth, coat a ring of wax around the trunk of your tree to stop them crawling up.

Sage is an antiseptic herb. You can make use of the properties of this herb to protect your fruit by making up a "tea" which can then be sprayed on the ground surrounding your fruit to get rid of pathogens



If you apple trees show signs of scab, don't compost the leaves and apples – these should either be incinerated or added to the council green garden waste recycling.

### **Planting Fruit Trees into Lawn**

Dig 1 meter diameter around where you want to site your tree. Remove the turf. You should consider adding some blood fish and bone to the soil – this should be mixed with compost. Since this was once lawn, there will be no leaf litter layer, so you will need to add some leaf mould. If you are putting in more than one fruit tree to your lawn and once, you will need to have them at least 8 feet apart. Water in the trees – soak the roots overnight.

The graft must be above the soil level. This is also why it is a good idea to keep the grass down, so that no roots from above the graft try to take hold. Never plant it any deeper than where it came out of the ground – look at the colour of the bark as a guide to help determine what was previously in the soil. Apply some mulch to keep the moisture in.

### **Soft fruit bushes and canes**

#### **Pruning Gooseberries**

- A gooseberry bush becomes tangled and unhealthy without pruning.
- Good management means keeping the centre open to air and sunlight, leaving a few, regularly-spaced, main branches.
- In winter, prune out dead or diseased stems, and any crossing in the centre.
- Cut back to a young shoot.
- Thin overcrowded areas and prune drooping stems to an upright side shoot.
- Shorten new growth by half to maintain an acceptable size.

#### **Pruning brambles / blackberries**

- Bramble /blackberries and hybrids such as loganberries and tayberries are all pruned in the same way. New canes grow one season and fruit the next, after which they are exhausted and can be removed.
- The problem is that generations overlap, so a plant will have one-year-old canes bearing fruit, mixed with the next season's stems making their early growth.
- To prune the plants, cut out the fruited canes at ground level and replace them on the wires with the new ones.
- If there are not enough of these new canes to cover the whole area, retain the best of the old canes, shortening any side shoots to one leaf.

#### **Pruning blackcurrants**

- Blackcurrant bushes need constant renewal to ensure heavy crops. Older branches will bear fruit, but quantity and quality decline with age.
- For this reason new bushes are planted deeply so that the plant produces vigorous young branches annually from below ground.
- These are then used to replace older ones cut out after harvest.
- Each year remove about one third of the oldest stems - the bark is very dark to the point of being black - and any that are weak or very low.
- Always cut back to ground level or to a strong new shoot.
- You can combine pruning with picking the fruit, or wait until winter.

### **Pruning strawberries**

- Although not normally associated with annual pruning, strawberry plants produce a number of runners bearing young plantlets.
- These should be cut off to conserve the plant's energy unless you want to propagate new plants.

### **Pruning raspberries**

- Summer-fruiting raspberries behave like blackberries, fruiting on one-year-old canes that are cut out after harvest and then replaced by the young canes.
- Autumn-fruiting varieties, however, are cut to the ground in late winter to make way for new canes that will grow from the base and fruit the same year.

## Notes on Pests, Diseases and Disorders session with Audrey Litterick

### What are Pests and Diseases?

#### Pests

Animals which attack your crops, they might be:

- mammals (e.g. moles, deer, rabbits)
- birds (e.g. pigeons, crows)
- insects (e.g. caterpillars, root flies, mealy bugs, aphids)
- microscopic worms (nematodes)
- mites (e.g. red spider mites, gall mites)

#### Diseases

Illnesses caused by pathogens, usually micro-organisms which attack your crops, they might be caused by:

- fungi (e.g. potato blight, clubroot, mildew)
- bacteria (e.g. apple canker, fireblight, spear rot)
- viruses, viroids, etc (e.g. tobacco mosaic virus, potato ringspot, beet western yellows)

#### What are Disorders?

Illnesses in plants which are not caused by pests / pathogens but by environmental conditions e.g.

- a lack or a damaging excess of one or more major, minor or secondary nutrient (usually linked to soil pH)
- too high / too low / too variable temperatures
- too much / too little water
- insufficient light
- excessive draughts / exposure to wind

#### What is Crop Protection?

Our attempts to keep crops

- Healthy and high yielding
- Free from nutrient deficiencies and toxicities
- Free from attack by weeds, pests & diseases

#### Sustainable crop protection

- emphasis is on prevention rather than cure
- try to avoid pesticides where possible
- Organic growers rely on a wide range of partial solutions to preventing and controlling pests, weeds, and diseases.
- Cultural methods to prevent and control problems

Pesticides are prohibited or restricted and are regarded as a last resort.



Companion planting with flowers and protective mesh

### **Key points for success 1**

Happy crops growing in the right place (for them) and properly fed, rarely succumb to pests, diseases and nutrient disorders

Learn how to provide the right environmental conditions for the crops you want to grow, and the right nutrition and you are more than half way to preventing pests and diseases.

### **Key points for success 2**

You've got an advantage: environmentally friendly pest and disease control works best in gardens and small holdings. Diseases love mono-culture, so our gardens with their greater diversity are at an advantage.

### **Non-nutritional disorders**

Lots of different types caused by, for example

- lack of light
- too much light
- draughts
- exposure to excessive wind
- unsuitable temperatures
- drought / over-watering

### **Nutrient deficiencies and toxicities**

- Greatly influenced by soil pH (degree of acidity). If the pH is too high or too low, the nutrients are inaccessible to the plant.

Also depends on:

- concentrations of major, secondary and minor nutrients in soil or growing media
- soil conditions (mainly soil temperature and moisture)
- crop covers (used and not used)
- weather conditions

A very big subject- too large and complex to cover in detail here. Seek advice from an expert if in doubt about diagnosis of a crop problem.

### **Examples of nutrient disorders**

- Calcium deficiency in lettuce – dry brown edge of leaves, which then goes slimy
- Calcium deficiency in tomatoes - sunken, dry decaying areas at the blossom end of the fruit. This is common in tomatoes grown in grow bags, not because of an actual lack of calcium in the growing medium, but because the roots get too wet.
- Boron deficiency in cauliflower – little holes appear within stem
- Magnesium deficiency in tomatoes – yellowy-orange bands between the veins, which may later turn brown if the deficiency isn't treated soon enough. This is common at the end of the season and on older leaves. It can happen as a result of calcium uptake.

### **Pests in horticultural cropping**

Pests can cause a lot of damage. The main pest problems you are likely to encounter will probably include:

- aphids
- slugs and snails
- vine weevil
- carrot fly
- cabbage root flies
- wireworm
- red spider mite (indoors)
- caterpillars
- moles
- rabbits and deer
- Potato Cyst Nematodes (PCN)

Nematodes are not such a problem here, because of soil temperature. In fact it is for this reason that many seed potato growers are based in this area.

Aphids, nematodes, mealy bugs and scale insects can be vectors for disease. Commercial growers that spray against these pests are often spraying because of the viruses rather than the pests themselves.

### **Diseases in horticultural crops**

Main disease worries will be:

- Potato blight and black leg
- potato skin diseases
- botrytis
- mildews (downy and powdery)
- rust
- white rot (alliums)
- vascular wilts
- damping off, root rots and wirestem (seedlings and transplants)
- sclerotinia root and stem rots

### **How to prevent / control pests and diseases?**

- Aim to prevent as many pests, diseases and disorders as possible through good horticultural practice.
- Aim to learn what pests and diseases you are likely to suffer from and learn as much as you can from books and knowledgeable friends.
- Learn about the life cycles and needs of your garden enemies in some detail, and learn what specific things you can do to help to prevent them and control them if they do occur.

### **General environment-friendly strategies for pest/ disease control**

- Grow only what will be happy in your garden (e.g. tomatoes, kiwi fruit and maize can be difficult outdoors in Scotland).
- Effective crop rotations
- Enhance numbers of predators / Parasites / Antagonists
- Optimised soil pH and crop nutrition
- Use resistant species and varieties
- Use crop and variety mixtures
- Agronomic measures (e.g. time of sowing / harvest, irrigation regime)
- Use barriers (e.g. polythene, fleece, mesh cages)
- Try bio fumigation (if pest / pathogen is soil-borne)
- Use safe pesticides as a last resort.

### **Appropriate Crop rotation**

- The biggest single measure that can help minimise the incidence and severity of disease and pest damage.
- Most effective against soil-borne diseases (e.g. clubroot, white rot, sclerotinia) and relatively immobile soil pests ( e.g. nematodes)
- Most effective against diseases / pests with narrow host range
- Less effective against air-borne diseases (e.g. mildew, potato blight) air born pests (e.g. aphids) and where the pest or pathogen has a wide host range
- Organic commercial growers will grow potatoes or carrots in a field one year in six.

## Vegetable Plant Families

### Pea / Bean Family (Leguminosae)

French bean  
Runner bean  
Broad bean  
Pea  
Clover  
Lucerne  
Lupin  
Trefoil  
Vetch / tares

### Potato Family (Solanaceae)

Potato  
Tomato  
Aubergine  
Pepper

### Beetroot Family (Chenopodiaceae)

Beetroot  
Spinach  
Swiss chard  
Spinach beet

### Lettuce family ( Asteraceae)

Chicory  
Endive  
Lettuce  
Salsify

### Grass Family (Gramineae)

Sweet corn  
Grazing rye  
All cereals / grasses

### Cucumber Family (Cucurbitaceae)

Cucumber  
Squash  
Courgette  
Marrow  
Gourd  
Pumpkin

### Carrot Family (Umbelliferae)

Carrot  
Celery  
Parsnip  
Celeriac  
Fennel

### Onion Family ( [Amaryllidaceae](#))

Onion  
Leek  
Garlic  
Shallot

### Cabbage Family (Brassicaceae)

Cabbage  
Broccoli  
Brussels sprouts  
Kale  
Swede  
Kohl Rabi  
Cauliflowers  
Radish  
Oriental brassicas  
Turnip  
Mustard

Audrey moves soil in and out of her glass house to achieve rotation as tomatoes, aubergine and peppers are all grown in there, and are all in the same family.

### Crop rotation

Ideally only grow vegetables in each botanical family for 1 year in 5.

Some diseases require longer, therefore control relies on much more than the rotation alone

E.g. white rot – 15 years

E.g. clubroot – 20 years

Producers of organic fruit (e.g. strawberries) for supermarkets grow their plants for 1 year only. This does give low yields, but is the most cost effective way to produce organic fruit. This is done on a fifteen year rotation. The plants are taken out and burned at the end of the year.



### **Predators, parasites and antagonists**

Encourage biodiversity and in particular, beneficial organisms from the large to the small.

Large species (e.g. birds, frogs and hedgehogs)

Smaller species (e.g. ladybirds, lacewings and predatory mites)

Microscopic species (e.g. parasitic and antagonistic fungi)

### **Encourage Biodiversity – how?**

- Diverse rotations (not as easy in tunnels, as there are cost implications)
- Encourage a rich natural flora in and around the garden
  - Destroy damaging weeds
  - Establish beetle banks
  - Collect seed from wild flowers locally and encourage beneficial species
- Add plenty of bulky organic mater, especially composts to soils

### **Predators, parasites and antagonists**

- You can use licensed, naturally occurring biological control agents
- Not generally effective outdoors, but they often give excellent results indoors

Examples include:

- For vine weevil and slugs (parasitic nematodes)
- For aphids, parasitic wasp (*Encarsia formosa*)
- For aphids, predatory mite (*Phytoseilus persimilus*)

### **Optimise soil pH and crop nutrition**

Susceptibility to pest / disease attack will be minimised if crops are grown in soil with appropriate:

- pH
- fertility

Crops and soils differ: It is important to know your soils and choose crops to suit, e.g. Do not lime potatoes (makes common scab worse)

Clubroot – add lime to reduce effects

Do not add too much Nitrogen – it can make (probably most!) pests and diseases worse.

### **Use Resistant species and varieties**

- Choose crop species that you know will grow or test on a small space the first time around
- Choose the best available varieties (sometimes old, sometimes new)
- Never forget the taste – be very wary of new highly disease resistant varieties, e.g. Potato “Lady Balfour”.

### **Use crop and variety mixtures**

Possibilities include strip cropping or inter-cropping (e.g. alliums in rows between carrots / parsnips.)

### **Cultural measures for disease / pest control**

Endless options and permutations! For Example:

- Time of sowing / harvesting
- Depth of sowing / planting
- Nature of cultivation regime

- Pruning / trimming time / method (perennial crops)
- Irrigation regime
- Nutrient application regime
- Harvesting method
- Storage and transportation methods
- To a large extent, experience will show you what works best for your soil, climate and expertise.

For example, to hopefully crop before potato blight may hit, start chitting and get the tubers into the ground as early as your frosts will probably allow, use protection like fleece if you can to bring forward cropping. Some varieties are much more blight resistant than others e.g. Sarpo Mira, Sarpo Axona, Setanta, Orla.

### **Barriers and traps**

- Electric / wire mesh fences
- Glasshouses, polytunnels, cloches and mini-tunnels covered with fleece or polythene are all potentially barriers if set up in order to exclude specific pests.
- Vertical barriers
- Slug traps
- Sticky traps
- Pheromone traps

Look out for enviro-mesh: this lets the rain get in better than with fleece. Make sure that there are no gaps at the bottom, and no holes. Keep the cover on for as much as possible – take off for weeding, and quickly replace.

### **Biofumigation**

The basic definition is to harness the natural chemical agents of plants to suppress weeds, fungal pathogens and insects. It is an agronomic technique that makes use of some plants' defensive systems. With this system, tissues of these plants can be used as a soft, eco compatible alternative to chemical fumigants and sterilants. Many plants in the brassica family contain glucosinolates which makes them taste spicy.

Glucosinolates also deliver a deadly punch to many soil borne pathogens, nematodes and weeds, making them an effective, all-natural alternative to chemical insecticides and herbicides.

- Relatively new technique used against nematode pests
- *Tagetes patula* “single gold” and sorghum sudan grass are commonly used in the Netherlands and in warmer climates.
- Mustard is also often used in the UK (grown to flowering, then chopped and dug in).
- Growers in the Netherlands aren't allowed to use some of the nastier chemicals, so instead use this marigold. The plants are grown, then cut down and dug into the soil.

### **Pesticides**

- “Pesticides” is the general term for products intended to kill weeds, pests and pathogens.
- Most are best avoided by those wanting to grow their own produce.
- Synthetic pesticides and several natural and semi-natural products are prohibited in certified organic farming systems.
- Products approved under the organic standards are not necessarily the safest for non-target organisms though.
- Be aware of the safety implications of using any pesticide.

### **Insecticides and fungicides that you might use**

- Sulphur products
- Copper products
- Conazole fungicides
- Strobilurin fungicides
- Tar acids
- Phenolic compounds
- Insecticidal soap
- Neem oil
- Pyrethrins
- Synthetic pyrethroids
- Imidacloprid
- Metaldehyde

### **Conclusions**

- When trying to prevent and control pests and diseases, gardens and small horticultural units have the advantages
- Diversify rather than specialise; use a wide range of different techniques to prevent pest and disease attack
- You should have few serious problems (apart from growing under protection).

### **More information**

- The Encyclopaedia of Organic Gardening, HDRA (Ed. Pauline Pears)
- Pests and Diseases (RHS) Pippa Greenwood and Andre Halstead
- National Sustainable Agriculture Information Service (an excellent USA website aimed at crofting style agriculture – <http://attra.ncat.org/horticultural.html>)
- Garden Organic Website <http://www.gardenorganic.org.uk/>
- Using pesticides in the garden [http://www.pesticides.gov.uk/garden\\_home.asp](http://www.pesticides.gov.uk/garden_home.asp)
- Grow Organic Food website - <http://organicgarden.org.uk/gardening/pests-diseases/sprays-organic-for-pest-control>

## Sustainability in Gardening

Producing food locally is a great way to reduce your carbon footprint. However, gardening just in itself is not necessarily good for the environment. With the looming threat of climate change for the coming generation it is important to consider ways in which we can ensure that having a productive garden is beneficial to our environment.

While our garden plants absorb carbon dioxide and give out oxygen, it is an oversimplification to say that our garden plants reduce our net carbon emissions. There are many inputs to modern gardening methods that need to be questioned as they release significant quantities of greenhouse gases:



Strawberry plants in old welly boots

### Fertiliser:

Almost all synthetic fertilisers that contain nitrogen will have been produced using the Haber Bosch process. This relies on converting the methane from natural gas into hydrogen first and the resulting by-product is CO<sub>2</sub>, making commercial fertilizer production a large producer of greenhouse gases. To produce just one tonne of food takes one tonne of oil, one hundred tonnes of water and produces seven tonnes of greenhouse gases using modern industrial methods.

### Peat:

Natural peat bogs are one of the earth's best carbon sinks – they absorb CO<sub>2</sub> from the atmosphere and lock it away. Many multi-purpose composts contain peat as it can help retain water. Buying compost or potting soil that contains peat has a negative carbon impact because it removes part of the earth's ability to absorb greenhouse gases. Amazingly nearly half of all compost sold in the UK still contains peat so if it doesn't say peat-free on the label it probably isn't!

Peat renews at approximately 1mm per year, therefore it is considered a non-renewable resource. Peat bogs are also home to a huge array of flora and fauna that thrive in such conditions. This includes birds, such as snipe and the skylark, which breed on peat bogs, as do many butterflies and dragonflies. It seems in our attempt to create our own little wilderness that we are selfishly robbing another.

### Heat:

Heating greenhouses is a very inefficient process. There is no double-glazing and they're draughty because good ventilation is required for plants. Unless you're using

electricity from a renewable source to power an electric heater there will be a considerable carbon footprint.

### **Water:**

Food gardening requires large amounts of water, especially during hot summers. When that comes from treated drinking water supplies the carbon footprint can be significant. A hosepipe can use 1000 litres per hour and the energy that went into treating and supplying that water is equivalent to leaving a 60W light bulb (or 5 low-energy light bulbs) running for the same period of time. The organisation which purchases the largest amount of electricity in Scotland is Scottish Water.

### **Non-renewable Resources:**

Garden centres and gardening supply companies often promote their green credentials yet their bottom line is nearly always profit and persuading us to buy ever increasing amounts of hard goods. Everything they sell requires energy to produce, adding to your garden's carbon footprint.

### **Transportation:**

Although growing food cuts out all the food miles that come from the food superhighway that supplies our supermarkets, there are still many garden products that are shipped around the world.

Once you take all these into account it's easy to see why the kind of easy gardening encouraged by garden centres could actually end up contributing to a higher carbon footprint, adding to the problem of climate change.

### **Gardening with a Tiny Carbon Footprint**

Here are some possible ways to help cut down your carbon footprint in the garden:



Recycling newspaper to make biodegradable pots

### **Reduce, Reuse, and Recycle:**

There are some excellent ways to reuse and recycle in the garden, from reusing yogurt pots as plant pots, and creating biodegradable pots using a paper potter, right up to home made composters made from pallets, as well as planters made from old bath tubs or old sinks, and CD bird scarers. We need people to move away from commercial quick-fix gardening to an awareness of how growing your own food can help offset the carbon footprint of our lives.

### **Avoid Peat:**

It isn't easy to find high-quality compost for seeds and young plants since many peat-free types of compost come from composted wood chippings and are too coarse. Look for up-to-date reviews of different brands in gardening magazines. For example, *Which? Gardening* has awarded Best Buys for container compost to three peat-free varieties – Vital Earth Tub and Basket Compost, New Horizon Multi-Purpose Compost, and Vital Earth Multi-Purpose Compost. Another solution is to use coir products. Coir is a waste product from processing coconut fibre and it is shipped across the world to reach us. However, this shipping is low on the scale of transport-produced CO<sub>2</sub> and the resulting compost is so much better than alternatives.



Hydrating a coir block

For further information and advice about going peat free, contact RoWAN's Zero Waste Volunteers or visit <http://www.wasteawareScotland.org.uk/peatFree.asp>

### **Fertilise with Compost and Green Manures (cover crops):**

There is now ample evidence that using good organic gardening techniques produces crops that are at least as good as non-organic and much better for our health and world. Composting everything you can reduces the methane emissions that would come from sending it to landfill and increases your garden's growth, a win-win situation. However, to keep methane emissions low, the composting needs to be well aerated so techniques such as hot composting where the pile is regularly turned to mix in air, are preferable.

### **Supplement Light not Heat:**

It's much more efficient to start seedlings inside a heated house with full-spectrum grow-lights than to heat a light but draughty greenhouse. I have now taken to leaving my greenhouse empty over winter and raising seedlings with grow-lights in a bedroom (warm air rises in the house so it's naturally warm).

### **Use Grey Water:**

With sensible precautions water from roofs, sinks and baths can be used around the garden rather than treated drinking water.



## GROW YOUR OWN GARDEN – MONTH BY MONTH

Seasonal notes have been prepared for each month. These notes are heavily based on resources such as Garden Organic “what to do now” website section, The Kitchen Garden magazine online and the book Vegetable Growing Month by Month by John Harrison. However they have been modified to suit growing conditions in the North of Scotland. As such, sowing and planting times are adapted, as well as advice about protecting crops, and what sort of fruit and vegetables to try growing. Additionally, low impact gardening techniques are promoted, such as using your own home made fertilizers rather than synthetic ones, and alternatives to heated propagators such as sowing in trays indoors.



## Grow Your Own Garden in December & January

The cold weather arrived with snow before the end of November in 2010. This does restrict what can be done out in the garden, and even just heavy frosts can mean that it is not possible to dig the soil or plant out some over-winter crops, or plant new trees or bushes before the New Year if you miss your window of opportunity! While there is less to do in the garden, it is a good time to plan for the next season, and order your seeds. It is also a good time to plan any changes to infrastructure, such as polytunnels, greenhouse, water butts, raised beds etc. Think about providing for the wildlife in your garden, and make sure that there is some water that isn't frozen available for birds as well as plenty of food. While we need to protect some of our crops from birds such as pigeons, other garden birds will help during the spring and summer eating up slugs and caterpillars. At this time of year, you may also wish to add to the types of food you produce for yourself, and consider giving growing mushrooms a try and also sprouting beans and seeds and growing micro-greens (leafy crops which are sown thickly and harvested when young).

### Jobs for December & January

- Begin pruning established apple and pear trees now that they are completely dormant and before they come into growth in early spring. Cut out diseased and crossing shoots and any suckers arising from the stem. Stems growing skywards (water shoots) can be removed to leave a framework of more horizontal fruiting branches. Cut back inward-growing shoots to 10cm (4in). There are many good books and references on pruning, and of course there are different styles and schools of thought which may contradict each other. You can also look online for some videos on pruning to see how it is done.
- Keep some fleece or cloches handy at all times to provide hardy leafy crops such as winter lettuce, mizuna and land cress with some protection in very cold spells.
- Lift winter vegetables while the soil is still workable and consider heeling in crops such as leeks, parsnips and carrots near the path or in a sheltered spot where they are not likely to become frozen into the soil.
- Cover cold frames containing young pea and brassica plants on cold nights with fleece or old carpet to help keep out the cold.
- Order your seeds for the spring
- Feed the birds! Many smaller birds are a great help to us in the spring when the caterpillars and greenfly hatch. Remember to supply the birds with water – thaw out frozen water with some warm water.
- Consider simple building projects for the garden, such as a cold frame. You can do this in the relative warmth of a garage, when there is less outdoor work to be done with your plants in the ground.
- Give your tools some care and attention. Scrub spades, forks and hoes with hot water, then dry thoroughly and wipe over with an oiled cloth to prevent rusting. Blades can be sharpened, a little too.
- Start chitting seed potatoes. Store the tubers in a light, cool, frost-free spot and leave them to sprout. This is known as “chitting”. Egg boxes make good chitting trays so start saving them now. Make sure you put the tubers with the 'eye' end - where the sprouts will grow from turned upwards.
- Check up on any over-wintered peas and broad beans, to determine how many you may wish to re-sow once it warms up.
- Clear out bird boxes ready for spring, and check for any damage or leaks that you can repair.

## **Sowing in January**

- Broad beans
- Salad leaves
- Bulb onions
- Sprouting seeds
- Micro-greens
- Greenhouse / polytunnel tomatoes & peppers (towards end of January)
- Garlic (although better yields are achieved planting late in Autumn)

If you have suitable indoor space, make some early sowings in trays. Try lettuce, summer cabbage and cauliflowers, plus round varieties of carrots, spinach, salad onions and turnips. Germination temperatures of around 13 °C are adequate so a windowsill is fine to get these seeds going.

## **Planting in January**

- Bare-rooted fruit trees and bushes
- Jerusalem artichokes
- Bare-rooted hedging
- Rhubarb

## **Snow, ice and frost in the Garden**

During winter 2010 / 2011 we experienced several episodes of lying snow which lasted for several days or even weeks. The snow can affect your vegetable garden in terms of access to your crops, quality of the crops, and of course your infrastructure, e.g. greenhouses and polytunnels. During the winter months it is therefore a good idea to keep an eye on the weather forecast to know when to expect snow and take steps to protect your garden.

### Disadvantages of Snow, ice and frost include:

- Frozen soil - this doesn't help if you want to harvest your leeks and beetroot.
- Freezing, thawing and re-freezing water – This can be bad for plant cells especially if this is happening in the crevices of vegetables or their leaves. It could also cause some diseases like rust or rot if the water it is in contact with the leaves for a period of time.
- Heavy weight – The weight of the snow could break or make plants collapse under its weight and some may not recover.
- No harvesting – Frozen soil, frozen leaves, or weight of snow on fleece are some reasons why harvesting may be delayed. You may need to wait for a break in the weather to be able to start harvesting again.
- No sowing seeds – Not that's there's much that can be sowed in December / January however nothing can be sown into frozen soil and germination rates are extremely slow in cold temperatures even on covered ground.
- Damage to infrastructure – Under the weight of snow, polytunnels may sometimes collapse, and damage may be done to glasshouses.

It is worth bearing in mind that there are some advantages that come with snow in the vegetable garden too.

#### Advantages of Snow include:

- Insulation - It can provide a cover to protect vegetables against frost and ice,
- Improved flavour - The dip in temperature can make vegetables like Brussels sprouts and parsnips have better flavour and sweetness,
- Pests reduced - Pest populations are hit hard by frosts and many pest communities like aphids will not survive to the spring. However a covering of snow can insulate and protect pests overwintering in the soil from subzero temperatures.

### **Protecting Your Garden & Your Crops**

To protect vegetable plants from extreme drops in temperature they can be covered with:

- mulch (e.g. straw, conifer branches, compost, newspaper & cardboard, old carpet etc)
- polythene sheets / mini polythene tunnels
- Horticultural fleece – although this can become too heavy to lift if covered with dense snow.

While a thin layer of snow on top of your polytunnel or greenhouse may help to provide some insulation to the vegetable plants inside especially during sub zero conditions. It is worth remembering that snow can be rather heavy with a covering of just 2.5cm (1 inch) weighing up to 10kg per square metre . Keep an eye on the depth of snow on your polytunnel or greenhouse, and be prepared to clear the snow off. You may also wish to consider adding temporary timber props to the frame hoops of your tunnel on the inside to help add extra support.

Watch out for pigeons! If the snow settles, and stays for a while, pigeons will come into the garden to feed on the brassicas, like Brussels sprouts. It is safer to net the sprouts, so that the pigeons will be kept off them if they do visit the garden, but be prepared to remove the nets before heavy snow, which could make it impossible to gain access to the plants.

Another aspect of the cold weather to consider is your stored vegetables. If you are keeping your stored vegetables such as potatoes and onions in a shed or garage, be aware that during long cold spells, your vegetables may be frozen and spoiled as a result. You could consider temporarily moving your store indoors or adding some extra insulation to your store.

### **Prepare the Ground**

Once all the snow has melted and the ground has thawed, it is time to prepare for the planting season! The days will be longer (slightly!) into January, and the temperature warmer so it's time to get to the first of the garden work! Preparing your vegetable garden will take a while and energy, but will make planting day so much easier and the harvest more successful! For those with heavy soils, this is the perfect time to dig, so that frosts can help break down newly turned clods. Digging heavy ground is hard work, and is best staggered over a few sessions to save your back.

The very first thing you must do is clean out the garden. Remove any dead plants from the previous gardening year. Some plants and roots will have completely decomposed and you can leave those to improve the soil. If there are any conspicuous stems, leaves or roots from your plants you are going to need to remove those from the garden. Compost healthy looking plant materials, but anything which looks diseased shouldn't be added to your garden compost, and you should either add to the Council green waste for recycling or incinerate in the garden.

Once your garden is clean you are going to need to start preparing your growing areas. If you haven't already done so in the autumn and early winter, then you should look into improving your soil. Some options at this time of year may include adding in your home made compost, seaweed from the beach, farmyard manure, leaf mould or any left over liquid fertiliser from last growing season. There are different approaches to how to add these, which essentially boil down to whether the materials are left on the surface for a period, or whether they are dug in straight away. If you have well drained soil, and you won't be planting out or sowing for a few weeks, which is likely in December / January then you may leave these on the surface, providing some cover. While a fresh application of seaweed for example may not be completely rotted by the time you come to plant out in the ground, it may have protected the soil surface and can be dug in when you are ready to use the ground.

Alternatively you can add your soil improving materials to the soil using a trench method. The same sorts of materials can be worked into the bottom of the trench, where the worms will redistribute it to improve soil consistency. Be systematic: remove a trench a spade's depth (also known as a "spit") deep and take it to the far end of the plot. This second method is more involved, but particularly useful in poorly drained soils, or in "new" growing areas which may have been compressed.

On "new" ground, where you are preparing beds, you can go through the same process. If it is lawn that you are taking up, turn the sod into the base of the trench where they will rot down, but on weed-infested ground you need to fork out live roots as you go. Super-heavy soils can have a generous layer of sharp grit spread over the surface after digging, but light soils are best dug at the end of the winter and the organic matter spread over the surface now. The mulch will protect the soil from winter rains and can be forked in late February and March.

### **Warm the soil**

When winter is in full swing, the time to sow can seem a long way off, but in fact it won't be long before early crops can be sown outside. There are a few tricks you can use to ensure that when the time comes, your soil is in perfect condition to encourage good germination.

After you have prepared your ground by clearing weeds, digging and adding soil improvers, you may wish to get the conditions in your soil just right for the plants that you will soon want to plant out. Good germination outside depends on the soil not being too wet or cold; otherwise the seeds will simply remain dormant in the ground and may rot or be eaten by the local wildlife.

Covering the soil with anything that will keep off the rain and allow the meagre heat from the sun to be trapped, absorbed and kept in the soil will help to bring sowing dates forward a little. Black polythene is good since it absorbs heat and traps it beneath. It

also helps to keep the soil drier during any persistent wet spells and can suppress the growth of weeds.

Cloches or cold frames (see over the page) are also ideal for this and can be placed over the soil that you intend to sow. Remember to 'seal' the ends also to both keep in the heat and keep out the cold. This will also prevent the wind from getting underneath and blowing your cloches away. For the same reason do make sure that your cloches are anchored firmly to the ground. Polythene can be anchored very simply by pushing the edges firmly into the soil with the blade of your spade or of course by holding it down with planks or bricks.

### **Time to plant fruit**

January is the ideal month for planting all sorts of perennial trees and bushes including, of course, fruit. Container-grown fruit trees and bushes can be planted at almost any time providing the soil is not too wet or frozen, but it is at this time of year, when plants are dormant, that specialist nurseries will lift them and sell them on bare-rooted. This simply means that they supply them with the soil removed and often with the bare roots wrapped in polythene to prevent them from drying out. Bare-rooted plants such as this are generally considered superior to container grown plants because they establish better in their new home and grow away more strongly. Bare-rooted plants are also usually cheaper to purchase, although the timing of when they are available can be restricted, as the nurseries will have to lift them once they have become dormant and before the ground becomes too frozen, which means it can be a long wait from ordering fruit and delivery.

### **Pruning & caring for Fruit**

Now's the time to do some winter pruning – some woody plants such as vines can bleed if pruning is left into the New Year. Vines can be pruned hard, back to two buds of last year's growth, to encourage fruiting.

Apples and pears, currants and autumn-fruiting raspberries can be pruned any time from leaf drop until March, but never prune stone fruit in the winter, as the retreating sap can draw in the airborne fungus, silver-leaf. While tending to your fruit it is a good idea to remove any mummified fruits hanging or on the ground under the trees as these will be harbouring pests. Take a note of any of your fruit trees which exhibited scab fungal infections, as you may wish to give these an anti-fungal treatment later in the spring, such as elder leaves infused with water.

### **Force Rhubarb**

If you grow rhubarb, you can cover some of the crowns with a large bucket or a special forcer which will cut out the light and encourage thin, pale and tender early growth, perfect for making crumbles and pies in the not too distant future. It may not seem like it now, but spring is only around the corner!

### **Sprouting beans and seeds**

The younger that plants are when eaten the more nutritious they are, and this is why more sprouting beans and seeds should be grown. Also they can be grown by anyone – you don't even need a windowsill since light is not essential unless you want green,



rather than white shoots – in fact white shoots often have a less bitter taste and add more crunch in your sandwiches and salads.

Sprouting beans and seeds are so easy to grow. You can start them off with nothing more than a clean jam jar, muslin or cheese cloth and an elastic band. Simply pour a couple of heaped tablespoonfuls of seeds or beans into the jar and half fill with water. Cover the top with the cloth and secure with an elastic band. Swirl the seeds around thoroughly to soak them and then pour the water away through the cloth. It will act as a strainer, keeping the seeds inside. It is essential to repeat this process twice a day to ensure that moulds do not colonise the seedlings and to wash away any impurities. Depending on the type of beans or seeds you have used your seed sprouts could be ready in as little as two to three days (e.g. mustard), but larger seeds such as chickpeas may take a little longer.

If you are more serious about your seed sprouting or just want to produce larger quantities, you might like to invest in a purpose-made seed sprouter and these generally cost between £5 and £30.

Most of the seed companies supply a range of sprouting seeds, but this technique also offers a great way to use up leftover seeds at the end of the season. In fact most of the seeds you might sow in the garden can also be used for sprouting including onions, broccoli, beetroot, lettuce and salad leaf mixtures. One exception is the tomato family – tomatoes, peppers and aubergines, the plants of which should not be eaten.

## Growing micro-greens

One other way to use up your excess seeds is to grow them as micro-greens. These are now becoming more popular with trendy restaurants, and some supermarkets sell packs of micro-greens too. These are simply seedlings cut just above soil level with scissors once the seed leaves have opened. Micro-greens can be grown in shallow, well drained trays or pots filled with compost. You will need to find a suitable indoor space to do this to achieve the necessary germination temperature. Simply sow into the tray – you can sow more thickly than you might usually do since the seedlings will not have time to become overcrowded. Harvested within a week of germinating, they are highly nutritious and delicious in sandwiches and salads or can be used as a garnish. Later in the year, you can grow micro-greens outdoors too.

There are some commercially available micro-green seed mixes available from many suppliers, or you can use any left over seed from previous growing seasons. As with sprouting, you should avoid the tomato family. Here are a few popular varieties to grow as micro-greens:

- Mustard
- Kale
- Endive
- Arugula
- Beet greens
- Spinach
- Tatsoi
- Radish greens
- Watercress
- Mizuna
- Peas
- Cabbage
- Basil

Unlike baby greens, you won't be able to get additional harvests from one planting of micro-greens. This is because the plants haven't had much time to develop, and you're snipping off everything except the very bottom of the stem, so the plant has no way to generate new growth. You can plant another crop after harvest by simply scattering fresh seed and covering it with soil. You don't need to remove the old roots; they are good sources of organic matter.

<http://organicgardening.about.com/od/vegetablesherbs/a/growmicrogreens.html>

## Growing Your Own Mushrooms

Although wild mushroom picking is now finished for the year, you can still think about mushrooms. Maybe you may feel that if foraging seems a little daunting, however you could give growing your own a try. Growing mushrooms at home can be both easy and fascinating to try and it can also be done all-year-round.

Some species can be quite exacting in their requirements and best attempted when you have some experience, but ordinary button mushrooms are good to start with, available in simple, self-contained kits – no fresh logs required as they are with some.

However, if you do wish to try those types, more of which are now readily available from mail order companies and garden centres, suitable logs from deciduous trees such as oak, beech or birch can be cut from now onwards and stored for a few weeks prior to 'sowing' with grains or dowels inoculated with mushroom spawn. It is important to use fresh cut logs since they are less likely to be contaminated with other non-edible fungi. Only use healthy logs, never those showing signs of existing fungal growth. One

supplier is Ann Miller's Specialty Mushrooms, based in Inverurie  
[http://www.annforfungi.co.uk/shop/dowel-spawn/cat\\_8.html](http://www.annforfungi.co.uk/shop/dowel-spawn/cat_8.html)

Local garden centres may well have button mushrooms and perhaps even shiitake. Kits such as this are very easy to use and come with everything you need. They vary a little between manufacturers with regard to how they are supplied and the way you need to set them up once you get them home, but all are very similar in the subsequent care they need to produce a crop. It may take some time before your mushrooms are ready for harvesting, so while this is something that you can start just now while it is too cold to get out in the garden, you will have to be patient to see the results. The mushrooms growing medium needs to be kept damp – which is possibly where some home-grown mushrooms fail, as they are easy to forget about.

To harvest the mushrooms, simply twist them gently and they should come away from the casing easily.

For further information about growing Shiitake mushrooms, please see Highland Birchwood's information sheet:

<http://www.highlandbirchwoods.co.uk/UserFiles/File/publications/Information-Sheets/Info4.pdf>

## The Grow Your Own Garden in February

February is regularly one of the coldest winter months even though it seems as though spring is in sight! Gardening tasks that can be done in February will depend greatly on the weather, so it is important to be aware of the weather conditions and how this may affect germinating seeds and small plants. Don't just follow your seed packet instructions to sow or plant outside in February. If the ground is cold and wet the seeds will not germinate, and will instead just rot. You can take steps to improve the conditions, by warming your soil, by covering it with cloches a few weeks before you wish to plant out. The extra warmth and protection from becoming waterlogged should help to get the soil in better shape to give your plants a good start. You may find that you can also compensate for colder conditions by sowing into trays, which you can move during the day to somewhere light (and warm) for example a sunny greenhouse, or polytunnel, and then somewhere more insulated (indoors, or under cover of fleece inside your polytunnel) for the evenings.

### Sowing

Most sowing at this time will be indoors, or in a polytunnel or greenhouse. All early outdoor sowings or plantings will benefit from the protection of cloches or winter weight fleece, and be prepared to re-sow anything that doesn't do so well in a few weeks time.

- Tomatoes
- Peppers
- Summer cabbage
- Summer lettuce
- Salad leaves
- Bulb onions
- Broad beans
- Parsnips
- Early peas
- Radishes
- Turnips



Tomatoes sown in seed compost

### Planting

- Soft fruit and tree fruit
- Bare-rooted hedging plants
- Jerusalem artichokes
- Rhubarb
- Garlic
- Onion and shallot sets

### Prune currants and gooseberries

Woody soft fruit should be pruned before the buds burst in the spring. Gooseberries in particular are some of the first to get growing as conditions improve.

Red and white currants should have their main shoots tipped back by half of last season's growth to outward-facing buds. Side shoots are reduced to about 2.5cm (1in), again cutting to just above a healthy, well-placed bud.

Blackcurrants are different. These fruit best on one and two year-old stems and so pruning forces the plant to concentrate on producing a constant supply of young growth from the base. Simply cut back up to a third of the oldest shoots to ground level (this

can in fact be done immediately after fruiting if you so wish). Other fruited branches can be cut back to healthy side shoots.

The lower branches of gooseberries tend to bend towards the ground when laden with fruit. Avoid this by cutting back the main shoots by half and reducing all the side shoots to 5cm (2in), to an outward-facing bud. Any shoots which are crowding the centre of the bush should be removed to allow light and air into the bush but also to make picking a little less painful!

### **Tend to autumn raspberries**

All the old canes of autumn-fruiting raspberries such as 'Autumn Bliss' and 'Allgold' can be cut down to ground level now and the area around them weeded, taking particular care to remove perennial weeds. Burn or put into your council garden green waste collections, the old canes as they may be harbouring pests and diseases.

### **Plant early peas**

Peas can be sown direct into well prepared soil now, providing your plot is free-draining and sunny. You will need a cloche to cover the rows until the worst of the winter weather has passed. However, if you have a frost-free greenhouse or polytunnel you could start some early crops now by sowing in guttering or into deep pots such as Roottrainers, or even sow direct into the soil if you have space.

### **Prepare the ground for asparagus**

Asparagus is always very expensive to buy in the shops, making it an appealing choice to grow at home. Now is a good time to prepare the ground for your asparagus bed. Asparagus can be grown from seed or one year old plants (known as crowns) can be bought. Growing from seed is the cheapest method but it is more time-consuming and it will take you an extra year to get a crop. For your asparagus bed, select a sunny, well-drained site and dig in plenty of well rotted organic matter such as manure or garden compost. Perennial weeds are one of the biggest problems with long-term crops such as this (asparagus should crop well for at least 15 years), so anything you are adding to the soil must be weed-free and when making your preparations be sure to remove any weed roots you come across. If your soil is very weedy it might be best to cover the ground for a season with thick ground cover fabric or black polythene to kill the weeds prior to planting. The asparagus bed should be kept weed free and because they are shallow rooted its best not to use a hoe. Hand weeding is best. With this in mind it may be best to mulch the area to stop weeds.

### **Pre-spring Cleaning**

When the spring comes, you will want all your essentials ready for use. Clean your polytunnel, greenhouse and cold frames, and wash your pots. Carry out any repairs needed, and replace any broken panes of glass.

### **Prepare for brassicas & potatoes**

Test the pH of the brassica patch. You want a pH of 6.5 – 7.0. Add lime to raise it up if it needs it. This will give the lime a chance to settle in before you start planting. This year's potato bed will benefit from a little extra well rotted manure spread on the surface as well. You can dig it in next month.

## The Grow Your Own Garden in March

March marks the start of the growing season, however as with February you should only start sowing and planting if conditions are right. If the soil is still cold and wet, delay for a few weeks longer and keep your sowings to pots and trays in a frost-free polytunnel, greenhouse or a bright windowsill. The days' length is such that the plants want to get going but the ground must be right for success. Don't panic if the weather is bad, as the plants will catch up. Even if conditions aren't yet great for our vegetables, it can pay to keep a check on the weeds, which will be springing up.

### Vegetables for Direct Sowing

- Beetroot (small fast varieties for eating in June rather than larger storing varieties)
- Kohlrabi
- Parsnips
- Carrots
- Radish
- Spinach Beet (Beet leaf)
- Early Turnips
- Cut and Come Again Lettuce and Salad Leaves
- Spring Onions
- Onion Sets
- Shallots

Remember to protect these with fleece or cloches.

### Vegetables to start off in modules

- Lettuce
- Sprouts (Early varieties to be ready for September)
- Summer Cabbages
- Celery
- Early Cauliflowers
- Onions from seed (keep around 10 -12 degrees, do not let them go above 15 degrees)
- Celeriac (celeriac needs a long season so best started at the beginning of the month)
- Peas
- Courgette (towards the end of the month)
- Cucumber (towards the end of the month)

### Making a Start with Potatoes

There are dozens of different potato varieties, usually described as “early” / “first early”, “second early” and “maincrop” potatoes. These names indicate when they crop and also give you an idea of the space you'll need, how closely and when they can be planted.

Early potatoes can take 13 – 15 weeks before they are ready for harvesting. If you grow these in a polytunnel, they may be ready 3 or 4 weeks earlier. You would probably find that other potatoes other than earlies would be in the ground too long to give precious polytunnel space. Second earlies take 16 to 17 weeks to mature after planting, so you should be able to harvest them from very late June through to the start of



August. Maincrops are ready 18 to 20 weeks after planting, so they can be lifted usually from July through to October. Maincrops take up the most space in the garden, but they tend to be the best varieties to grow if you want to keep some for storage.

### Chit potatoes

Chitting is the process of placing seed potatoes in a cool, light place to encourage strong sturdy shoots to grow before they are planted in the ground. Place your seed potatoes with the end with the most eyes uppermost in old egg boxes. Put them in a light, cool (frost-free) place to chit or shoot. Chitting is especially important in early varieties to give them a good start. For maincrop varieties, it is not so important, so if you get hold of your main crop potatoes late, then don't delay planting them in order to chit.



Potatoes chitting in old egg boxes

Mid to late March is the time when the first potatoes – the first early varieties – can be planted such as 'Swift', 'Rocket', 'Pentland Javelin' or 'Lady Christ'. These will provide you with a harvest during June and July and can be harvested in as little as seven to eight weeks from planting.

### Planting Potatoes

The conventional way to plant your potato tubers is in trenches. Earlies should be planted about 30cm (1ft) apart in the rows with 60cm (2ft) between the rows. It is important to allow plenty of space between the rows to provide enough soil to earth up the shoots as they emerge. Earthing up helps to protect the tender shoots from any late frosts and also encourages more tubers, which form on the growing stems.

The trench should be a good 12cm (5in) deep to protect them from frosts immediately after planting, but also to encourage strong, long shoots on which the crop will form. This depth and subsequent earthing up also helps to ensure that light does not reach the young tubers to turn them green. Cover the tubers with soil and watch for signs of the shoots appearing through the soil over the coming weeks. If frost is forecast draw a little soil over the shoots to protect them, or sprinkle with a mulch layer or cover the bed with fleece.

Once the shoots are about 23cm (9in) high earth them up with soil to cover as much of the stems as possible, just leaving the shoot tips clear.

### Sow salads

Sow some quick-growing salad leaves now in any large pot, window box or tub and keep them in a greenhouse, polytunnel, cold frame, under a cloche or in a mini

greenhouse. At this time of year they should germinate and grow quickly providing you with a crop of fresh leaves for salads and sandwiches.

### **Sow early carrots**

Providing the soil is warm and not too wet a first sowing of carrots can be made under cloches or in the polytunnel this month using an early variety such as 'Early Nantes'. Sow thinly to avoid the need for thinning – seed tapes can make this process easier. If carrot fly is a problem in your area consider sowing a carrot fly resistant variety. Alternatively use cloches to cover your crop immediately after sowing or fleece or crop protection netting.



Raised beds with plastic cover protecting some tender crops

Of course carrots are also ideal for growing in containers in any well-drained compost – a smaller, sweet variety such as the thin-rooted 'Sugarsnax' or a round-rooted variety like 'Paris Market' is ideal.

### **Start broad beans**

Broad beans are hardy and can be sown direct into the soil now, usually in double staggered rows with the beans 20cm (8in) apart in the rows and with the same distance between the rows. You can also sow into deep cell trays or “root trainers” and to plant out later as this avoids the problems associated with cold, wet soil, bean weevils and mice.

Sow singly into the cells using fresh propagation compost and grow on until the plants are well established and the weather a little warmer. You should be able to plant out your March-sown crop by the end of April and to harvest by the end of June. Thereafter sow in the soil at monthly intervals until the end of May for a succession of cropping. Harvests from final sowings in May are ideal for freezing for the winter.

### **Sowing Greenhouse & Polytunnel Tomatoes and Peppers**

If you didn't get your tomatoes and peppers sown in February, you can sow some now. These plants need a long growing season, and also like warm conditions to germinate, so you may wish to propagate them inside the house in a windowsill in a covered propagator tray, or a heated propagator, if you have one. This needn't take much room since you can start them in shallow 7.5cm pots and move them on to individual pots or modules when they are big enough to handle. If you don't have space to grow these undercover or inside on a sunny window ledge, then look for the outdoor bush variety “Red Alert” which should give you a crop here in the North of Scotland. You will find that not all varieties which claim to be suitable for outdoor growing will do well here, but these two have had some success.

### **Last Harvest for Leeks & Parsnips**

Any leeks you have left in the ground should come up now. Parsnips too should come out of the ground in early March before they try and re-grow.

## Grow Your Own Garden in April

At last it is possible for all of us to sow seeds of hardy vegetables safely outside in the open soil. Don't forget however, that it is possible to experience frost until the beginning of June, so cloches & fleece may yet be required. Do remember the weeds are springing into action, so keep on top of them with your hoe. Just slide it back and forth slightly below the surface of the soil and you'll stop the weed seedlings in their tracks. There's quite a list to sow and plant outside, especially if March has not been suitable and even if it has been reasonable the successional sowings continue.

### Parsnips

Parsnips can be sown from as early as February, but germination tends to be very poor. Slowly warming soils through March and April improve this situation and offer the best time to sow for large roots for winter use. However, the trend for smaller, baby roots means that many gardeners now sow up to the middle of May. To improve germination still further, either pre-germinate (chit) on damp kitchen towel in an old ice-cream tub, or sow in drills and cover with fresh sowing compost rather than soil. Sow unchitted seeds, two per station, 7.5cm (3in) apart and 1cm (½in) deep. Allow 30cm (12in) between rows.

### Celery and celeriac

Both of these closely related crops should be sown as soon as possible this month, preferably under cover in trays for planting out when well established, but can also be grown in cell trays in a cold frame. Go for self-blanching celery for ease of growth and plant in blocks in well-prepared, moisture-retentive soil during May and June allowing about 23cm (9in) between plants to encourage blanched stems. Sow in pots or trays 6mm (¼in) deep using fresh sowing compost.

### Lettuce

With a little planning and the right varieties you can be harvesting fresh lettuces from the garden nearly all year round. Get the ball rolling this month with a sowing either direct into the open ground (protect with cloches until established), in a cold frame or in cell trays for planting out later, or of course in a tunnel. You can also scatter some seeds fairly thickly in a trough for use as delicious cut and come again leaves. Sow a short row every three to four weeks for a succession of cropping. Sow 6mm (¼in) deep in the soil, pots or the open soil. Sow thinly, thinning out as the seedlings develop. Replant the thinnings or use as baby salad leaves.

### Leeks

Leeks are an essential winter standby. They take up space in the garden for many months but are so useful and easy to grow that they easily earn their keep. Either sow in a pot to germinate on a sunny window ledge, a polytunnel or greenhouse, and plant out when they resemble chives, or try sowing a short nursery row in the garden or alternatively sow individually in cell trays for planting out when pencil thick. If sowing direct to the soil, choose a sunny site and protect with fleece if necessary. Once the seedlings are well established, thin them in the rows to leave about 2.5cm (1in) between each plant. The thinnings can be added to salads or stir-fries.

## Brassicas

As with leeks, brassicas can also be grown in nursery rows in the garden which benefit from a protective cover to keep warm and to protect from pests. You can also grow these in cell trays in a polytunnel or cold-frame. The latter option is the best since it helps to protect the young plants from a number of predators from birds to slugs and flea beetles. The extra warmth also gets them off to a good start. Sow one seed per cell in a cell tray and grow on until they are about 10cm (4in) high and have four or five true leaves, at which stage they can be planted out.

Your brassicas to plant out:

- Broccoli
- Brussels sprouts
- Cabbage
- Cauliflower
- Kale

## Sowing the Peas & Beans

**Broad beans:** You can sow these into root trainers (long thin planting modules, which split apart so you can easily plant out without disturbing the roots). Then plant them out when the plants are about 10cm (4in) tall and the roots capable of holding the plug of compost together. Alternatively they can be sown in close rows, or wide drills. For drills, dig out a drill in the soil to a depth of 6cm (2in) and 20cm (8in) wide. Sow the seed in two rows, one row down one side of the drill, the other row down the other side. Each bean in a row should be spaced 25cm (10in) apart from the next bean.

**Peas:** Another sowing of peas can go in

**Dwarf runner beans:** You can start a few dwarf runner beans in pots to grow in the greenhouse or polytunnel. Unlike the normal runner bean, these dwarf plants will thrive in a large (20cm), pot and provide an early treat.

**Runner beans:** These are not at all hardy and so you need to plan carefully. Plants outside that have grown too large to protect will be killed if a late frost arrives so start off in pots towards the end of the month. These can then be planted out mid-May and if a frost should strike will still be small enough to protect with fleece or even newspapers.

**French dwarf beans:** These can be started now, again in pots preferably in the greenhouse, polytunnel or cold-frame. Just start a few because the risk of losing them is high this early in the season and the May sowing often does best, arriving as the frost risk is reduced.

**Climbing French beans:** These can be started in pots, treat just as runner beans and remember that frost risk.

**Borlotti beans:** These beans are grown for drying needs the longest season you can provide so if you can only protect a few climbing beans, these are the one to start first.



## Beetroot

Sow thinly in rows, thinning to allow 10cm (4in) between plants for mature roots. The thinnings can be used as baby leaves to add colour to salads and sandwiches. Seeds should be sown 1cm ( $\frac{1}{2}$ in) deep with 30cm (12in) between the rows. Monogerm types will only produce one seedling per 'seed', but traditional varieties such as 'Boltardy' will produce two or more seedlings and these are usually thinned to leave the strongest to develop. Another option is to leave both seedlings to grow, and then harvest the beetroots when they are young to get some lovely, tender little roots.

## Summer radish

This quick-growing crop is so underrated, yet easy to grow and delicious if harvested when the roots are young and tender. There are so many varieties to try and all add a splash of colour and spice to any summer salad. Children enjoy growing radishes as they are so quick, however they do not always enjoy the spicy peppery taste of many varieties. If you are growing radishes with children, look out for some milder varieties, such as the Cherry Belle, or German Giant. The earliest roots can be grown in pots in a cold frame or cold greenhouse or polytunnel from February onwards, but mid-March/April is the time when most of us start sowing outdoors. Sow thinly in short rows; crops mature so quickly (within about six weeks at this time of year) that it is better to sow a small number every three weeks or so, than to have too many maturing at once, when they tend to become woody.

## Plant onion & shallot sets

Onions and shallots can be grown from seeds or from immature bulbs called sets. Seeds should really be sown by the middle of March in order to give them the longest growing season possible, but this is a good time to plant sets outside. Many growers in the north of Scotland opt for growing onions from sets rather than seeds due to length of growing season. If you have opted to grow from seed, now is the time that you should be planting out. Choose a sunny spot in well-drained soil for best results and try to choose a bed or patch where you will also be growing related crops such as leeks and garlic.

Onions like a reasonably fertile soil so you should ideally choose a spot where some organic matter, such as well-rotted garden compost, was dug in during the autumn. Follow this up with a sprinkling of balanced fertiliser about a week prior to planting and rake in when making final preparations. The roots of any perennial



Planting out onion sets

weeds must also be removed as they will cause severe disturbance to the roots of the crop when removed later on.

Advice varies on the depth to plant sets, but because birds like to pull the bulbs out of the soil if they can see any part of the bulb above ground. Try burying them so that the tips are just below the surface. This doesn't foil all wildlife (e.g. squirrels), so as an added precaution a layer of netting can go over the onion bed until the shoots are a couple of inches high.

Although onions like reasonably firm soil in which to grow it is not a good idea to push the bulbs into the ground as the developing roots will tend to push them out again. Plant with a trowel or make a drill and pop the bulbs into this, covering over with more soil.

### **Planting Potatoes, Artichokes**

Easter usually falls in April and Easter is the traditional planting date for potatoes, but anytime in April will be fine.

It's not too late to get Jerusalem artichokes planted, although you are pushing the edge now so the sooner they go in the better.

### **Successional Sowing**

Don't forget to keep sowing lettuce and salad leaves every fortnight or three weeks to keep a continuous supply along with radishes and spring onions. A successional sowing of kohlrabi, beetroot, spinach beets and chards can go in along with true spinach.

Carrots do well when they are sown now but the carrot root fly is around. Covering with fleece is the best protection against this pest but do ensure the edges are to the ground so the carrot flies can't sneak in. Try companion planting with any member of the onion family – the strong smell should confuse the carrot flies.

### **In the Greenhouse or Polytunnel**

If you've not already done so, get those polytunnel / greenhouse tomatoes and peppers started early in the month - better late than never. If they don't do well, you may have to buy in some pre-grown plants, but it is worth trying to grow from seed too.

You also start cucumbers, courgettes and marrows off in April, bringing them on to plant out when all danger of frost has passed at the end of May.

Towards the middle or end of the month start the sweet corn in pots or toilet roll inner tubes closely packed in seed trays. This crop will need to be protected when they are planted out in mid-May, as they will be vulnerable to any late frosts. Some years you may find that you don't get such a good harvest from your sweet corn, if the weather has not been great. The difference in taste between sweet corn picked fresh and shop bought sweet corn is great, with the kernels sweet, juicy and full of flavour, is what will encourage you to grow sweet corn.

## Grow Your Own Garden in May

May is the busiest month in the vegetable garden as you fill every available space with the bulk of your sowings for summer harvests. Try not to get carried away however – it is best to sow fast-growing crops in small batches to avoid gluts later on and leave some space for the tender crops that will be planted out next month. Do watch out for a late frost, many growers have been caught out and lost their recently planted beans etc. Keep that fleece handy just in case. If you do not have any horticultural fleece you can use old net curtains, bubble wrap and the traditional newspaper as a method of insulation when a cold night is forecast. You need to keep on top of the weeds in May. Just as your crops respond to the warmer weather and longer day length, so to do the weeds, and it can be disheartening to see them take over. Try splitting your growing area into sections and tackle a section a day for a week.

### Sowing

- Runner beans
- Dwarf and climbing French beans
- Courgettes, marrows, squashes
- Lettuces
- Chicory
- Radicchio
- Carrots
- Radish
- Coriander
- Sage
- Thyme
- Parsley
- Summer cabbage (early in the month)
- Winter cabbage
- Broccoli
- Brussels sprouts
- Cauliflowers
- Kale
- Spring onions
- Salad leaves
- Cucumbers
- Melons (only for polytunnel or greenhouse growing)
- Sweetcorn
- Beetroot
- Swiss chard
- Swede
- Turnips
- Sweet peas, wild flower mixes, poached egg plants (for attracting pollinators to the garden)

### Planting

- Tomatoes
- Peppers
- Aubergines (only for polytunnel or greenhouse growing)
- Potatoes (early in the month)
- Brussels sprouts
- Celery
- Celeriac
- Pot-grown cane fruit
- Strawberries
- Lettuces

### Sowing top tips for May

- Rake the soil to break down any clods to form a fine, level seedbed prior to sowing your seeds. Rake in some general purpose fertiliser such as pelleted chicken or sheep manure or Growmore at the rate of around 112g (2oz) per square metre or yard, preferably a week prior to sowing.
- Try and keep things neat; use a garden line to ensure that your rows are kept on the straight and narrow. Wandering rows use up more space and don't look very attractive. It is also easier to see which seedlings are weeds and which are crops if you have sown in neat rows.



- When sowing brassicas or planting onions, both of which prefer firm soil, walk over the seed bed on a board or tread with the feet applying even pressure to the soil prior to sowing. Even out any slight dips or bumps by raking very lightly afterwards.
- Large stones should be removed when raking, but don't be tempted to try and remove too many as small stones can aid drainage on heavy soils.
- Sow your seeds as thinly as possible to avoid the need for thinning later on, however those crops the thinnings of which can be eaten, such as lettuce and rocket, can be sown a little closer together to provide some tender, young pickings.
- If you are short of space to sow your veggies, you can save space by growing some fast-growing crops such as lettuce and radish among slower-growing types such as leeks and sweet corn, or consider growing some space-hungry crops such as potatoes in containers.
- Earth up your potatoes. Earthing up means to move soil around the base of the plants to protect them from turning green and from blight infection. This helps to stimulate tuber production, since potatoes grow from underground stems, not from the roots. Earthing up is done when the shoots of the plants are about 20cm (9 Inches) tall. Break up the soil between the rows with a fork and remove all the weeds, then bring it up around the plant in a tent like shape up to about 15cm (6 Inches). Leave about 5 cm of shoots above the soil.



Using string to mark a straight line for planting

## Carrots

For some varieties a March sowing is stated on the packet – but you may find you get better results if you wait until April or May. It is important to sow thinly so as not to attract carrot fly when thinning and although low barriers are often recommended it may be a good idea to combine this with a cover of crop protection fleece. These measures will only work if you aren't growing your carrots where they were last year as carrot fly may be pupating in the soil, so you should remember to rotate your crops. As an added precaution you could also sow a carrot fly resistant variety. Companion planting with a strong smelling plant such as rosemary, sage or any member of the onion family, may also serve to confuse the carrot flies. You could either opt to sow your carrots near where you have already sown your garlic, or sow alongside where you plant out onion or shallot sets. Sow your seeds 6mm (1/4in) deep in well prepared soil to which you've added some balanced fertiliser, but no manure. If you do require to thin your carrots, do this late in the day as the carrot flies will be settling down for the night. Return your fleece cover back over your carrots as quickly as possible.

## Peas and Beans

**Dwarf French beans:** These tender but highly productive crops can be sown this month for planting out when the frosts are over. Sow one seed to a small pot or large cell in a cell tray. The temperature should be kept at or above 10 degrees C. However, if you prefer to sow direct into the ground it is best to delay until the middle of the month so that the plants are emerging in early June when frosts should be far less likely.

Traditionally dwarf beans are sown in rows 45cm (18in) apart allowing 10cm (4in) between the seeds. Make a drill with the edge of a hoe and bury the seeds 5cm (2in) deep. However, these heavy cropping little plants, which grow on a single stem, can become top heavy and require staking on windy sites. To help get over this problem sow in triple rows 30cm (12in) apart, staggering the sowings in the rows to give each plant a little more room. In this way they should be close enough to provide mutual support when cropping, but not so close that air cannot flow around the leaves. Some stakes to the outer plants may still be required.

**Runner beans and climbing French beans:** These can also be sown this month. Sow in rows under cloches. If you cannot cover them with a cloche then sow towards the end of the month to ensure the seedlings will not be caught by a late frost, or grow in root trainers in a polytunnel or cold-frame to plant out later. If sowing direct, it is an idea to drop in two seeds at each point you intend to use a supporting cane, to ensure at least one plant per cane eventually.

**Peas:** The maincrop peas are sown towards the end of the month and the beginning of June; these usually climb highest and will need the sturdiest of support. It's worthwhile setting the stakes and netting before sowing because when the plants start growing you may damage them in the erection process.

## Chicory and radicchio

Resembling lettuce these crops have never been as popular in the UK as they are on the continent, particularly in Italy, but deserve to be more widely grown. There are two types, forcing, such as witloof chicory 'Zoom F1' and non-forcing types such as 'Sugar Loaf'. A characteristic of the non-forcing types is a bitter taste, too bitter for some, but a few leaves in a green salad can give it a welcome lift. These are usually sown next month while the forcing types are sown now for lifting and forcing in November. Forcing gives them a sweeter taste and they can be used raw in salads or steamed and eaten hot at a time when little else is available.

Sow thinly in rows in a sunny, sheltered site on reasonably fertile soil. Allow 30-35cm (12-14in) between the rows and thin, using the thinnings as a salad vegetable, until there is 30cm (12in) between the plants. Keep the rows well watered in the summer. Plants can be lifted, the heads removed and the roots potted into large pots, five roots per pot and placed in the dark from November onwards in a temperature of 10-15°C (50-60F).

Radicchios resemble round-headed lettuce and come in green and red varieties, the red types obtaining their best colour as temperatures fall in the autumn. They can be sown from now until August and either allowed to mature to form heads or used as a salad leaf. As with chicory they are bitter so only a few leaves are required to add sharpness and colour to summer salads. They are then, best sown in short rows or planted among other slow-growing crops as you won't need very many unless you have a passion for the flavour.

## **Courgettes, marrows & squashes**

More frost-tender crops can be sown now that the long winter is finally a memory. They are best sown indoors (which you can also do in March or April).

They take off quickly so be prepared to pot on if you cannot get them planted out when they are ready. Courgettes are very productive and two or three plants will be quite enough for a family. It is good to grow a few spare, just in case you lose some to pests or disease – any spare can be swapped with fellow gardeners.

If sowing in pots, sow one seed per 7cm (3in) pot or alternatively sow into large cells in a cell tray. Sow using fresh, free-draining seed compost, placing the seeds 1.5cm (3/4in) deep and keep in a propagator somewhere warm. Germination is usually rapid (7-10 days) and as soon as the seedlings have emerged the propagator lid can be removed to avoid the plants from stretching. For the same reason, give the young plants as much light as possible.

Towards the end of May you could try sowing direct to the soil covering with a cloche or a glass jar. If you try direct sowing, you should add some well rotted garden compost to the soil prior to sowing. Sow the seeds on a mound of soil / compost as this ensures that water runs away from both the seed and the stem of the growing plant should the weather turn wet. They are however far more successful planted in pots in the warm.

## **In the Polytunnel & Greenhouse**

Tomatoes, peppers, cucumbers and aubergine (if you wish to try it) can go into their final home now, either in beds, growbags or large pots. It's too early for outdoor tomatoes unless you can cover them.

## The Grow Your Own Garden in June

The vegetable garden continues to fill with tender plants, many sown on windowsills, in the polytunnel or greenhouse. These can go out (after hardening off) as the weather begins to warm up. Of course lots of other crops can be sown direct into the ground now with a good chance of success. As with May, we really need to keep on top of the weeds so keep that hoe moving. Take care not to damage soft stems, hand-weeding if necessary close to the rows. This is where sowing in neat rows can pay off, making it easier to tell young crop seedlings from unwanted invaders.

Check your directly sown crops, carrots, parsnips, beetroot, turnips etc and thin as necessary.

This can be a dry month so keep an eye on the need to water. If the soil appears dry then check under the surface either by scraping some soil away with a trowel or pushing your finger in. If it comes up dry, you need to water. Remember that some plants, such as radish, beet and salad leaves will quickly bolt (run to seed) if water supplies are erratic. For more information about when to water, and how much to water your garden, see the notes in the Grow North Topics section. Remember that mulches can not only help suppress weeds, but help to retain moisture. Consider using mulches with your crops – see the notes on Mulching in the Grow North Topics section for more details.

Consider sowing some fast-growing flowering plants this month such as limnanthes (poached egg plants), marigolds and wild flower mixes as these not only add some colour and interest to the garden, but more importantly can help to attract pollinators. Sweet peas are a good companion crop for climbing beans for the just the same reason. If you haven't already sown some sweet peas, you can try now, but it may be an idea to purchase some pre-grown plants at this time.

Don't forget those successional sowings of carrots, beetroot, radishes, turnips, peas, salads and other crops, concentrating on those you use the most or which are most expensive in the shops.

Keep your eyes peeled for pests – and be prepared for them before they get the chance! Slugs and snails will be attacking your plants at ground level so take action to keep them down – there are many methods to choose from, and you may need to combine different tactics if it is a bad year for slugs and snails. Also, don't forget about the birds who will happily drop down and eat your crops – setting up netting should help to deter birds.

The butterflies are about now as well, so keep a check on the undersides of your brassica leaves for the yellow or white eggs that will hatch into caterpillars and devastate the plant. You can squash them, wipe or wash them off easily at this stage. Cover your brassicas with protective mesh.

### Plant Tomatoes

If you haven't already planted out your greenhouse or polytunnel tomatoes, you should do so now. You will get better results for tomatoes if you grow under cover (including a sunny window ledge), but if you don't have suitable space for this, then consider outdoor tomatoes. Outdoor tomatoes can be planted out once properly hardened off in June. Many varieties may not do so well in the North of Scotland, but the bush variety "Red

Alert” does quite well. Choose a sunny spot with some shelter from the wind and soil which has been well manured the previous autumn. Plant in pots or in rows 76cm (30in) apart with plants 45cm (18in) apart. The rootball should be a couple of inches below the surface, so burying a length of bare stem below the soil to encourage additional roots to form from the stem to help feed the plant and add essential support. If you wish, you can add a little general feed (such as a homemade comfrey “tea”) to the hole and backfill to get the plants off to a good start. Remember to keep feeding your tomatoes plants as the season progresses.

Insert the stake before planting so that you don’t damage the rootball and once it is in place pop the rootball into the hole and firm the soil gently back around it. Water well. It is a good idea to surround newly planted tomatoes with some windbreak netting to keep chilly winds at bay for the first week or two.

In the polytunnel or greenhouse keep pinching off the side shoots from your cordon tomatoes and keep an eye out for pests such as aphids, whitefly, and red spider mite.

### **Tend to Potatoes**

Keep watch on early potatoes planted in March. If you haven’t already earthed up your potatoes, you should do so early in this month. If the weather is hot and dry when they start to flower give them a good soaking with water to help swell the tubers prior to lifting later this month or in early July. To be sure that they are ready, carefully dig away the soil from around one side of a root to see how the tubers are developing. If they need a little longer, simply cover them up again to prevent them turning green. Check again in a week or so.

### **Tend to peas**

Early peas may start cropping outside this month. Pick regularly to keep fresh pods coming and water the plants well during dry weather or they will soon run out of steam, turning yellow and becoming unproductive.

June is a good month for making sowings for late summer and autumn. These crops can be a challenge as they will be cropping when the disease powdery mildew is common, so choose a mildew resistant variety such as ‘Ambassador’, ‘Meteor’ or ‘Balmoral’. Keep them covered to prevent bird damage.

### **Prepare to plant courgettes, squashes & pumpkins**

Pumpkins and other squashes are very hungry and thirsty plants and need a very rich, fertile soil to crop really well. They will do best undercover, but they grow to quite large plants – so you may wish to train them upwards and provide support, so that you have room for other crops in your polytunnel or greenhouse.

They need a long growing season, so if you haven’t sown yours yet, consider buying in some young plants. If you have seed, try sowing it – better late than never, but be prepared to purchase pre-grown replacements.

In the meantime prepare the planting site. If well rotted compost or manure was not dug in last autumn it is not too late to enrich the site now. Once this is thoroughly incorporated the individual planting holes can be prepared.

Large squashes such as pumpkins require plenty of space to stretch their rambling stems, so allow up to 1.5m (5ft) all around for large varieties, 90cm (3ft) for smaller types such as bushy courgettes. The bed will seem quite empty at first after planting, but the plants are so rampant that they will soon cover the soil with foliage and crowd out all but the strongest weeds.

Dig out a hole which is a spit (spade's depth) wide and deep and fill with more well-rotted compost, manure, mushroom compost or similar. Overfill the holes to leave a mound about 15cm (6in) high into which you will plant (or sow). Water the mound well and leave for a week to settle.

Cut-down drinks bottles come in handy for another purpose here and that is to help with watering. If you wish you can bury a bottle in the soil so that the top lies close to the roots to act as a funnel to water, handy in the summer when water tends to evaporate so quickly.

### **Protect soft fruit**

Early types of soft fruit will be cropping or preparing to crop this month. The first early strawberries should be ripening at the beginning of the month, soon followed by gooseberries and then currants. If you have some strawberries grown under cover, either in your polytunnel or greenhouse, then expect them to crop sooner. The ultimate protection from birds and other fruit-loving wildlife is a fruit cage although making them completely bird proof can be a challenge. But if you have just a few plants a piece of netting may be all you need. A simple framework of canes can be made over a longer run or single bed of plants such as strawberries. Some gardeners cover their canes with upturned glass jars to prevent the canes from poking through the netting to keep the nets at the required height, and also to prevent poking themselves while tending to the fruit!

Mulch around the base of strawberries if not planted through fabric or polythene to help keep the developing fruit clean. Consider methods for keeping slugs at bay, such as creating a barrier that they won't like to cross (such as crushed egg shells, or charcoal) or copper tape, or slug traps.

If not done earlier in the year, feed around the base of fruit bushes and canes with wood ash (or other potash rich feeds), taking care not to dust over the leaves to give a boost to developing fruit.

Weed regularly to reduce competition and the possibility of harbouring pests and diseases and water well to help swell the fruit. Strawberries should not require any feeding now; too much nitrogen in particular will tend to encourage masses of leafy growth at the expense of fruiting.

The beetroot sown at the end of June can be left to swell and store with the root vegetables whilst the earlier sown are taken at golf ball size to go in salads. The swedes go in at this time as do the turnips but remember swedes are brassicas and can be vulnerable to club root. Put extra lime in the soil and start off in fresh multi-purpose compost. Varieties such as Marian show resistance to club root.

## Grow Your Own Garden in July

Looking ahead to the rest of the growing year, there are a wide range of vegetables that you can be sowing and planting now. Don't be put off summer / autumn sowings if you don't have a polytunnel or greenhouse, most of these veggies will grow outdoors quite happily, especially if you can provide some protection such as mini plastic and fleece tunnels or traditional cloches. Often just keeping cold winds off your plants is all that is needed to give you a really successful crop.

- **Oriental greens** - milder greens for salads, or tasty mustard greens

There are a whole range of remarkably cold-hardy oriental greens. They are ideal to keep your garden going through the depths of winter, particularly if you don't have the space or time for traditional winter vegetables like Brussels.

Many are good both in salads and cooked - try Pak Choi, Mizuna, 'Pe Tsai' Chinese Cabbage, Mibuna, Tatsoi and Mispoona, all of which can be sown from the end of June through to end September (you can keep on sowing through into the winter if you have a polytunnel or greenhouse).

Mustard greens are even hardier than the milder green - which means that they will keep on growing new leaves even in the worst of weather. Raw they are spicy - so although it is nice to put small quantities raw in salads, they're mostly used cooked. When you cook them the heat disappears, leaving a rich, full flavour, with just a little spicy zing. They are especially useful because they grow so well in cooler weather.

- **Bunching onions**

Bunching onions are MUCH easier to grow from seed than normal onions. They're really quick and useful, providing lots of greenstuff early in the Spring Gap when there's not much else available. Sow them after midsummer for a winter/spring crop

- **Bulbing or 'Florence' fennel**

Sow up to the middle of August. The plants will stand up to Christmas or beyond in milder areas.

- **Kale**

Kales are great for baby leaves (salads & cooked) in autumn, and then left to over-winter for delicious greens through to the following April.

You can sow kale 2 ways:

- 1) In autumn in a tunnel - for tender baby leaves.
- 2) Outdoors before early August - for hardy over-wintering plants.

- **Lettuce**

Winter lettuce varieties are particularly cold-hardy, selected for sowing after mid-summer, for harvest in autumn - and with a bit of protection, on into winter, ideal if you have a polytunnel and want winter salads - or outdoors under a cloche or mini-tunnel.

Also keep on successional sowing summer lettuce varieties in July - August to give you a wide range of salads in autumn.



- **Other salads**

Land cress is great in salads but can also be eaten cooked for example as a substitute for watercress in soup. It is sown in autumn & grown over winter.

Also try Salad Endive, which is hardier than lettuce, and has pretty pale green leaves with a good non-bitter flavour, it can be sown spring, summer or autumn.

And don't forget plenty of mizuna, Chinese cabbage and mispoona, which will give you endless delicious salads through the worst of the winter

- **Cooking Radishes**

These are a fantastic root vegetable that everyone should try. They bear no resemblance to a breakfast radish (the usual small red radish). This is a large root - tennis ball sized and upwards - which you use in soups, stews and stir-fries. They are also great eaten raw grated or sliced finely into salads, with a mild zing to them. Sow them from July to Sept, for pulling all winter.

- **Beetroot**

Beetroot are ideal for sowing outdoors or in a tunnel in July and August for pulling as tender baby beet in autumn.

- **Broccoli/calabrese**

Sow broccoli undercover for an autumn harvest.

- **Cabbages**

Sow Spring cabbage in late August or September and you'll get nice fresh cabbage very early the following spring.

- **Carrots**

Carry on sowing carrots in July and August to pull as tender carrots in autumn.

- **Chards & greens**

Sow leaf beet and chard up until end July for a seemingly endless supply of greens in autumn and into next spring.

- **Summer herbs**

Successional-sow coriander until the end of July for a continual supply of fresh leaves. Parsley can also be sown up to midsummer and will stand through into the winter with a bit of protection.

- **Peas**

Use an early variety to have them ready before the season ends. In the autumn you may wish to try sowing some to over-winter – perhaps best in a polytunnel or other protected area.

- **Turnips**

Sow turnips from mid June through to end July for harvesting through the autumn and into the winter.

- **Swedes**

Sow swedes from early June until mid July for harvest in November/December - they will also store well in a cool place until well after Christmas.

### **Crop Care in Summer**

As the summer progresses, you will want to ensure that your plants are all gearing up to provide you with a great harvest. At this time of year, it can be very dry, and sometimes summer winds can be experienced, both of which can do harm to your harvest, if countermeasures aren't taken. During the summer, you will need to think about weeding, providing support for taller plants, protection from birds, other animals and pests, feeding and watering, and also managing the quantity and quality of your crops by taking steps such as thinning out root crops and fruit from trees, pinching out side shoots on cordon tomatoes and strawberry runners. Bringing in your harvest is also an important task, as many plants (e.g. tomatoes, cucumbers, courgettes and beans) will stop producing if allowed to develop mature fruit or pods. Regular picking extends their useful life. If you are going away on holiday, and have asked for help with watering, consider asking if your helper could also pick peas, beans and courgettes too.

- **Potatoes**

When you harvest your early potatoes take care to remove all the tubers. Any left will not only sprout next year and become a weed (or "volunteer") but will also be a reservoir for disease and potato blight spores. It's often worth forking over a few days after harvesting potatoes because more seem to miraculously appear.

You may also need to earth up your main crop potatoes if you have not already done so. Earthing up means moving soil around the base of the plants to protect them. This is done when the plants are about 22cm (9 Inches) tall. Break up the soil between the rows with a fork and remove all the weeds, then bring it up around the plant in a tent like shape up to about 15cm (6 Inches).

Keep an eye on the potatoes and if you spot characteristic brown blotched leaves remove that foliage immediately and incinerate. There is no cure for blight available to us and once started a spray may delay the inevitable but that is the best we can hope for.

- **Tomatoes**

Tomatoes need some attention this month because the fast-growing plants will run out of steam if not fed often. A comfrey feed is as good as commercial tomato feed and free to produce. Regular training and trimming will be required as plants develop this month and next. This involves removing any side shoots from cordon-trained plants (those growing on a single, upright stem). You do not need to do this with bush varieties of tomato.

Side shoots should be removed while still small so as not to damage the main stem. Some plants will also grow a second main shoot in the growing point and the strongest and best placed of these should be selected for keeping while the other is removed. At the same time twist the main shoot around its string support or tie to the cane. As the trusses ripen you may wish to start deleafing. Only remove the leaves below the lowest truss and if necessary one or two above that if they are shading the fruit and preventing it from ripening.

Potato blight will also strike tomatoes, which seem to suffer more than potatoes. To minimise risk of contamination, try to avoid visiting your greenhouse or polytunnel plants

after handling blighted foliage. More often than not, the greenhouse crops will miss the blight.

- **Peas & beans**

Keep harvesting your peas and beans to keep them producing. Ensure that climbing varieties are supported with canes or sticks.

- **Brassicas**

Now is a good time to plant out brassicas for the winter time such as winter cabbages, kale, winter cauliflower and Brussels sprouts. You may find that in order to make space for these you have to harvest some of your earlier crops. These slow-growing crops can then be inter-planted with fast-growers such as lettuce, radish and salad leaves. If you did not sow any winter brassicas in April/May it is not too late to find ready-grown plants in the garden centres or online or from mail order catalogues. Once planted out, keep covered with fine netting at all times to protect against caterpillars. Be sure to take precautions against slugs and snails.

- **Leeks & Celery**

Leeks should be ready to move to their final position this month. Ideally they want to be about pencil thickness. Celery can go out now as well.

- **Fruit**

Apples and pears are often attacked by codling moths during June and July and the larvae of this pest causes a great deal of damage by burrowing into the fruit as it develops. Plum fruit moth is also active this month and causes similar damage as its pinkish caterpillars eat into the fruit. Both pests can be controlled using pheromone traps which are hung in the branches and baited with the pheromone of the female moth. This lures the males to the trap where they are caught on a sticky card, so reducing the number of eggs laid. Several online or mail order companies and garden centres sell both types of trap.

Plum trees can be severely damaged if the weight of the ripening crop becomes too much for heavily laden branches. Prop them up with poles to prevent breakage and consider thinning the fruit if setting has been very good. This will also improve the quality of the remaining plums. Apples and pears may also have set lots of fruit and although the tree is likely to lose some of this during the natural June drop. More could be removed after a heavy set in order to improve the quality of the remainder. In the case of apples and pears, thin to leave two healthy, well-shaped fruit per cluster with about 10-15cm (4-6in) between the clusters for dessert apples and pears and 15-23cm (6-9in) for cookers.

Once blackcurrants have been harvested the plants can be pruned, removing up to a third of the oldest branches to encourage new growth from the base.

Continue to tie in the new shoots of cane fruit such as brambles / blackberries and summer-fruiting raspberries. Autumn-fruiting varieties of raspberry may need some support.

You may wish to protect your fruit from birds using netting, fleece, or hanging scarers (old cds).

## Grow Your Own Garden in August

This can be a busy time in the garden, with much to harvest and enjoy. You will also be thinking ahead now - planning your winter crops, so there is still scope for some sowing and planting out.

### Sowing in August:

- Lettuces
- Spring onions
- Radish (including winter types)
- Leaf beet
- Land cress
- Spring cabbage
- Oriental cabbage
- Carrots
- Endive
- Salad leaves
- Kohlrabi
- Autumn onions
- Spring cabbages
- Salad leaves (including late spinach)
- Turnips

### Planting out in August:

- Autumn onion sets
- Summer cauliflowers (early in month)
- Winter cabbages
- Kale

At this time it is also important to keep up the effort to get the most from your crops, so stay on top of weeding if you can, and continue to feed tomatoes and cucumbers using a high potash fertiliser to aid fruit development.

### Get green manure growing

If bare areas of soil are starting to appear in your vegetable garden, you may wish to consider sowing them with a hardy green manure. Green manures offer many benefits, including helping to protect the soil from having nutrients washed away during autumn and winter rains, and also helping to reduce weed growth. It will also add nutrients and humus to the soil when dug in and as it decomposes. You will need to prepare the ground by removing any weeds. Then thinly scatter seeds of the green manure crop over the surface and rake in gently.

At this time of year you can still sow a range of green manure crops including grazing rye, annual ryegrass, phacelia, crimson clover, fenugreek, mustard and radish. Remember to check the family of your green manure and factor this into your rotation plans, as for example, mustard and radish are brassicas. Rye and phacelia can be sown anywhere. Try sowing some dwarf French beans as a green manure, the seeds are cheap and the plant produces a fair amount of leaf and stem plus the roots. As with all legumes, they have nodules containing bacteria that fix nitrogen from the atmosphere. Free fertiliser as well as organic matter can't be bad. Unlike most green manures, French beans can be used in even small patches.

### Be on the look out for pests and diseases

As summer progresses problems with pests and diseases can build up on many crops. Brassicas may be attacked by cabbage white caterpillars and whitefly, aphids will be

found on all sorts of fruit and vegetables. Of course potatoes and tomatoes may get blight, and powdery mildew may be rife on many late summer crops including fruit, peas and squashes. Let's not forget about our old friends the slugs and snails, and of course pigeons that may be partial to nibbling away at your crops too! All these problems are greatly reduced if you keep a regular eye on your crops, so that you can quickly notice, identify and treat them early using your preferred form of pest control. Of course you can also do lots by simply making sure that conditions are right for your plants, while at the same time not being conducive to the pest or disease. For example, regular watering can help to keep powdery mildew at bay and also make plants less attractive to sap-sucking pests such as greenfly (wilting plants have a sweeter, more concentrated sap).

Pests can often simply be removed by taking the tops out of broad beans or pruning back pest or disease-ridden tips of fruit bushes such as gooseberries, or by simply removing badly infested leaves or using the trusted finger and thumb method to squash them.

If you do get an attack of potato blight the best method to preserve the crop is to remove the "haulm" (stem) and dispose of it, then leave the potatoes in the ground for a fortnight to stop the spores getting onto the tubers. It's best to harvest potatoes fairly early in the day, rinse them off as they come from the ground and then leave in the sunlight for a day to thoroughly dry off and harden the skins before storing.

## Grow Your Own Garden in September

In September, you will notice that many of your crops are completing their life-cycle. There is a lot to harvest, enjoy eating and storing. However, there are still plenty of jobs in the garden looking after winter crops, and thinking ahead to the following spring. If you haven't sown seeds for some over-winter crops, you may wish to think about buying in some pre-grown small plants whether from a garden centre or from a mail order company.

### Sowing now:

- Spring lettuce
- Winter spinach
- Oriental leaves
- Pak choi
- Salad leaves
- Turnips
- Hardy green manures

### Planting now:

- Spring cabbage
- Autumn onion sets

### September Garden Tasks:

- Pick apples, plums and pears. Pick apples and pears by cupping in your hand and gently twisting. If the fruit comes away easily, it is ripe; if not leave it for a few days before trying again. Always handle any fruit very carefully to avoid bruising and it is important to try and retain the stalk on all tree fruit as this helps to prolong the life in storage. Look out for wasps when picking plums, as at this time of year they are looking for sweet foods, and will be drawn to ripe plums on the tree. You may wish to investigate wasp traps around your fruit trees, if you are worried about being stung. But do remember, that wasps are not all bad as they eat insects and will help out with eating caterpillars from your cabbages.
- Autumn-ripening varieties of raspberry such as 'Allgold' and 'Autumn Bliss' will be ready to harvest now. These can keep producing fruit right up until the first frosts of the year.
- This is a good time to pot up some herbs for autumn and winter, either using new plants from your local garden centre, seeds or by lifting plants from the garden. It is also still possible to take cuttings of some woody herbs such as sage which should just have time to root and establish. Chives and mint can be lifted and potted for growing in a cold greenhouse where the additional shelter will keep them going for a little longer than they would outside in the elements.
- While the bulk of sowing is over for this season, there are a few things that can be started now to provide some variety during the winter months and into the spring. One of these is winter spinach, a nutritious and easy to grow crop. Simply sow direct into the ground in a sunny, sheltered spot or sow into cell trays for planting out when the young plants are well established.
- Look out for autumn onion sets in garden centres, or order them in. These can be planted now giving them plenty of time to establish before the onset of winter. Bulbs such as this may not seem to be growing once planted, but although little top growth will appear this year, the roots will be very active, enjoying the remaining warmth in the soil to establish before the winter freeze. Your bulbs should be ready to harvest in June or July next year.

- If your compost containers are filling up, it may be a good time to harvest your compost, and turn over compost that still needs to be left composting for longer. You can add your completed compost to any beds that you have just cleared, to improve the soil ready for the next crop.
- Keep feeding the tomatoes, peppers, aubergine and cucumbers, the rule being not to stop until the fruit has ceased to develop. Outdoor tomatoes and cucumbers will benefit from shelter unless the weather is exceptionally nice. Remove the growing point from outdoor tomatoes to encourage the existing trusses to ripen, since it is unlikely that there will be time for plants to form many more fruits before falling light levels slow growth too much.
- Harvest your potatoes. Once the potato crop is cleared, leave for a few days then fork over the top 20cm, which will reward you with potatoes that you will be amazed you missed when you harvested. Leave them out to dry before storing (do this indoors if the weather remains wet) and store only undamaged ones in a dark frost-free place, in paper sacks tied at the neck. There is no hurry to reduce the temperature of potatoes immediately after harvest. Temperatures between 10-15 °C promote the development of a layer of protective corky tissue on the skin, and the healing of any minor wounds. After 2-3 weeks move them to a cooler spot, storing them in the dark, at temperatures between 5-10 °C
- Keep picking runner beans, French beans, courgettes and cucumbers regularly to prolong the harvest period up to the first frosts. When your peas are finished, compost the foliage of the peas but leave the roots in the ground as the nodules on them contain valuable nitrogen.
- The last of the onions should be drying now. Once harvested you need to ensure they have dried off to prevent rot in storage. They do best on a rack outdoors allowing air to blow through but you need to keep the rain off in some way without laying sheeting directly on them.
- Small leeks may well be ready to pull in September. Pull alternates from the row, allowing more space around those left to go through the winter.
- Begin lifting root vegetables for storage such as carrots, beetroots and turnips. Parsnips are better left in the ground, as they taste better after the first frosts. To store the root crops, choose only undamaged roots, twist or cut off the foliage and store in boxes between layers of sand or old potting compost.



Freshly harvested beetroots and turnips



## Grow Your Own Garden in October

By now we have definitely moved into the autumn with shorter, cooler days. There may even be frosts during this month, so it is time to enjoy your harvest and look ahead to the next season. A lot of work can be done at this time, as you empty your veggie beds working the soil ready for your next crops. Options to consider are green manures, seaweed, farmyard manure, and of course home made compost.

### General Jobs for October

- Turn the compost heap to help speed rotting now that lower temperatures have slowed the process. If you intend to spread your compost in the garden, you may need to stop adding material, or at least separate the more recent additions that will not be sufficiently rotted down.
- Continue to pick apples and other fruit, such as pears that may be ripe, using any damaged fruit immediately to eat or to make pies, jams and preserves.
- Cover salad leaves with cloches or fleece to protect the foliage from the worst of the weather.
- In exposed areas consider moving wormeries into a sheltered spot where they will not become too cold. Draw off any liquid to prevent a build-up that may cause the material to become too wet to the detriment of the worms.
- Order your new fruit trees and bushes, as from now till the end of February next year is the ideal time to plant and you don't want to miss out on your favourite varieties. In the meantime, prepare the soil removing weeds and incorporating plenty of organic matter.
- Continue to weed winter crops such as brassicas and leeks to prevent competition for light and nutrients and to remove hiding places for pests and diseases.
- Place a cloche over parsley, to keep up supplies for the winter months. Tired plants may be woken up with a gentle application of nitrogenous plant feed.
- Keep the greenhouse / polytunnel well ventilated in the daytime and carry out any watering jobs early in the day so there is not too much dampness around on cold nights.
- Take every opportunity in dry and sunny weather to open greenhouse doors and ventilators to let the fresh air through. It is the best means of avoiding mould.

### Harvesting and Planting jobs

This is also the time to plant out autumn onion sets and garlic, which may need to be ordered in, as not all garden centres stock these, or have them available early enough. You will certainly get a greater choice of variety from catalogue suppliers. Garlic needs the winter cold to perform well, so it is good to get these in now. They spend the winter establishing roots and get the longest possible growing season to help them produce those fat, juicy, pungent bulbs. The cold weather also encourages this hardy crop to produce bigger bulbs. Cloves are usually planted direct into well-prepared soil which is weed-free, gets plenty of sunshine and has good drainage. On heavy soil, add plenty of grit and well-rotted compost to improve drainage and ensure that any hard layers of the soil (pans) are broken up by digging prior to planting.

The onions varieties for planting now are hardy and will in theory over-winter producing a crop about a month earlier than the spring planted onions. A cloche or fleece covering will get them off to a good start and stop the birds from pulling them out.

It may also be worth purchasing some small pre-grown plants, such as some over winter brassicas, such as kale, if you have not sown some earlier.

The late main-crop potatoes will be coming out of the ground now to store away. Lift any potatoes that may still be in the soil to prevent pests such as slugs and wireworms or diseases from taking their toll on the tubers.

It is a good time to harvest remaining carrots and beetroot. However, if you have well drained soil, you may consider leaving some root crops in longer and covering with straw to protect them and to prevent the ground from freezing. This may appeal if you don't have a suitable cool, frost free storage place for your vegetables. As you harvest and store or preserve your produce, remember to use up anything with a blemish or other damage first, and store or preserve only the best. Keep a regular check on any stored apples, pears, potatoes, or root vegetables, as if one becomes rotten, it may spread to the rest, and cause more wastage.

You may wish to cover raised beds with glass or plastic cloches to help extend the good growing conditions.

You can sow hardy broad beans and peas, either in a polytunnel or a cold frame, or under a cloche. This should give them a head start so you could be enjoying crops before spring-planted peas and beans. There is more of a risk sowing at this time of year because in wet soil they may just rot rather than germinate. Always sow a few spares in pots to fill in gaps in the row. If you have a particularly wet and heavy soil it is probably not worth winter sowing, especially if you cannot provide cloches to cover them. Choose your variety of pea carefully – the smooth-seeded types such as the classics 'Feltham First', 'Kelvedon Wonder' and 'Meteor' are the best, although if you can find other smooth-seeded types, you may wish to try them out.

Many gardening books or magazines will suggest removing tomatoes even if they are still green in September. Living further north, it is good to give them longer than this, but towards the end of this month it is good to remove them, red or green. You will want to get these before any frosts come. Pick unripe tomatoes and place them in sealed brown paper bags either on their own (slow ripening) or with a ripe apple/banana (quick ripening). The reason for the apple/banana is due to ethylene gas production, which promotes ripening. You could also make some green tomato chutney, or try out green fried tomatoes (in a light batter).

The runner beans and French beans will come to an end when the frosts start. You may notice that your beans become stringier at this stage of the season. Where you've allowed the bean to develop in the pod, these should be dried out. Spread the pods out somewhere dry – indoors, or a greenhouse to get them dried and then the shelled beans are dried further before being stored in air-tight jars for use in winter soups and stews.

When the beans come off, cut the foliage at the base for the compost heap and leave the roots with their nitrogen store in the ground to release in the next year.

Squashes and pumpkins are usually left on the plant for as long as possible. Once the parent plant does show definite signs of dying back, cut the fruit but leave it in place outside for the skins to become thicker prior to storing, as this should give them a longer

shelf life. Place the fruit on some bricks or a piece of slate or wood to lift it from the wet soil and to deter slugs.

Cut the last of the outdoor cucumbers and courgettes early in the month before the frosts arrive and pull up and compost the plants.

Brassicas are an autumn and winter mainstay. You may well have been harvesting calabrese and early purple sprouting broccoli for a month or so. Remove any yellowing leaves from over-wintering brassicas, they are of no use to the plant and will encourage botrytis to develop, and slugs. Apply lime where necessary, a low pH reduces the resistance in brassicas to club root. Crop rotation and increasing the level of pH to a more alkaline pH7.5 or pH8 will improve their chances. Add 1lb of lime to a square yard (560grams/square meter) for average soil, less for sandy soil, more for clay.

Many gardeners prefer to leave Brussels sprouts until they have been frosted since they tend to have a sweeter flavour after a cold spell, but if there are some sprouts formed, you can start picking, starting at the bottom of the stem and working up. Cabbages can come up now too, they'll keep remarkably well in a shed or garage but beware a slug that may be lurking under the leaves. Check your cabbages thoroughly before storing, and as with all stored fruit and vegetables, keep a regular check, in case there have been some particularly well hidden slugs. One option is to sprinkle the outside with salt as this will deter them from eating away through the winter. Since the weather is likely to deteriorate now, it is a good idea to firm the roots and to provide tall plants such as sprouts and kale with a stake against the winter winds.

Cut down canes of Jerusalem artichokes to about 1ft (30cm). Dig out the tubers freshly as required over the coming months. Where eel worm is a problem, lift the tubers of Jerusalem artichokes and store them as you would potatoes.

### **Tend to fruit**

Once the leaves have fallen from established trees, this season's growth can be pruned. Delay this work if the autumn leaf fall is late as you have until growth begins again in the spring to complete the work.

The autumn can bring strong winds so make sure that young trees are well supported and that any stakes and ties used when planting are still in good condition and doing their job, supporting stems and preventing wind rock. If ties have become too tight, ease them off to prevent 'strangling' the tree.

If growing your trees in a lawn, clear the soil around the trunk for a distance of about 90cm (3ft). This prevents competition from the grass and allows food and water to be applied and to get down to the roots more effectively.

Cut out fruited stems on cultivated blackberries and tie in the new ones. Sever any layered tips and replant elsewhere.

Take hardwood cuttings of blackcurrant bushes using vigorous shoots 12in (30cm) long.

## **Plant new strawberries, including the rooted runners, into new rows. Prepare the ground using plenty of moisture-retentive compost or manure.**

### **Grow Your Own Garden in November**

It's noticeably colder now in the garden, and it is normal to have had frosts by now. There is less daylight, so you will probably find less time to go out into the garden and perhaps less inclination, but there are some worthwhile tasks ranging from planting up some over-winter crops, to tidying up so that your garden is ready to go come the Spring, pruning your fruit trees, bushes and canes and improving and protecting your soil. Think ahead to next year and start to make your plans. You should also keep a check on your current over-winter crops and be on the look out for pests and disease, or if extra support or protection is required. You may also wish to think about seeds, plants, fruit trees or bushes and any equipment that you may wish to order. It is a good time to reflect about what has gone well in the garden and what hasn't worked so well so that you can aim to improve for the next growing year.

### **Things to do in the vegetable garden this month**

- Consider lifting root crops or give them protection from frost if you have decided to leave them in the ground, with straw or bracken, hedge prunings, or horticultural fleece.
- Protect cauliflower curds by folding over and / or tying the leaves. Exposure to sunlight discolours the cauliflower curd and can produce off-flavours. This will protect the cauliflower and keep the cauliflowers a nice creamy white.
- Early Brussels sprouts will be ready for picking now. Remember that you can cut the small 'cabbage' from the top of each plant and eat it too. You may need to net the plants against pigeons if you haven't already done so. Pigeons become an increasing problem as the weather gets colder.
- Finish clearing crop remains and compost them. Most material is fine to compost but do not compost diseased plant material such as onions with white rot or brassicas with club root. Add it to your green waste for collection or take to your local Recycling Centre, where the waste is taken away to be composted at higher temperatures than can be reached by composting at home.
- Check stored crops, potatoes in particular, for signs of disease. Dispose of any showing signs of rot so it doesn't get a chance to spread.
- Put out food for birds; they will reward you by eating pests such as aphids, caterpillars, slugs and snails.
- Clean pots and seed trays now to make the spring rush less frantic.
- Remove any last traces of crops from the greenhouse and clean the glass, staging and floor using a garden disinfectant.
- Make sure that bare ground is covered. Autumn leaves or seaweed make good winter mulch spread over the soil protecting it from heavy rainfall.
- Prune indoor vines after the leaves have fallen, and burn the old leaves to reduce disease. Ventilate well and keep the greenhouse cold. If there are no plants inside that could suffer, leave it open for a couple of months.
- Tend to brassicas - first clear away any yellowing or fallen leaves as these harbour diseases and act as a hiding place for slugs and other pests. Remove weeds at the same time. Next, check over the leaves, squashing or rubbing off as many leaf

pests such as aphids or whitefly as possible. Spray bad infestations if necessary. Then stake any tall or top heavy plants – kale, broccoli and sprouts are the most vulnerable – to prevent root damage caused by wind rock and finally take precautions against slugs and snails using your favoured form of control (traps, barriers or pellets) and of course where birds are a problem, cover the rows with netting or erect bird scarers.

- Order your soft and tree fruit as soon as possible to ensure you get the varieties you want.
- Plant out winter lettuce, rhubarb crowns, onion sets and spring cabbages.
- Check and repair fences, especially rabbit proofing if rabbits are a problem in your area. The netting should be buried at least 15cm (6in) under the ground in an 'L' shape to prevent rabbits digging underneath. Repair fences and broken posts before winter gales blow them over. Wooden posts are less likely to rot at the base if they are not concreted into the ground. Drive the metal spike-type post-holders into the ground and slot the posts into them.
- Start a “compost trench” for sowing runner beans later in the spring. Put fresh vegetable waste in the bottom of a trench, which can later be filled in and be ready for your beans.

## Sowing and Planting

Carry on sowing and planting for winter cropping such as winter salads, and for early harvests next season. Use cloches, cold frames, greenhouses and polytunnels to maintain growth over winter.

### Garlic

Plant in November - the sooner the better for the best crop. It is preferable to plant named varieties of garlic, such as *Thermidrome* and *Printantor*, rather than using left-over cloves from garlic bought from the greengrocer. This will avoid the risk of introducing disease, and help ensure you are growing a variety suited to the UK. Some varieties of garlic, such as *Printantor*, can also be planted in early spring, but will give much better yields if it goes through a cold period over winter. Plant 7 inches (18 cm) apart.

### Broad beans

Broad beans are traditionally sown in autumn (late October to early December) for an early summer crop. Autumn sown plants are also less attractive to blackfly, but their success can be variable; mice and wet conditions can cut plant numbers considerably. You can either sow direct to the ground, or in the greenhouse or polytunnel. If opting for indoor sowing, consider using deep cell trays (Roottrainers) or toilet roll inner cardboard tubes. If sowing outside, make sure that the soil is well prepared, and is not too exposed, windswept or the soil very heavy. For outdoors growing, it is a good idea to cover the rows with cloches to keep off the worst of the winter weather. Sow in double rows with 15-20cm (6-8in) between rows and the same distance between seeds in the row. If sowing on raised beds single rows with seeds spaced at 15cm (6in) intervals is fine. Dress soil with a potash fertiliser if chocolate spot disease is a regular problem. Use extra hardy cultivars such as *Super Aquadulce*, *Aquadulce Claudia*, *Imperial Green Longpod*, or *The Sutton* (a bush variety good for small gardens under a cloche). If autumn sown crops tend to fail in your garden, don't despair; some of the spring-sown cultivars can produce a crop that is almost as early.

### Hardy peas

Round seeded, hardy peas can be sown now for a June crop – this is particularly effective if you plant in a polytunnel. Suitable varieties include *Douce Provence*, *Feltham First*, *Meteor* and *Pilot*. They can also be sown in the spring. Pea seeds are a favourite with mice, so it is not worth sowing them now where mice are a problem.

### **Hardwood Cuttings of Black currant and Gooseberry**

While pruning your currants and gooseberries, take some hardwood cuttings. Take cuttings from healthy bushes only – ignore bushes with any signs of disease. Select a healthy looking stem of ripened (brown not green wood) and cut a 25 cm length. The cut should be made just below a bud. Pull off all the leaves from the stem being careful not to remove the stem.

The first year with your hardwood cuttings can be regarded as being like a nursery year - where the hardwood cuttings can develop their root ball. If you were doing a large quantity, you could fit lots and lots of cuttings in a trench, and then dig them up and space them out a bit more at the end of the year. If you have fewer cuttings, you could either put in where you would like to have them ultimately, or they would also be fine in pots for this year. When you plant them, make sure that at least 7.5 cm above the ground.

### **Make your own Leaf mould**

Autumn leaves rot down to make leaf mould - a pleasant, dark brown, crumbly material. Leaf mould is a good soil improver, lawn conditioner and mulch. It can be used in seed and potting mixes too.

Leaf mould is easy to make, is free and saves using peat-based products. It is good for the soil, and cuts down on the need for watering. Use leaves that fall in the autumn. They will be brown and look dead, and avoid evergreen leaves such as holly, laurel or Leyland cypress and other conifers. Autumn leaves are rotted down mainly by the slow, cool action of fungi rather than the quicker acting bacteria that are responsible for composting. This is why autumn leaves in quantity are best recycled separately in a leaf mould heap. Small quantities of dry autumn leaves could be added to your compost heap, to provide a balance to complement your kitchen waste.

Collect fallen leaves from your garden, and from pavements and verges of quiet streets. If you have a dog or are collecting leaves from a public place it may be a good idea to wear gloves in case there may be concealed dog poo amongst the leaves. Don't disturb drifts of autumn leaves under hedges and other out of the way areas. They may be used as hibernating sites by hedgehogs and other creatures. Leaves can be gathered up by hand, using a lawn rake.

Leave the leaves in a suitable container – whether this is black plastic sacks or a mesh / netting container that you can make yourself. You will need to leave the leaf mould for a year or two, and then it will be ready to use when it is well rotten and crumbly. You can use the leaf mould when it is still young as a mulch, winter cover for bare soil or as a soil improver. When it is fully matured options for use include creating seed-sowing mix (mixed with equal parts sharp sand and garden compost) or potting compost (mixed with equal parts sharp sand, loam and garden compost).

For a more developed plant, the spacing is 1.5 - 1.8 meters apart, so that would be for next year. If you made any hardwood cuttings of currants and gooseberries taken last autumn, these can be transplanted into their final positions, after thorough enrichment of the soil in the planting hole. They like a good feed - so some well rotted manure would keep them happy.

### **Pest & disease watch**

- Brassica whitefly can be a major problem for winter brassica crops - Brussels sprouts, broccoli, cabbage, kale etc. Where infestations are severe, a couple of sprays of insecticidal soap may be necessary. Pick off any yellowing lower leaves before you spray, which is where most of the young whitefly scales will be found. Remember to spray under the leaves too. Insecticidal soap must come into contact with the pest in order to be effective.
- Net Brussels, broccoli and other winter brassicas to protect them from pigeon damage. Secure the base to prevent any birds getting caught up in the netting. Support the nets above the plant tops so that pigeons don't just land and eat the leaves through the netting.
- Leek rust - a fungal disease of leeks. Red/orange pustules develop on the leaves and stems. Sheltered sites, poor drainage and planting too close together can exacerbate this problem. Cold weather can halt the progress of this disease. In a mild autumn the disease may continue to develop, turning leaves yellow and resulting in reduction of plant size.

### **Review your growing year so far**

As you think about ordering seeds, plants, fruit trees and bushes or equipment it is a good chance to reflect on how things have gone in the garden so far. Here are some questions you can ask yourself.

- Did you have a good garden site? Did you get enough sunlight? How was your drainage?
- Was the garden large enough, or was it too large or too small?
- Were the vegetables you planted worth the space they used up, or the time you spent on them?
- Were there any vegetables that you did not like to grow or eat?
- Were there any varieties that did better than others?
- Could you have planted more of certain vegetables?
- Did you plant too much of any crop?
- Did you plant the vegetables varieties at the right times? Too early? Too late?
- Did you have problems with insects or pests? Which vegetables were affected?
- Did you have any disease problems? With what vegetables?
- Did you have all the tools that you needed? Are they still in good shape?
- If you tried some new techniques such as mulching, how did it work out?
- Did you have as much fun as you thought you would gardening?

Keeping a record of your gardening can be a very useful activity, and if you find that something seemed to be planted out too early or too late, noting down when you did will help you decide when to plant in following years. If you haven't already kept a note or journal of your gardening tasks, consider starting one. It can be useful to note down first frosts of the autumn and winter and also the late frosts in the spring, so you can build up a picture of what to expect in your garden.



# GLOSSARY

## **Blanching**

Excluding light from growth to produce tender, usually less bitter and pale coloured growth, e.g. celery.

## **Bolting**

To produce flowers prematurely, usually leafy crops; resistant varieties available.

## **Bud**

Immature/condensed shoots containing leaves or flowers ready to grow.

## **Bulb**

Compressed leaves acting as a storage organ for a developing plant, e.g. onion.

## **Cane (fruit context)**

Fruiting stem, e.g. raspberry.

## **Cloche**

Portable structure for protecting plants from cold weather, advancing growth and warming up the soil. Useful for early and late season sowing. Made from glass or plastic covering over a framework or steel hoop tunnel.

## **Compost**

Material from decomposed organic materials, eg plant remains. Used for potting and improving soil

## **Earthing up**

Pulling soil around the base of the plants and stems to encourage rooting, blanch stems and prevent wind-rock (destabilisation of roots).

## **Edible flower**

Edible blossom of certain plants (always check).

## **Established**

When plants have grown roots and top growth after sowing/transplanting and are less dependent.

## **Fruit**

Mature ovary of a plant, e.g. apples with seeds, but classification often reflects longstanding associations, e.g. rhubarb is a vegetable known as a fruit; pumpkin is a fruit known as a vegetable.

## **Feeding**

Supplying plant nutrients for healthy and vigorous growth, e.g. adding compost. Can also add 'concentrated' fertilisers, e.g. organic tomato feed.

## **Forcing**

Inducing plant growth by changing growing conditions, e.g. rhubarb under pots for early stems and Witloof chicory indoors for early leaves.

**Fruiting stems**

Growth that bears fruits, eg blackberry plants fruit on one-year-old wood. This is pruned to soil level after fruiting in its second year. Meanwhile, the plant produces new one-year-wood that fruits the year afterwards, and so on.

**Greenhouse/polytunnel**

Protected growing environment for plants. Greenhouses have glass or plastic glazing over a framework; polytunnels have plastic sheet covering over metal hoops.

**Green manure**

Plants grown to improve soil, add nutrients and suppress weeds. They are cut down and dug into soil before the space is needed for a crop.

**Harden off**

Acclimatising plants to a new growing environment, e.g. moving plants from a greenhouse to a sheltered place outdoors during the day and returning at night. Repeat for two weeks, gradually leaving plants outside all the time, e.g. before planting.

**Head**

Dense group of flowers (e.g. cauliflower) or inner compact leaves (e.g. cabbage). Latter also known as 'hearts'.

**Herb**

Plants grown for their medicinal, culinary and/or aromatic qualities.

**Horticultural fleece**

Light fabric for protecting plants against frost and some pests by providing a physical barrier. Available in different grades.

**Humidity**

Amount of water vapour in the air. Important to increase for some crops by spraying water over the floor which then evaporates, e.g. for tomatoes growing in a greenhouse or polytunnel.

**Long term crop/perennial**

Plants that live for more than three years, e.g. asparagus, fruit bushes, etc.

**Mulching**

Laying material over the soil surface to conserve moisture, suppress weeds and insulate roots, e.g. 2-5cm of compost or well-rotted manure around fruit trees, vegetables, etc.

**Pinching out**

Removing the growing tip of a plant shoot, i.e. where new leaves are produced. Useful for stopping growth, removing pest populations and prompting bushy growth with multiple stems.

**Planting/transplanting**

Putting something in the soil, eg tuber, fruit bush. Includes moving plants from one location to another, usually where they can grow to maturity, eg from a pot or seedbed into the soil or container.

**Pot on/re-pot**

Moving plants into larger pots or trays to give them more space to continue growing.

**Pruning**

Cutting off or shortening unwanted growth, e.g. removing diseased material, reducing length of side shoots and encouraging fruiting stems/canes.

**Rootstock**

Plant used to supply roots for chosen variety, e.g. 'Golden Delicious' on 'M26'.

**Row**

Lines in the soil for sowing seeds or transplanting. Seeds are sown in narrow channels at the right depth for the seed, called a 'drill'.

**Sets**

Small bulbs planted for an earlier crop, /e.g. shallot.

**Seedbed**

Area of soil for sowing seed. After thinning in situ, young plants are transplanted at final spacing, e.g. leeks.

**Side shoot**

Growth arising from a plant stem. Also known as 'laterals'.

**Sowing**

Planting seed in a pot or row and giving it the right conditions to germinate (start growing).

**Spur (fruit context)**

A short stem that flowers and produces fruit, e.g. on apple trees.

**Taking cuttings**

Removing pieces of plant to use for increasing numbers, e.g. stems

**Thinning**

Removing crowded seedlings to give room for remainder to grow on. In rows, thin alternate plants in stages until final spacing. In pots, remove weakest seedlings.

**Tuber**

Swollen underground food storage organ, e.g. potato.

**Vegetable**

Edible plant part that isn't the fruit, i.e. 'vegetative'/non-flowering, e.g. roots like carrots, stems like celery.

**Weeding**

Removing plants growing where you don't want them and that can otherwise take nutrients, water, space and light from crops, reducing harvests.

# Seeds and Seed Saving

## Introduction

Seeds are a gardener's greatest treasure. Nowadays we're spoilt for choice in both varieties and sources of supply, particularly since the internet has matured over the last ten to twenty years. But you don't have to go back many decades for much more restricted availability and, until a couple of centuries ago, virtually the only source was seeds saved oneself or obtained by personal contact.

Most seeds are now grown considerable distances away from where they are sold with a resultant hefty carbon footprint. Saving seed can save you money, reduce your garden's carbon footprint and if more people do it, increase a community's resilience to shocks due to peak oil. It can also be good fun.



*Kale, beetroot, borlotto bean, carrot, runner bean seeds*

## Storage and viability

Seeds need moisture and warmth to germinate, some need light. You only want them to germinate when they're sown so they should be stored dry, cool and dark.

How dry? Below 8% moisture content and impervious to all external sources of moisture.

How cool? Below 5°C is optimal, in a freezer for very long term storage, properly dry seed is safe to freeze.

Dr James Harrington experimented on the effects of seed moisture content and temperature on seed viability back in the 1950s and established two approximate rules which have been subsequently verified by other researchers:

- seed life is doubled by each 1% reduction in seed moisture content between 6% and 16%
- seed life is halved by each 5°C increase in temperature from 0°C to 50°C

Thus, a seed which could survive 10 years at 5°C might only survive 7.5 months at 25°C! Let it absorb moisture and it may only survive a few weeks. Poor seed storage not only reduces germination, it weakens the seed, adversely affecting its early growth and often reducing the plant's ultimate yield.

I store my many seeds in food storage containers or jars in a filing cabinet in a very cool, unheated, Scottish barn. Their temperature almost never rises above 10°C and rarely drops below 0°C. I only ever take out what I'll sow in an hour or so, always keep that in the shade and protected from wet, and never leave them in a hot greenhouse. A day of heat maltreatment could shorten seeds' life substantially. I rarely buy seed from warm garden centres - a few months at 25°C does a lot of damage to seed viability - online purchased seed is much more likely to have been stored appropriately. Properly dried saved seed is best stored in something like 'ziplock' plastic bags which can be purchased online very cheaply in various sizes. These bags can then be kept in airtight food containers and jars.

When you open seed packets that you won't completely use up at once do so in a way that lets you reseal them properly and read all the important information - especially the seed's

identity and use by date. Seeds that have an inner foil packet can usually be fairly well resealed, seed packets without this are best stored inside a ziplock bag but always ensure the packet is dry before storage. If I've stored commercial seed well I often find it remains viable for several years beyond its 'sow by' date as this tends to be conservative to allow for typical heat and moisture abuse.

Fridges are ideal for medium term storage but you should ensure seeds are kept airtight for a few hours after taking them out of the fridge to avoid condensation moistening the seeds. If you plan to store seed for more than its natural lifetime freezers are the best option. You should ensure any seed you intend to put in the freezer is well dried before storage. When you need to use only take out the seeds you plan to use in the next few weeks and put the rest back into the freezer immediately. Keeping the seed airtight in the freezer and, when taken out, until it is up to ambient temperature is very important.

How long will your seed live? Surprisingly long if you treat it well. I've had 75% germination from tomato seeds I saved 12 years before and stored in a paper envelope in a cool place, and get very good results from cabbage, kale and beans saved 5 years and more ago. Not all seeds have similar longevity, here are some general guidelines (gathered from several sources - which can be surprisingly contradictory - and personal experience) for seed stored dry and below 10°C:

Very short (1-2 years): Parsnip

Short (2-3 years): Leek, onion, sweetcorn

Medium (3-5 years): Celery, celeriac, pea, carrot, rhubarb, parsley, sage, thyme, kohlrabi, basil, okra, coriander

Long (4-6 years): Beans (broad, french, runner), spinach (annual and perpetual), mustard, pepper, chilli, endive, salsify, scorzonera, beets (beetroot, chard), cabbage, rocket

Very long (5-7+ years): Lettuce, cauliflower, broccoli, borage, chicory, courgette, squash, pumpkin, tomato, cucumber, aubergine, fennel, turnip, radish, kale

I've done experiments on my own saved parsnip seed and got the following approximate germination rates at various seed ages:

Next season (less than 1 year old): 80%

Over 1 year old: 60%

Over 2 year old: 25%

Over 3 year old: 10%

Over 4 year old: 0%

Parsnip is the worst seed I know for keeping; commercial seed suppliers only have to prove 50% germination when packed. For virtually all other commercial vegetable seed minimum required germination rates - in ideal conditions - is at least 90%. It's recommended you only use parsnip seed in the season it is produced for, but I've had decent germination in the following year or two. Often the major cause of failed parsnip germination is cold, wet, soil.

## **Sowing and germination**

The optimum temperature for most seed's germination (in both success rate and speed of emergence) is 20 to 25°C, worth knowing where you have total control as when sowing in a heated propagator - very few vegetables (cucumber, melon, okra) benefit from a temperature of more than that. Fortunately many are not too fussy and will germinate well, albeit more slowly, at lower temperatures. Most seeds tend to germinate and grow faster at higher temperatures but some, notably some lettuce, have strongly suppressed germination above 25°C.

Typical germination temperatures for common vegetables:

Aubergine 21 to 27°C

Broad bean 5 to 25°C

Runner and French beans 10 to 27°C

Beetroot 10 to 20°C

Broccoli 10 to 27°C

Cabbage 7 to 27°C

Carrot 7 to 30°C

Cauliflower 5 to 27°C

Celery 5 to 25°C

Chard 4 to 30°C

Chilli 20 to 27°C

Coriander 5 to 27°C

Courgette 15 to 30°C

Cucumber 20 to 27°C

Fenugreek 5 to 30°C

Lettuce 4 to 25°C

Leek 10 to 30°C

Melon 21 to 30°C

Onion 10 to 30°C

Parsley 10 to 30°C

Parsnip 4 to 30°C

Peas 4 to 25°C

Radish 7 to 30°C

Salsify 7 to 25°C

Scorzonera 7 to 25°C

Squashes 20 to 27°C

Tomato 20 to 27°C

Turnip 4 to 40°C

There can be considerable variation between different varieties of the same vegetable, some have been bred and / or produced in hotter climes and this can have a noticeable effect. Some seeds burst into life almost immediately given good conditions and you may see seedlings within a week: many brassicas, coriander, fenugreek. Others are naturally much more reticent: parsley, carrot, onion, parsnip, celery - they can often have you wondering whether they've failed or are just taking their time, you might not see seedlings for a month if you sow them in early spring.

Unfortunately most weed seed will be germinating and growing more vigorously than many vegetables so early weeding is critically important to enable the vegetable plants to get established.

## **Seed Saving**

Seed saving is fun and mostly very easy. As well as saving money and having the satisfaction of growing plants from your own seed I've found that my saved seed nearly always performs better than purchased seed - it usually germinates faster, grows more vigorously and produces better crops. I don't know why this is, but hazard a couple of guesses:

- the plants were usually grown in the same climate as they were resown and had adapted somewhat

- commercial seed may have been harvested all at once rather than at optimum ripeness

- commercial seed may have been overly dried, hence slower to wake up

## **Growing seed**

Simply: a plant grows, flowers, the seed ripens and you harvest - it's what the plant wants to do! But it's not quite that simple. Some plants do indeed produce seed in the same year they're sown but others, like most of our root crops, don't flower and set seed in one season from sowing - and they wouldn't be much use as root crops if they did. So, we have the problem of keeping them alive through winter to produce the seed crop in their second season and they will occupy space in the garden for two seasons. Then we have the problem of interbreeding between different varieties of the same crop, between closely related crops, even with related weeds. We can solve this by isolating our seed crop in space or time of flowering, or by barriers. Another problem, particularly in our northerly climate, is inclement weather hampering seed ripening and harvesting.

Many vegetables which need to overwinter will survive winter well enough in situ, and you can cover with a couple of inches of soil, or with straw or fleece to help. Root crops can be lifted and stored in soil clamps or in very cool conditions in slightly damp sand or compost. Basically they need to be cool enough to keep them sleepy, moist enough to avoid drying out but not so wet that they freeze or rot. Bigger plants like cabbages are harder to lift and store: they need to be lifted with about a cubic foot of rootball and they have a big leaf area to lose moisture through - storage is challenging if you don't have a root store, and 3 to 4 months is about the limit for storage even in near ideal conditions.

An alternative to lifting and storing is to grow immature plants specifically for seed to overwinter in a protected frost free but cool situation for planting out in spring. Typically these would be sown around the end of July, put somewhere safe from frost in October and planted out by late March (dependent on weather). The disadvantages are: you won't be able to see which plants are best and they will each produce significantly less seed than a fully grown plant would so you'll need more plants.

Even if plants have overwintered outdoors you may want to move them to spend the



summer producing seed. Most transplant well if you do it before they burst into life, do it carefully and take a decent rootball; I often don't move crops like purple sprouting broccoli and kale until they are beginning to flower. Planting them fairly closely in square or rectangular blocks is better than rows for space use and pollination. I space smaller root crops about 4 to 6" apart, larger plants so they are just touching. It's surprising how small an area is needed to produce a lot of different seed.

Often plants get unexpectedly tall when allowed to flower so growing them in a pattern that enables support with stakes and string is a good idea, especially in exposed situations. Until you know better assume the flowering plants will be about 4 feet high.

Can you eat crops from plants you intend to save seed? Yes, but - in most cases - the more you pick from them the less seed they will produce.

Some plants benefit from special treatment to help them produce seed. Tight headed lettuce and cabbage like a slit or cross cut in their heads about an inch deep to help the flower spike to emerge, brussels sprouts and multi headed broccoli produce more flowering heads if you pick out their main growing head.

### **Genetics and Selection**

Hybrids (often termed F1 hybrids, F2 hybrids, etc) don't breed true, you'll almost certainly get poor results from saving their seed. Avoid. Like humans there can be considerable variation within one variety - you'll increase the likelihood of producing good crops from your seed by selecting your best and undamaged plants for seed production and minimising any cropping from them. For some vegetables, like salad crops, you don't want the seed from plants which go to seed soonest, you want seed from plants which stand longest before going to seed, so pull out and eat the ones that bolt first or pinch out their flower heads before they open. Also too much inbreeding can cause problems so you should try to save seed from a sufficient number of plants, fortunately about 8 is enough for the vast majority of vegetables.

### **Pollination**

Some flowers are almost completely self-pollinating so even a single plant can produce viable seed; some cannot self-pollinate so require other plants of the same type to set seed; many are in between these extremes. Some are largely pollinated by wind; some require insects; some use both. Many vegetable species cross pollinate, some don't; some will cross-pollinate with related plants, including commercially grown fodder and processing crops, and there are some weeds which will cross-pollinate with certain vegetable crop plants. This is the main area of complexity with seed saving.

### **Isolation**

Where cross-pollination is a potential problem you can isolate your seed crops by separating them from cross-pollinating crops by sufficient distance, usually about half a mile in open situations but much smaller distances - perhaps a fifth or tenth of the open recommended distance - can be adequate in areas with lots of barriers like buildings, walls, hedges. Or by growing them to flower at a different time, or by sacrificing the outer rows of your seed plant block and only saving seed from the inner plants (not so useful for small scale seed production), or by using physical barriers to protect your seed plants. Different crops and situations are amenable to different tactics. It's fairly easy to sow broad beans, for example, such that two varieties flower at different times by sowing an early variety at the beginning of April and a slower growing variety around mid-May. Most related plants are more difficult to separate in time like this - they tend to want to flower at the

same time, especially overwintered crops and those that take two seasons to produce seed.

Where several people are growing crops in close proximity, like allotments, or if you are saving seed from several varieties which cross-pollinate, isolation can be a real problem, particularly for brassicas, broad beans and courgettes / squashes. Bagging and caging can be necessary in such situations.

For insect pollinated crops a fine mesh or net curtain material is ideal, for wind pollinated crops something like polythene or fleece is needed. Individual plants or flower heads can be bagged to prevent external pollination; larger cages can be fashioned to enclose blocks of multiple plants. You often need to resort to hand pollination to produce an adequate seed set where you've excluded the normal pollination vector. A small paintbrush works well, use it to brush pollen from one flower's stamens onto the stigma of another flower. If the plants are "self-incompatible" the flowers need to be on different plants.

In the special situation of only two proximal cross-pollinating varieties you can use 'alternate day caging': isolating one crop on day 1, the other on day 2 etc during the flowering period, hence allowing the wind or insects to do their job when the variety is not caged. You need to make your cages easily movable or openable for this.

### **Ripening and harvesting**

When are seeds ripe and ready to harvest? That's hard to describe in general terms but actually quite easy to tell if you use a bit of observation and common sense. It often takes surprisingly long for flowers to become ripe seed so be prepared to be patient. For peas and beans the pods need to have shrivelled, dried and darkened (beans) or lightened (peas) and become papery. If the pods feel dry and warm compared to a green pod they're probably ready - just peel them open and you have your seed. For small podded seeds like brassicas the pods lighten to a colour like dry grass and, if you keep a close eye on them, you'll probably see the most mature pods split and release their seed. Again, the warm and dry pod feel is a good indicator, roll the pods between your fingers and they will often split open and the seeds pop out into the bowl you're holding to catch them. Those that produce naked seeds like parsnips, lettuce and carrots, you will see the seed change colour, usually from green to buff - the warm and dry feel indicator works for these, too, and you can pluck the seeds or snip the seed heads off to process.



*Ripe turnip seed pods*

Unlike most commercial processors you might have the luxury of regularly checking your seed and harvesting it as it ripens rather than in one hit. However, if the seed is about ready and the weather is wet or threatening to be, you can cut off branches of seed heads or pods, even whole plants, and hang them up somewhere light and dry, with reasonable air circulation, to finish their drying and ripening. Seed harvesting is definitely a fair weather sport, avoid harvesting when wet if at all possible. At times the season's weather will defeat you, use your judgement to harvest what you can and hang up to dry and ripen before too late - most seeds continue to ripen once the plant has been pulled up.

## **Cleaning seeds**

Common sense and ingenuity are very useful when cleaning seeds. A variety of sieves and a gentle breeze come in handy, too. Your objective is to have viable seeds and nothing but. A first stage will likely be separating the seed from its pod or head. Bean and pea pods you just peel open, small pods and seed heads usually respond to rubbing between your hands over a bowl or bucket, sometimes you'll need to use fingernails or plucking etc. This will give you a mix of seeds and unwanted detritus.

The two methods I use to separate them are sieves and a wind tunnel. Sieves depend on things being different sizes - the seeds you want will be bigger than some detritus and smaller than other detritus. But you'll never have exactly the right sizes of sieve and some seeds aren't round. The wind tunnel depends on the seeds being heavier than the detritus (more true than you might expect for most seeds) so the detritus gets blown away more than the seeds. No, I don't have a wind tunnel but I can blow on a bowl of seed while shaking it (carefully, it takes a bit of practice) and often use a breeze by pouring seeds from one container to another (beware: round seeds bounce, breezes gust). A cool and slow hair-drier or fan can be used too.

Gelatinous seeds like tomato need fermenting in water for several days to separate the seeds from their gel coating, just put the seed in a lidded jam jar with water, shake vigorously and release any pressure daily, and after 3 to 6 days the seeds will separate and you can wash thoroughly and strain, then dry them on a plate - avoid using paper as they stick to it.

The whole seed cleaning process is usually very iterative, at times patience trying, but ultimately satisfying. They don't have to be completely clean to be usable.

## **Drying seeds**

How dry should your seed be before storing? That depends. If you are going to use it all next spring and store it in paper bags meanwhile then it just needs to be dry enough not to sprout or go mouldy - if you store it cool enough. If you intend to use it over several years and / or store it in airtight containers then it needs to be drier: a moisture content of below 10% by weight is necessary, and below 8% is advisable. Fungal growth will typically occur at above 12% seed moisture, insect activity (eggs, grubs) at above 8%. Commercial seed is typically dried to a moisture content of around 5%. Usually I just dry seed on plastic food trays or plates, ideally in a single layer (regular stirring and shaking works for layers a few millimetres deep) on a sunny window ledge. If you have live wildlife in with your seeds use a shallow plate to encourage them to wander off - most don't like too much heat, bright sunlight and nowhere to hide.

How long it takes to dry seed depends on how warm / sunny it is and how big the seeds are. Smallish seed like most brassicas, carrot, lettuce should dry sufficiently in about 5 sunny September days, beans can take several weeks - very dependent on how dried out they were when you harvested them. A rough way of checking if seed is dry is to see if you can dent it using moderate pressure from your fingernail, if you can it needs more drying. A more scientific way, if you have very accurate weighing scales and a decent amount of seeds, could be to weigh the seed before drying then daily as it dries. Since you don't know the moisture content before drying you won't be able to accurately calculate the moisture content when it's dry but you will notice that the weight drops more quickly initially then levels off, two warm sunny days with minimal weight loss (about 1% in total) should indicate it's sufficiently dry. Your scales should be accurate enough to detect a 1% drop in total seed weight - for 100gm of seed they would need to measure 1gm etc. Even more scientific would be to dry a weighed sample of the seed to destruction in a cool oven

(between 50°C and 75°C) for a day or so which should reduce its moisture content to below 2% and use that to calculate what the weight of the rest of your seed would be when dried to about 5% moisture. NB you should weigh the rest of the seed at the same time as you weigh the sample you then put into the oven so they are at the same moisture content for the calculation to work. I've not gone to these more scientific extremes. They would be good experiments.

Alternatives to sunny window ledges are: an airing cupboard, a very cool oven, a solar or electrical fruit drier - temperatures of 25°C to no more than 40°C are about right for most seed. Do alert other users of the facility about what you're doing or you may get upset seeds and tempers! Another way is to use desiccating crystals, like silica gel. I did try this method when I first started seed saving but felt more comfortable with the windowsill / airing cupboard approach. The basic principle is to dry out the crystals or sachets in the oven to expel the water they've absorbed then put them into an airtight container with the seeds (about equal weight of silica desiccant and seeds) for 5 to 7 days for smallish seeds, up to 2 weeks for large bean seeds. You may need to re-dry the desiccant for the bigger seeds.

Don't make the mistake of over-drying your seeds, ultimately you could kill them, 2% moisture is regarded as the lowest it's advisable to go, 5% is probably a sensible level to aim at. Drier seeds store longer but I think they need longer to wake up when sown. You could spread your bets (always a good gardening principle) by drying some seed a shorter time for use in the next year or so and the rest of the seed a bit longer to store in the freezer for 5+ years.

### **The really easy seed saving vegetables**

Pea

Lettuce

Tomato

Broad bean

Runner bean

French bean (dwarf and climbing)

Chilli

Pepper

These all produce seed in one season, are self-fertile (pollination occurs within one flower), and are easy to process for seed. However, even some of these can cross-pollinate so you may want to take precautions against this happening. I say 'may' because sometimes you might not mind varieties crossing. This is particularly true for beans which usually produce something fairly good even when varieties do cross. One strategy could be to grow several varieties together one year to see what happens and just a single variety in alternate years to ensure a pure strain. If you have a big garden or multiple sites you could do both in the same season.

Lettuce is possibly the least likely vegetable crop to cross-pollinate. The flowers only open briefly (often no more than an hour), so there is little opportunity for cross-pollination. If you want to be near certain to avoid crossing, separate different varieties for seed saving by at least 5 yards. You can separate varieties in time, too, by separating their sowing time by a few weeks. The biggest problem with saving lettuce seed here is our weather, it can often be wet at the time the seed would be maturing resulting in soggy, useless, seed heads; lettuce flowers are rather like tiny dandelion flowers and their seed heads don't like the

wet, their seed is ripe 2 to 3 weeks after flowering. Growing lettuce for seed in a greenhouse works well, about 4 plants is sufficient. It's particularly important to avoid saving seed from the first plants to start bolting - eat them - and save seed from the plants that stand longest.

Peas are nearly as unlikely to cross-pollinate as lettuce, varieties should remain pure even when grown and flowering together. If you want to be certain of purity you could separate different varieties which flower simultaneously by 20 yards. If you grow one each of early, mid-season and late season peas their flowering should be isolated in time so you won't need to bother about separating them in space. Seed is sufficiently ripe when the pods become papery and dry.

Dwarf french beans, climbing beans and runner beans are all treated the same way. Crossing does happen, particularly between runner bean varieties, but is fairly infrequent. Where crossing occurs between similar varieties the result is often as good as the parents. If you want to ensure varietal purity about 10 yards separation should be sufficient for french bean varieties, 500 yards for runners. The big problem here is ripening the seed. It takes 6 to 8 weeks longer than producing edible pods. If we have a decent summer and an 'Indian summer' without frost (these beans hate frost) lasting into October then you have a sporting chance. If you have well filled but not fully ripe pods by the time frost threatens you can pull the whole plant up and hang somewhere light, frost-free and airy to hopefully complete the ripening and drying process.

Broad beans are, unlike the other beans above, very promiscuous - different varieties do cross readily and with field beans which are occasionally grown as a fodder crop. You'll need to cage them if other broad or field beans are simultaneously flowering nearby and you want to ensure purity. The charcoal flowered broad bean above is a single plant which grew in 2012, believed to be a cross between Witkiem Manita and Crimson Flowered varieties. Pods turn a dark chocolate brown when fully ripe but you can cut the plants and hang them to finish maturing once the pod walls have started to dry and thin.



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Peppers and chillies do cross-pollinate easily, *"charcoal flowered" broad bean!* so you can get unpredictable and interesting results if you don't isolate them. Bagging or caging is needed to ensure purity if you grow more than one variety of these in close proximity. Let the fruit mature as much as you can - ideally till it starts to wrinkle - open, scrape out the seeds and dry them.

Tomatoes are a mixture for cross-pollination, some are virtually immune from cross-pollination but some can cross-pollinate; which is determined by the physical structure of the flower. Those varieties susceptible to cross-pollination have a stigma which protrudes from the flower. The others have a stigma which is enclosed tightly by stamens so the flower is self-pollinated. There's no hard and fast rule - you'll need to examine the flowers of each variety - but older varieties, large beefsteak types, very small fruited types and potato leaved varieties are thought generally more likely to cross pollinate. Since the flowers are self-fertile you can happily bag or cage plants if you need to avoid crossing, or separating varieties by about 30 yards is sufficient. Beware hybrids, many modern varieties are, you will very likely get very poor results from their seed. Cleaning the seed / removing the gel is covered earlier.

## Cabbage Family (Brassicacae)

This large and important group of vegetables falls into distinct sets which readily cross-pollinate within their set but not outwith their set. Knowing which set your seed plants are in is the first problem with brassicas, their Latin names are a good guide to which they belong.

*Brassica oleracea*: kale (most types, including Red Russian / Ragged Jack), cabbage, cauliflower, kohlrabi, calabrese, broccoli (all types), brussels sprouts.

*Brassica rapa* (sometimes named *Brassica campestris*): turnip, chinese cabbage, mizuna, pak choi, tatsoi, mibuna, chinese and japanese mustards, winter fodder turnips.

*Brassica napus*: swede - including some grown as a winter fodder crop, oil seed rape, siberian kale.

*Raphanus sativus*: all kinds of radish.

*Eruca sativa*: rocket.

*Lepidium sativum*: garden cress.

*Brassica juncea*: Indian mustard, mustard greens, some of the green manure mustards are this.

*Brassica hirta* (aka *Sinapis alba*): white mustards, many of the green manure mustards are this.

*Brassica nigra*: black mustard, the kind used for producing mustard powder and paste.

The winter fodder crops will likely have been eaten before they flower so shouldn't be a problem for cross-pollination; oil seed rape within a half mile can be a problem for swede. Many brassicas are "self-incompatible" and require pollen from another plant to produce seed; also nearly all require insects for pollination. This combination is awkward, if you cage to exclude outside insects the flowers won't get well pollinated unless you do it by hand. Isolation and successful pollination is problem two!

Apart from summer radish, the salad leaf types and some broccoli which can be annuals, most are biennial. After overwintering they tend to flower about May in these parts. Problem three is keeping the plants alive over winter.

These difficulties may seem daunting but, with a little forethought, you should be able to save seed from five or six brassica types quite easily in a single season in the same garden. Choose just one or two of your overwintering *Brassica oleracea* vegetables - because of pollination issues - then transplant in March with a good rootball the best 6 to 12 plants of each type into a closely spaced, about 12 to 24" between plants, rectangular block (at opposite ends of the garden if doing two types), let them flower and collect the seed from around midsummer. If doing two types you could use alternate day caging using a fine mesh to help ensure purity but you should get good results without.

Turnip and swede usually survive winter pretty well, protecting with straw or fleece helps. They don't cross-pollinate with each other or with *Brassica oleracea* types so you can safely grow one of each for seed. Transplant the mature roots in March into blocks, turnips can be closer spaced and, since they produce less seed, it's good to grow a few more for seed.

Biennial brassicas which are not so winter hardy, like summer cabbages, cauliflowers, broccolis, can be efficiently grown specifically for seed rather than food crops. Sow around mid-July and keep protected in polytunnel, greenhouse or cool indoors over winter to plant out in mid-March. They'll flower on schedule but won't produce as much seed as bigger plants would. An alternative is to lift mature spring sown plants to be used for seed around

end November, store, and re-plant as soon as possible in early spring. To store them for about 3 months you need to lift a decent rootball with the plants, about 12" across and deep, and store between 0 and 5°C at about 80% humidity - a root cellar is ideal, they don't need light.

The annual brassicas are straightforward, just let them flower and go to seed. If you want to keep strains pure just grow one variety of each to flower at one time. You could easily save seed from two different varieties each of rocket and radish in one season. Growing multiple varieties of radish and rocket which flower simultaneously produces useful seed and is only a problem if you want to keep varieties pure.

The annual oriental salad brassicas (mizuna, pak choi, mibuna, mustards) seem to be surprisingly simple. I've had good results - no noticeable crossing - with several types flowering at the same time, even saved seed from a mixed oriental salad of about 6 types and got similar results from the saved seed as the original.

When growing brassicas for seed it's important to pull up or pinch out any flower heads of other brassicas you don't want to cross-pollinate with your seed plants before they flower. This can be a problem on allotments.

Most brassica seed pods are similar, spitting easily to shed their round seed when ripe. Threshing and rubbing between your hands in a bucket extracts the seed easily. Radish is the exception, their seed pods are more corky and robust and you'll probably need to use your fingernails on them.

### **Onion Family (Alliums)**

This includes leeks, garlic, chives as well as onions. Each will cross with its own vegetable type but not with the others. If growing more than one variety of a type for seed you ideally need more than a half mile separation or use alternate day caging. They are insect pollinated. Chives and garlic are best propagated vegetatively, splitting clumps of chives and replanting individual cloves of garlic. You can save their seed but the results tend to be variable and it takes about three years to get a usable crop.

Mature onions easily store over winter in a cool, dry place and can be replanted in spring to flower around midsummer. Keep a close eye on the developing seed heads because they can shed their black seed rapidly when ripe, pick each head when it is ready and hang up indoors to shed its seed. If your original crop was grown from sets try to make sure it was not a hybrid.

Leeks are similar but the flowers and mature seeds are later, slower to ripen and harder to extract. You'll need to cut off the seed heads in October and hang them somewhere to dry for a month or so before vigorously rubbing between your hands to extract the seed. The plants can be left to overwinter where grown as a food crop then the best remaining plants transplanted to a block by early April to produce seed, they'll be there until autumn.

### **Carrot, Celery, Celeriac, Parsnip and other roots**

These all need two seasons to produce seed and are insect pollinated.

Carrot varieties cross with each other and with wild carrot (Queen Anne's Lace). If you grow two varieties for seed try to separate by half a mile or use alternate day caging. Contamination with wild carrot pollen will cause some of your seed to produce small and useless white roots but normally this is an insignificant problem and you wouldn't use those progeny to produce future seed. Also carrots are prone to inbreeding depression if the seeding population is too low. The answer to both these potential problems is to grow a few more carrots for seed, try to grow at least 20, ideally 40. They flower July to



September and the seed sometimes has difficulty ripening here before the weather turns. The seed is ripe once it turns from green to pale brown, rub seed heads between hands to separate the seeds and rub off the little seed spikes.

Parsnip varieties cross with each other and with wild parsnip but the latter rarely causes problems here. Parsnip is actually one of the easiest vegetables to grow for seed and I do one variety every year, just transplant a dozen roots in spring and their tall, often over 4', flower spikes will produce seed in August. The seeds are produced in pairs on each flowerlet, a good indicator of a flowerhead being ripe is the first sign of these pairs starting to split apart. Parsnips produce a lot of seed, you can get a pint from about 8 plants. Unfortunately the seed only remains viable for 2 to 3 seasons; the perfect solution would be for a handful of people growing at least half a mile apart to produce a different variety each and share the proceeds.



*Ripe parsnip seed heads*

All celery and celeriac cross with each other and with wild celery (rarely a problem) so it's best to grow only one variety for seed in one place / season, or else separate by a half mile or use alternate day caging. I have grown both vegetables for seed close together and there was clearly a lot of crossing resulting in a high proportion of useless plants. Celeriac should survive winter well enough with a straw mulch. Celery is less hardy, particularly the selfblanching varieties, you can earth it up (slugs will thank you for their new winter palaces), or lift and store somewhere very cool and humid for replanting about the beginning of April once the worst frosts are over.

Salsify and scorzonera are easy to grow for seed, they don't cross with each other or any other vegetables, only with varieties of their type - there aren't many of those and what there are tend to be very similar. Both produce tall and pretty flower spikes, salsify's are blue, scorzonera's are yellow and daisy like. Salsify is easy enough to relocate in spring but scorzonera's deep roots are hard to extract and replant intact so I've just left about 8 plants to flower where originally grown. They survive winter well in the ground.

Hamburg parsley is related to parsley but the once I've saved its seed with leaf parsley growing nearby I didn't detect any obvious crossing, and it doesn't cross with any other vegetables. For cultivation treat as parsnip but the seeds mature later - September / October.

## **Cucurbits**

Courgettes, marrows, pumpkins and squashes; melons; cucumbers and gerkins.

These are insect pollinated and will cross within their species but not without. Progeny from crosses are generally inferior and often useless as crops. Since common names are not always a good indicator of species I'll have to resort to Latin nomenclature and you'll need to use it to determine the likelihood of cross-pollination, I've simplified a little to avoid giving you pages of varieties most of which you'll never encounter.

*Cucurbita pepo*: nearly all marrows, all courgettes, most acorn squashes, crookneck squashes, all scallop squashes, most pumpkins, some gourds.

*Cucurbita moschata*: butternut squashes, cheese squashes, some other squashes and a few pumpkins.

*Cucurbita maxima*: buttercup squashes, hubbard squashes, banana squashes, a very few marrows, turban squashes, Uchiki Kuri, Marina di Choggia.

Amongst the squashes you may also rarely encounter *Cucurbita mixta*, *Cucurbita ficifolia*, *Cucurbita foetidissima* - same rules apply: they cross within but not outwith the species.

*Citrullus lanatus*: watermelon.

*Cucumis melo*: nearly all other melons.

*Cucumis sativus*: (nearly) all cucumbers and gerkins.

If there is another variety of the same species growing within an open half mile (much less if there are barriers) you should probably resort to bagging and hand pollination. The objective is to ensure only pollen from a male flower of the same variety fertilises a female flower. You can use a male flower from the same plant as the female (known as "selfing") or from a different plant of the same variety ("sibling"). Sibling tends to increase genetic diversity, selfing is used when trying to select specific characteristics and to reduce variability. It's beneficial to use more than one male flower on each female, and each male can be used on a couple of females, but it's a good idea to use at least one fresh male on each female.

First you need to identify the male and female flowers. Male are usually borne on longer, thinner stalks; female are usually borne on a detectable immature fruit. For most species, particularly those with larger flowers, this is quite easy to see. Then you need to catch the flowers before they open, once they have insects may have pollinated them already. Examination at least daily, best in evening, is needed; ideally twice daily, morning and evening. Having spotted the about to open flowers you need to stop them opening using something like a plant tie, clothes peg, masking tape, elastic band or bag sealed round the flower stem. It doesn't matter if the male flower is damaged as it will be discarded after pollination, but the female flower will need to be resealed again so avoid damaging it too much. About twelve hours after first sealing the flowers it's time to do it. Prepare your males: pick them from the plants with a few inches of flower stalk if possible, carefully unseal and tear off the petals, take them to a female, and ready materials to reseat the female. Very carefully unseat the female, gently rub the male pollen onto the receptive part of the female's stigma then quickly and carefully reseat the female flower, you don't want insects getting in. The female flower needs to remain sealed for about 4 days after

pollination, and you should mark each manually fertilised fruit so you know which are being saved for seed - coloured ribbons or tape are useful for this.



*Manual pollination of a courgette flower, the insect shouldn't be there!*

A few other problems... Ideally you should save seed from a minimum of six different plants. The fruit need to be left on the plant to mature fully and then stored (removed from the plant) for a further 20 days for the seeds to develop further (less important for cucumbers but still well beyond the edible stage). You need to have sufficient time before the first frosts for the fruit to mature, so pollination early in the season is advisable. Maturing fruit suppress subsequent fruit's growth on the same plant. The seedless ("parthenocarpic") / all female greenhouse cucumbers won't produce seed. Some seeds have gelatinous coats - remove by fermentation, described earlier; all the seeds benefit from a good wash before drying as there can be germination inhibitors. Avoid drying seed in direct bright sunlight or at temperatures above 35°C. Good luck!

### **Beetroot, Chard and Spinach**

Beetroot, swiss chard, mangelwurz, sugar beet and perpetual spinach are all *Beta vulgaris* and will cross-pollinate. They are biennial and can be overwintered here given protection with straw or fleece. It's advisable to save only one variety of this group in a season. The flower spikes tend to be tall and sprawling; support is usually needed to avoid



the seed, which is produced in small clusters along the stems, from rotting or germinating on the ground. The seeds tend to mature from the bottom of the plant first, turning brown and corky. You can pick the early ripening seed in situ and later cut the whole plant down to hang up and dry then strip off the main crop of seeds.

Annual spinach (*Spinacia oleracea*) varieties don't cross with the above.

The big problem with all these is their light, fine pollen. They are wind pollinated and the pollen is carried for miles. If you suspect there are any flowering that will cross-pollinate within 5 miles it would be wise to cage the plants using fleece - fine mesh is no good as it lets the pollen through. Most annual spinach plants are either male or female, but some are both. If yours doesn't have hermaphrodite plants you should aim for a ratio of 2 female to 1 male and a population of at least 6 plants in total; if you grow about 20 plants you don't need to worry about the male / female ratio.

### **Chicory, Radicchio and Endive**

All chicories and radicchio are *Chicorium intybus*, out-breeding, and can be cross-pollinated by insects. Endive is *Chicorium endivia* and is self-pollinating. *C. intybus* can be pollinated by *C. endivia* if grown in close proximity but not vice versa. It's probably wise to only grow one variety of chicory / radicchio for seed in one season, use alternate day caging or separate by half a mile if more; and, if you are also growing endive for seed, separate it from the chicories by at least 10 yards. Chicory seeds are clumps of stubby cylinders inside the base of the flowers and are a bit of a pain to extract and split up.

Most are biennials and reasonably winter hardy; the less hardy ones can be lifted and stored as roots, trimming all but 1 to 2" of leaf, they transplant easily enough.

### **Herbs**

Many herbs are relatively easy to save seed from. Generally they will cross within their own species but not outwith, and if you do save seed from multiple varieties of one species their crosses are usually reasonably good. Here are some brief notes:

Parsley is biennial, usually overwinters well and is easy for seed saving but the seed often doesn't mature until around October here.

Garden sorrel is perennial and very easy. It also propagates vegetatively forming clumps which can be split.

Sage is perennial, the largish round seeds form in small clumps inside the base of the flower, ripening from the bottom of the plant upwards from about late July through September. They tend to fall out as soon as they turn brown and ripen so successive collection by regularly picking the nearly ripened flower husks is the best way. Sage is also easy to propagate from cuttings.

Basil is usually treated as an annual here but some can be perennial given a warm winter home. There are many varieties and they do cross quite readily, about 50 yards separation between varieties is necessary for purity in open situations. As it needs fairly hot temperatures to flourish and insects to pollinate, it's quite difficult to produce good seed here. Like sage it matures from the base of the flower spikes but the seed doesn't drop out easily and takes some effort and care to extract and clean.

Dill is an annual that quickly goes to seed and doesn't cross with anything else. Saving is easy provided you sow no later than May to allow the seed to mature in a poor summer.

Fennel, *Foeniculum vulgare*, has three forms: Florence fennel grown as a vegetable for its bulbous stem base; herb fennel grown for its leaves and seeds; Sicilian fennel grown to be

used like celery. They can be annual, biennial or perennial, and all forms can cross-pollinate via insects. Isolation of a half mile or caging is recommended if growing two varieties that will flower. Bolting is a problem with Florence fennel. Sowing in the second half of May seems about best for most varieties here, the bulbs can then get to a usable size by about mid September when they will probably start to bolt. Of course, then there will be insufficient time for seed to mature before winter unless you are growing in a polytunnel. If you have some plants which don't bolt you could mulch or lift and store like celery to obtain seeds in their second season. If you have a few perennial herb fennel, saving its seed which is mature by about September is very easy.

Coriander / cilantro doesn't cross with anything else, is a very brief annual and quickly goes to seed. There don't seem to be any widely recognised different varieties but seed from different sources definitely varies in ability to produce a decent amount of leaf before bolting. Once you find one or two strains that do work well for leaf production I suggest you restrict yourself to them, rogue out any that bolt early and save your own seed, it's extremely easy.

Fenugreek, whose seeds are used in Indian cooking, grows well in a polytunnel and will produce a fair crop outdoors in most summers. It's like a very small bean held in long, thin pods.

Angelica is an impressive biennial plant a bit like a giant hogweed in its second season. The seed doesn't keep well so should be sown within a year in either autumn or spring. I've collected seed from a solitary plant and it has performed well.

Oregano / marjoram has many varieties and they can cross. Saving its very tiny seed is fairly easy: pick and dry the dead flower heads, rub them to separate the seed and very carefully shake and blow to remove the detritus.

Thyme is very similar to oregano for seed saving but the seed is even tinier so harder to collect. You can also propagate thyme and oregano by 'layering'.

Rosemary is best propagated from cuttings; mint by root division; horseradish by root 'thongs' about the 6" long and the thickness of a pencil.

## **Flowers**

Wild flowers and herbs are a great source of seed if you happen on them at the right time. Saving seed from many garden flowers is easy but beware hybrids. These usually work well: sweet pea, poppy, calendula, marigold, tagetes, wallflower, forget-me-not, lupin, antirrhinum, cornflower, echinacea, foxglove, cornflower; but try anything, you're more likely to have success than failure.

## **Other sources of information**

There is less useful information available online and in print than you might think.

The International Seed Saving Institute (USA based) has a fairly good online vegetable seed saving guide:

[http://www.seedsave.org/issi/issi\\_904.html](http://www.seedsave.org/issi/issi_904.html)

The US Seed Savers Exchange has information for individual vegetables followed by an alphabetically organised set of herb and flower seed saving instructions:

<http://www.seedsavers.org/instructions.htm>

The Real Seed Catalogue, based in Wales, have a good page on saving vegetable seed:

<http://www.realseeds.co.uk/seedsavinginfo.html>

Locally there is the Highland People's Food Seedbank Project where seeds are being gathered from a wide variety of sources and stored in freezers to ensure seed supply for future years.

Contact:- Chris Scatchard, The Highland People's Food Seedbank Project,  
35 Telford Road, Inverness, Scotland, IV3 8JA – tel 01463 729277 or email  
highlandseedproject@hotmail.co.uk

## **Suggested books**

"Seed to Seed" by Suzanne Ashworth, very good, detailed and comprehensive reference but American.

"Back Garden Seed Saving" by Sue Strickland, quite good, British.

"Saving Seeds" by Marc Rogers, quite good, American.