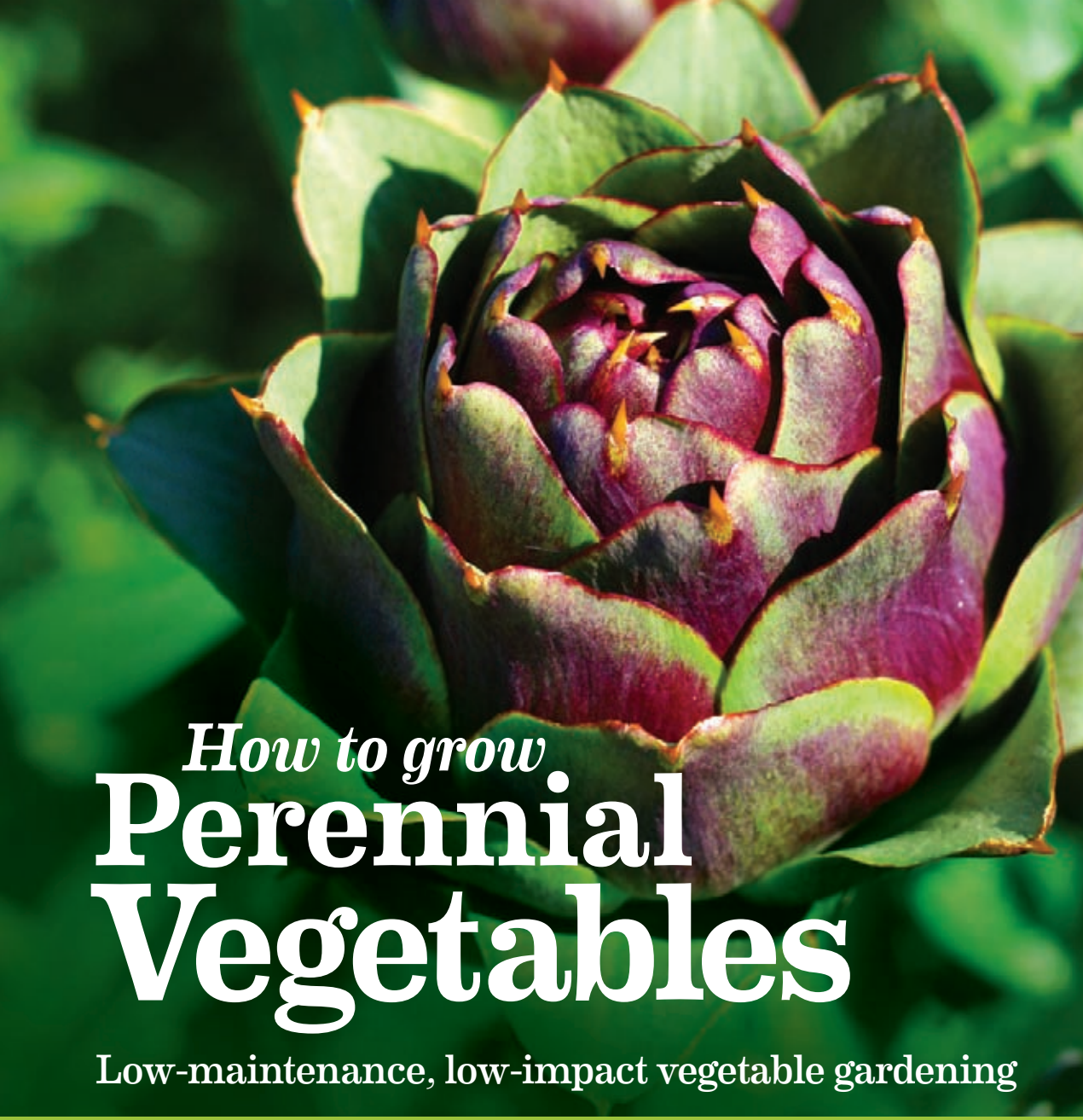

How to grow

Perennial Vegetables

Low-maintenance, low-impact vegetable gardening

Martin Crawford

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Disclaimer: Many things we eat as a matter of course – potatoes, beans, rhubarb, sorrel (to name but a few) – are all toxic to some degree if not eaten in the right way, at the right time and with the right preparation. At the time of going to press, the advice and information in this book are believed to be true and accurate, and if plants are eaten according to the guidance given here, they are safe. However, someone, somewhere, is allergic to almost anything, so if you are trying completely new plants to eat, try them in moderation to begin with. The author and publishers accept no liability for actions inspired by this book.

Page 2 image: sea kale

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"Martin is a true pioneer and his work deserves respect and celebration."
Permaculture magazine

"Martin Crawford has spent 15 years creating what is almost certainly the best forest garden in the temperate world. He's also a remarkable researcher of information on plants and their ecology, and the breadth of his knowledge matches the depth of his experience."
Patrick Whitefield, author of *Permaculture in a Nutshell*

"Martin Crawford is a frontiersman, a pioneering teacher and an inspiration. Both his work and his garden are national treasures."
Chris Nichols, Director of the Ashridge MSc in Sustainability and Responsibility

"There can be nothing, absolutely nothing, more important to the future of humankind and of our fellow creatures than agroforestry: raising trees, crops and livestock in productive and sustainable harmony. People worldwide have known this for millennia, but we in the West, as is our way, have put agriculture in one camp, forestry in another, and wildlife conservation in a third – and engineered a turf war between the three. Martin Crawford is among the few brave souls who have stood out against the Western trend."
Colin Tudge, author of *The Secret Life of Trees* and *Consider the Birds*

To Rosie and Tom, with love.

Acknowledgements

It seems appropriate to thank a few people who, over the years, have guided and nudged me in various ways and without whom I may have ended up doing something quite different. So thanks to John Dalby, Ben Foley and Pam and Nick Rodway.

Thanks to Marion for her great drawings and calm enthusiasm.

Thanks to the folks at Green Books for turning my text into a magnificent-looking book.

My greatest thanks, as ever, are due to Sandra, for her constant encouragement and sense of humour.

Foreword

Even the most enthusiastic of us vegetable growers tend to be a bit set in our ways – hidebound by tradition and convention; drawing on decades of well-hoed wisdom. We might be converts to raised beds and no-dig systems, but rarely do we question or seek to expand the range of proven veg crops that has served so many generations for so long. For some, even growing things like bulb fennel or rocket seems a bit racy!

This lovely book makes it clear that we are not just missing a trick, we are missing a feast. As one who loves to forage, and not just for berries and nuts but also for shoots, stems and leaves, I find the case argued here particularly compelling. Almost by definition, wild plants that yield edible crops are perennials – including irresistible seasonal favourites like nettles, sorrel, alexanders and elderflowers.

To me, growing perennial vegetables is the perfect fusion of foraging and gardening – because you are growing low-maintenance plants that more or less take care of themselves, and offer up their edible harvest year after year. You are basically planting plants that you can then 'forage' for just a few steps from your own back door.

If that makes sense to you in principle, then Martin's expert advice in the pages that follow will help you turn a great idea into a growing reality. And you will reap the rewards for many years to come.

Hugh Fearnley-Whittingstall
River Cottage, East Devon, April 2012

Introduction

We in Europe or North America are not very used to growing or eating many perennial vegetables. There are a few that most people know – globe artichoke and rhubarb probably being the most familiar – and some, like potatoes, are grown as replant perennials (see page 21). However, the way agriculture has developed, into an almost entirely short-lived-plant-based and mechanised method of growing vegetables and grains, means that perennials have been somewhat left behind.

Why should this be? Perhaps it is partly because the soil is easily tilled between annual crops to keep it weed-free. With perennials, once they are established then mechanical or chemical weeding is not usually quite so easy.

Another factor is yield. Most short-lived vegetables are either killed when they are first harvested or are exhausted at the end of the growing season by regular harvesting. They have short lives and have to grow fast.

Poke root – a North American wild edible that is easy to grow. The cooked shoots are delicious.

Perennials, on the other hand, are usually harvested in a sustainable manner, allowing the plant to continue its growth, so yields can often be less per unit area than those of annual crops.

But things are changing. More and more people are starting to understand that measuring the success of a growing system only in yield or output gives only part of the story. What about carbon emissions? You'll find that tilling the soil annually is one of the worst offenders in agriculture. What about inputs of chemicals? Increasingly, people are unhappy with food grown using chemicals. What about human health? We are what we eat, and you'll find that foods from perennial plants almost always contain far more nutrients than those from short-lived plants (see pages 16-17). What about ecosystem health? The growing systems used for perennial plants disturb the environment much less than annual tillage.

What's more, you don't always have to go far to discover perennial vegetables. Lots of those mentioned in this book grow wild in forests and hedgerows. But why delineate between the wild and the cultivated? You can grow perennial vegetable plants in your own garden in a number of ways and turn harvesting times into an enjoyable forage!

Key to plant descriptions

Under each plant in Part 2 of this book is a symbol indicating which part(s) of the plant are edible (see box). Also given is the hardiness zone.

Edible parts symbols

Hardiness zones

This American system of numbering climate zones has been applied to Europe and other parts of the world with varying success. The zone number given for a plant is an indication of the minimum average winter temperatures that a plant can tolerate – hence a plant hardy to zone 7 (say) can tolerate a minimum temperature of -18°C (0°F).

In the UK the system does not work quite so well, because here the cooler summers must also be taken into account – sometimes after a poor summer, new growth is either insufficient or does not harden off, which can also affect plant survival over winter. A new system of hardiness rating is being created by the Royal Horticultural Society (RHS), which should be better for the British climate, but meanwhile the zone system is still of use.

Most of the UK is classed as zone 8, with upland areas zone 7 and areas adjacent to coasts, especially in the south, as zone 9. But the microclimate you create in your garden can move your hardiness zone rating one higher – so if in theory you are in a zone 8 area, in a well-sheltered garden you may be able to grow zone 9 species. Another complication is that the hardiness of a species may vary according to its origins, with provenances further north leading to hardier plants.

Remember that minimum air temperatures are not the same as minimum soil temperatures – so a zone 8 plant, for example, is likely to tolerate soil temperatures down to only about -5°C (23°F).

Hardiness zone maps for Europe and North America can be found at: http://en.wikipedia.org/wiki/Hardiness_zone.

The zone system of plant hardiness

Zone number	Average min temp (°C)	Average min temp (°F)
1	Below -46	Below -50
2	-46 to -40	-50 to -40
3	-40 to -34	-40 to -30
4	-34 to -29	-30 to -20
5	-29 to -23	-20 to -10
6	-23 to -18	-10 to 0
7	-18 to -12	0 to 10
8	-12 to -7	10 to 20
9	-7 to -1	20 to 30

Metric and imperial values

Values throughout this book are given in metric, with imperial conversions for lengths, weights and temperature. Other metric-to-imperial conversions are as follows

$1m^2$ = 1.2 sq yards
1 hectare = 2.5 acres
1 litre = 1.75 pints (UK); 2.1 pints (USA)
100 litres = 22 gallons (UK); 26 gallons (USA)

Saltbush – a Mediterranean shrub with superb salty leaves.

Part 1

An introduction to perennial vegetables

Chapter 1

Why grow perennial vegetables?

Most gardeners who want to grow some of their own food have a combination of annual vegetables and fruit bushes and/or trees, but few have perennial vegetables (apart from, perhaps, rhubarb). This seems such a shame, because there are some fantastic food plants out there with delicious flavours that are often very easy to grow.

Oca is a crop widely grown in the Andes, with delicious lemon-flavoured tubers.

What is a perennial vegetable?

For the purposes of this book, a perennial vegetable is defined as a plant that lives for at least three years, and is raised for some edible part of it – such as the leaves, shoots, leaf stems, roots or flowers. The edible part might be used raw or cooked. The plant must also be capable of being harvested without killing the plant itself. You'll also find some well-known fruiting plants included here as a vegetable – strawberries, for example. These are included only if a part other than the fruit can also be eaten.

There is a distinction, rather blurry, between a vegetable and a herb. A herb (in the culinary sense) is a plant with a strong, distinctive taste, used as a flavouring in relatively small amounts. So I have not included, say, lovage as a perennial vegetable, even though it is perennial, and is edible. However, I do include some plants that we often think of as herbs if they can be used in bulk amounts in salads or cooked dishes – so you will find entries for some of the mints, and for sweet cicely.

In the context of this book, I am talking about plants being perennials in the climatic conditions found in the temperate and continental climates of Europe and North America. Some annuals of course become perennials if the climate is warm enough, and these are not usually included unless, like runner beans, they can be grown as a replant perennial (i.e. a plant that is perennial in a warm climate but in a cold climate can still be grown by lifting plant parts in autumn, storing them over winter and replanting in spring).

Also in this book are some replant perennials such as potatoes and mashua, where it is common practice to save some of the tubers in the autumn for replanting next year.

The case for growing perennials

There are lots of reasons why growing perennial vegetables makes sense.

Less work

You don't have to cultivate the soil every year. Turning the soil over takes a lot of energy, whether it is tractor energy in ploughing or human energy in digging. Because perennials are planted only once (or once every few years), you do not have to disturb the soil so often.

If you stop turning the soil, and keep on top of the flush of weeds you'll get from the initial soil preparation, then the weed seed bank in the top layer of the soil will not get replenished with deeper dormant seeds. You'll find that the weeding required decreases over time, especially if you mulch around your perennials.

Because most perennials do not need digging up every year, it is more important to weed out pestiferous perennial weeds when small. (When growing annual crops, the weeds can always be dug out in winter.) Nevertheless, even in the first year after planting, the weeding demanded should not be any greater than that for an annual crop.

Fewer carbon emissions

A few years ago, nobody considered what carbon emissions were resulting from agriculture and horticulture, but that is changing rapidly. Growing food and other materials creates a lot of carbon in the

atmosphere, not least because almost all crops are short-lived, requiring the energy-intensive cultivating of soil every year. Cultivating the soil exposes soil organic matter (humus) to air both on the soil surface and in the soil itself, leading to release of carbon in the form of carbon dioxide.

Once you stop digging soil, carbon emissions are vastly reduced, and quite possibly reversed – you may start to actually store more carbon in the soil. This is because certain fungi (mycorrhizal fungi – see page 42) are critical in storing carbon in soils, and soil cultivation kills them.

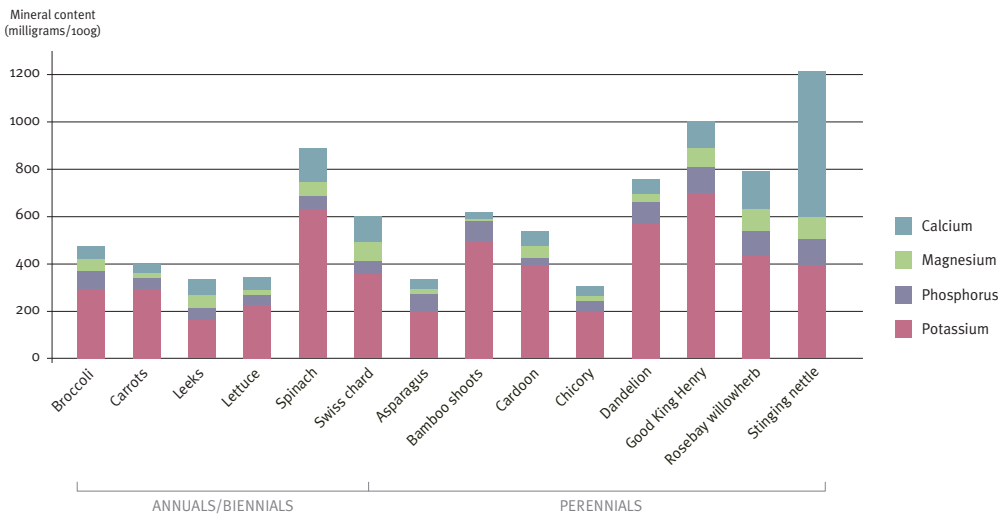
Better for the soil

When you stop digging the soil and grow perennial crops that cover and protect the soil, the soil structure is maintained, which in turn helps everything growing in it. Soil humus levels build up, nutrients don't wash out so easily, and water is retained in drought, yet drains in very wet weather.

If you think about it, annual plants are not very widespread in the natural world. They appear whenever soil is disturbed by animals, plants falling over, and so on. But they persist for only a year or two before they are succeeded by perennial plants. In nature, most plants are perennial, and in basing our whole civilisation on short-lived plants we may have been down a productive but nevertheless destructive cul-de-sac.

Healthier food

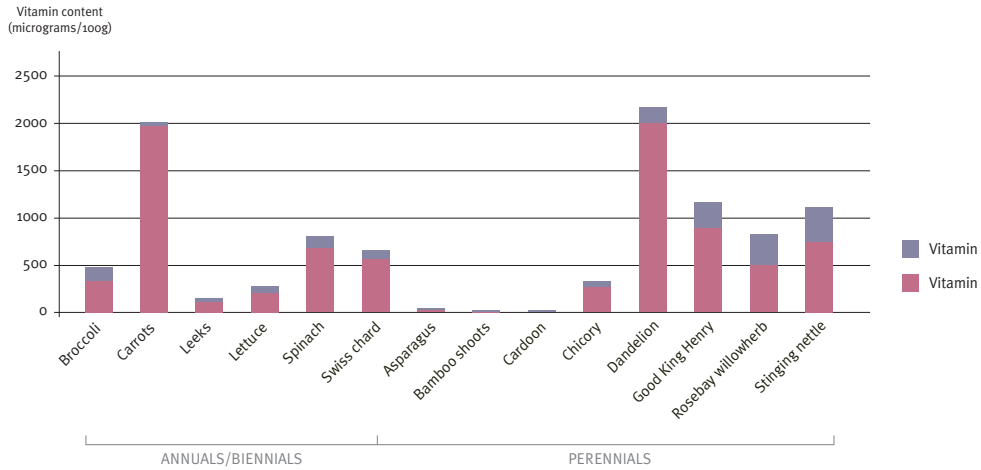
Most perennial plants contain higher levels of mineral nutrients than the common short-lived plants grown as vegetables, which is not surprising really, considering that they have larger and permanent root systems, able to exploit soil space more effectively and thus take up more nutrients.



Mineral content of some common annual/biennial and perennial vegetables.

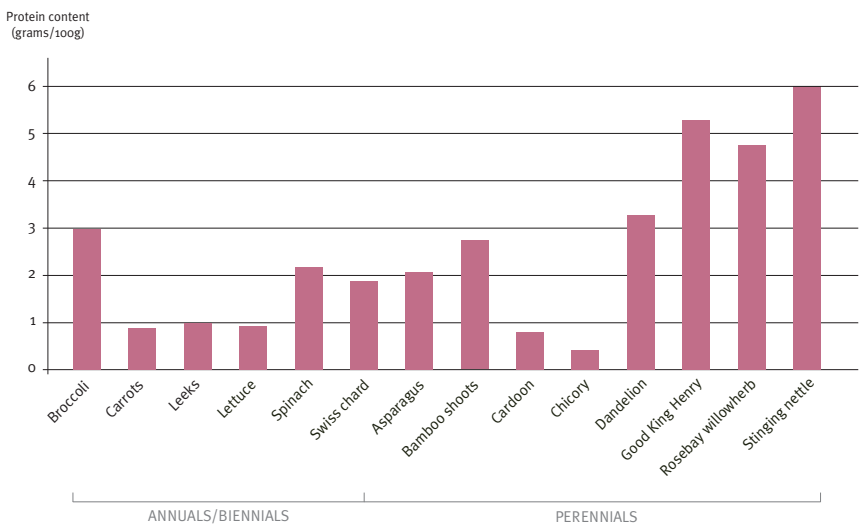
Data for the charts on these two pages comes from the USDA National Nutrient Database for Standard Reference at http://www.ars.usda.gov/ba/bhnrc/ndl and from *Cooking Weeds* by V. Weise.

Vitamin levels in perennial vegetables are more variable, but can certainly be as high or higher than those in short-lived vegetables, even those known for high vitamin levels.



Vitamin content of some common annual/biennial and perennial vegetables.

Protein levels in green vegetables can be high, and the protein content of perennial vegetables is frequently higher than that of annuals and biennials.



Protein content of some common annual/biennial and perennial vegetables.

Extension of the harvesting season

Short-lived crops are distinctly seasonal. How seasonal depends on your climate, mainly on how cold the winter is. But there is nearly always a gap in annual production – the 'hungry gap' between April and June, when overwintering annuals have been harvested but newly sown crops are not yet ready.

Cropping of perennial vegetables is more evenly distributed over the year. Perhaps the most useful time for perennial vegetables is spring, as there are plenty of perennials in which the edible crop is the young shoots that emerge in April, May or even June – for example, Solomon's seals – from a perennial rootstock. There are also various perennial leaf vegetables that leaf out in the same period – for example, lime trees – which can begin to be harvested.

Other good reasons

You may well already have beds of perennials growing in your garden for ornament, for attracting bees or for fragrance. Why not have perennial beds with the same functions, but where the plants also have edible virtues? Some of the plants featured in this book, such as Solomon's seals and hostas, may already feature in your ornamental beds.

Perennial vegetables tend to be of more value to bees, other pollinating insects and beneficial insects in general; most are allowed to flower, whereas most annual vegetables are not. If you grow annual vegetables as well, you might well find that you get fewer pest problems on these because of the perennials nearby – you can even deliberately interplant annuals and perennials in various ways (see Chapter 2, page 26, for more on planting mixtures).

Chapter 2

Growing perennial vegetables

In normal gardening lingo, 'perennial' is usually used to describe a low-growing herbaceous or evergreen non-woody perennial plant. However, this book takes a much wider perspective. For example, trees and shrubs are also perennials, and in fact there are many nice edible leaves from them – lime leaves, saltbush leaves and mulberry leaves, to name but three.

Aquatic perennial plants are also included here, as are some bulbs, and one fern.

Good King Henry – a hardy perennial spinach-type plant.

Types of perennial plant

This book describes plants of the following types.

Trees

A number of trees have edible parts that may be used as a vegetable, one example being the snowbell tree. A tree like this, which is grown for the young fruits, is not usually coppiced (see below) as this would cut off the fruiting wood.

Shrubs

Likewise, a number of shrubs provide vegetables. One is the American elder, whose flowers can be fried as a fine vegetable. I include bamboos – one of the finest of the spring vegetables – in shrubs, even though they are strictly speaking perennial grasses.

Coppiced trees

Trees that provide a leaf vegetable are often coppiced – cut off low down so they will produce vigorous new shoots the next year – to maintain them as more of a compact bush and so make leaf harvesting easier and more practical. The branchwood from coppicing may also be of use for firewood or for growing mushrooms on. The coppice cycle can be anything from one to five or more years, depending on the vigour of the tree and the desired size. I coppice large-leaved lime annually, and small-leaved lime every three to five years, and use the young leaves widely as a salad vegetable.

Herbaceous and evergreen perennials

Most of the plants described in these pages fall into this category, which gardeners often call simply 'perennials'. Herbaceous perennials – for example, asparagus – die down to underground roots, rhizomes or tubers in the winter. Evergreen perennials – for example, globe artichoke – retain some or all of their leaves over winter. Some perennials do not fit so neatly into these categories: for example, many mallows retain a rosette of green leaves over the winter in milder areas but may not do so in colder areas. From here on, herbaceous and evergreen perennials will be referred to as 'non-woody perennials'.

Perennial bulbs

The alliums are good examples of perennial bulbs, and there are several described here. The top growth of bulbous plants usually dies back for a part of the year – though not necessarily winter. So, for example, Babington's leek dies back to a bulb from late July to early September, whereas ramsons dies back from late June to February. The bulbs that die back for part of the summer usually prefer well-drained sunny sites and can be particularly useful for a supply of leaves in winter.

Perennial ferns

Well, 'fern', actually – there is only one mentioned in this book, ostrich fern, whose young 'fiddleheads' are a well-known wild edible in North America and Scandinavia. Other ferns – for example, bracken – have been eaten in the past but are no longer considered safe to eat.

Climbers

There are both climbing herbaceous perennials (e.g. hops) and climbing shrubs (e.g. grape vines) that can be used as

vegetables. These plants can be grown in many ways, from bushy plants kept small by harvesting to climbers covering walls, fences, trees and so on.

Aquatic perennials

These are plants growing in water, usually dying back to bulbs or rhizomes for the winter. An example is American arrowhead or duck potato, which forms tubers that can be cooked in various ways.

Replant perennials

This term refers to plants that are perennial in warm climates and sometimes mild temperate climates, usually producing tubers or rhizomes, but are not hardy enough to survive winters in colder temperate climates. I have included some of these, even though they are not truly perennial in colder regions, because plants such as mashua and cinnamon vine, or Chinese yam, can be grown in milder temperate regions such as the south of England, and in warmer microclimates. Potato is a replant perennial (though the ones that evade harvesting often survive the winter and regrow), and runner beans can also be grown in this way.

Perennial root and tuber crops

It is common for folk to say to me, "It's all very well having all these leafy vegetables, but where are the substantial bulb and root vegetables to take the place of onions, carrots and parsnips?" Well, several of the above categories of vegetable have roots or tubers as the main crop. These are listed in the table, right.

Tuber, bulb and root perennials

Vegetable	Crop type
Arrowheads	Tubers (underwater)
Babington's leek	Bulbs
Chinese artichoke	Tubers
Egyptian onion	Bulbs
Elephant garlic	Bulbs
Garlic	Bulbs
Groundnut	Tubers
Jerusalem artichoke	Tubers
Marsh mallow	Roots
Mashua	Tubers
Multiplier onions	Bulbs
Oca	Tubers
Potato	Tubers
Rocambole	Bulbs
Scorzonera	Roots
Sea kale	Roots
Silverweed	Roots
Skirret	Roots
Sweet cicely	Roots
Sweet potato	Tubers
Ulluco	Tubers
Water caltrop	Tubers (underwater)
Water chestnut	Bulbs (underwater)
Water lotus	Rhizomes (underwater)
Yacon	Tubers
Yams	Tubers
Yellow asphodel	Roots

Soils

You can grow edible perennials in any type of soil. Most soils can be improved, if necessary, by adding organic matter of whatever kind you can source. Loose mulches can help a lot too. A mulch is a material laid over the ground, either to clear weeds or to keep a planted area weed-free with minimal effort.

Perennial beds

Beds can be pretty much whatever shape or size you like, and the planting design can be anything from a formal geometric arrangement to a much more random and semi-natural layout. Bear in mind the shade tolerance of the perennials you are growing (most prefer sun), and in general plant taller perennials towards the north side and/or shadier side, with shorter plants towards the south/lighter side.

It is really worth trying to make sure that the bed is free of perennial weeds before you plant out. In a smallish garden this may mean digging over the area, or alternatively you can use a sheet mulch (see opposite). Some of the perennial vegetables described in this book can be grown as a good

Perennial vegetables suited to specific soils		
Dry soil	**Wet soil**	**Poor soil**
Asparagus	Arrowheads	Bellflowers (alpine)
Babington's leek	Day lilies	Chicory
Bellflowers (alpine)	Giant butterbur	Dandelion
Cardoon	Golden saxifrage	Day lilies
Chives	Groundnut	Groundnut
Daffodil garlic	Ostrich fern	Mashua
Day lilies	Ramps	Perennial sweet peas
Fennel	Skirret	Perennial wall-rocket
French scorzonera	Tiger nut	Poke root
Globe artichoke	Watercress	Red valerian
Ground plum		Rock samphire
Iceplant and orpine		Saltbush
Nopale cacti		Sweet potato
Perennial wall-rocket		Ulluco
Red valerian		
Rock samphire		
Saltbush		
Sheep's sorrel		