Carrots

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History

It is believed that the cultivated carrot originated over 3,000 years ago in Afghanistan and initially had branched, purple roots.

Carrot cultivation spread westwards and northwards over many centuries; to North Africa and Spain by the twelfth, Italy in the thirteenth, Germany and the Netherlands in the fourteenth and the Britain by the fifteenth century.

Up until the sixteenth century all carrots grown were purple or yellow. There was a preference for the yellow carrots, as they did not release the dark pigment (anthocyanin) into cooking. The modern day orange carrot dates from the seventeenth century when they were developed by selection by the Dutch.

Varieties to try

- **Autumn King, Kingston F1 AGM, Flyaway, Parmex AGM (small round roots), Purple Dragon, Purple Haze, Yellowstone.**

Description

The carrot is an edible, fleshy root with fine, feathery leaves. There are various shapes, sizes and colours; narrow and pointed, round, cylindrical, yellow, red, white, purple and, of course, orange. Wild carrots have white roots, which are fibrous and inedible. Carrots are biennial vegetables, which means that if they are left in the ground for a second year they will produce white flower heads. When these flowers are pollinated they produce lots of carrot seed.

The Latin name for carrots is *Daucus carota subsp. Sativa*.

Daucus is from the ancient greek for carrot, *Carota* is a variant of the greek word *Karoton*, which means red rooted, and *Sativa* means cultivated.

The carrot is a member of the root family and its relatives include beetroot, parsnips, swede and turnips.

Interesting facts

fact! Carrots can be eaten raw, cooked (boiled, baked, roasted, steamed, or stir fried) or processed into juice or soups. They can also be used in sweet recipes such as carrot cake.

fact! Carrots are the best plant source of beta-carotene (provitamin A). This vitamin is beneficial for eyes and vision. During the world wars they were given to pilots to help them see in the dark. However, the amounts they ate would not have made a significant difference to night vision. The story was actually a cover to divert enemy attention from the use of radar.

fact! Carrots are also a favourite food for fictional rabbits, including Bugs Bunny and Peter Rabbit.

fact! In seventeenth century England it was fashionable for ladies to trim their hats with carrot leaves!

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Food Plants of the World' by Ben Erik van Wyk; 'Cabbages & Kings: the origins of fruit & vegetables' by Jonathan Roberts; and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Growing conditions

Carrots grow best in a light, freely drained soil. To improve your crop, dig in plenty of compost or well-rotted manure in the previous season.

Thoroughly rake the soil to produce a fine tilth (very fine, crumbly soil).

When to grow

Early varieties can be sown as soon as February or March under cloches or fleece.

The main sowing season is from April to early July.

How to grow

By regular sowing of suitable types you can have fresh, frozen or stored carrots all year round.. As with most vegetables, they are at their best when freshly picked.

Sow the small seeds 1 cm deep, in rows 15 cm – 30cm apart (spacing depends on the type you grow, so check your packets). Sow thinly to avoid having to thin them out. If you do have to do this, then thin them to 5-7 cm apart.
To help with sowing carrot seeds, mix them with a small amount of sand and sprinkle them into the drill (row). You can also grow small 'baby' varieties in containers.

The odour that arises from thinning carrots can attract the carrot root fly. To avoid an attack by this pest erect a barrier made from posts and, clear plastic, fleece or enviromesh. It should be 60 cm high around your carrot bed. Planting carrots among strong smelling vegetables, such as onions and garlic, is said to confuse the carrot root fly and keep them at bay.

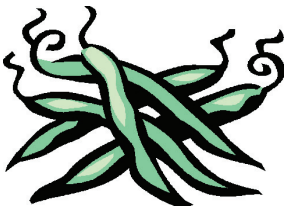
Harvesting

Harvest carrots as soon as they are large enough to use. Carefully use a fork if the soil is heavy. If you have a large carrot crop, these can be lifted in late autumn and stored in a box of slightly damp sand so that you can have carrots to use through the winter. But for the best flavour and texture, store them in the soil with a thick covering of straw or cardboard to keep out frosts.

Pest and disease problems

Carrot root fly is the main pest that may attack your crop. Try the methods set out above to minimise attack and grow a variety that offers some resistance, such as Flyaway. Root aphids and slugs can also occasionally damage the roots. Disease problems are unusual, but can include leaf diseases and violet root rot. There is more information on the RHS website: *www.rhs.org.uk*

French beans



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History

In Central and Southern America, these beans have been grown as a crop for thousands of years. Archaeologists working in Peru have dated bean remains to about 50,00BC!

French beans were introduced to Europe in the sixteenth century by Spanish and Portuguese explorers. They also introduced these beans to Africa.

Description

There are two types of French beans. 'Climbing' (pole beans) and 'bush' beans.

They are closely related to runner beans, which are more popular in Britain than French beans. Once planted, French beans grow just once, but runner beans can live for several years.

The Latin name for French beans is *Phaseolus vulgaris*

phaseolus = comes from the Greek name for a kind of bean, *vulgaris* = common.

They are in the legume (pea and bean) family..

Photograph: taken by & copyright RHS/*Open Futures growit* project.

Interesting facts

fact! French beans (and their related varieties) are the most widely cultivated bean in the world, although they are less grown in Britain as the climate is too cool for many forms of this crop.

fact! There are many other varieties of this type of bean including cannellini, kidney, flageolet (half-ripe pods, beans eaten like peas) and haricot (dried) beans. Haricot beans are what are in baked beans, just with a tomato sauce. Other famous bean dishes include the French 'cassoulet', 'salad Niçoise', and Mexican 'chilli con carne'.

fact! Beans, and other members of the legumes family, play an important role in soil. They are an important supplier of nitrogen, which they 'fix' in the soil via their roots. Nitrogen is essential for forming proteins needed for plant growth, especially leafy growth. The roots of peas and beans need to be left in the soil and dug in to add the nitrogen. In crop rotation, Brassicas (cabbage family) are planted the following season after legume crops, as they are leafy crops that benefit from the extra nitrogen in the soil.

Varieties to try

- Climbing: Cobra, Hunter, Kingston Gold; Trionfo Violetto (Purple).
- Dwarf bush: The Prince, Purple Teepee, Cropper Teepee, Mont D'Or, Purple Queen.

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Food Plants of the World' by Ben Erik van Wyk; 'The New Oxford Book of Food Plants' by J.C. Vaughan & C.A. Geissler; and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Growing conditions

French beans are sensitive to frost and cannot be grown outside until late May-June.

Beans prefer light, fertile, well drained soils. It's a good idea to add organic matter, such as compost, to improve the soil.

When to grow

French beans can be started off in pots in greenhouses or on windowsill in April (after the Easter break). These can then be planted out in May, but if there is a risk of frost then they should be protected with bottle cloches or fleece.

The main outside sowing period is May and June; sow in early July before the summer break to have a crop to return to in September. Sow for haricot and other dried beans in early June and the dried beans can be gathered in the autumn term, for use as seed next year or for use as haricot beans.

How to grow

Climbing beans have a twining stem and need something to clamber up, like a cane wigwam, twiggy sticks or netting. If you planting around a wigwam, then plant one plant at the base of every cane. Dwarf beans do not need support as they only grow to a low bushy plant. The flowers can be white, pale yellow, pink or violet, and these develop into green, yellow or purple edible pods.

Indoors – April / May
Sow 1 seed at a depth of 2.5 cm in a small 8 cm pot. Place in a greenhouse or on a sunny windowsill. Keep well watered. Once plants are about 8 m high, plant them outside allowing 20-30 cm between plants and rows.

Outside – May-July)
Sow seeds 5 cm deep, 10 cm apart, in rows 30-45 cm apart. It's important they are covered with fleece if cool weather is expected. Keep well watered, especially during periods of prolonged dry weather. The bush types may not need supporting, but short twigs can be used to help keep the beans off the soil. Bush types can also be intercropped with taller crops such

Harvesting

Begin picking the pods when they are 10 cm long. Pods are ready when they snap easily and before the beans can be seen through the pod. By picking regularly you can crop plants for up to seven weeks. Once all the pods have been harvested, water the plants and feed with a liquid fertiliser. This way you can get a second cropping of smaller, yet worthwhile pods.

Shell dry beans when the pods are dry and papery and store the beans somewhere cool and dry before cooking. Be sure to cook thoroughly, as undercooked raw dry beans can cause digestive upsets. It may be best just to save the dry beans for growing next year, rather than cooking with them as they can take at least an hour to cook properly.

To take advantage of the nitrogen-giving properties of beans, put the stem and leaves into your compost bin and wait for nature to do its thing.

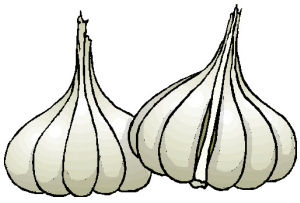
Pest and disease problems

Slugs and black bean aphids and red spider mites are the main pests attacking French beans.

Diseases include foot and root rot problem, and sclerotina rots of the pods and stems.

An easy way to avoid diseases is to plant your beans in different places each year. For more information, see the RHS website: *www.rhs.org.uk*

Garlic



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Description

Garlic is a bulb and a type of herb. It is made up of a number of segments called cloves. It has a very distinct strong smell and is used a lot in cooking.

Garlic is a member of the 'onion family' (known as Alliums), which includes onions, leeks, chives, spring onions and shallots.

The English word garlic originates from the Middle Ages, gar= spear, leac = pot herb.

Its Latin name is *Allium sativum*.

Allium = Latin for garlic,
Sativum = cultivated / farmed.

Varieties to try

- **For autumn planting: Early Wight, Purple Wight, Solent Wight, Arno, Germidour, and Cristo.**

History

The origin of garlic is unknown, but it has been used as a food and as a plant for medicine for over 4,000 years!

In folklore it is said to bring good luck and protect from evil and an Egyptian papyrus from 1,500 BC recommended it for 22 illnesses. The Egyptians fed it to the slaves who were building the pyramids, as they thought it increased their stamina.

The Greeks and Romans are said to have used raw garlic for repelling scorpions, healing wounds, curing leprosy, coughs, asthma and preventing colds. Roman soldiers would have a daily ration of garlic to keep them in good health. It is thought that it was the Romans who brought garlic to this country from Italy.

In the Middle Ages it was thought that garlic helped to prevent the plague. In France, thieves in Marseille invented a potion containing garlic called 'Vinegar of the Four Thieves'. It was said to be so effective that they could rob the houses of those suffering with the plague with no risk of getting the disease themselves!

During World War II, garlic was used as an antiseptic to disinfect open wounds and prevent gangrene.

Interesting facts

fact! If you split a garlic bulb then you will reveal the individual cloves inside. If you peel one of these you'll instantly get the unique smell of garlic.

fact! Garlic's strong flavour means that it is used a lot in cooking, particularly in European and Asian dishes.

fact! Garlic can be eaten raw, where it has a very strong flavour, but most often it is cooked to make it less strong and more appetizing. It can make your breath smell after eating it, but chewing parsley or a clove is said to get rid of the odour. It is a good source of vitamin C and can help to ward off colds.

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Food Plants of the World' by Ben Erik van Wyk; 'The New Oxford Book of Food Plants' by J.C. Vaughan & C.A. Geissler; 'The Folklore of Plants' by Margaret Baker; the Royal Botanic Garden Kew website: *www.plantcultures.org/plants/garlic_history.html*; and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Growing conditions

Garlic like an open, sunny site with fertile, well-dug soil. The best way to get a soil that contains the important nutrients is to add compost, either made at school or at home. But do not plant in soil that has been recently manured.

The soil should be light and free draining. If your soil is a heavy, clay one, then just add compost or organic matter.

It is definitely best not to use garlic from the supermarket, as these bulbs may have a virus. Although this virus does not affect their eating qualities, it will affect the way they grow. The resulting cloves will only produce small bulbs, which may be stunted in growth.

Buy your garlic bulbs for planting from seed supplier's catalogues or garden centres.

When to grow

November is the best month to plant garlic, though any time between October and– December is possible and it can also be planted in the spring.

Among the varieties that can be planted in the Spring is Elephant garlic (a very large garlic, which is actually a modified leek!), and Sultop.

How to grow

Break the cloves off the bulbs, but do not peel the paper skins off the cloves.

Plant in rows that are 30 cm apart. In each row plant the cloves 15 cm apart.

Each clove should be gently pushed into the soil, with the flat basal plate (the bit at the bottom of the garlic, from which it will grow) facing downwards, so that it is just buried below the soil surface. The depth should be about 3 cm.

Some books recommend planting much deeper, up to 8cm, but experiments in some growit schools in 2007 found that there was no difference in the quality and size of the harvested bulb compared to the method that you will be using.

Harvesting

Harvest the garlic from June / July onwards. You will know when it is ready when the garlic's leaves start to turn yellow and die.

Lift carefully using a fork to gently loosen the soil around the bulbs, but don't fork the bulbs themselves. Once it is out of the ground, place it on netting, wire, sacking or trays to dry out properly. Or they can be dried on a sunny windowsill, as outside they will need to be covered in rainy weather. After they are dry they can be plaited using the dried leaves, hung in bunches or stored in net bags.

Pest and disease problems

Garlic is largely pest and disease free, but sometimes rust, a fungal disease of the foliage, can be damaging. If this happens, then grow garlic in a different part of the garden in future years and destroy all of the infected foliage.

White rot disease is present in some soils and attacks the roots. If this happens grow garlic in tubs of soil-based potting media, such as John Innes No3 compost. More advice can be found on the RHS website: *www.rhs.org.uk*

Leeks

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History

It is though that the leeks we grow in our gardens probably evolved from the wild leek *(Allium ampeloprasum)*, which is found growing around the Mediterranean and Central and Northern Europe, including the United Kingdom.

Preserved remains of leeks have been found in Egyptian tombs, dating this crop to 2000BC. The Greeks certainly grew leeks and called them prasa. They are even mentioned in the ancient Greek poem 'The Odyssey', by Homer.

Romans introduced the cultivated leek to Britain, where it became an important food plant.

Emperor Nero was very fond of leeks, as he thought that eating them would improve his singing voice. He was given the nickname 'porrophagus', meaning 'leek-eater', although no one called him this to his face!.

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Whole Foods Companion' by Dianne Onstad; 'Food Plants of the World' by Ben Erik van Wyk; 'The New Oxford Book of Food Plants' by J.C. Vaughan & C.A. Geissler; 'Cabbages & Kings: the origins of fruit & vegetables' by Jonathan Roberts; and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Description

Leeks are long thin vegetables with wide, flat leaves. The bases of the leaves encircle each other to form an elongated, cylindrical white bulb, also known as a 'pseudostem'. The white base of the stem is called the 'shank'. They are hardy vegetables, which means they do not die down when the weather gets frosty and colder. They can be harvested from the autumn, all the way through winter and into the following spring.

The Latin name for leeks is *Allium porrum*. *Allium* is the Latin name for garlic, and *Porrum* means 'with leek-like leaves'.

In this case, the clue is in the name, because the leek is a member of the onion family. Its relatives include onions, shallots, chives, garlic and spring onions. However, in crop rotation leeks are often included with the root family.

Interesting facts

fact! The leek is the national emblem of Wales, to commemorate the victory of King Cadwallader over the Saxons in AD640. It is believed that the Welsh soldiers wore leeks in their helmets to distinguish them from their Saxon enemies.

fact! The leek is a key ingredient in many famous soups, including 'vichyssoise' (a leek and potato soup invented in the USA by a French chef) and the Scottish 'cock-a-leekie' soup.

fact! Houseleeks *(Sempervivums)* are not related to the vegetable leek, but are succulent plants. In some parts of Britain, it is folklore to grow houseleeks on the house roof to ward off lightening and witches!

Varieties to try

- **Autumn Giant2 – Porvite (rust resistant), Oarsman (rust resistant) Toledo (all AGM)**

Growing conditions

Leeks grow best in a deep, rich soil. To get a bumper crop, the previous autumn you will need to improve the growing area by digging in plenty of compost or well-rotted manure.

When to grow

March and April is the best time to start, either directly outside or by starting them off in pots or module trays. Young plants are raised in a seed bed (or pots) and then transplanted. Transplant means to dig up all the small plants and then space them out and replant in their final growing spaces. This means that leeks can be transplanted into soil previously used for other crops, so they won't take up a large area of your vegetable plot in early summer.

How to grow

Sow the seed thinly, 13 mm deep, in rows 15 cm apart in March and April. Take care not to make the rows too deep for the small seed. The soil needs to be finally raked when you're done. Alternatively, fill a pot or module tray with compost, tap down so that it is level 15 mm from the top of the pot, then finely sprinkle the seeds and cover with 13 mm of compost. Pots can be placed outside or in a cold frame and need to be regularly watered.

The leeks are ready to transplant from June until July when they are about 20 cm high and the thickness of a pencil. Make sure you water them well before lifting and transplanting. Use a fork to lift the whole row and shake off surplus soil on the roots. Then separate them out into individual plants and trim the roots to 2 cm long. They will then fit easily into the planting holes.

Using a dibber make 15 cm deep holes, spaced 15 cm apart. If you are transplanting more than one row then space the rows 30 cm apart. Drop a leek plant into each hole and fill it with water to settle the roots. You won't need to fill the holes with soil, as they will gradually do that anyway as you water them. Top up with water as necessary for the plants to establish.

By dropping the plants into the holes you will get longer white stems. This process in known as blanching and happens because that part of the stem is not exposed to light (it's beneath the soil). You can increase the length of white stem even further if you want. It can be blanched by gently drawing dry soil around the stem in stages. Try not to allow soil to fall between the leaves. Another easier way is to slide a section of drainpipe, tubing, or something similar over the plants.

Harvesting

Start when the leeks are still quite small, as this will ensure a long harvest period that will run from the autumn term all the way through the winter and into the next spring. Gently lift from the soil using a fork. Leeks can remain in the ground through out the winter until they are needed.

Pest and disease problems

Leeks are usually trouble free. In some areas, onion flies and leek moth attack the plants. Growing leeks under insect-proof mesh is the best way of avoiding these insects. Rust is a very common fungal disease in late summer, spoiling the leek's appearance. You can choose cultivars (varieties) with partial resistance if this is a problem in your area. See the RHS website for more information.

Lettuce and salad leaves

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History

Wild lettuce is native to Europe, Asia and North Africa. It is from this wild species that all cultivated varieties originate.

The Ancient Egyptians were the first to cultivate lettuce as far back as 4,500BC. They used it in their herbal medicines, such as one recipe that included mixing it with fresh beef, frankincense, juniper berries, bread and beer, straining and then drinking for four days to treat stomach ache!

The Romans also thought lettuce had medicinal properties and were also responsible for its introduction to the UK. The ancient world could not quite decide when was the best time to eat lettuce, either at the beginning of a meal to stimulate the appetite or at the end to induce sleep.

Description

There is a wide range of leafy crops that can be grown to be eaten in salads. With so many types to choose from, there is one for every season. Even in the winter months, hardy leaves such as rocket, mizuna, red mustard, spinach, sorrel and land cress can be grown and harvested. They are all short-lived, annual plants, which will set seed (bolt) within one year.

A good way to grow salad in schools is to choose a 'cut-and-come again' salad mix. These leaves can be cut when young, and will re-grow, providing two or three harvests before going to seed.

The Latin name for lettuce is *Lactuca sativa*. *Lactuca* is Latin for milk (milky, white sap), while *Sativa* means cultivated.

Lettuces are grouped into different types, including butterhead, cabbage, cos, crisphead and loose leaf.

Interesting facts

fact! 95% of lettuce is water! Salad leaves are not suitable for freezing because of this. They just disintegrate into a mush when defrosted.

fact! Salad crops are mainly used fresh. They are grown throughout the world and a particularly important crop in Europe and North America. They can also be lightly cooked and added to dishes.

fact! Lettuce contains tiny amounts of Lactucarium, an appetite enhancer and mild sedative. If you eat lots of lettuce before you go to bed it might help you sleep well!

Varieties to try

- Lettuce: Little Gem AGM; Lobjoits Green Cos AGM, Pandero Red Cos AGM, Nymans AGM (red cos leaves), Salad Bowl AGM and 'Cut and Come again' salad mixes.
- Other leaves include rocket, sorrel, mizuna, mibuna, oriental salad mixes, lambs lettuce, and land cress.

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Food Plants of the World' by Ben Erik van Wyk; 'Cabbages & Kings: the origins of fruit & vegetables' by Jonathan Roberts; 'The Complete Book of Vegetables, Herbs and Fruit' by Matthew Biggs, Jekka McVicar & Bob Flowerdew; 'The Complete Vegetable and Herb Expert' by Dr Hessayon & the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Growing conditions

Salad leaves are very easy to cultivate and can be grown in good quality soil, either in the ground or in containers. The soil needs to be very finely raked before planting (fine tilth), as the seeds are very small. Salad crops grow best in open sunny sites, but can tolerate light shade. Lettuce need plenty of water, especially through the summer months or if grown in containers.

When to grow

Outside – March – September
Early and late sowings would benefit from being protected by cloches or a layer of fleece. Lettuces do not like transplanting, so it is preferable to sow direct in the ground when possible.

Indoors – February – September
Indoor sowings can be useful if no outdoor protection is available for young seedlings.

How to grow

Outside
Sow the small seeds in rows (drills) that are 1 cm deep, in rows 20-30 cm apart. The spacing does depend on the type of crop, so do check the seed packet. Where the soil is dry, water the row before sowing the seeds. Sow thinly, scattering the seeds along the length of the row.

If you are planting early, then protect the rows with cloches. Once true leaves appear, you should thin the seedlings, leaving about 15 cm between the plants.

Indoors
Sow in seed trays or containers and thin the seedlings when their first true leaves appear. In module trays sow only 2-3 seeds per module. Once the plants appear sturdy (about 5 cm, with a handful of leaves) you should transplant them to their eventual growing position or a suitable container.

Most lettuce varieties are not hardy, so it's a good idea to protect them with cloches, or even to grow them in a greenhouse (if you have one) if there is any chance of frost. Once planted, lettuce needs minimal care, other than to remove outer leaves if they are wilting or damaged.

Harvesting

Salad crops can be ready to harvest 6-14 weeks after sowing, depending on their variety.

Lettuce is ready to be picked as soon as a firm heart is formed, approximately 8 weeks after planting. With some types of salad leaf you do not have to pick the whole plant, but can just pick off a number of leaves that you need. They will grow again. This is particularly useful with cut-and-come-again plants and oriental-type salad leaves.

Pest and disease problems

Slugs and Snails cause the majority of damage to lettuce plants, but aphids can also cause problems. You may also encounter bolting, which is when a plant puts out a tall flowering stem before the lettuce is ready to harvest. This is caused by delayed transplanting, lack of water, or overcrowding and you should remove affected plants. Downy mildew is common in wet weather, but just throw away infected leaves, as new ones are quickly formed. More information can be found on the RHS website: *www.rhs.org.uk*

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Lettuce and salad leaves

Sheet 2

How to grow salad in the classroom (Micro greens)

'Micro greens' article taken from the RHS magazine *The Garden*, January 2007 p20-21

Getting started

Micro greens are harvested when seeds have sprouted and formed their first leaves, these tender seedlings bring variety to the salad bowl, have intense flavours and can also be grown indoors year round.

The method of growing micro leaves is similar to childhood projects of germinating mustard and cress seed. Recycle a food tub or use a seed tray as a container and lay a medium for the seeds to grow on. Felt or kitchen roll, cut to the tray's dimensions, holds water well.

High sowing rates are the norm as cropping is done at such an early stage. After sowing, place on a warm windowsill or in a glasshouse to germinate. As seeds germinate ensure a constant supply of moisture by misting or watering daily - this is particularly important in summer. Sample sprouted seeds as they grow as flavours develop over time.

Ideal temperatures for germination and rapid growth are 18-22°C (65-72°F). In summer this is easy, and crops can be ready in seven to 10 days, but as days shorten and temperatures drop, germination slows; extra light is needed to prevent etiolated or 'drawn' seedlings.

Some varieties to try

Fenugreek had a pleasant crunchy texture. It produced little initial flavour, but had a distinct curry-like, peppery aftertaste. Leaves were light green in colour; took 10 days to crop.

Coriander, with its thin stems, had a soft texture and a more subtle, yet distinct flavour compared with mature leaves. Stems and leaves were light green; took 10 days to crop.

Red-stemmed radish had a mild initial taste but with an extremely pungent and peppery aftertaste. Purple leaves had highly attractive, bright red stems; seven days to crop.

Greek cress was immediately pungent and mustardy, so use sparingly. Deep green feathery leaves; cropped in seven days.

There are many others to try, including: amaranth, Thai basil, beetroot 'Bull's Blood', green broccoli, salad rocket 'Dentellata' and kale.

Mix fiery subjects with milder ones or simply sow one at a time.

Edible stages of development

Sprouts eaten when the seed case has split and shoot is still white. Must be soaked, then washed twice daily. Ready to eat: two to six days. Examples: alfalfa, mung beans.

Micro greens eaten at seedling stage when first leaves develop. No soaking is required. An easy technique. Ready to eat: seven to 14 days. **Examples** radishes, green broccoli, beetroot.

Baby leaves used in salad bags by supermarkets and are the most tender of leaves. Raise from modules, or direct sow into soil, harvest leaves when small. Ready to eat: three to four weeks. Examples: red mustard, pok choi, rocket, lettuce, chard.

Teen leaf term used in the salad-growing industry for leaves larger than baby and yet not fully mature. They are still deliciously tender. Ready to eat: four weeks onwards.

Mature leaf the final stage. Fully-grown leaves are usually ready in eight weeks

Onions

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Description

Onions are very popular and widespread crop that come in several colours, including yellow, brown, red, white and pink. They can be grown from seed or from 'sets', which are just young onions.

Onions are bulbs, which are underground storage organs with a central stem surrounded by fleshy leaves.

The Latin name for onions is *Allium cepa*, which is a combination of the two words for garlic and onion. They have their own family, which includes garlic, leeks, chives, spring onions and shallots.

History

The onion is one of the oldest known vegetables in the world, dating back to 3,500BC.

It is believed that it originated in Asia. It has been grown as an edible crop for a long time, as it is one of the few foods that would keep well in the winter months.

It is said that the ancient Egyptians worshipped the onion believing that its spherical shape and concentric rings symbolized eternity. Carvings of onions have even been found on Egyptian tombs. In ancient Greece, athletes ate lots of onions to 'lighten the balance of the blood'. During Roman times, the onion became a staple in the Roman diet. Gladiators were rubbed down with onion juice to firm up their muscles!

As well as being an important food, during the Middle Ages, physicians prescribed onions to alleviate headaches, snakebites, and even hair loss!

During this time onions were such an important food to the Europeans that they were even used as currency to pay for essentials such as rent. Sometimes they were even given as gifts!

Interesting facts

fact! If you cut an onion in half length-ways and cut a slice through it, you should be able to see the central stem (1), surrounded by the layers of leaves (2).

Photograph: taken by & copyright RHS/*Open Futures growit* project, and Fiona Secrett.

fact! Today, onions continue to be an important part of our diet. They are used raw, cooked, dried or pickled in many savoury dishes. Eating onions may help to prevent coughs and colds, as they contain vitamins and antioxidants. If you have freezing toes in the winter you could try rubbing a piece of onion on your feet, as it is believed that will help circulation (although you will end up with smelly feet!).

fact! Onions contain sulphur compounds, which is why they are famous for making you cry when you cut them. Techniques used by chefs to minimise the tears include leaving the root base on until last, cutting them in running water or sprinkling vinegar on their chopping boards.

Sources: 'Grow Your Own Veg' by Carol Klein; 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Food Plants of the World' by Ben Erik van Wyk; 'The New Oxford Book of Food Plants' by J.C. Vaughan & C.A. Geissler; British Onions website: *www.onions.org.uk/facts/facts.htm;* and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Varieties to try

- Over-wintering varieties include Radar, Senshyu Yellow, Swift, Sonic, Electric (Red).
- Spring varieties include Jet Set AGM, Red Baron, Setton and Sturon AGM.

Growing conditions

Onions like an open site, with fertile (just add compost), well-dug soil. They grow best on a site in full sun. You should keep them well watered, but only when required. Don't water them when the bulbs have swollen as this may impair ripening and storage.

When to grow

Over-Wintering 'sets' are best for schools, as they grow within a school year and can be harvested before the summer holidays. These are available to buy in the autumn and you need to check the packaging for planting times, though it will be between September and November. Sets can also be planted in mid March-mid April, which gives a later harvest in August/September.

Onion sets are easy to obtain from garden centres and plant suppliers catalogues or websites. Sets are great to grow with younger pupils, as their larger size makes them easier to handle than small seeds.

How to grow

Plant in rows with 10 cm between each set. If you are growing more than one row then allow 20–30 cm between each. Each set should be gently pushed into the soil so that you can just see the tip (depth 2-3 cm).

Harvesting

Harvest from June onwards. The tops of the onions will turn yellow and start to die down, which you should allow them to do before you lift them. Do this carefully, using a fork to gently loosen the soil around the bulbs. Don't fork the bulbs themselves.

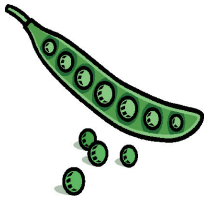
Onions should be placed on netting, wire, sacking or trays to dry out properly in the sun. A sunny windowsill might be a good idea, as outside they will need to be covered in rainy weather.
Once dried they can be plaited, hung in bunches or stored in net bags.

Pest and disease problems

Onions are usually pest free, but occasionally onion fly will tunnel into bulbs and thrips can cause speckled foliage. The damage is seldom that serious. Downy mildew disease is very damaging in wet weather, but there is no remedy other than to cut off mouldy foliage. If you are unlucky enough to have onion white rot in your soil you can grow onions in tubs of John Innes No3 compost.
This avoids the bulb rotting that this disease causes. Onion neck rot can cause the bulbs to rot in store, so check stored bulbs regularly and discard any rotted ones.

Onions occasionally bolt or produce flower shoots without producing a bulb. When this happens you have probably planted too early, so plant a little later in future years. You can find out more on the RHS website: *www.rhs.org.uk*

Peas



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Crop sheet

Description

Lots of you will be familiar with peas, but did you know that they grow in green pods? Most pea plants have tendrils and rounded leaves. Tendrils are a twining, thread-like part of the stem that helps the plant to hold onto its support. The flowers of the crop are usually white, but can also be lilac or pink. 'Mangetout' and 'sugar snap peas' have pods without a stiff inner parchment, so these can be eaten whole.

The Latin name for peas is *Pisium sativum,* which just means pea that is farmed.

They are in the legume (pea and bean) family.

History

Peas are one of the oldest cultivated crops in the world. They became a farmed crop around 8,000BC in south west Asia and eastern Mediterranean Europe, together with wheat, barley and some other legumes.

Archaeological investigations have found charred pea seeds in early Neolithic farming villages in south east Turkey, as long ago as 7,500-7,000BC!

The cultivation of peas spread eastwards to India and reached China about 1,000AD, while it thought that the Romans introduced peas to the UK. '

Peas have also played an important role in science. In the nineteenth century, the scientist Gregor Mendel grew and studied peas for his experiments, which led to the foundation of the science of genetics. This science led to the plant breeding that is very important to modern gardeners.

Interesting facts

fact! Peas are a valuable source of protein (23%), carbohydrate (59%) and fat (only 1%), as well as a good source of iron.

fact! In some parts of the world the young green tops of the plants are eaten and the tendrils are a luxury treat sold in smart restaurants. The plants are also used by farmers for silage, hay and green manure.

fact! As with beans, Legumes play an important role in soil. They are an important supplier of nitrogen, which they 'fix' in the soil via their roots. Nitrogen is essential for forming proteins needed for plant growth, especially leafy growth. In crop rotation, Brassicas (cabbage family) are planted the following season after legume crops, as they are leafy crops that benefit from the extra nitrogen in the soil. The roots of peas and beans need to be left in the soil and dug in to add the nitrogen. However, the haulm (stems and leaves) contains most of the pea's nitrogen and make rich compost, improving the fertility of the garden.

fact! Fresh, canned, dried or frozen, peas can be whole, split or ground into flour.

Growing conditions

Peas prefer well drained, neutral to alkaline soil that is moisture retentive.

Open sunny sites are ideal. You should never sow peas in cold, wet soil.

When to grow

Autumn – October-November
It is good to plant a hardy overwintering variety, such as Meteor or Oregon Sugar Pod AGM, for an early crop in May. Cover to protect over winter.

Spring – March, once the soil has warmed up
Choose early pea varieties such as Early Onward, Kelvedon Wonder or Misty. You can also sow mangetout peas, like the Oregon Sugar Pod or sugar snap peas like the Sugar Ann. You can then harvest these in June and July.

Late summer term – June- July
If you have people to water your crops over the summer holidays, a sowing late in the year can give a pea crop to return to in September. Varieties include Cavalier and Kelvedon Wonder, while mangetout and sugar snap peas also work well.

How to grow

Sow direct in the soil. Using a hoe make flat row in the soil 10-15 cm wide to a depth of 5 cm. You should then sow the pea seeds at 5-10 cm intervals on both sides of the row. When growing more than one row the spacing between them should be equivalent to the eventual height of the plants. You will need to check on the seed packet for this.

In colder areas, or to protect against mice, peas can be started off indoors or in a greenhouse by growing them in pots, modules or guttering filled with compost, and can be planted out when they are 10 cm high. Water well during dry periods and, if available, add a mulch around the plants to help keep moisture in the soil.

Peas like to scramble and climb, so will need some support once they start growing. An easy and natural support is to insert twiggy branches (often called 'pea sticks') after planting. Alternatively use sheep netting or plastic mesh supported with sawn wood stakes, which can be used year after year. This not only gives them something to climb up, but also protects young seedlings from birds.

Harvesting

Pods are ready to harvest when they are well filled and the pod is fresh and green. If you pick them regularly then the plants produce more peas. Snap the pods off next to the stem, taking care not to damage the main stems. If you cannot use them that day or the next, shell them, blanch (plunge in boiling water for 2 minutes and then ice cold water) and then freeze them. You should do this because the sugars that make fresh peas taste sweet start to turn to starch two hours after picking.

Pest and disease problems

The main pest is the Pea Moth, whose maggot-like caterpillar will be found in pods of peas – so do look out before eating! Early sowing can help to avoid attack, or insect proof mesh will keep the moths off. Other pests include the Pea Aphid and Pea Thrips. Washing these off with a hosepipe is a simple control method. There is also the Pea & Bean Weevil, but protecting the peas with fleece helps. As if they weren't enough, there are then birds and mice! For birds, netting and fleece can help. If mice eat seeds, try raising plants indoors.

Diseases include foot and root rot problem. This sometimes occurs if soil is cold and wet. Powdery mildew can also be particularly problematic for late crops, although choosing resistant varieties such as Cavalier can help. For more information, see the RHS website: *www.rhs.org.uk*

Potatoes

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Crop sheet

History

Most people believe that the potato arrived in Britain with Sir Walter Raleigh during the 16th century.

However, it seems more likely that the Spanish brought it here from South America, via mainland Europe, in the 15th or 16th centuries. Certainly it was eaten by the Incas in Peru around 6,000 years ago, but did not really feature in the British diet until late in the 17th Century.

As varieties improved, potatoes became a regular part of our diet and, despite the Irish potato famine in the 1840s, potatoes have remained a staple of what we eat for nearly 200 years.

Varieties to try

- First Earlies: Accent AGM, Mimi AGM, Lady Christl AGM, Pentland Javelin AGM
- Maincrop: Sarpo varieties such as Sarpo Mira and Sarpo Axa are strongly resistant to blight and ideal for growing for lifting in the autumn term.

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'RHS Encyclopedia of Gardening' by C. Brickell; 'The Vegetable Garden Displayed' by Joy Larkcom; and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Description

The potato (*Solanum tuberosum*) is the world's most famous and most widely grown tuber crop. A tuber is a swollen food storage organ.

Potatoes come in lots of different shapes, sizes and colours, from the common white, to yellow and blue-fleshed spuds, all of which can be turned into a whole number of different things to eat. Early types, often referred to as new potatoes, are small and generally cooked whole for hot dishes and salads. Late-maturing types have large tubers that can be cooked in many ways

The potato is a perennial (it can live for more than one year) but, as it does not tolerate cold, the seed potatoes must be grown after the winter frosts. Similarly, the tubers must be harvested before winter.

Interesting facts

fact! In October 1995 the potato became the first vegetable to be grown in space. NASA called in experts to develop super-nutritious and versatile potatoes to feed astronauts on long space voyages.

fact! The loss of the potato crop in Ireland in the 1840s was due to the fungal disease, 'blight', that can still destroy our crops today.

fact! Potatoes are a good source of carbohydrates, providing energy over a long period. They contain vitamin C, and are lower in fat and calories than pasta or rice.

fact! Potatoes are in the same family as tomatoes (compare their flowers if you don't believe us!) and for this reason they should be treated in the same rotation group. This family also contains the deadly nightshades – a good reminder that only the tubers are edible, the rest of the plant, especially the seed, is poisonous.

fact! Potatoes can be grown in open ground but perform very well in containers, even in dustbins!

What to grow

There are lots of different types of potato, but for schools 'first earlies' are ideal, as they can be closer spaced and occupy the ground for less time. They are also less prone to disease and can be easily raised in containers and placed under cover for extra, early yields.

'Maincrops' require more space and greater attention to which varieties you select (in particular looking for resistance to blight and scab), but they will provide crops in September. 'Second earlies' and many salad potatoes crop in August and are therefore best avoided.

Growing conditions

Potatoes need to grow where it is moist, but where they will not suffer from frost. Ideally they should have a deep, fertile soil with a pH of 5-6. You should add plenty of organic matter, such as well-rotted manure or garden compost, ideally in the autumn before planting. Then add a general purpose fertiliser, such as chicken manure pellets, immediately prior to planting.

When to grow

Seed potatoes of a first early variety should be started indoors in February, planted out just before Easter, and lifted for eating late June or early July.

For September crops, maincrop varieties can continue to be planted from April to May, again after sprouting indoors ('chitting').

How to grow

Sprout or 'chit' the seed potatoes by arranging them, with 'eyes' uppermost, in egg boxes or seed trays in a light, cool, but frost-free room. Plant when the sprouts have reached 2 cm in length (after 4-6 weeks), in a row or in individual holes in the soil, 7-15 cm deep. With the sprouts pointing upwards, cover them with at least 2.5 cm of soil. They can also be grown in pots, tubs and dustbins.

Space 'early' types as close as 30-38 cm between the tubers and 38-50 cm between the rows. However, a wider row spacing of 50-60 cm makes 'earthing up' much easier and is a good idea if you have the space. Maincrop varieties need more room, 38 cm between the tubers and 75 cm between the rows.

Emerging growth should be 'earthed up'. This is when the soil is drawn up around the stems and should be done periodically. This is done to prevent the tubers being pushed to the surface and turning green in the light, making them inedible. It's best done when there is about 20-30 cm of growth. Draw the soil to leave 10 cm of foliage exposed to light, which ensures that photosynthesis continues to occur.

Harvesting

Harvest early potatoes just as the flowers open. Leave healthy maincrops in the soil to bulk up until September. In the autumn cut the stems of each plant to about 5 cm above ground level. Leave for two weeks to harden the skins before lifting.

Lift with a fork on a dry day, taking care not to damage the tubers, and leave to dry on the soil for a few hours. Store in paper sacks in a cool, dark and frost-free place until required. Never store diseased or damaged potatoes.

Pest and disease problems

'Blight' is first seen as brown patches on the leaves and is most serious in warm wet weather in the summer. Grow resistant varieties or grow only first earlies. Also, avoid overhead watering and, if blight strikes, cut the stems down to 5 cm above the ground and leave for two weeks before harvesting. Do not compost the foliage.

Slugs can be a problem, particularly for maincrops that are in the soil in the autumn. Grow less susceptible cultivars and harvest as soon as mature. More information is on the RHS website.

Pumpkins and squashes

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Crop sheet

History

The oldest archaeological remains of one of these crops dates back to 7000-5,550 BC and were found in Mexico. They are thought to have evolved in Central and South America from gourd-like fruits, originally with bitter flesh but edible seeds.

By the time Christopher Columbus arrived in America (1492), pumpkins were being cultivated by native Americans alongside sweetcorn (maize) and beans. It is believed that they were introduced to Europe after this time.

When the Pilgrim Fathers, from England and Holland, first landed at Cape Cod, Massachusetts in 1620, they had little experience of growing their own crops. In the first winter, half of their party died, but their fortune in future years is said to have been thanks to the Patuxet Squanto Indians showing them how to grow pumpkins. In October 1621, they held their first thanksgiving meal which included boiled pumpkin to eat, and the pumpkin has been part of traditional thanksgiving celebrations ever since.

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Food Plants of the World' by Ben Erik van Wyk; 'Cabbages & Kings: the origins of fruit & vegetables' by Jonathan Roberts; and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Description

Pumpkins and squashes come in lots of amazing shapes, sizes and colours. Some giant ones even weigh more than 400 kg. They have large, prickly leaves and stems. They have bright yellow flowers, which develop into the part that we eat; this is the fruit of the plant. Each fruit can contain lots of seeds.

Pumpkin is an American word for what is a 'pompon' in French.

The Latin names are complicated! *Cucurbita maxima / Cucurbita moschata / Cucurbita pepo*

Cucurbita= Latin name for gourd,
Maxima = largest,
Moschata = musky,
Pepo = 'false berry'.

These crops are in the Cucumber family and their relatives include cucumbers, courgettes, melons and gourds.

Interesting facts

fact! Lots of people will know pumpkins from Halloween, when they are carved with faces and lit from inside. This is an old English tradition, as it was thought that by putting the pumpkins outside a house on the 31st October, evil spirits would be kept away.

fact! Seeds can be eaten raw or made into pumpkin seed oil used for salad dressings and cooking.

fact! Pumpkins and squashes can be cooked in many ways – sautéed, stuffed, boiled, baked or pickled. They are used in a number of dishes, including risotto and soup. Pumpkin pie is a traditional sweet dish cooked in the USA as part of Thanksgiving Day celebrations.

Varieties to try

- **Baby pumpkins:** Baby Bear, Mars
- **Giant:** Mammoth
- **Squashes:** Butternut, Crown Prince, Sweet dumpling

Growing conditions

Pumpkins and squashes are closely related and are grown in basically the same way. They need a sunny position, a moisture-retentive soil and somewhere out of cold winds. A good way of improving the soil is to add lots of organic matter, such as compost or well-rotted manure.

When to grow

Pumpkins and squashes can be started off in pots in greenhouses or on school windowsill in April (after the Easter break). These can then be planted out in the garden in May, just before the half term break. If there is a risk of frost then it's a good idea to protect them with bottle cloches or fleece.

If you don't have the space inside (or if your indoor crop fails), seeds can be sown direct outside in late May / early June.

How to grow

Indoors – April / May
Sow 1 seed on its side at a depth of 2 cm in a small 8 cm pot. Place in a greenhouse or on a sunny windowsill. Keep well watered. Once plants are about 6-8 cm high, plant outside allowing 60 cm – 1.2m between plants, depending on the type you are growing. Just check the seed packet to make sure. You can make cylindrical cloches out of large plastic drinks bottles with the tops and bottoms cut off.

Gently slide them over the young plants, but remember to take them off before they get too large. Alternatively you can protect them with fleece until the plants are established.

Outside – May- June
Sow 2 seeds on their side, 2.5 cm deep and approximately 5 cm apart. Again, protect with cloches or fleece until they are established. You will then have to thin the seedlings, leaving just the strongest one.

For the biggest fruits make sure that you give lots of water. In dry spells, as their leaves grow large, it can be difficult to get the water on the soil and to the roots, so sink a pot or use a funnel (cutting the top off a plastic bottle makes a good one).

Feed the crop every couple of weeks with a liquid fertiliser, such as seaweed feed, once the first fruits start to swell. Keep the fruits off the soil with black plastic, bits of wood or tiles.

Harvesting

You can harvest summer squashes when you want them, even when the fruit is quite small.

For pumpkins, winter squashes and marrows, let the fruit mature on the plant and remove it before the first frost, ie just before the autumn half term.

They can be harvested when they are fully coloured and have a hollow ring sound when tapped. These can be used straight away or you can store them in a cool, frost free shed for a few months, and then use over winter.

Pest and disease problems

Slugs and snails may attack small seedlings. Powdery mildew is the main disease to affect these crops in late summer – cut off the affected leaves and make sure that you do not put on the compost heap.

Refer to the RHS website gardening advice, for examples of pests and diseases.

Radishes

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Crop sheet

History

The radish originated from both Asia and the eastern Mediterranean regions.

It has a long history as a crop and was being grown by the Egyptians more than 4,000 years ago. It is thought that the Egyptians grew them to make radish-seed oil. This oil was widely used before olive trees were introduced to Egyptian soil. Both the Greeks and Romans grew radishes and the Chinese have grown them since 500BC. But here in the UK we did not develop a taste for the radish until much later, in the sixteenth century.

Varieties to try

- Summer: Cherry Belle (round and red), French Breakfast (long crimson and white), Purple Plum (purple), White Icicle (white). Winter: Black Spanish Round (black skin), Mantanghong (red).

Description

The radish is a quick growing crop producing tasty roots that can be ready to eat just 4-8 weeks after sowing the seed. The flavour of radishes can range from mild to quite peppery. They also come in a range of colours, not only the pink-red ones we see in the shops, but also white, purple and black.

Because of how quickly they grow it's important to be careful when you sow the seed. They grow even faster in the summer months, so in schools it's not a good idea to sow after the end of June or they will crop in August when you are on holiday.

The Latin name for radish is *Raphanus sativa*, which comes from Greek. *Raphanu* means 'easily raised', while *Sativa* means cultivated or farmed. In Latin, *Radix* means root.

Though we eat the roots of this salad crop, it is actually in the same family as the cabbage, known as the *brassica* family.

Other edible roots in the cabbage family include turnips and swedes. It is also related to mustard, often sharing its strong taste.

Interesting facts

fact! Radishes are now grown all over the world. They can be eaten raw or cooked, which you do by steaming or stir-frying. There are also varieties of giant radishes (known as daikon or mouli), which are regularly used in Asian cookery. The Chinese mash them up and mix with flour to make Chinese dough cake, while the Japanese slice or grate them to add to many of their dishes. In the UK we can grow winter radishes, as well as the quick growing salad varieties we usually see in the shops.

fact! Not all radishes are grown for their roots. The 'rats-tail' radish is grown in South East Asia for its leaves and edible seed pods.

fact! Radishes are a good source of Vitamin C. Summer radish should be harvested and eaten when young, so that they do not become woody.

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Food Plants of the World' by Ben Erik van Wyk; 'Whole Foods Companion' by Dianne Onstad; 'The New Oxford Book of Food Plants' by J.C. Vaughan & C.A. Geissler; the eat the seasons website: *www.eattheseasons.co.uk;* and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Growing conditions

Radishes like fertile, moisture retentive soil. Open, sunny sites are best, but they can still grown in semi-shade.

When to grow

Autumn term – September
In schools, summer varieties can still be sown in early September for a late autumn harvest. Alternatively, try sowing hardier winter varieties, which can be harvested throughout the winter months

Spring and summer terms
It's a good idea to sow and harvest regularly to make the most of this fast growing crop. They can be sown fortnightly from late February to July. Sow little and often to keep a regular crop and don't allow them to stay in the ground to mature or they will become woody and inedible.

As radishes are quick to mature they can be used as a 'catch crop' being sown between rows of slower-growing vegetables such as parsnips and potatoes. This is useful way of seeing first hand the difference in germination rates between vegetables.

How to grow

Sow little and often, direct in the soil. Use a hoe or the point of a trowel to make a drill (line in the soil) only 1 cm deep. If the soil is very dry, then water the drill before sowing the seeds. Sprinkle the radish seeds thinly along the row (2 cm apart). If you growing more than one row then allow 15 cm between each.

Radishes can also be grown in containers.
Fill the pot with compost to 2 cm from the top, sprinkle the seeds sparingly over the surface and cover with 1 cm of compost.

Early sowings of summer varieties (February and March) should be protected with cloches or fleece and will provide you with an early crop in April to May. Water well, especially during dry periods.
Winter varieties

Harvesting

Pull summer varieties when you want them, making sure they are never left to mature and become woody. Try to eat them as fresh as possible, but if the leaves are removed them can be kept in the fridge for up to a week. Winter varieties can be left in the ground and dug up as required.

Pest and disease problems

The flea beetle, slugs and snails may all like to share your radish crop. The flea beetle eats lots of small holes in the leaves. To minimise attack cover the plant with fleece and/or keep your crop well watered, as the flea beetle thrives in dry soil.

The main pest is the cabbage root fly; these can be deterred by growing your crop under a layer of fleece or under cloches or in summer, but use insect-proof mesh. More information can be found on the RHS website: *www.rhs.org.uk*

Raspberries

(Autumn fruiting)

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Crop sheet

History

The red raspberry grows wild in many parts of Europe, western Asia and North America.

Archaeological finds have indicated that it has been gathered by humans for to eat for many thousands of years before it was brought into cultivation.

The Greeks and Romans also used the raspberry for medicine, calling it the Ida Bramble as they felt it originated from Mount Ida in Crete. They used the blossoms in a cream for sore eyes and for stomach troubles.

It was in the Middle Ages that raspberries started to be grown as a crop and by 1826, the Horticultural Society (which became the RHS in 1861) recommended 23 different varieties.

Varieties to try

- Autumn Bliss AGM and Fallgold (golden variety).

Description

Raspberries are popular, small soft fruits. The plant is shrubby, with slightly thorny stems, known as canes. Raspberries have small pink, white or green flowers. Whilst the fruit of many varieties are shades of red/pink, there are also orange/red, purple and golden raspberries.

Raspberries are grouped into two categories: summer fruiting (June-August) and autumn fruiting (September-through to first frosts). In schools, autumn fruiting raspberries are a good choice, as they provide a tasty crop for the start of the school year and are easier to prune and maintain.

The Latin name for raspberries is *Rubus idaeus*.

Rubus = Latin for blackberry, *Idaeus* = of Mount Ida, which is in Crete.

Raspberries are in the berry family and are related to the blackberry, loganberry, tayberry, cloudberry, wineberry and boysenberry.

Interesting facts

fact! Today raspberries are grown on a commercial scale in Scotland, southern England, eastern Europe, western North America, Chile, New Zealand and Southern Australia.

fact! Raspberries are an expensive crop to buy, as they are very soft and bruise very easily. They do not have a long shelf life in the shops. It makes them a good crop to grow in schools (and at home), or just to pick for yourself at farms. They are best eaten fresh, as soon as possible after picking, but can also be frozen, canned and made into jams, jellies, purees and syrups. Raspberries are an important source of juice and a widely used flavouring in many food products and drinks. They are high in vitamin C and fibre and are a good source of iron and folic acid.

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Food Plants of the World' by Ben Erik van Wyk; 'The New Oxford Book of Food Plants' by J.C. Vaughan & C.A. Geissler; 'Cabbages & Kings: the origins of fruit & vegetables' by Jonathan Roberts; the British Summer Fruits website: *www.britishsummerfruits.co.uk*; and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Growing conditions

Autumn fruiting raspberries need a warm, sunny position so that they ripen before the first frosts. They require well-drained soil, rich in organic material. Before planting, the area should be dug over, weeds removed and manure or compost well dug-in to the planting area.

Choose plants from a reputable, certified source (like a fruit nursery or good garden centre), as these will be vigorous and free from pests and diseases.

When to plant

Bare-rooted plants – November- February
It is preferable to buy and plant bare-rooted raspberries in the winter months, when the plants are dormant. These will look like dead twigs with wispy roots on the bottom, but don't worry they will grow! You can also buy container grown raspberries, which can be planted throughout the year, but these will be more expensive.

How to plant

Raspberries should be spaced 35-45 cm apart along a row. If you are planting more than one row then you need to allow a good 2 m between rows.

Mark out a straight row and dig a shallow trench or planting holes. With bare rooted plants, do not plant any deeper than 5-8 cm, spreading the fibrous roots out in the planting hole.

Firm the soil around the newly planted canes and cut back the bare canes to 25 cm above soil level.

In the springtime, once the weather starts to get warmer, the new growth will emerge from the soil and will soon grow into canes 1.2-1.5 m high. Spring is a good time to weed the plants and then apply a mulch of well-rotted compost.

Staking

Autumn fruiting raspberries fruit on the current season's canes (one year old), so you will get a crop the following autumn. As the canes are only one year old they do not need an elaborate staking system to support them. You can just put canes or small wooden tree stakes in the ends of the rows and tie string or wire around to support the canes as they grow.

Harvesting

Once the raspberries start to ripen, pick on a regular basis every 2-3 days to get a continuous crop. Only pick plump ripe berries, as once they are picked they will not go on ripening. You should eat them as soon as possible, as they do not keep for more than two days in a fridge. If you have a large crop you can freeze them and use them later in crumbles and cakes.

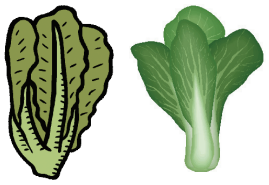
Pruning

In late winter (January/February) cut down all of the fruited canes to just above ground level (1 cm). Raspberries spread by suckers growing under the ground – pull out any that appear outside of your row when the suckers are young. But remember to beware of thorns – make sure you wear gloves.

Pest and disease problems

Autumn fruiting raspberries are seldom affected by pests. Shield bugs are often found, but these are harmless. Putting netting over your crop can deter birds, but autumn fruiting crops seldom suffer badly from these either. There aren't many diseases, but you might see cane spot, cane blight and chlorosis. In wet weather, botrytis is very damaging to fruits. Just pick off and discard mouldy fruits as soon as you see them. For more advice, see the RHS website: *www.rhs.org.uk*

Spinach and chard



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Crop sheet

History

Spinach originates from Iran (Persia) and spread to China around 1,400 years ago.

The Moors introduced spinach to Spain in the eleventh century, but its widespread cultivation in Europe did not occur until the Middle Ages. It is believed that the Romans may have originally cultivated chard (leaf –beet) from wild sea-beet found in the coastal areas of Europe and western Asia.

Varieties to try

- **Chard: Bright Lights, Bright Yellow, Rhubarb Chard**
- **Spinach: Palco F1 AGM (Mildew Resistant), Tetona F1 AGM (Mildew Resistant) Scenic F1 AGM (Mildew Resistant).**

Description

Spinach is famous because it is the favourite food of the old cartoon character Popeye the sailor, who gets enormous strength after eating a can of it.

Both spinach and chard are leafy crops and are an attractive and tasty addition to a flower border and are a colourful addition to any vegetable patch. Some varieties of Chard have brightly coloured, attractive leaf-stalks, in many colours of the rainbow – red, pink, white, yellow, orange.

The Latin name for Spinach is *Spinacia oleracea*, which means spinach of the vegetable garden.

Chard is more complicated. It's called *Beta vulgaris subsp. cicla var flavescens*.

Beta = Latin for beet,
Vulgaris = common
Flavescens = becoming yellow / yellowish.

Both of these crops are in the *Chenopodiaceae* family. This is also known as the goosefoot family, as the leaves look like the feet of a goose! Chard is also closely related to beetroot and sugar beet and is also called 'leaf beet', or, confusingly, 'spinach beet'.

Interesting facts

fact! Spinach can be eaten raw or cooked. It is quick to cook, using just a small amount of water to boil. When cooked both spinach and chard wilt down considerably. Chard can be cooked in a similar way, but the stems need longer cooking than the leaves. Spinach contains lots of good vitamins including beta-carotene, and vitamins A, B and C, as well as important minerals including iron and folic acid. By cooking it briefly you can make sure not too many of these good bits are lost.

fact! Spinach can be used in lots of recipes including soups, quiches, curries, pates, soufflés and pate. Spinach is also available in tins or in frozen form. Swiss chard tart is served as a dessert speciality in Nice, France.

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Food Plants of the World' by Ben Erik van Wyk; 'The New Oxford Book of Food Plants' by J.C. Vaughan & C.A. Geissler; and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Growing conditions

Both crops prefer fertile, moisture-retentive soil, and thrive when lots of organic matter, like compost and well-rotted manure, has been added to the soil. This also helps make sure that the leaves don't taste bitter when you eat them. Alternatively a pelleted fertiliser can be added to the soil before sowing, such as pelleted chicken manure.

Chard likes a sunny site, as do winter spinach varieties. Summer spinach prefers semi-shade, so try growing it amongst rows of taller crops. Chard is considered easier to grow than many varieties of spinach, as it is less prone to bolting (going to seed). There are winter hardy varieties of both chard and spinach, but they don't grow much in winter and become ready to cut in spring.

When to grow

Plant chard directly in the soil between April and July. Sow summer varieties of spinach from mid-March to the end of May, and winter varieties in September (or even August if you have a summer holiday gardening club). It's important to check the seed packets carefully for sowing times, as these differ from type to type. One sowing of chard can provide a crop for many months, but spinach is more short-lived.

How to grow

Chard – Sow thinly 1.5 cm deep in rows. If you are planting more than one row, then allow 40 cm between them. Once the seedlings have grown, you will need to thin them out to allow 20cm between plants. You can still use the thinnings in salads & cooking.

Spinach - Sow thinly 1.5 cm deep in rows. If you are planting more than one row then allow 30 cm between them and, once the seedlings have grown, you will again need to thin them out, this time allowing 8 cm between plants. (you can use the thinnings in salads & cooking). A few weeks later you can harvest every alternate plant, to allow a 15 cm spacing between the final plants.

During prolonged dry periods you should keep them well watered. Mulching (putting a layer of compost/straw/leaf mould) will also help keep moisture in the soil. Unless your school is in a mild part of the country, you will need to protect both spinach and chard during the winter by covering them with cloches or by protecting the crown with straw and fleece.

Harvesting

Chard – Pull off the outer leaves when they are large enough for the kitchen; don't wait until they reach maximum size. Small leaves can be used in salad.

Spinach – Harvest the leaves continually once large enough to pick. You can do this for the summer varieties between late May and the end of October and from October to April for the winter varieties.

Pest and disease problems

Fungal leaf spot can disfigure older leaves on chard, but younger leaves are unaffected. Downy mildew attacks spinach, but can be reduced by ensuring spacing between plants, or by buying mildew resistant varieties. Birds can eat seedlings so cover with netting or fleece. More information can be found on the RHS website: *www.rhs.org.uk*

Strawberries

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Crop sheet

History

The strawberry we commonly find on supermarket shelves, or growing at 'pick your own' farms, is a modern large-fruited type *(Fragaria x ananassa)*.

It is a cross between American *(Fragaria virginiana)* and Chilean *(Fragaria chiloensis)* varieties. The range of strawberries is now vast and the best thing about growing them yourself is that you can pick ones tastier than those you can buy.

Description

While strawberries grown in heated greenhouses can be enjoyed nearly all year round it is hard to beat the taste of a sun-warmed strawberry eaten soon after picking. As they are inexpensive plants to buy, compact, versatile and easy to grow, both in the open ground and in containers, then they should be one of the first plants that you make room for. Besides, nearly everyone loves to eat them.

By choosing early, mid and late season varieties you can be picking strawberries throughout June and July and with the use of plastic tunnels or greenhouses this season could be extended even further.

There are also 'Perpetual' varieties, which are a cross between wild and modern strawberries, bearing a succession of fruits from July to October.

Growing conditions

All strawberries are herbaceous plants, dying down in winter, and cropping for up to four years. After this they have usually built up too many diseases to be worthwhile keeping and are generally pulled up, with replacements planted into clean soil.

Sunny, warm sites give the best flavoured fruit. Sandy soils produce the earliest crops, loams and clays the heaviest and most finely flavoured, whereas chalky soils give poor results. Good drainage is essential, but can be overcome by growing the crop in raised beds. Slightly acid soil with a pH of 6-6.5 is ideal.

Remember that everbearers fruit after the end of the summer term.

When to grow

Summer fruiting strawberries are most easily grown by buying certified, disease-free runners from a fruit nursery. These are most cheaply available from autumn as freshly dug runners and should be delivered as bare root plants with strong root systems requiring immediate planting. If planted before the weather turns cold (ie early autumn) they should establish well and produce a good crop the following year. Later plantings can be made, but it is advisable to remove the flowers in spring, thereby foregoing the first year's crop, to allow the plants to establish.

Perpetuals are best planted in autumn or spring. Alpine strawberries can be easily raised from seed sown in either the autumn or the spring, grown on in warm conditions before being hardened off and planted out in late spring.

How to grow

Prepare the soil in advance by digging in at least one bucketful of organic matter every square metre and removing all perennial weeds. Plant each strawberry plant at 30-38 cm intervals. Avoid constricting the roots and ensure that the crown (the part of the plant where the leaves emerge) is level with the surface. Fill in the hole and firm with your fingers, checking that the plant does not pull out easily. Water thoroughly to settle the soil and keep watered, especially while they are producing new leaves. Avoid watering them overhead once they have formed fruits as this can lead to mould (Botrytis) and slug damage.

Some gardeners don't let them flower in their first year to let them build up a strong plant – you don't have to do this if you plant in September or buy pot grown plants. For growing in containers, use a general purpose compost. Avoid grow bags unless you are prepared to water them two or three times a day. Plants in containers will probably require extra feeding, such as a tomato feed with high potash content.

Varieties to try

- **Honeyoe AGM (early), Hapil, Pegasus AGM (mid season), Florence (late)**
- **Everlasting/everbearer: Aromel, Calypso**
- **Alpine: Baron Solemacher**

As the plants grow they will produce runners, which if allowed to root will compete for water, nutrients and light and reduce the overall crop. They also direct energy away from the parent plant. They should be removed as they appear. However, they do provide an easy way of propagating more plants, either to extend your collection or for plant sales.

Ideally keep a few plants separate from your fruiting varieties, pinch out all of their flowers as they appear and allow them to freely produce runners. These can be pegged down with wire onto the soil, to encourage rooting, during late spring and early summer and lifted and potted up or transplanted to their final position in September.

When the strawberries are in flower, a thick layer of dry straw or special strawberry mats should be placed underneath to prevent soil splash onto the fruits. If growing through plastic or fabric mulch this is unnecessary. Cloches or tunnels placed over a row in late winter will advance ripening by about 2 weeks and is a useful way of extending the season. Remember to open the sides during the day to encourage insects for pollination.

Harvesting

Check the plants every other day and pick the fruit, when fully ripe, with stalks attached. They can be frozen, but will lose their firmness.

Pest and disease problems

Birds will eat more of the crop than you will unless you cover the plants with netting supported on hoops or a frame. Slugs enjoy the fruits as well, so take the usual measures against them. You should also buy certified virus-free plants, and remove, but do not compost, any plants showing signs of disease while growing.

The same should be done if the plants are showing signs of Botrytis, a grey mould. Once the plants have finished cropping, cut off all the leaves just above the crown (be careful not to damage the young leaves), remove all the straw and weed the crop. More information can be found on the RHS website: *www.rhs.org.uk*

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'RHS Encyclopedia of Gardening' by Christopher Brickell; and & the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Tomatoes

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Crop sheet

Description

While tomatoes are an important crop in the vegetable garden, they are actually fruits. They are the fleshy berries of the tomato plant and often referred to as 'fruiting vegetables'. While we think of tomatoes as being red and round, they do come in other colours (yellow, orange, purple, green, stripy), shapes, and sizes (cherry, pear/teardrop, oblong, plum, beefsteak).

The Latin name for tomatoes is *Lycopersicon esculentum*. *Lycopersicon* is from the greek *Lycos*, meaning a wolf; *Persicon* means peach; and *Esculentum* means edible, or good to eat.

The tomato family *Solanaceae* is a large plant family. It includes many edible plants, including aubergines, peppers, chillies, tomatillos and even potatoes. This family also includes potentially harmful plants such as deadly nightshade, the mandrake and tobacco.

History

Tomatoes are thought to originate from misty, riverbanks in Peru, where wild tomatoes still grow today.

The Spanish brought the tomato back to Europe in the 16th century. When it was first introduced in Europe, the tomato plant was regarded with suspicion owing to its resemblance to Deadly Nightshade and the Mandrake, a plant believed to have magical powers and to shriek when it was pulled up (a plant mentioned in Harry Potter). For many hundreds of years it was grown only as an ornamental plant, as European herbalists said it was bad to eat, upsetting the stomach or causing fainting. By the 1800s, however, the tomato slowly became accepted in Europe as an edible crop.

Today, tomatoes are grown all around the world. In warmer countries they are an outdoor crop, whereas in countries such as the UK they are commercially grown in large glasshouses. There are many outdoor varieties that are suitable for growing in gardens and allotments in the UK in warm, sheltered or southern districts.

Interesting facts

fact! Tomatoes can be eaten raw or cooked and are used in salads, sauces, stews and soups. They are widely used in Mediterranean recipes, especially Italian and Spanish cuisines, and are also processed to make juice, pickles, chutney, ketchup, puree, pastes. They can also be tinned.

fact! China is the world's largest grower of tomatoes and grows about 20 million tonnes a year.

fact! Tomatoes are mainly made up of water (90%) and do not have many calories (23kcal per 100g). They are rich in vitamins A, B and C.

Varieties to try

- Outdoor Girl, Tigerella (stripy),
- Cherry: Gardener's Delight & Sungold.
- Outdoor Bush: Tornado, Tumbler (hanging basket)

Sources: 'RHS Fruit & Vegetable Gardening' by Michael Pollock; 'Grow Your Own Veg' by Carol Klein; 'The New Oxford Book of Food Plants' by J.C. Vaughan & C.A. Geissler; 'Cabbages & Kings: the origins of fruit & vegetables' by Jonathan Roberts; and the RHS Website 'Grow Your Own Veg': *www.rhs.org.uk/vegetables/crops/index.asp*

Growing conditions

There are two main types of tomato plant: 'vine/cordons' and 'bush', which include hanging basket varieties. Choose varieties that are suited to growing outside.

Tomatoes prefer fertile, nutrient-rich, well-drained soil, to which you should add organic matter, such as compost. Tomatoes can also be grown in grow bags or pots. They need a warm, sunny site for the fruit to develop and ripen.

When to grow

Start growing the seeds indoors in late March to early April, (just after the Easter break). Sow them in seed/multipurpose compost, in either seed/module trays or small pots.

Fill the pot almost to the top, tap the compost level, place the seeds on the surface and then cover with a thin layer of fine compost.

Place on a warm, sunny windowsill. Ideally, you should cover them with plastic propagator tops, or, if you have one, use a heated propagator. Tomatoes need at least 18°c to germinate.

If you have a greenhouse at school, then you can start growing tomatoes earlier in the year, from January and February.

How to grow

Once two seed leaves have formed, prick out the small plants into 5-8 cm pots once two 'seed' leaves have formed. Biodegradable pots, such as coir pots, are particularly good as they will allow you to plant the tomatoes without disturbing the roots. Wait until the risk of frost has passed in your area (late May-mid June), until the roots of the tomatoes have filled the pots, and until the first flowers have formed, before planting outside in the ground, pots or growbags. Vine/cordon tomatoes will need to be supported by being tied to stakes or canes pushed firmly in the ground. Make sure you put toppers on canes to protect from eye injuries.

Remove the sideshoots regularly, when they are about 2.5 cm long. This is called 'pinching out'. Side shoots grow where the base of the leaf joins the main stem. Those grown as bush or hanging basket types do not need to have sideshoots removed. 'Trusses' are the branches of yellow flowers that become vines of tomatoes. Once there are 4 trusses, then pinch out the top to stop it growing taller and to encourage the plant to put all its energy into forming the fruit.

Tomatoes need watering on a regular basis. Feed every 10-14 days with a balanced liquid fertiliser suitable for tomatoes. You'll need to make sure someone does this during the holidays.

Alternatively, grow them in large pots so that they can be taken home to be looked after.

Harvesting

Start picking when the fruit is ripe and fully coloured. At the end of the growing season, lift the plants and pick the green fruit.

These can be stored in a drawer next to a banana, or on a sunny windowsill until they ripen.

Pest and disease problems

Irregular watering can cause 'blossom end rot', where a black sunken scar develops on the bottom of the fruit. Such watering also causes splitting. Outdoor grown tomatoes can be prone to potato blight and viruses and plants must be removed and not composted if they get these diseases. More information can be found on the RHS website: *www.rhs.org.uk*