

THE STORY OF THE SQUASH

Origin

Pumpkins, patty pans, hubbards, courgettes and marrows are all part of the squash family, which is generally divided into winter squashes (the ones which form a hard skin and are stored all winter) and summer squashes (which are eaten young and fresh). Their ancestors originated in Central America and were grown in Mexico as early as 5,000 to 7,000 BC. They have been an integral part of the *Día de los Muertos* (Day of the Dead) celebrations since Aztec times. When the Spanish conquerors brought sugar cane and their sugar making equipment the locals used it to slow-cook winter squash with spices and make a traditional dessert called Calabaza en Tacha.

By 2700 BC, squash had spread into North America, where they were being grown and shared by Native American tribes. It is believed that Christopher Columbus was part of the first group of Europeans to see a pumpkin patch in Cuba in 1492; he took seeds back and introduced pumpkins to Europe. They were first pictured in Europe in the prayer book of Anne de Bretagne in the early 1500s. They then spread throughout Southern Europe and onwards including into Asia, most likely via the well-established Silk Road trading route. In the 1800s the zucchini (or courgette) was bred near Milan. A huge variety of winter and summer squashes have been developed which have become very adaptable growers and are now cultivated on all continents of the world apart from Antarctica.

Hallowe'en: Warding off Evil Spirits with a Turnip or a Pumpkin?

The pumpkin has become the symbol of Hallowe'en but the tradition has Celtic origins going back 2,000 years. The Celts, living mostly in what is now Ireland, but also in other parts of the UK and northern France, marked two major events in the annual calendar with festivals. One was *Beltane*, which celebrated the end of the harsh winter and the start of spring, and *Samhain*, held on the 31st October/1st November, which marked the onset of the cold, dark winter often associated with death. At these times, particularly at *Samhain*, they believed that the boundary between the living and dead worlds became blurred, and that it was a vulnerable time. To ensure a safe winter and ward off evil and the return of the dead, they carved scary faces, not into pumpkins (which they did not know existed), but into the root vegetables they grew, such as beetroots and turnips.

Christianity had made its way to Ireland by the ninth century and the traditions and celebrations began to merge and be replaced. Eventually the Church introduced All Souls' Day to honour the dead, which some people believe was an attempt to replace an important Celtic day with a Christian one. It was celebrated in a similar way to *Samhain* with bonfires and rituals to ward off evil spirits, and was known as All-Hallows. The night before, the 31st, the most important night of *Samhain*, became known as All-Hallows Eve, and then by contraction Hallowe'en. When Irish immigrants were fleeing to America to escape the potato famine in the nineteenth century they introduced the Hallowe'en tradition to North America, where squashes were being grown in abundance. The root vegetables were eventually replaced by the larger, orange and easier to carve pumpkin.

World Record Pumpkins and the £1,250 Seed

Growing giant pumpkins for competition is a dedicated business full of secret techniques, watering and feeding regimes, the ultimate quest being to hold the world record for the heaviest pumpkin. The history of giant pumpkin competitions can be traced back to the World Fair held in Chicago in 1893, where these large squashes were a curiosity. By 1900, competitions for the largest pumpkin were held at the World Fair in Paris, the winner weighing in at just over 180 kg (400 lb). The weights stayed relatively low until Howard Dill from Nova Scotia bred '*Atlantic Giant*' in 1979, which topped the scales at 199 kg (438 lb). Since then, every world record holder has been of this variety.

The World Championship Pumpkin Weigh-Off is held in Half Moon Bay, California, every October and offers sizeable prize money with the winner being paid \$9 per pound of pumpkin, second prize \$3,000 and third place \$2,500. If the world record is broken at the event, then \$30,000 is up for grabs. The 2020 winner received \$16,450. This long-standing interest of competitive growing across North America has been reflected with growers from Canada and the US dominating the previous world record holders. However, in recent years the record has been broken by European gardeners. The current world record pumpkin, weighing in at 1,226 kg (2,702 lb) was grown by Stefano Cutrupi in Italy.

The potential financial rewards don't end with the competitions, as the seed from the winning pumpkins are heavily sought after by



other growers on their quest to hold the world record. Seeds from Travis Gienger's 2020 Half Moon winner have sold for \$100 each, and UK seed company Thompson & Morgan paid £1250 at auction for a single seed of the previous world record holder from Belgium. Not every grower carries this quest for financial reward; many seeds from champions are donated to pumpkin growing associations across North America for annual auctions. The funds raised help to support the organisations to operate, run shows and offer prize money for future winners, which keeps the competitions flourishing and the history alive.



THE STORY OF THE CUCUMBER

Origin

Native to India, cucumbers, Cucumis sativus, have been in cultivation for at least 3,000 years, with evidence that the Egyptians were growing them freely. They are mentioned in the Bible, Numbers 11:5: 'We remember the fish we ate in Egypt at no cost - also the cucumbers, melons, leeks, onions and garlic', and Egyptian pottery models of cucumbers have been dated to 1850-1700 BC. The initial cucumbers will most probably have been bitter, a problem that can persist in some heritage varieties today, but which would have been gradually bred out by skilled gardeners. They were introduced to China before making their way to Europe by the Greeks, and then the Romans. Pliny the Elder reported that Emperor Tiberius demanded a cucumber on his dining table every day of the year. To meet this demand, fruit needed to be produced in winter and spring, and this required the creation of some of the first forcing houses, several of which were mounted on wheels so they could be moved around the garden for maximum sunlight in winter. However, there is debate among historians that the cucumbers Tiberius so favoured were the elongated types of melon, Cucumis melo, rather than Cucumis sativus.

Charlemagne was said to be growing cucumbers in Italy in the eighth and ninth centuries, and they were believed to be a favourite of Catherine of Aragon, Henry VIII's first wife. Christopher Columbus' exploration of the New World took cucumbers to Haiti in 1494, and throughout the 1500s European explorers, trappers and hunters traded with Native Americans across North America. The Mandan and Abenaki tribes of the Great Plains were growing them along with other introduced crops such as beans, corn and squash.

However, by the eighteenth century, the enthusiasm for cucumbers had waned significantly as people began to be suspicious of them, thinking it was dangerous to eat vegetables which were not cooked, something the cucumber does not lend itself to. By the nineteenth century it was back on the menu and its popularity increased rapidly, helped in the US by Heinz adding pickled cucumbers to its range in 1876. Cucumbers were also much beloved by gardeners on Victorian estates in Britain, who were responsible for many new varieties.

The Straightest Cucumber: A Victorian Gardener's Obsession

The cucumbers which were historically grown in the UK needed to be cultivated in greenhouses, and they produced bitter fruits when the pollen from the male flowers was transferred to the female ones. To produce the best quality required skill and dedication. To many Victorians with large walled gardens attached to big estates, growing the highest quality cucumber was an obsession, with glasshouses dedicated solely to the fruit. One result of this infatuation was the breeding of the '*Telegraph Improved*' variety, which became the number one choice for any respectable head gardener. It was celebrated for producing a long, thin-skinned and tender cucumber. The ultimate reward, as with melons, was to win awards at the premier gardening shows. This was regarded as a seal of approval, not just for the gardener but the owner of the estate on which it was grown. Many gardeners of the time bred their versions of the '*Telegraph Improved*' and named them after themselves, members of the royal family or their employees. These names could then be seen on the show bench by the public and by neighbouring estate owners, with the rights of the best being sold off to the biggest seed suppliers of the day. '*Rollinson's Telegraph Improved*' is one such variety still available today. It was big business, and some unscrupulous seed suppliers would sell seeds of the same variety but give them a different name to attract the buyer. It required an act of parliament to put an end to such behaviour.

To win a first-class prize at horticultural shows required uniform growth along the length of the cucumber, and gardeners across the country tried to get theirs to be the straightest. George Stephenson, the Victorian civil engineer and 'father of the railway', was also a very keen fruit grower, taking particular pride in his cucumbers. While living at Tapton House in Derbyshire he used his inventor's skills to create the ultimate cucumber straightener. He designed an elongated glass tube which he had made at his Newcastle steam engine factory. The glass was placed over a young fruit which then developed inside the tube and therefore could only grow straight. This method was not without risk - if the cucumber was not keenly observed daily it could quickly grow too wide and become stuck inside the glass. So popular was this invention that an 1848 advert in the Gardeners' Chronicle and Agricultural Gazette offered a range of different size straighteners from 12 to 24 inches. Sadly, this method became too expensive as it required more labour than was available, especially after the First World War, and it fell out of favour. However, straight cucumbers still remain the most desirable today, as they are more efficient to pack and transport, and easier to use in the kitchen.



MELONS AND WATERMELONS IN THE GARDEN

Even though melons and watermelons belong to a different genus the growing conditions are very similar so they are described together in this section.

BOTANICAL INFORMATION

Melons and watermelons are from the same family, *Cucurbitaceae*, but are from a different genus: melons belonging to *Cucumis melo* and watermelons being *Citrullus lanatus*. Melons have a great variety of fruit sizes, shapes and appearances, which over the years has resulted in many attempts at classification. This has not been helped by the ease with which melons cross and produce new varieties. Pitrat et al (2000) is the most comprehensive and widely-used classification, and breaks down melons into sixteen different cultivar groups. Of these, there are three main groups that gardeners should be familiar with:

Cantalupensis have been historically grown in Europe, and have a ribbed, smooth or warted skin. They can have rough areas on the skin but are not 'netted' (a term derived from their Latin name, which translates as reticulated or marked like a net or network). In general, these are most suited to growing in the

melons & watermelons in the garden

UK, and include varieties such as 'Charentais', 'Petis Gris de Rennes' and 'Ogen'.

Reticulatus are commonly called musk melons (though in North America they are confusingly referred to as cantaloupes), and are defined by their heavily netted skin. Varieties include *'Blenheim Orange'* and *'Green Nutmeg'*.

Inodorus are known as casaba or winter melons but labelled as honeydew in the supermarkets. They have a hard ribbed skin which is usually yellow or green but can be nearly white. They have no fragrance but are crisp and sweeter than most other melons. They descend from Spain, Turkey and the Middle East, and require a long, hot season to thrive and generate their full sweetness so are therefore difficult to grow in the UK. If they are your favourite melons to eat then '*Collective Farm Woman*' is the best choice for flavour, and '*Giallo d'Inverno*' is a good option if you want a traditional looking casaba melon. Another of the groups to note is the Ameri, which includes the '*Ananas*' variety which is an excellent melon to grow and eat.

NUTRITIONAL BENEFITS

Melons are a good source of dietary fibre. They also contain vitamin C, which helps maintain a healthy immune system; vitamin B, which helps to form red blood cells, improve brain function and release energy from foods; potassium, which is important for heart health and has been linked to reducing blood pressure; and copper, which aids skin cell regeneration. Watermelons contain lycopene, which is a powerful antioxidant found in red-coloured fruit and vegetables. The darker the red the more lycopene it contains. Antioxidants help prevent cell damage and may prevent several types of cancer.

Common Causes of Failure

In most gardening books the cultivation problems section comes at the end. However, the aim of this book is to encourage you to try growing melons, and to try again if you have failed before. Therefore, it is advantageous to highlight some of the major common causes of failure and describe techniques to prevent them. This leads into a section on growing techniques, which aims to offer different ways to cultivate melons in the UK and avoid these problems.

ROOT TRANSPLANT SHOCK

All cucurbits dislike root disturbance but melons and watermelons are the worst affected. They can stop growing for a prolonged period, which is time you generally do not have when trying to get a good crop of melons in the UK climate. In the worst-case scenario, but sadly not at all rare, the plant can die from root shock. The sure signs are wilting within the first day or two, and/or very slow or no growth. If you are unsure whether the plant is growing, measure a new leaf with a ruler, make a note of the width of the leaf and check it again over the next couple of days. If the weather is warm and sunny there should be a noticeable increase in size. If any of these symptoms of root shock are noticed, give it a few days of settled warm weather, and if it does not improve or gets worse, replace it.

Fortunately, there are some techniques which can be used to avoid this. Direct sowing into the ground is not really an option with the short and unreliable UK growing season. Therefore, the only option is to sow into pots, then grow on and plant out. Some

people will sow seed into trays and prick out as soon as the first seed leaves have developed. This can work but is to be avoided where possible. Any pricking out risks disturbing the roots. Seed should be sown into pots, either one or two seeds, whichever you decide on (see Propagation section, below), into 7 or 8 cm diameter plastic pots. Grow the plants on until they produce their fourth true leaf (four leaves after the two seed leaves). The fourth leaf does not have to be full size, just large enough to be recognisable. At this point, the plant will have produced a big enough root ball in this size pot to hold all the compost together. If planted out before the plant has reached this stage there is a risk that when it is taken out of the pot the compost will fall away and expose the roots. This will invariably lead to root shock. Watermelons, which are more vigorous growers, can be planted out at the three-leaf stage if the planting conditions are right and you are eager. If weather conditions and temperatures are not optimal then it is possible to wait until melon plants have five or six true leaves (four or five for watermelons). Any longer than this and the plant can become stunted and fall behind others planted at the correct time.

When it comes to planting, the best technique is to take an empty pot of the same size and use this as a mould to make a planting hole. Place the pot in the compost deep enough to cover roughly half of the pot (the top half of the pot should be protruding from the compost) and then build up the mound of compost up to the rim. The top of the pot should now be level with the surrounding compost, with the compost sloping away to the original pre-planting compost level. Give the compost a good water by pouring the water directly into the pot and allowing it to drain away. Make sure the compost is moist, but not soaking wet. It may also be necessary to gently water the mound around the pot with a fine rose or misting spray, so that the compost is moist and stays in place when the pot-mould is removed. Ideally carry this out a couple of days in advance to allow the now damp soil to warm up. If this is not possible then water with warm water. Gently remove the pot and it should leave the perfect sized hole to match the melon plant root ball. Take the potted plant and place a hand, palm side down, over the top with the fingers split either side of the stem, then gently tip the pot upside down and carefully squeeze the pot and the plant should drop softly into the palm. Take the plant, and as gently as possible guide it into the pre-prepared hole that has been made. Do not firm in. Let it settle naturally. It may be necessary to top up the compost mound to make sure the root ball is covered. The plant can gently be watered in with a small amount of water, depending on when the planting hole was pre-watered.

Some growers are successful in avoiding transplant shock by sowing the seed into biodegradable pots, such as those made from paper fibre and coir. These are then planted, pot included, into the ground and the roots grow through them. This reduces root transplant shock and is arguably more environmentally friendly than plastic. However, the biodegradable pots can easily sit cold and wet when conditions prior to planting are not optimal, which melons greatly dislike. Therefore, they always need to be kept warm, but then they have a habit of drying out quicker than in pots. This is something that you can potentially trial yourself, particularly if you are having transplant shock issues.

Stem Rot (Soft Collar Rot)

Stem rot is a very common cause of failure, particularly in the first few weeks and months of growing. Often, gardeners are used to growing and caring for traditional greenhouse crops such as tomatoes, peppers, aubergines and cucumbers (cucumbers can

be victim to stem rot but are not as susceptible as melons and watermelons), which they water liberally with the leaves and stems of the plants getting wet. While this is fine for those listed above, for a melon plant a wet stem, particularly when followed by cooler nights, will quickly spell disaster. Water must be prevented from sitting on the stem from the moment the seedling appears above the compost. At the seedling stage the best way to achieve this is to cover the surface of the compost with vermiculite (perlite is acceptable but not as good as vermiculite, see the Propagation section below for reasons why), and water from the top, using a water bottle with a watering nozzle or a small watering can without the rose attached. Water around the edges of the pot only and well away from the stem, which will ideally be in the centre of the pot. Once the water drains from the bottom of the pot, stop watering and make sure that the pot does not stand in water, which makes the compost too wet and risks stem rot.

When planting the seedlings into their final positions – be that pots, grow bags or into beds – they must be planted on a mound to ensure any water drains away from the stem. The easiest way to achieve this is to use an empty pot the same size as the one the seedling is growing in. Dig a hole about half the depth of the pot, place the pot in, and mound up compost to the rim. Leave the pot in place for a few days, and water into it and gently around the mound to help it set firmly in place. It will have created a sufficient mound to prevent water collecting around the stem and a perfect mould for the plant to gently drop into, hopefully without creating any root shock. Dust all around the mound and where the stem touches the soil with yellow sulphur. This helps to prevent any fungal diseases, lowers the soil pH, and adds trace nutrients. Reapply when this has worked its way into the soil.

Throughout its growing life, ensure that whenever watering keep

moisture away from the stem. Initially, after transplanting, the plant will need to be gently watered around the base of the mound to make sure the roots have access to water and are encouraged to grow away from the planting hole. As the plant matures and the roots grow further from the stem, so can the watering, making it easier to prevent the stem getting wet and sitting in damp compost.

Root Rot

Root rot takes place when the roots of the plant sit in cold wet soil for prolonged periods. The risk is obviously higher at the beginning and end of the growing season, but it can happen during unseasonable cold spells if they last long enough. The symptoms are not noticeable at the time the roots are being lost but it quickly shows itself once the weather warms up again, as the plant's leaves wilt in the sun. It can also cause the leaves to turn yellow, and female flowers to be aborted. This is because the plant had developed roots to support its top growth, but has now lost a proportion of them and so can no longer provide moisture to the amount of leaves it has. The plant can and will recover from this if the temperatures stay warm, but the process is slow and can delay flowering and fruiting by weeks rather than days. At the beginning of the season when the plant is small the recovery is quicker, if this happens midseason (e.g. July) then losing two weeks growing time can be the difference between enjoying eating a home-grown melon and thinking about what could have been.

The ideal situation is not to let the soil temperature drop below 10°C. In reality this is harder to achieve than it sounds. Short periods, such as overnight, just below 10°C are acceptable if the weather is warm the next day. During a cold spell of numerous back-to-back days with sub-10°C nights and cold rainy days you

might need to take steps to raise the soil temperature. The easiest and most effective way, if you have electricity to your greenhouse or polytunnel, is to run heat cables under the grow bags, pots or the plants planted in the beds. If you do have this luxury then you can easily prevent root rot and force an earlier crop by turning the heating cables on every night below 10°C, and every day below 15-18°C. However, most amateur gardeners do not have the facilities to be able do this, so an alternative method is required. Conventional hot-water bottles are excellent at providing heat to grow bags in particular. They should be filled as normal and then placed on the top surface of the grow bags between your two plants (it is not advisable to try and push them under the bag with the plants in place as this risks disturbing the roots), and then covered with bubble wrap to reduce heat loss to the air and direct it to the roots. You may need to do this multiple times a day depending on the temperatures. Some people arrange plastic pop bottles filled with water on the soil and around pots and grow bags. During the day the sun heats up the water in the bottles and it is released slowly overnight. This can help through short cooler overnight periods and generally help raise the temperature over the whole growing season, but it will not be enough to heat the soil through prolonged periods. Paraffin heaters or electric heaters will help to raise the air temperature a few degrees which the plants will appreciate, but it will not provide the direct root heat the plants are looking for. If it is not possible to use any of the above methods then you should focus on growing the varieties listed as cold tolerant, such as 'Minnesota Midget', 'Blacktail Mountain', or any of the FIS.

GROWING TECHNIQUES

Melons and watermelons may be from a different genus, but their

growing requirements are very similar. They like heat, no, they demand it, particularly at their roots. They grow best and quickest with fewest problems when their roots are baked by the sun. They also require the gardener's dreaded 'moisture retentive but freedraining soil', the most difficult to achieve. There are various ways to help achieve this in the UK climate and it is something the gardeners of Victorian estates refined to produce regular crops of melon, even out of season.

The Victorians grew them in glasshouses – often dedicated to the purpose – that were heated with hot water pipes powered by coal-fired boilers tended by large numbers of gardening staff. While we do not all have that luxury what we can do is recognise, copy and adapt their main growing method in our own greenhouses and polytunnels. What the Victorians did was to raise the root zone off the ground to around waist height, originally on crates used to transport lilies, and then onto purpose-built staging. This was a metal mesh rack supported by bricks, on which old grass turfs from the estate grounds were stacked in mounds, with the melons planted in the peak of those mounds and trained up along the glass with the fruits supported by nets. The wire rack allowed the growing medium to be very free draining and put the roots in direct sunlight, where they want to be. The heating helped to guarantee a crop and allowed them to be forced to fruit out of season.

To provide the heat and protection melons and watermelons need, they should be grown in a greenhouse or polytunnel. If you do not have either and cannot obtain one (you will never regret owning a greenhouse or polytunnel), then good results can also be obtained on a hot bed or by planting in ground covered with black plastic mulch (both described in detail later in this section), provided they can be covered at the beginning and end of the season, as well as during unfavourable weather.

Soil pH

Both melons and watermelons prefer a slightly acid soil, ideally between pH 6.0 and 6.5 but will grow adequately up to 7.0 (neutral), which is the pH value of most bought in compost. The pH of the compost or soil is important as it affects the ability of the plant to take up nutrients. If growing direct in the ground, you should aim to take a pH test of your soil using a bought pH test or a pH soil meter. If you cannot or you forget to test the compost you have purchased, then if you assume it is pH 7.0 you will not go far wrong. The easiest way to lower your pH into the preferred zone of the melon is by applying a good dusting of yellow sulphur to the surface of the compost. This is readily available from garden centres and it not only gently reduces the pH, it adds sulphur which is an important nutrient for photosynthesis and protein production, and also helps to prevent stem rot. Using yellow sulphur is one of the key steps that should significantly increase your chances of success.

Where possible, only water using rainwater. UK water regulations state that tap water should have a pH between 6.5 and 9.5 and is typically above neutral (7.0) and therefore alkaline. While rainwater is fortunately not as acid as it used to be, it still generally has a pH lower than tap water. If you are in doubt, check it with a pH test.

PROPAGATION

The first rule is to sow early, aim for mid-April. In warmer climates and longer season areas, gardeners have the option of sowing direct into the ground as soon as the risk of frost and weather conditions are right. In the UK we don't have that luxury, so there is no option but to sow, and grow on, in pots before planting out. By sowing early, you are stealing time on the season by gaining 4 to 6 weeks growth before planting out, which brings forward the flowering – and most importantly the fruit ripening – into the warmer months of August and September. It is much easier to steal time at the beginning of the season, when light is increasing daily and there are some hot days in the sun. By the second week of October temperatures don't get hot enough or for long enough to sustain ripening. You are fighting a losing battle. To be able to start early you are going to need some heat and a place to keep plants frost free until the middle of May in a good year, or the beginning of June in a year with a cold spring.

The second rule is to grow spare plants, at least one per variety you are growing. The common problems section will have given you a feel for why this is necessary, mainly so you have a replacement should you suffer losses due to transplant shock. If you do not end up requiring the spares, enjoy your success and give them to friends to try rather than composting them.

Even though the seeds of melons and watermelons are smaller, they should be sown on their side, as with all cucurbits. If they are sown flat there is a risk of water gathering on them in the soil and the seeds rotting before they germinate. The compost should be good quality multi-purpose (peat-free provides excellent results) with added drainage. Perlite is good for this, better than horticultural grit which is heavier and does not aerate the soil like perlite does. About a quarter to a third of this should make up the total planting mix.

Sow two seeds on their side into a 7 or 8 cm pot and cover with compost to a depth the same size as the seed (imagine another seed is on top of the seed you are sowing). Cover the surface with a good layer of vermiculite, enough so no soil is visible, to help prevent damping off and stem rot. You can use perlite for this, but vermiculite dries out and provides an indication of when the plant needs watering. This can be difficult to determine with perlite as it always remains dry, even when the compost is saturated. Give them a gentle water from the top so you are confident the water has soaked as far as the seed. They do not need to be completely saturated, just evenly moist. Do not leave them sitting in water, or water them by standing them in a tray of water at any stage. This is a recipe for seed or stem rot.

Place the pots in a heated propagator which provides bottom heat. If you do not have a heated propagator, on top of a radiator or on a sunny windowsill would be adequate but not ideal. What they need for quick reliable germination is a continuous bottom heat of 20°C or higher, at which temperature, with fresh seed, they will be up and visible within a week. They will germinate even quicker at 30°C. Watermelons have a thicker seed coat so take longer to germinate. To speed this up they can be pre-soaked in a bowl of warm water overnight. Watermelons have a higher optimum germination temperature of just above 30°C, but with the pre-soak they will germinate fine in a propagator at 20°C, which is what most standard heated propagators are set to operate around.

If the seeds are to be germinated on a windowsill or radiator, then the pots need to be placed into an unheated propagator (a tray with a clear removable plastic lid), or if you do not have one, a clear sandwich bag will suffice. The aim of the cover is to maintain humidity and prevent regular drying out of the compost, which can create erratic germination. Remove the bag during the day once seeds have germinated and place in good light. Replace the bag at night until the plants have grown two true leaves. If they are to be grown on indoors and they cannot be placed in a greenhouse during warm sunny days, they need rotating regularly to prevent the seedlings pulling and leaning towards the light. If you do not do this it can result in etiolated (leggy) seedlings with a long stem before the first leaves, which is prone to falling over or snapping. Thin stems are also vulnerable to stem rot. If both seeds in the pot germinate then one of them needs to be removed. Choose the smallest or weakest and snip the stem at soil level with a pair of scissors. Do not be tempted to pull out the seedling as it risks disturbing the roots of the one you wish to keep.

If you cannot bring yourself to dispose of a seedling or have rare or a small number of seeds, then it is best to germinate them using damp paper towels or kitchen roll. A small container with a lid or a resealable sandwich bag is required. Take two sheets of kitchen roll and get them thoroughly damp. If using a container then line the bottom with one sheet of kitchen roll, place the seeds apart from each other and then cover with the remaining kitchen roll and seal with the lid. If using a sandwich bag, line each side of the bag with kitchen roll, with the seeds placed between them, and seal. Put these in your propagator or on top of the radiator. With good fresh seed germination should take place in one to two days under consistent heat. The white root will emerge from the seed coat first. At this point you know the seed is viable and has germinated, and it can



GROW BAGS



be transferred to a pot to grow on. Fill the pot with compost and gently take the germinated seed (a small piece of thin card is useful for sliding under and lifting the seed) and place it on the compost, taking care not to damage the root. Lightly cover with compost and finish with a layer of vermiculite. Place it back in your chosen propagator to germinate fully.

Once the seeds have germinated and the plants have produced their two seed leaves (cotyledons) keep them on the heat. On sunny warm days turn off the heat, remove the propagator lid (or sandwich bag) and then put the lid and heat back on overnight. If the propagator is inside, move them to the greenhouse on sunny days then back inside on the heat at night. This may seem like a lot of work but you will be rewarded with good, stout and welldeveloped plants.

Once they have reached the stage of four or five true leaves (three or four for watermelons) then they are ready for planting in their final growing position. See the section Root Transplant Shock above for techniques on how to do this. Do not be tempted to pot on into a larger container to grow on, as this creates another opportunity for root disturbance which the plant will not appreciate. The advantage of grow bags is that they distribute the roots over a shallow wide area which can gain maximum sunlight and heat across the full root zone. The plastic bags are excellent at absorbing heat from the sun and transferring it to the compost while retaining moisture, as only a small amount of the growing medium (at the planting holes) is directly exposed to the sun. The design of the bag also allows heat to be provided to the compost in unseasonable weather or on sub-10°C nights. This is easily achieved by placing a standard hot-water bottle on the centre of the bag. Cover the top side of the bottle with bubble wrap to increase the amount of heat that goes into the compost rather than being lost to the atmosphere.

Purchase the best quality grow bag you can (excellent results can equally be obtained with peat-free grow bags), place them in full sun and raise them up to waist height or as high as you can, by making your own homemade Victorian-style wire racks placed on bricks or cement blocks, or putting them on greenhouse staging. Raise the bags off the staging using bricks or pieces of wood, or make a wooden frame, as this will enable the bags to drain off any excess water and stop them standing in the puddles that drain out, avoiding the risk of root rot.

A standard size grow bag will accommodate two melon plants, each planted a third of the way from the end edges of the bag. The new extra-large grow bags will accommodate three plants. Follow the grow bag instructions, but all bags should first be given a good shake to loosen, open up and evenly distribute the compost before planting. Cut out a square of the plastic about twice as big as the pot (most grow bags have useful cut-out markings printed on the bag), remove a hole about half the depth of the pot size you have your young melon plant in. Build up a mound around the plastic pot with fresh compost to allow water to be kept away from the stem. Follow the planting instructions as described in the Root Transplant Shock section earlier. A hole should be cut in the middle for a plastic plant pot to be sunk 1 to 2 cm deep into the compost for watering. Be careful when watering as most grow bags contain compost which is designed to hold onto moisture rather than dry out quickly, and this can easily lead to overwatering issues and root rot, particularly if there is a cold spell during the growing season. Water less regularly than you would for tomatoes, and check the compost regularly. If the compost feels moist, do not water.

Pots and Other Containers

When it comes to pots, black plastic is your friend. As much as terracotta or a coloured glazed pot wins in the looks stakes, it is substance over style that wins when it comes to growing melons. What black plastic offers is a thin wall which absorbs the most heat and readily transfers it to the compost, which the melons will appreciate.

Use a good quality multi-purpose or peat-free compost with a handful of organic slow-release fertiliser (such as chicken manure pellets or fish, blood and bone) mixed in. Add some perlite if you have it for improved drainage, less than is necessary for seeds, but the roots will appreciate anything up to a third of the total volume. Raise the pots off the ground and place in full sun, on staging if you have it, if not then on bricks or on top of a sturdy upturned pot. A brick or flagged floor will absorb the heat during the day and release it back during the night as temperatures cool, so you can place your pots on them if you choose. It is important that the pot is raised off whichever surface you choose, by using bricks or pieces of wood, as this will prevent the plants sitting in pools of water, which significantly increases the chances of root rot. A pot size of 28 cm (II in) in diameter (measured across the top and often called a 10 litre pot) is ideal for one plant, and a few centimetres bigger will be fine but avoid going smaller. Some people prefer to cultivate three plants in one pot and have had good success in doing so by growing them up a support system. For this you will need a pot 40 to 50 cm (I6 to 20 in) in diameter (30 to 40 litre).

The main advantage the black pot has over the grow bag is that as the melons grow the leaves can shade the surface of the grow bag and prevent the roots being heated up to the same degree as pots, which have a greater vertical surface area that the leaves do not shade. The only disadvantage of growing in a pot is that should you get an unseasonable cold spell they are difficult to add heat to, unlike grow bags. There is potential to place a hot-water bottle under the pot, but it would be difficult to put one on the surface without damaging the plant. These are, of course, minor details but the more you can stack in your favour the greater your chances of success will be. Black plastic pots are the best container method for beginners, as the compost can be mixed to specific requirements, and watering is easier to manage.

Some people grow melons in the bags designed for growing potatoes or in a strong plastic bag, such as an old compost bag. As they are made from plastic and are thin but strong, they allow the sun to heat up the soil quickly and keep it warm. If you try this method you need to cut or roll the bags down to one third for a standard compost bag, or a half for the potato growing bag. Melons do not require the depth of a full bag, as it runs the risk of creating cold damp areas in the bag that the sun cannot get to and warm up, a situation the roots will not thank you for. It is important to make sure there are enough drainage holes, and you must also raise them off the surface on bricks or pieces of wood to ensure free drainage.

Melons can be successfully grown in old tyres. The advantage of

this is that the black rubber is excellent at absorbing and retaining heat from the sun. However, there are concerns regarding the release of chemicals into the soil as the tyre breaks down. If you choose this method then line the tyres with an old compost bag to prevent direct contact with the compost, place them on ground that has been turned over or loosened and is weed free, and fill with good quality compost. They can support two plants if necessary (stick to one plant for watermelons) as the roots will make their way into the soil you have prepared below the tyre.

WATERMELONS IN CONTAINERS

Watermelons are vigorous growers that can grow vines three metres or more in length in multiple directions, and they root widely. Therefore, not all of them are ideally suited for growing in containers the way melons are. If this is the method you prefer, or it is your only option, you should choose the smaller fruited varieties such as '*Little Darling*', '*Petite Yellow*' or '*Golden Midget*'. If you can accommodate grow bags then the 'icebox' varieties (i.e. those small enough to fit in your fridge) such as '*Sugar Baby*' and '*Champagne*' should be successful with two plants per bag, but limit them to one fruit per plant for maximum size and flavour. Keep them consistently moist (not waterlogged) and well fed.

Growing in Beds Undercover

Melons and watermelons can be successfully grown in beds in greenhouses or polytunnels. While a lot of people have enjoyed success this way it is not the preferable method for a reliable crop or for trying out a wide range of varieties. The major disadvantages are that as the soil is at or close to ground level it does not offer the level of drainage required, and it is also difficult to warm it up and have it retain that heat. The only realistic way to add additional heat when required is to run heat cables in the soil under the plants. If this is the way you wish to grow them there are couple of tricks you can do to shift the odds in your favour.

Raise the soil into mounds or ridges and plant into the top of them. The mounds improve drainage dramatically and they offer a bank of soil which faces the sun and therefore gets more heat than if the soil was level. If you have grown melons or any of the cucurbit family in the bed the previous year, replace the soil and then prepare it by digging it over and incorporating some well-rotted manure and organic fertiliser. Build the mounds up so they are 30 to 45 cm (12 to 18 in) high and 60 cm (24 in) wide. If you are planting multiple melons, make this into a long ridge rather than individual mounds. Plant approximately 40 cm (16 in) apart and train the plants vertically or allow to scramble over the ground.

You can increase the heat absorption of the compost even further by covering the mounds or ridges with black plastic and planting



melons & other cucurbits

through it. Black weed-proof membrane or black plastic sheets work well for this (see the following section for more details). It also prevents any weeds from growing.

Growing Melons and Watermelons Outside

Growing outside is very much possible in the UK if a few adjustments are made. It is a good option for watermelons, which put on a lot of growth in multiple directions and are therefore difficult to train vertically or grow in pots, but it can also work equally well for melons.

The trick for success outside is to be able to increase the temperature and retain it in the soil. There are two ways to achieve this and ideally you should use both. The first - and this is essential - is to cover the ground with black plastic or weed-proof membrane. Black plastic with a gauge of 500 / 125 mu is ideal, as it is not too thick but captures the sun's heat and warms the soil significantly. The other option is heavy duty woven weed control fabric made from plastic, not the lightweight non-woven version which doesn't absorb enough heat. The woven fabric will warm the soil but not quite as much as black plastic. However, it does let moisture through, whereas black plastic does not. If you use plastic then holes will need to be made in it for watering. If you can water regularly (daily in hot spells) then black plastic is preferred, due to how well it heats the soil and allows you to control the water the plant receives. If getting to the melons for regular watering is an issue, then woven weed-proof membrane will allow any rainfall through it.

The second step is to be able to cover the plants with clear plastic at the beginning and end of the growing season, and through any cold and rainy spells. The best material for this is polytunnel plastic which can be bought by the metre, or if you are lucky you may be able to source some off-cuts from a polytunnel installation. To achieve this, it is necessary to create a mini polytunnel structure to support the plastic sheet and prevent it sitting on the plants and damaging them. The best way to do this is to install some low half circle supports made from MDPE water pipe, or similar material. Bamboo canes are not strong enough and have the potential to break when being forced into a curve. Aim for the supports to be approximately 60 cm (24 in) high at the apex, and it may need three, four or five of them (depending on the size of the growing area) running parallel along the bed. Cut the pipe to the length you need to create a half circle over your growing area then push short bamboo canes (30 to 45 cm or 12 to 18 in long) into the ground at the edge of the growing area and thread the water pipe onto the bamboo canes to create a half circle. The canes will keep the water pipe rigid and prevent it being blown away, which it would do if the lengths of pipe were simply pushed into the soil. Lay the plastic cover over the pipe structures, making sure it does not rest on the plants, and hold down the edges of the plastic with stones or bricks. During the day, always leave the ends of this mini tunnel open to allow air movement. Cold, damp and stagnant air will cause plants to rot quickly. As soon as the sun comes out, take off the plastic to prevent overheating. Early in the season it is often necessary to re-cover overnight and remove again in the morning. This may seem like a lot of effort, but you will be rewarded with stronger plants that flower and fruit earlier.

Start with a bed of soil that has not had cucurbits growing in it the previous year and has been improved over the winter or early spring with a good amount of added compost.

Ideally, the ground should be free draining, if you are on clay soil which holds onto moisture, then create raised beds to improve drainage. These can be constructed from wood, metal, plastic or bricks, and should be 10 to 30 cm (4 to 12 in) high and filled with good quality compost. If you cannot create raised beds then make mounds or ridges from the compost (as described in the Growing in Beds Undercover section). Try not to walk on the soil, or do so as little as possible, as melons and watermelons are shallow rooted and do not like soil compaction.

Peg or weigh down the black plastic or weed-proof membrane at least a month before you are ready to plant out, around mid-April for planting at the end of May. This will prevent any weeds growing but more importantly it will warm up the soil so the plants can get off to a flying start.

When the weather has warmed up sufficiently to produce regular night-time temperatures of above 10° C – in a good year this can be the end of May, in a not so good one the middle of June – then they are ready for planting out. Each plant should be grown 1.5 to 2 m apart, and squares be cut out of the fabric as planting holes. Use the technique described earlier to prevent stem rot by planting in a small mound, and then dust with yellow sulphur. If you are using black plastic then watering holes will need to be made. Do this by placing a plastic pot approximately 15 to 20 cm (6 to 8 in) from the planting hole, one either side for even watering. Cut around the plastic pot, take out a small amount of soil and sink the pot into the hole. Initially, until the plant is established, you will need to gently water into the planting holes, but you must avoid getting any water onto the stem. Once the plant is established, watering and feeding is done by pouring directly into the plastic pots you have put in place. The water will soak in the soil and the roots will quickly go in search of it. If you are using the weed-proof membrane, water can be applied straight to this as it will soak through the membrane. If you have the option of using a soaker hose then these should be run underneath the plastic or membrane.

If the site is regularly exposed to cold winds then erecting a wind barrier around the melon bed – or at least on the side of the

prevailing wind – will be greatly beneficial. This does not need to be very tall, a metre or a little less in height will do, nor does it need to be a permanent structure. Sheets of polycarbonate or fabric sheeting fixed in place with stakes would be enough to buffer the wind and prevent cooling of the plants, and more importantly the soil.

Growing in a Cold Frame or Hot Bed

If you have a cold frame then this can be the perfect place to grow melons. Due to their small size, cold frames do not get as hot or retain heat as polytunnels or greenhouses do, but they offer the ability to cover the plant early in the season and during cold spells. Make sure the soil is free draining, and if it isn't then either dig it out and replace it with compost, or if the cold frame is of reasonable depth half fill it with compost. If possible, cover the surface of compost in the frame with black plastic or woven weed membrane and they will grow even better. Put this cover in place and keep the lid closed for at least two weeks before planting to warm up the compost. Plant into the middle of the frame using the mound method explained earlier and dust with yellow sulphur. Remember to cut a hole and sink in a small plant pot for watering. Once the plant has produced five true leaves, pinch out the growing point (this is the process of removing the very end of a stem after a leaf, or pair of leaves, where a new shoot is developing. This is very soft young growth which can easily be removed by pinching the shoot between the nails of your thumb and finger. The purpose of doing this is to divert energy away from the growing point to other areas of the plant). This will also encourage side shoots, of which the four strongest should be selected, pinching out any others which grow. Train each of the four shoots to the corner of the cold frame and pinch out their growing point when they reach the side of the frame, this will encourage sub-laterals which will produce most of



the flowers. Aim to grow no more than one fruit on each of the four side shoots, otherwise the plant will produce small fruit with poor flavour. Early in the season, when the days are not sunny, it is best to close the lid in the day, and overnight where possible throughout the year. As there is significant danger of overheating and scorching on sunny days when the cover is closed, leave it open to give the foliage ventilation. This will also aid pollination and prevent fungal diseases developing.

A cold frame with a depth of 50 cm (20 in) or more can be turned into a hot bed. If a cold frame is not available then one can be constructed from bricks, concrete blocks or wood. A hot bed has a layer of fresh, un-rotted organic material, underneath a layer of compost. As bacteria and fungi break down the organic material they give off heat, which rises into the soil above it. This will provide extra heat to the roots of your melons and provide a readily available supply of nutrients.

If you are constructing your own, then aim for a minimum depth of approximately 50 cm (20 in), though you can build it higher if you wish, and ideally it should be two metres wide in both directions. The hot layer should make up two-thirds of the depth i.e. if the depth is 50 cm (20 in) then the hot layer will fill the bottom 20 cm (8 in), with 10 cm (4 in) of compost placed on top, leaving 20 cm (8 in) for the melon to grow under the cover. The hot layer can contain un-rotted horse manure, wood chips, grass cuttings or wet leaves, ideally a mix of at least two of these, with fresh manure being the best. Cover this with a layer of compost and then add the plastic mulch (plastic sheeting). Do not be tempted to plant straight into the hot layer as the heat can burn the roots. If possible, cover the self-constructed hot bed with clear plastic or glass, like a cold frame, and remove it on warm sunny days and when the plants are in flower. Vigorous plants can grow up to touch the cover – if this happens then remove the cover permanently to prevent scorching and causing other damage to the leaves.

TRAINING VERTICALLY

Melons and watermelons have evolved to grow as vines that trail in multiple directions along the ground, eventually covering anything from 1.5 to 3 metres or more, with watermelons being the most vigorous. For most people, space in a greenhouse or polytunnel is in demand so the best space saving way to grow them is vertically. This isn't really an option for watermelons other than the icebox types with small fruit, as it is difficult to support the weight of them. If you want to grow the larger varieties, then the best method is along the ground using black plastic mulch.

You might read some information that says the central leader should be grown vertically up a cane, and that a shoot on each side should be trained laterally every 30 cm (12 in). However, melons are irregular growers and it is very difficult to get them to comply with such structured training. Unless you want to be removing side shoots from the main stem regularly then you need to accept this is not going to happen. It is also not advisable to create frequent wounds along the main stem, as this increases the chance of bacterial or fungal diseases.

If multiple plants are to be grown side by side, either in grow bags or pots, then a frame made from bamboo canes and wire provides a sturdy support if it is attached to the greenhouse or polytunnel structure. Melons can grow up to two metres (6 ft) tall, so you need to be able to accommodate this height in a straight line to the roof, or be able to train them at an angle once they meet the pitch of the roof. Construct the frame in advance of planting so you are not pushing the canes through and damaging the roots of your newly growing plants. Ideally, the frame should be 30 to 40 cm (12 to 16 in) from the glass or plastic (though this is not as imperative with plastic) to prevent the sun scorching the leaves. Insert canes vertically into the compost, approximately 10 cm (4 in) from the planting hole, and tightly attach a cane horizontally at the top, middle and bottom (the bottom one being around 15 cm (6 in) from the compost surface). In the gaps between the horizontal canes run wire or strong string so that you have either a cane or wire/string running horizontally at 30 cm (12 in) intervals. This will allow you to support the side shoots and the fruit that grows. You can avoid the wire/string horizontals by using pea netting if you prefer. Melons do have tendrils and will attach themselves to the netting, but some will still require tying in.

As the plant grows, one main stem will develop: this is the leader. The leader should be trained to grow vertically by loosely tying it to the bamboo cane with twine. Melon stems are vulnerable to damage so should be tied in using a loose loop, with the knot being tied to the cane. This should allow the stem to move about and have room to expand without putting pressure on it. Should the leader reach the top of your support then the growing tip should be pinched out or cut off. This will then increase the amount of side shoots produced. Melon flowers, particularly females, are produced in the most abundance on the side shoots (laterals), and the shoots from these side shoots (sub-laterals), so the more you can encourage, the greater your chances of fruit are. Melons which are grown well and healthily will produce laterals and sub-laterals freely, but you can encourage them further by pinching out the lateral after five leaves have formed, and pinch out the sub-lateral at two or three leaves. Pinching only produces small wounds that heal quickly so the risk of infection is low. These laterals and sub-laterals should be loosely tied into the frame horizontally where practicable.

They can be successfully trained up strong string as per tomatoes and cucumbers. The string should be fixed firmly to the ground by the plant using a peg hammered into the ground. If you are growing in pots or grow bags, the end of the string should be tied around the pot/grow bag or be placed in the planting hole, and the melon planted onto the string with the developing roots holding it in place. The top of the string should be fixed to a strong structural support of the greenhouse or polytunnel as it needs to bear the weight of the plant and its fruit. Twist the leading stem around the string as it grows, and tie in the laterals to the string as they develop.

WATERING

As already discussed, both melons and watermelons require a moist but free-draining growing medium. In reality this means that the compost is not dry but nor is it waterlogged; when inspected the compost should have a darker colour (rather than light and dusty) but the compost should not yield water when pressed gently. It should not be allowed to dry out completely either. Where possible, use rainwater and bring it up to ambient temperature, or even better a little warmer. The easiest way to do this is to fill up a watering can or bottle and place it in the greenhouse or polytunnel, either the night before or in the morning, and let the sun warm it up. This is always preferrable to putting cold water on the roots, the area where melons desire the most warmth.

Never, under any circumstances, water from above or spray the leaves and stems with water, even for a short time. Melon leaves are very susceptible to fungal diseases that prefer damp conditions on foliage. Spraying with water is also a sure way to create stem rot, as the water runs down the plant leaves and stem, and eventually sits where the stem meets the compost. This, combined with the moist conditions subsequently created around the lower stem, can kill a small or mature plant equally quickly.

Regular gentle watering is the best solution to this. When the plant is growing at seedling stage and growing on until planted out, water regularly with small amounts of water. The best way to gauge this is to cover the surface with vermiculite (which will also help to prevent stem rot), as it changes colour and dries out when it requires watering. Water gently with a small watering can, or a bottle with a watering nozzle attached, and apply only around the edges of the pot, away from the stem. As soon as water comes out of the bottom stop watering and move it somewhere to drain. Never leave the pots standing in water.

During the period just after the plants have been planted into their final positions continue to water gently around the planting zone using the water bottle or small watering can method. Once the plants have put out roots and begun growing rapidly, usually by mid-June, it may be easier to change watering methods to make sure they stay moist. If you are growing in pots or grow bags, and are available to tend your plants once or twice a day during hot weather, it is possible, and a good option, to continue to water with the water bottle or small watering can method. Water when the surface of the compost starts to become dry, particularly during spells of hot weather. If there is a spell of dull, cooler or rainy weather, then don't be in rush to water, as the plants will slow down in growth and only sit in cold wet soil, which increases the chances of root rot. It is much better during less favourable conditions to not water at all than overwater. The effects of underwatering can be corrected, whereas overwatering can cause much more damage, often irreversible. Obviously, the plants do not want to go through periods of significant wilt as this can damage the cell structure, which it cannot recover from. Slight wilting is not usually an issue.

If the plants cannot be tended daily, then a drip watering system is an excellent option. It provides regular, gently applied water direct to the compost. Remember to turn off the drippers during colder dull spells to prevent the plant's roots sitting in water in suboptimal conditions.

Plants grown outside with a black plastic or weed-proof membrane mulch will require watering much less than those in pots, as the roots are not restricted and can go out looking for moisture. Watermelons in particular need more water than people tend to think, especially when the fruit is swelling. The general rule of thumb is to apply 2 to 5 cm (I to 2 in) of water per week in sunny warm weather. If it is overcast, cool and the compost is moist, then skip watering until the weather warms up again. There are a few ways to apply the water they need. Firstly, by cutting holes into the membrane (ideally one hole at each side of the plant) and sinking a plastic pot 2 cm or so into the compost. Water is then applied from a watering can into these pots and allowed to soak in. Woven weed-proof membrane will also allow water to permeate through it, so it can be applied directly to the membrane, however, this is not very controlled and risks water getting onto the stems and leaves, leading to fungal problems. It is better to use the sunken pot watering method. If a soaker hose (sometimes called a leaky hose or leaky pipe) is to be used, gently supplying water over a longer period, then this should be run under the membrane prior to planting.

If the compost dries out significantly and the plants have wilted, the temptation is to give them lots of water all at once to correct the problem quickly. The urge to do this with melons should be avoided, as sudden flushes of water will split the stems (which they can recover from, but which creates a vulnerable point for potential infection), or even worse, the fruit. As the fruit is growing the skin is thin, and when it nears ripening and is at full size a surge of water can crack open the fruit, exposing the moist flesh which will quickly rot. The emotion of the gardener, when this happens, cannot be described in words. To prevent these issues, water should be administered very gently over a period of time – drip feeders and bottle top watering nozzles are good for this. Apply a small amount and let it soak in, then return to it shortly afterwards and do the same. Do this over the course of a day or a few hours until the compost is moist again, but do not rush it. The plant will recover, split fruit will not.

As the fruit begins its process of ripening, the watering should be reduced to maximise the amount of sugar in the flesh. In a good year with most varieties, this process will start in early August; the fruit will have remained the same size for a noticeable period, and then the leaves of the plant will start to deteriorate by wilting and turning brown. This can cause a panic among growers and a temptation to water because the leaves are wilting, but this should be avoided if the compost is moist and there is well developed fruit, as the plant will have started the ripening process and will not be wilting from lack of water. At this point the plant is no longer growing but concentrating all its energy on producing fruit and viable seeds, so it is not demanding water for growth, only to sustain the remaining leaves. Watering should be reduced to such a level that they do not wilt due to lack of water. The best way to do this is to keep the compost on the dry side and add small amounts of water if the remaining green leaves begin to wilt. With some melon varieties the leaves die back almost completely as the fruit ripens, at this point little or no water should be applied.

Feeding

Both melons and watermelons grow rapidly and produce heavy fruits, so it should be no surprise that they require feeding regularly to maintain this growth. When the young plants are being grown on in their small pots ready for planting out, they can be fed with a weak general liquid feed after the first two weeks. If they are to be grown in pots then a handful of all round granular fertiliser, such as fish, blood and bone, should be mixed in with the compost prior to planting. A similar fertiliser should be applied to the surface of the compost at the same stage when you are growing the melons directly in the ground.

Once the melons start to produce flowers they will benefit from a liquid high potassium feed, applied weekly until the fruits stop swelling, when the plant stops growing and starts the ripening process. As ever, the feed should be applied gently, without flushing the compost with water. If weather conditions are poor and the compost is moist, then put off feeding as you would watering, until the weather has picked up again: liquid feeding at this time will only mean the plants sit wet and cold.

Pollination

Melons and watermelons, like pumpkins and cucumbers, are monoecious plants: they produce both male and female flowers on separate structures on the same plant. The male flowers, which



always appear first and in larger numbers, carry the pollen, and can be recognised by a thin stalk and no swelling behind the flower. The female flowers have an embryo fruit noticeable at the base of the flower, and require the pollen to be transferred from the male flowers to their stigma, from where it fertilisers the immature fruit.

In nature the process of pollination is carried out by flying insects visiting each flower, taking the pollen with them and depositing it on the female flowers. Gardeners can help this process by ventilating indoor growing areas by opening doors and windows, particularly on warm sunny days. Insects will quickly find the flowers and begin their work. It is also helpful to keep the humidity down during pollination time.

The pollination process can also be helped along by hand pollinating the female flowers. To do this the male flowers need to be removed by pinching them off with the stalk attached. Next, carefully remove all the petals to expose the pollen-carrying part of the flower, and gently rub it on the stigma in the middle of the female flower. The pollen grains are very small and difficult to see on melons, but are much more noticeable on watermelons and the female parts easier to access. Some growers also remove the petals from the female flower to increase the surface area of the stigma to work with, however, this can risk damaging the embryo fruit at the base of the flower if not done carefully. The ideal time to pollinate is on a warm sunny day around mid-morning, when the flowers have recently opened, the pollen is active and the female flowers most receptive. If this window has been missed and flowers are open and available, then pollination should still be attempted. Aim for at least two males to be used to pollinate each female, but use more if they are in abundance.

If fruit has set, the embryo will quickly start to swell once the petals die back. If it has failed, the fruit will turn yellow and drop off. Patience is required in high quantities during pollination, as many more female flowers fail than take. In watermelons the success rate can be around 50%, and in melons as low as 10%. If true seed is not required, then a mixture of opening the growing environment to insects and hand pollination will provide the greatest chances of success.



Thinning the Fruit

Removing fruit which has set is a difficult task, not because it requires a lot of skill, but because it feels awful. Having nurtured these plants, trained them, watched them flower, hand pollinated them and have the fruit set, you are now being told to remove some of the potentially delicious melons and compost them. It is awful. This process is called thinning, and by doing so it improves flavour, maximises size and ensures that all the set fruit ripen. If too many fruit set, it places too much demand on the plant and results in small melons. Plants grown in pots or grow bags should be limited to three (or potentially four for a smaller fruited variety such as '*Minnesota Midget*'), and up to four when grown in the open ground or hot bed. When the fruits are the size of a walnut the best and largest should be selected to grow on to full size. Only one fruit per side shoot should be allowed to stay, two per side shoot can result in inferior melons.

Watermelons grown in the open ground tend to become a mass of side shoots and leaves, which makes it difficult to determine which side shoot they have come from. If it can be identified, then minimise to one per side shoot, but do not worry overly, and limit to no more than four fruits per plant. If really large watermelons are desired, limit to two or even one fruit per plant. The best way to detach a fruitlet is to cut them rather than pinching them off, as this gives a clean cut which is less likely to be a point of infection. Watermelons grown in containers, including grow bags, should not be allowed to grow more than two fruits per plant.

Melon and watermelon vines tend to die back as the fruit is ripening, which creates a problem if there are fruits which have set a significant time after the others. As the early setting ones ripen and the plant starts to die back, the later fruits can run out of time to mature sufficiently to a stage where they can ripen. To avoid this, ideally all fruits should set within a ten-day window. This is not set in stone, and if another fruit is set after twelve days there is no rush to remove it because it is two days past the preferred window. Sometimes a plant can set a solitary fruit early (mid-June) and while this is exciting it should be removed if there are no other female flowers being produced or setting at this time. The plant will focus all its energy on this one fruit at the subsequent expense of producing any more viable female flowers or fruit. Wait a few days, and if the plant is continuing to produce more female flowers and another two or three set within the next week to ten days then leave the early fruit and the plant will most likely deliver an early crop of melons.

Supporting the Fruit

Once the embryo melons have set, they grow quickly, become heavy and require some form of support to prevent them becoming damaged or falling from the plant. If the fruit has set low down, close to the compost level, or the plants are being grown along the ground, then they will need to be raised off the compost; if they are allowed to sit on the damp compost there is a chance they will rot. Anything with a flat surface that does not absorb water (therefore wood should be avoided) such as a flat stone, a piece of slate, an old plate or upturned plant pot saucer can be used. Gently lift the fruit and place your chosen item under it, avoid resting it on the stem, or close to it, to prevent it becoming damaged, and lower the fruit. Check regularly as the fruit grows to make sure no part of the melon is touching the compost surface. Most watermelons are grown along the ground and should also be supported in the same way (even if they are sitting on plastic mulch or weed membrane), though they will require a larger object as they grow much bigger than melons and have a larger surface area touching the support.

For melons which are grown vertically the best way to support the fruit is by reusing the net bag from bought fruit, such as oranges and lemons, or making a cradle from tights. These take the pressure off the stems by holding the weight of the fruit, and also catch them if they ripen quickly and fall from the vine. The support should be put in place when the fruit is about the size of a golf ball. When using a net bag, thread some twine or string through either end and place the fruit into the net bag then tie the string to a strong support, such as a horizontal cane/wire or the structure of the polytunnel or greenhouse. It should be tied tight enough to support the weight of the fruit currently and be able to stretch as the fruit swells. Tights are also an excellent option as they are strong and stretch easily to support the developing melon. The lower part of each leg, including the toe part, should be cut off, and holes made on either side with string being threaded through each side. The melon should then be placed inside, sitting in the toe section, and the tight tied to supports, as with the net bag method. Squares of material cut from tights can also be used to make slings, with string being threaded through each corner. It is important not to have the string or net bag pressing against the stem on which the fruit has set, as this can cut into it or cause it to snap entirely.

HARVESTING MELONS

Judging the ripeness of a melon can sound like a complicated process but there are many signs to help you harvest at the correct time. As you grow a certain variety multiple times and your experience builds up you will know exactly when to pick your favourite types for maximum texture and flavour. In most instances melons ripen as the vine dies; the leaves start to wilt, turn yellow and brown, and the stem can also dry up. Do not be tempted to dig up and throw away plants where the vine





looks dead but the fruit is not fully ripe, because left in place, as long as there is still some warmth in the sun, the melons will ripen.

Melon growers often use the terms 'full-slip' and 'half-slip' to describe one of the main signs of ripening. When most melons are approaching ripeness small cracks begin to appear where the stem meets the fruit. The half-slip stage is where it would still require a degree of force to separate it from the plant. Most melons are harvested at full-slip, which is where the cracks are well developed and the stem will detach from the fruit with a gentle touch. This sign, combined with a slight but quick change in colour, usually to a yellow tone, coupled with a melon scent from where the stem joins the fruit, will tell you it is ripe.

The smooth skinned Charentais type fruits of the *Cantalupensis* group, such as '*Petis Gris des Rennes*', '*Ogen*', '*Alvaro*' and '*Cantalun*', do not always crack and slip from the stem, so this should not be used as the main sign for ripeness. The best indicators to look for are a change in colour, usually to a yellow tone, which can happen quickly, and a melon scent which is apparent from the blossom end rather than the stalk end. If the thumbs are pushed gently around the blossom end and the fruit gives a little, this, combined with the other indicators, confirms that it is ripe.

The ripeness of melons in the Inodorus group is more difficult to determine because they generally do not give off any scent. One of the main indicators is that the fruit colour will change from green to yellow for '*Giallo d'Inverno*', and a light creamy green for some of the modern bred varieties such as '*Honeydew*'. Wait until all the green has changed colour and the skin is smooth and waxy; if it is dusty and dull then wait. As with the Charentais melons a squeeze of the blossom end with the thumbs will help: if it gives and springs back, then it is ripe, if it is solid and does not move, it is not yet ripe.

None of the melons increase in sugar content once they are

melons & watermelons in the garden

separated from the vine but their flesh does soften. Apart from the Inodorus group they do not store well and should be consumed at room temperature a short time after harvesting. If they are to be kept for a short time they should be stored in the refrigerator.

HARVESTING WATERMELONS

Watermelons do not display any of the ripeness signs that *Cucumis melo* do, and they require regular observation as they are a bit trickier to get exactly right. The main indicator that most growers look for is the drying out of the tendril. The tendril is the slender growth from the stem which curls around objects to support the vine. The important one to keep an eye on is the one joined to the stem that attaches to the fruit. The tendril should have fully turned brown and dried out before harvesting takes place. At the same junction as the tendril there is often a very small leaf which is referred to as a 'leaf ear', this will also turn brown as the fruit ripens. Sometimes there is no tendril present where the fruit stem grows from the vine. If this is the case then use the leaf ear drying out as the gauge.

The area of the watermelon which sits on the ground (or support) has a different colour to the rest of the fruit, this is called the 'ground spot' or 'field spot'. The changing of the ground spot colour to a creamy buttery yellow is another key indicator that the fruit is ready for picking. Look for the tendril to start drying and then gently lift and turn the fruit to observe the colour of the ground spot; if it is pale green or white then it is not ripe. The whole skin should also be observed regularly; it should change from bright and shiny to dull. If it is still bright it is unlikely to be ripe. At this stage of ripening the watermelon should show ribs along the fruit, another sign that the fruit is ripe.

Some growers count forty days from fruit set to harvest and

consider this to be the best indicator. This relies on two things, that the exact date of the fruit showing signs it has set is observed and noted, and that the weather is relatively consistent for the next forty days.

The technique of knocking the watermelon with a knuckle and if it sounds hollow then it is ripe has long been dismissed by experienced growers as an inaccurate indicator, as different sized fruits can sound different, and what sounds hollow to one person may not to another.

Using all the indicators discussed above (apart from knocking it to see if it sounds hollow) is the best way to accurately determine the ripeness. Firstly, closely observe the tendril and when it is turning brown gently check the ground spot, if it has changed to a buttery yellow then harvest, if it hasn't, wait for the tendril to dry out fully and check the ground spot again. Do this while observing the change in skin colour from bright to dull, and the development of ribs. If all or most of these criteria are met the watermelon is ripe. Try to make notes of the variety and what these indicators were like at the time of harvest and whether it was slightly over or under ripe, so that harvesting can be adjusted in future.

COMMON PROBLEMS

Red Spider Mite

Primarily a problem of indoor growing areas. The small red spiders suck the plant sap and create a fine silky webbing over the leaves and stems. The foliage becomes discoloured, bleached and sometimes speckled. The growth on new leaves and shoots becomes stunted and can be severe enough to cause leaf loss and plant death. The best treatment is preventative, as once a bad infestation has got hold the mites are difficult to remove. Spider mites dislike a damp atmosphere so increase the humidity by damping down the greenhouse or polytunnel floor regularly (sometimes multiple times daily) during hot spells. Under no circumstances be tempted to spray or wet the leaves as this will create other, potentially more severe, problems.

Fusarium Wilt

This is a fungal disease which is found in soil. There are many different strains of this fungus which effect different groups of plants. When it enters the plant and gets into the water-carrying xylem vessels, the plants try to defend themselves by producing a gum which causes the vessels to become blocked. The first sign of this disease in melons and watermelons is a sudden wilting of the leaves due to the lack of water being able to flow to them. Wilting can also be a sign of root rot or simply due to the plant being in direct hot sun. If the soil is moist and the wilting does not recover overnight, then it could be fusarium wilt. A key diagnostic tool is to cut a leaf that is wilting from the plant with some of the leaf stalk attached. If a dark ring is present in the cross section of the leaf stalk then it is most likely fusarium wilt. The cut leaf stalk can also be pushed gently back to the cut surface on the plant and then drawn back away; if the sap is viscous and stretches across the gap as the leaf is pulled away that is also a sign of the disease. There are no treatments once it is discovered but it can be prevented by changing the soil each year or rotating away from where cucurbits have been grown in the last three or four years. If the fungus is known to be present in the soil, grow resistant watermelon varieties or grow in containers with bought in compost. Destroy any plants that have been infected with fusarium wilt.

Verticillium Wilt

Verticillium wilt is another soil-borne fungal disease which causes very similar symptoms to fusarium wilt; however, the leaves tend to turn yellow from the lower leaves upward. The biggest cause is the plant sitting in cold wet soil for prolonged periods, therefore if cool or overcast weather is forecast avoid watering until temperatures warm up again, which will also help to avoid root rot and stem rot. The fungus can remain in the ground, so replace the soil, grow in containers with fresh compost, or rotate the growing area.

Anthracnose

Another fungal disease which effects melons and watermelons, anthracnose can remain in the soil for a prolonged period while also being hosted on plant debris and passed down through seeds to the next generation of plants. Its spores are transferred to plants when favourable cold and damp conditions are present, particularly if water is allowed to sit on the leaves. Spots appear on the leaves and grow quickly with each spot having a yellow halo. The infected areas turn brown and dry, and cause the whole leaf to die. If identified, the leaves should be removed and destroyed, but if a bad infection takes place the whole plant may need to be destroyed. There is no treatment, but indoor growing areas should be well ventilated and water should be prevented from touching the leaves. Soil and compost should be replaced and rotation take place. Some varieties of watermelon and cucumber are resistant to anthracnose infection.

Mildew

Mildew is a form of fungus that can affect a wide group of plants, attacking foliage, stems and flowers by covering them with a white powdery coating. It causes a weakening of the plant, distorted growth and potential death. It can occur on both indoor and outdoor grown plants, and is problematic where the soil is dry but the atmosphere humid. It can often occur at the end of the growing season when the plants are in their ripening phase and night-time temperatures are becoming cooler. At this stage it is not of concern and will not affect the crop. Keeping the compost just moist during warm weather is the best preventative method. There are chemical treatments available for powdery mildew, but some growers report good success by spraying leaves with a 40/60 ratio mix of milk and water every ten days or so. This should be a last resort for melons and watermelons (but can be more freely tried with the other cucurbits) as wetting the leaves should be avoided at all costs.

Blossom End Rot

Blossom end rot, as its name implies, attacks the area of the young fruit where the blossom was, which begins to turn brown and black and rots away, leaving the fruit unable to reach maturity. The cause of this is lack of calcium in the plant. Irregular watering, particularly when the fruit has just set and is swelling quickly, causes a fluctuation in calcium being taken up by the roots. Aim to keep the compost moist, not wet, during the growing and fruiting phase. It is also important to use the correct liquid feed with a higher potassium concentration, such as a tomato feed, because a high nitrogen content fertiliser will encourage an increased formation of leaves, which in turn will create a high demand on calcium, diverting it away from the fruits.

Stem Split

This problem generally occurs low on the stem, often between the first true leaves and the compost level. There are two main causes of stem split. The first is a sudden change in temperature over a few days from cold to warm. This is especially an issue early on in the season when the temperatures are erratic and the plant is growing quickly. A sudden change from cold weather, when the plant will slow down or grow slowly, to hot weather will cause the plant to respond quickly. This sudden surge in growth can cause the fragile stem to split. The second cause of stem split is irregular watering, usually a drying out of the compost followed by a sudden flush of water. If the plant has wilted or the compost has dried out, then it must be watered very gently to re-moisten it, otherwise stem split (and fruit split at that stage) will invariably occur. Do not be tempted to flush through water in a panic that the plant is wilting. Gently provide a little water, let it soak in, return in an hour or so and do the same. More damage will be caused by overwatering than underwatering. Stem split is a significant point of weakness for infections but also for stem rot to take place, particularly if near to compost level. If it does occur, the wound should be kept dry and a good dusting of yellow sulphur will help prevent infection. Unless the split is severe, with the correct care most plants grow on without any problems and fruit as normal.

Overwatering

A sure sign of overwatering is the leaves starting to turn yellow. As the compost becomes saturated with water, oxygen is pushed out of the soil which prevents nutrients being absorbed, and if the roots sit in water for a prolonged period, particularly during a cold spell, they will quickly begin to rot. If the overwatering is caught quickly, the plant will recover, if not, the plant may continue to lose vigour and eventually die. Aim to make sure the compost is just moist, not wet, particularly during the quick growing phase, and that it doesn't sit in water. All pots, grow bags etc. should be raised from the surface they are placed on to allow excess water to drain away. If in doubt, stay on the drier side than wet.

Plants Producing Small Fruits

Some varieties of melon, such as '*Minnesota Midget*' and '*Golden Midget*' produce smaller than average fruits but if the fruit being produced is smaller than expected there are some potential reasons. Irregular watering while the fruit is swelling quickly after being set is a common cause, as is not feeding regularly, usually weekly, with a high potassium fertiliser once the melons begin to develop. Allowing