Your Garden

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INTRODUCTION:

For most of us our garden is our own private refuge, a place where we can satisfy our need for beauty, tranquillity and personal achievement. The garden provides a link with nature, a balance and harmony of the living world. Each garden is an entity, created from its share of the sun and rain and the qualities of the soil, with its own unique character.

The majority of plants we grow today have been brought from far-flung regions of the world, giving us variety and the opportunity to experience growing different species than those found locally. Many native species are cultivated to improve appearance and stamina, strengthening their immune system to resist pestilence and predators, creating larger flowers with better form, colour and features and give longer flowering periods. However, those people with an interest in cultivating plants which are extremely tender to the area where they garden, must go to some lengths to enable their choice of plants to flourish and must give them winter protection.

There are many factors affecting a plant's hardiness, or rather its ability to succeed in any particular place. The type of soil, its ability or inability to release nutrients, or to drain, or to allow roots to penetrate to sufficient depths, can all affect plant growth. The level of rainfall, and when it falls, is vital. In many places around the world drought is a problem, particularly in the hottest regions.

In Northern Europe, it is often not the lack of water but excess, especially if it is accompanied by cold spells. Shelter, in a larger area as provided by hills and mountains or more locally by buildings, walls and trees, these affect what can be grown successfully.

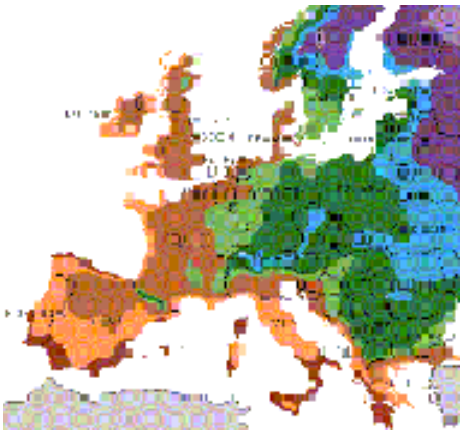
Towns and cities are usually a few degrees warmer than rural areas. Frosts can be preceded by snow, which provides protective insulation for plants; frost before snow, especially if it is accompanied by drying winds, can damage plants. An overnight frost on a calm night maybe harmless; a prolonged frost can prove fatal even for some of the hardiest varieties. Northern and eastern winds, or salt-laden winds from the sea, can be disastrous. Day length, the angle of the sun and brightness of the light, are as important as the temperature.

Climates repeat themselves around the world due to weather patterns, latitude, proximity to large bodies of water (oceans and major lakes) and other factors. Many of us garden in temperate to sub-tropical climates and these are the ranges of climate in which the vast majority of our "hardy" garden plants originate.

If we can identify the broad type of climate where we garden, and we know where a plant is native and can identify the broad type of climate of that area, we are then moving in the right direction for successful gardening.

The Plant Hardiness Zone System devised by The United States Department of Agriculture was created to help plant growers identify areas where each particular plant can be grown successfully. Most plant information will include a zone number, indicating that the plant is capable of withstanding the average minimum winter temperature of that zone and those zones with higher numbers. Therefore it is imperative when choosing plants that we take this information into consideration, it will enable us to make the right decisions for successful cultivation of each plant we acquire. This will inevitably save a great deal of expense and avoid disappointments.

European Zone Hardiness Map



Average Annual Minimum Temperature

°C	Zone	°F
-40 to -35	3	-40 to -30
-35 to -29	4	-30 to -20
-29 to -23	5	-20 to -10
-23 to -18	6	-10 to 0
-18 to -12	7	0 to 10
-12 to -7	8	10 to 20
-7 to -1	9	20 to 30
-1 to 5	10	30 to 40

USA Zone Hardiness Map

Average Annual Minimum Temperature

Temperature (F)	Zone
Below -50	1
-45 to -50	2a
-40 to -45	2b
-35 to -40	3a
-30 to -35	3b
-25 to -30	4a
-20 to -25	4b
-15 to -20	5a
-10 to -15	5b
-5 to -10	6a
0 to -5	6b
5 to 0	7a
10 to 5	7b
15 to 10	8a
20 to 15	8b
25 to 20	9a
30 to 25	9b
40 to 30	10

The Soil:

Soil Texture
The most important factor when beginning to cultivate your garden is to know your soils texture -- whether it's sand, silt, clay, or something else. Testing the texture is something that every gardener can do at home. To get a general idea of your soil texture, the test you need to perform is quite simple. Take a handful of moist soil and roll it between your palms until it forms a sausage shape. If it feels gritty and breaks apart immediately, the soil is predominately sand. If the soil feels smooth, and holds its shape for a short time before breaking apart, it's mostly silt. However, if it feels sticky and holds together, then it's clay. Even without knowing the soil's exact texture, it's a safe bet that adding organic matter will help.

Soil Types
Sands are not necessarily all sand, nor are clays necessarily all clay. In between these two extremes there are a number of different textural classes.

Sandy Soil
Coarse-textured soils, which include sands, loamy sands and sandy loams, are valuable not just because they are easy to cultivate but also for the fact that they are able to warm up quickly in spring. They drain well so the plants do not stand with their roots in water for too long. However, as they drain quickly so plants need to be regularly watered and fed if they are to thrive. Sandy soil feels rough and gritty when handled. They are usually a reddish brown colour and easy to dig. One advantage is that they very quickly warm up in the spring, so sowing and planting can be done earlier in the year than it can in clay soils. However they may lack nutrients because much of it is washed through the soil in wet weather.

Silty Soil
This soil type is richer in nutrients than sandy soil; it is also heavier because it can retain moisture and has a tendency to become compacted. It does however tend to drain well and much easier to cultivate than clay.

Clay Soils
Clay soils are generally termed heavy soils, being weighty to lift and difficult to work. Drainage is usually bad and they are acid, clinging to the feet in wet weather. Clay particles provide the smallest soil fragments, so they naturally pack down very closely. A sponge-like substance called a Colloid surrounds each separate particle. During wet weather these absorb moisture and become sticky, pressing the particles still more tightly together. In dry weather they lose moisture and shrink; we must all have seen at some time or other, clay soil that has severely cracked after several weeks of dry weather. To combat these conditions we should add lime, gypsum and work in plenty of compost, which will help to separate the soil and give it texture. Work in materials such as straw, manure and rough compost. If lime is required a top-dressing every third year should work wonders.

When preparing the beds for vegetables in clay soil, the organic fertilizer should be added at a rate of two bucketfuls to the sq. yd. If the soil is heavy clay and needs drainage, then it might be advisable to seriously consider having land drains, pipes laid below the soil. The pipes are obtained in fixed lengths and may be earthenware, tile, plastic or concrete. Alternatively, drainage trenches can be dug. The trenches should be 2 ft. (60cm) deep, the main trench being 1 ft. (30cm) wide and running to the lowest part of the garden. The side trenches should be narrower and should run diagonally into the main trench. The bottom can be filled with large stones, clinkers, rubble and other similar material through which the water can percolate.

Though trenches are not as effective on land with excessive drainage problems, if pipes are out of the question for financial or structural seasons, it will never the less help to elevate some of the problem. If on the other hand these too are not an option, then raised beds could be the answer.

Loamy Soil
In the medium-textured soil group are loams, which contain sand, silt and clay, in such well-balanced proportions that none produces a dominating influence. These are amongst the most fertile soils. With proper management almost any crop can be grown in them. They warm up quickly in spring and rarely dry out in summer. Loamy soil is brown and wonderful crumbly, the perfect medium, one that is suitable for most plants. Its texture is similar to that found on well worked allotments, it is easy to dig and naturally high in nutrients, if you have this then you are extremely lucky!

Chalk Soils
Chalk soils are very variable, for their fertility depends largely on the depth of soil overlaying the chalk bed formation. If the topsoil is thin the ground will be poor and hungry. It will be bone dry in summer and the plants will need far more watering and feeding than on any other soil. If however, it is fairly deep, good growing conditions are possible. Chalky soils are often sticky and soft in wet weather; you can help this situation by building up a good layer of topsoil by working in plenty of manure and compost. In these conditions, green manures are particularly beneficial. In chalky soils potash is often deficient so use sulphate of potash ½ - 1 oz. per sq. yd. the alternative is wood ashes 8 oz. per sq. yd. as a spring top dressing.

Peaty Soil
Though peaty soils are uncommon they do occur in fen or boggy areas. Peat is composed of excessive quantities of humus and is associated with water- logging. The soil is usually very acid, dark brown in colour, fibrous and spongy in texture and contains few nutrients. It does have one advantage in that it warms up quickly in spring. The best way to work it is to add drainage, add lime occasionally to correct acidity. It is excellent for plant growth if fertiliser is added.

Soil Fertility
One simple way of checking if your soil has good fertility is to wait until spring while soil is moist and warm (at least 55 ° F), find an area of the garden where the ground is covered by mulch or green manure, and dig up a clod 1 ft. (30cm) square by 6-inch (15cm) deep. Place the soil on a piece of wood or cardboard, and count the earthworms in the mass of soil. If you find 10 or more earthworms, your soil has good fertility.

Soil Testing
It really is helpful and can save you money if you know the makeup of your soil. If your garden is growing well, an argument could be made not to bother testing at all. However, if some of your plants aren't growing as well as you would like, or you are wondering if you are using the right amount of fertilizer, a soil test is the place to start. It will give you a periodic snapshot of your soil's mineral health. Tests are most useful when done regularly (every three to four years), at the same time of year (spring is fine, but autumn is best because that's when fertility is lowest).

A sample test:
Soil pH. This is measured on a scale of 1 (acid) to 14 (alkaline). Most garden crops grow well at a pH of 6 to 7, but specific crops such as blueberries and azaleas may need a lower (more acidic) pH. Soils tend to be more acidic in high-rainfall areas while drier climates can have more alkaline soils. In general lime is used to raise pH, while sulphur is recommended to lower it. If your soil also lacks magnesium, dolomitic limestone

(which contains magnesium along with calcium) is recommended. Apply lime and sulphur in summer when the soils are warm and micro organism activity is high.

Nitrogen (N). Nitrogen is one of the key nutrients needed for plant growth, deficiency usually appears as pale yellow leaves (often the older leaves first) and stunted growth. Since organic matter can hold and then slowly release nitrogen as it breaks down, soil can become acidic as a result of organic matter decomposition and by the addition of ammonia cal (NH4) nitrogen fertilizers. Hydrogen ions produced by these processes dislodge calcium, magnesium and potassium from the surface of the soil so that they are washed away from the upper levels of the soil and lost. As the concentration of the hydrogen ions increases, the soil acidity increases.

Phosphorus (P). Phosphorus levels are often reported as either available or reserve. Available phosphorus can be used now, while reserve is tied up due to pH or nutrient imbalance. Often, just raising or lowering the pH to the ideal 6.5 will free up phosphorus for plant use. If it is not used up quickly, adding too much will build excessive levels that run off, causing pollution. Purple leaves, brittle roots, skinny stems, and late fruit set and maturity indicate deficiencies. In early spring, deficiency symptoms on seedlings may disappear with warmer temperatures and increased microbial activity. Super phosphate, rock phosphate, and bone meal are good sources of phosphorus.

Potassium (K). Potassium is vital for stem strength, root growth, and disease resistance. Many soils are naturally high in potassium, and it is readily available to plants. However, sandy and highly weathered soils can be deficient. Signs are irregular yellowing of lower leaves and poor root growth. Muriate of potash, greensand, and wood ash are good sources.

Calcium (Ca). Calcium is important for cell-wall integrity and root and leaf growth. If you lime your soil regularly to keep the pH above 6, calcium deficiency would be unlikely. However, on alkaline soils (pH above 7) add gypsum (calcium sulphate) instead of lime. Low levels of calcium show as deformed new leaves and branches, and weak stems and roots.

Magnesium (Mg). Magnesium is essential for chlorophyll and green leaf development. Pale leaves with green veins are a sign of deficiency. Adding dolomitic lime to raise the pH often corrects deficiency symptoms; on alkaline soils, add Epsom salts (magnesium sulphate).

Caution exchange capacity (CEC). CEC measures the ability of soil particles to hold and release specific nutrients. In general, sandy soils tend to have a lower CEC than most clay soils. Adding well-rotted compost raises the CEC. High CEC usually means a more fertile soil. If your soil has a low CEC, add small amounts of fertilizer throughout the growing season to prevent runoff and waste.

Organic matter is essential for nitrogen absorption and release, and as a food for micro organisms that help make other nutrients available. A level of 3 to 5 percent organic matter is considered ideal. But it's the quality, not the amount that can make the difference. Soils high in un-decomposed organic matter, such as wood chips or sawdust, can tie up nitrogen and create a deficiency. The best-quality organic matter to apply, especially right before planting, is well-rotted compost.

Percent base saturation. Some experts consider the relationship between four key elements (calcium, potassium, magnesium, and sodium) an indication of soil health. The ideal ratio is approximately 60 to 80 percent calcium, 10 to 15 percent magnesium, 5 to 7 percent potassium, and less than 3 percent sodium.

Adding these figures gives a number called the base saturation. In general the higher the number within the given ratios the more fertile the soil is. If you're adding bulk organic fertilizers such as manure, you can reduce the amount of other fertilizers by a third.

Do-it-yourself soil tests. For a quick check, many home tests are available. These rely on colour charts to match the nutrient levels in a soil solution. Unless you buy an expensive test kit, the specific nutrient tests aren't, in general, as accurate as in a professional soil test but never the less they do equip you with a basic knowledge of your gardens soil. They give a guide of the pH and nutrients that are immediately available.

Acid or lime: - Acid Soil does not have much - if any - lime in the soil. An Alkaline Soil does have lime in it - to varying degrees. A Neutral Soil will have lime in it, but not enough to class it as an alkaline soil. You can also do a basic test by drying a teaspoonful of soil, and then sprinkle some vinegar on it. If it bubbles, it will probably have lime in it. If is doesn't it will probably be acid or neutral!

Lime
Most plants need lime in the soil to live and thrive. Rhododendrons, Camellias, Ericas and a few others do not. They cannot flourish in soil where there is lime, in fact most will not just struggle to survive they will die!

Lime encourages soil life, for the bacteria that sorts out your organic matter into Nitrogen, are quite lethargic in acid soils.

Lime improves the 'tithe' (crumbly structure) of heavy soils such as clay soils. A really sticky clay soil can be put right quite dramatically with a dressing of lime. The lime coaxes the individual clay particles to form 'groupings, allowing moisture to drain, and plant roots the freedom to roam.

Lime can act, as a deterrent for some pests - slugs and leather-jackets are not keen on lime. It will also act as a preventative for club root in brassicas.

Lime in the soil is good for earthworms. Most soils will benefit with a high earthworm population. As well as helping to break down raw organic matter, they make a network of drainage channels in the soil - great for heavy clay soils.

Improving the Soil:

Compost is great for enriching and improving texture and aiding drainage, but another effective way to add organic matter to the soil is through green manures and cover crops.

Green manures
Green manures have been used for thousands of years for mainly vegetable crops; it is a way of replenishing organic matter into the soil, especially soils that have been impoverished by chemical fertilization. It is a sustainable enrichment of soil by incorporating un-decomposed green plant material for the benefit of the soil. You dig it in and let the roots, stems, and leaves decay there.

Some green manures have very deep roots, which reach down into the subsoil and pull up nutrients that would not otherwise be available to most garden plants. The above ground portion of a green manure crop covers the soil, protecting it from erosion and compaction due to heavy rains.

These rapidly growing plants also shade the ground, which suppresses the growth of winter weeds. Other green manures are nitrogen-fixers. This means that certain bacteria colonize within the plants roots. These microbes have the ability to pull nitrogen out of the air and convert it into a form that they (and your plants) can use:

Increase soil fertility
Increase biological activity
Nourish subsequent crops
Reduce soil erosion
Reduce nitrate losses
Weed suppressant
Soil structure improvement

The **Annual Lupin** is extensively used as a green manure crop as is **Crimson Clover** (Trigonella foenum graecum) and **Mustard** (Sinapsis alba). These will add organic matter to improve the soil as they rot down. One key ingredient in green manure is a legume, which fix nitrogen into the soil. This is a good practise especially in soil where hungry feeders have been grown. When choosing a green manure, look for a plant that germinates easily in your soil and grows quickly, covering the ground. Some manure crops are planted in autumn and turned under in the spring, giving you organic matter quickly. Others grow from spring to spring, giving long-term erosion control.

However, green manure does not give quick results as it is slow to activate – and the reason why it is not often used in ordinary home gardens. It usually takes at the very least six months for the vegetation waste to rot down. When crops are dug into the land in a fresh condition, the soil organisms have to get to work on the green plants and break them down. In doing so they starve the land of nitrogen during the time the waste is being broken down. Therefore green manure method is generally applied on land that is to have a season of rest. There are other factors, which come into play in order that the best results are achieved from green manure. The land should be properly drained so that sufficient air is present; it should be adequately limed so that it is not acid, and the soil should be warm.

For more information about this extensive subject:
http://dspace.dial.pipex.com/town/close/xpz05/greenmanure.htm
http://www.hdra.org.uk/grn_mans.htm

Cover Crops: Cover crops like green manure crops are plants grown to cover the soil during idle periods when the land would otherwise be barren. Many gardeners' plant cover crops in autumn for winter cover, but some gardeners also use cover crops as part of a summer rotation. When cover crops are returned to the soil, they supply plant nutrients and organic matter.

Many types of cover crops offer a secondary benefit, not only are you adding organic matter, but cover crops attract beneficial insects to the garden as well.

Using a cover crop: Decide on a cover crop or crops that suit your garden's needs
Cover crops are available in bulk from most organic seed suppliers. Scatter small seeds or hand place large seeds and keep them watered (some cover crops are very fast growing and others will take longer especially if they are planted in the late autumn).

Most cover crops are cut down and turned in (or composted) before flowering in order to keep the nutrients in the ground. The nitrogen remains in the soil and later becomes accessible to future crops. Before planting spring vegetables, flowers, etc. wait 2 to 4 weeks to allow all the turned in cover crops to decompose

Compost:
If adding compost is your chosen method to add nutrients to the soil, then there is a wide range of materials you can use. Composted manure, homemade compost, municipal compost, sawdust composted with manure -- they're all good products. If you work in compost in spring, it will improve the soil structure just as the season is beginning.

It's important to use only completely decomposed compost as unfinished substances can cause problems as described above. Many people are unsure of the amount of compost that they should add, but even a small amount is better than none, every little bit helps. The general rule of thumb is to add about a third to two parts of soil at any one time.

I am sure that everyone is aware of the benefits of composted plant waste. Rich in all the necessary ingredients including micronutrients and micro organisms, it is one of the best if not the best products we can use on our soil. Whether it is a simple worm bin or specially built container, anyone who is keen to grow his or her own food must have a compost source.
Not only will it be a place to dispose of the grass cuttings but you can add lots of other waste too:

Leaves
Clippings
Straw.
Sawdust.
Shredded branches and twigs.
Cut flowers.
Comfrey leaves.
Tea leaves.
Coffee grounds.
Egg shells.
Banana skins.
Fluff from the vacuum cleaner.
Manure.
Urine.
Shredded paper.
Vegetable waste

Kelp (a form of sea weed) is an excellent fertilizer. If you live near the coast and can collect it yourself, it is ideal for adding to compost heaps.

Never add kitchen scraps because it will attract vermin. Other ingredients that should not be used are dog or cat manure (their worming treatment will kill off the composting worms); don't use citrus peel either its too acidic for worms and don't use diseased plants it could mean that you run the risk of spreading the disease all around your garden.

To help the compost to rot down an activator should be used. This can be manure, bird droppings, urine or a propriety activator; in dry weather the compost should be watered.

In a properly made compost heap the temperature will rise to 180deg. F. (82 deg C.). It is then that the actinomycetes break down the more resistant proteins and carbohydrates. As the temperature begins to cool and this could take about a month, the bacteria will begin their work to complete the breakdown process.

It will take roughly about 12 months for the pile to break down properly into compost. If your container does not have a lid it is a good idea to cover the top with plastic sheeting or a tarpaulin weighted down to reduce the amount of rainwater from leaching out the nutrients and to keep in the heat. Frequently turn over the waste with a garden fork to accelerate decomposition. Another tip, chop-up the waste as it will take less time to break down. Vary the type of material making layers of the different ingredients; this all helps to speed up the decomposition process.

If the composted waste takes up an area of at least 12ft. x 12ft. it is a good idea to include a ventilation shaft which will help with decomposition.

This is done by inserting a post in the centre of the heap, piling the waste around it layer by layer until the pile reaches a height of about 6 ft. (1.8m), then the post is removed, leaving an air shaft through the middle; this will ensure that the waste gets a balanced airflow. It is easy to see when the compost is ready; it will be rich and dark brown, crumbly, loose, in fact it resembles the potting composts available in bags from the garden centre. It will now have become the perfect product to return to feed the soil.

Compost when properly made can be more valuable than dung for it contains plant food and it is alive with millions of micro organisms for the health and well being of the soil. It will contain most of the minor minerals or trace elements all vital in good, healthy crop cultivation.

When the compost is ready to use it can be added all around the garden but especially the vegetable plot. It will improve the soil just dig in between 1 – 2 inch (2.5-5cm) of compost. It can be used as mulch, or as an extra boost during the hungriest part of the growing season when the fruits are developing. You can even mix some compost with water to make a liquid feed.

Compost Bins / Worm bins:
If you are restricted to the amount of space you have available for a compost site, worm bins are ideal. Commercially made Worm bins are available in all shapes and sizes, but you can make your own by adapting a plastic refuge/dust bin, which will work just as well. Cut out a hole about 2-inch (5cm) from the base of the bin; insert a plastic tap available from DIY stores. To ensure free drainage, stand a ridged plastic box inside the bin on the bottom. Covered this with a sheet of ridged plastic, creating a platform for the compost to sit, raising it from the bottom of the bin. The plastic will of course be slightly

smaller in diameter than the bin and fit reasonably snugly. This should have holes punched in to allow the liquid from the rotting compost to pass through, but not the compost itself; therefore preventing sludge from blocking up the tap. The diluted liquid makes an excellent plant food.

Compost Bin made from Pallets:
There are many commercially made compost makers available in many shapes and sizes. One of the best designs that costs virtually nothing for the garden with a bit more space available, is the bin constructed from wooden pallets. Take four pallets, stand each on its end forming a square, with the topside of the pallet which has all the slats, facing inwards so that the extra slats made good compost retention, the side with the fewer slats should be on the outside of the bin.

Through the centre of each pallet to retain the position, two stout stakes are driven vertically into the ground. When the compartment is full of compost, three more pallets can be joined on form a second chamber. When this too is full, a third chamber is erected at the side and eventually the fourth; the total number of pallets required is twelve. By the time the fourth is filled, the first compartment will have compost ready to be used around the garden. Access to each compartment cannot be easier; either of the outward walls of each bin may be simply lifted over the stakes for the removal of the compost. If the pallets are first painted with wood preservative, they should last for a quite few years, after which they can be replaced either individually or completely at very little cost.

Manures:

Well-rotted animal manure is one of the finest by-products that are available to the organic gardener. It may sound like a messy and an unhygienic substance to handle but in this form it looks completely different from the fresh product. It doesn't smell, in fact it resembles rich, brown, crumbly compost, which of course it is. However, when handling any type of composts and fertilizers it is sensible to wear gloves.

Farmyard manure is a mixture of the droppings of horses, pigs or cows, including their urine and the litter used for their bedding. Cow manures are wetter, colder and lower in nutrients than horse manure, and decompose more slowly in the soil, which makes them more suitable for sandy soils. Likewise, pig manure is slow acting but long lasting, as it is slow to ferment, this too is a cold manure and therefore unsuitable for the making of hot-beds.
Bullock manure is not recommended because many are fed a composition diet to build up tissue and body weight, therefore the residue could be transported into their manure and which might not necessarily be beneficial to us.

One ton of farmyard manure will give about 10lb. Nitrogen, 5lb. Phosphoric acid and 10lb. Potash, much of which is accessible to the plants soon after application. Not everyone lives in the country or close by riding stables but many of the animal manures can be purchased from good Garden Centres or from suppliers with web sites who can deliver to your home. Manures are generally good all round balanced fertilizers with amounts of nitrogen as well as a little of many other ingredients. It must always be used when it has matured, fresh will harm the plants by "burning" the stems and roots. If you are able to collect it from source let it rot for about 8 weeks but do make sure that you cover it to stop the rain-washing away all the nutrients.

In autumn dig lots of manure into the vegetable plots it will ensure that the plants have a really good start in the following season. Besides root crops prefer soil that has been manured the previous season.

Chicken manure is often sold in pellet form so it is easy and cleaner to handle.

It is very rich being high in nitrogen but it is lacking in almost all other nutrients. It is very useful when used combined with other fertilizers. Chicken manure must never be used fresh.

Hop Manures- Spent hops are useful for improving the physical condition of the soil, however they have little if any nutrients.

Liquid manure
There are so many things that you can make up into a liquid feed. Comfrey leaves put in a bin with water and allowed to rot down make a very good liquid feed. Other ingredients such as manure, blood and bone meal, a capful of concentrated seaweed fertilizer allowed to stand for about a week, make up a very fine brew. It must be diluted at a ratio of about 1 parts liquid feed to 4 parts water. As you draw the last dregs from the container, it is wiser to dilute a little more, as the mixture becomes more concentrated at the bottom. This feed can be administered about every 2 – 3 weeks throughout summer.

Foliar Feeding. All living parts of a plant above the ground can absorb nutrients: twigs, branches, buds, fruits, flowers, leaves and stems. Foliar intake of nutrients is similar to absorption by plant roots except that foliar nutrients are readily available and more easily utilized by the plant than soil nutrients. Foliar feeding is quick acting and especially useful when applied to plants that are suffering nutrient deficiencies in chalky and other alkaline soils. It improves the plants root structure, which facilitates the uptake of nutrients from the soil and enhances the photosynthesis process. For strengthening and increasing leaf growth a spray containing urea at the rate of 1 oz. per 2 gallons of water, will be sufficient to cover 25 to 30 sq. ft. (7.62m-9.144m) of soil fully covered with foliage. Potassium nitrate, when applied at the same rate, will help to harden soft sappy tissue without checking growth.

Mulch:
Mulch is generally used at the beginning of the season but there is no hard and fast rules so even if the season is well under way, it's still not too late to improve the soil with organic matter. Its important to make sure that the garden will perform well right through the season. In hot locations just a 4-inch (10cm) layer of mulch drops the soil temperature from 105 ° to 80 ° F. At the same time, it contributes organic matter and nutrients to the soil as it decomposes. Regardless of where you garden, you can still improve soil even once you're growing in it.

Organic Mulches:
There are so many ideas for the best material with which to mulch; one that is particularly effective is kelp meal. Kelp or seaweed is a great source of trace minerals and growth elements. Just apply 1 pound per 100 square feet at any time during the growing season. Adding seaweed triggers an increase in microbial activity and fuels the decay cycle of organic matter in the soil.

Some of the most commonly used organic mulching materials are manures; bark chips, sawdust, grass clippings, leaves, and newspapers (shredded or in layers). Organic mulches allow some flexibility in fertilizing and watering since they can be raked back from the plants. They should normally be applied uniformly 2 or 3-inch (5cm-7.5cm) deep around the base of the vegetable plant.

Inorganic Mulches:
Black plastic is the most frequently used inorganic mulch. Clear plastic is of little use, as it does not exclude the light that aids weeds seeds to germinate. Gardeners should make sure there is adequate moisture in the soil before any mulch is applied. There are also several durable weed fabrics that are very effective in weed suppression. The decision of whether to use organic or inorganic mulch really depends on the season of the year and what the gardener is trying to accomplish. Organic mulches should be applied after the soil temperature has warmed in the spring. If applied to cold soils, the soil will warm slowly and the growth rate of most vegetables will be reduced. Inorganic mulches can increase the soil temperature by at least 6 to 8^0F. therefore, their greatest value is early in the growing season when soils are naturally cool.

Leaf Mould:
Even if you don't have a compost bin you can still make compost from the fallen leaves. Simply collect the leaves and put them into a black plastic sack, place them somewhere out of sight in the garden and forget about them until later the following year, when you will have some rich compost to spread around the garden.

It takes at least a year to compost down the leaves, depending on leaf-type: beech or oak leaves decompose readily, but waxy leaves take much longer. (Sycamore and London Plane in particular take years to rot down) Also warm, wet, weather conditions promote faster leaf decomposition.

Once fully decayed, there should be no whole leaves present in the leaf mould. If it contains debris such as twigs, it should be put through a coarse sieve. The leaf mould can be added to potting compost (1 part leaf mould to 4 parts potting compost), or used liberally in the garden as plant mulch, or dug in to improve soil structure.

Potting Mixtures:
Potting Mixture for cuttings and transplanted seedlings: - 2 parts sharp sand, 1 part loam, and 1 part leaf mould (or peat moss for acid tolerant plants).

Potting Mixture for general potting, especially for such plants as the pelagoniums, fuchsias, chrysanthemums, Sansevieria, Pandanus, palms, etc. 1 part sharp sand, 2 parts loam, 1 part leaf mould or humus, 1/2 part dried palliated manure, 1 5-inch flower pot full of bone meal to each bushel of the mixture.

Potting Mixture for plants requiring extra humus, such as begonias, many ferns, primulas, etc. 2 parts sharp sand, 2 parts loam, 2 parts leaf mould or humus, and ½ part dried cow manure, 1- 5-inch flowerpot full of bone meal to each bushel of the mixture

Potting Mixture for potting many hardwood plants such as azaleas, Ericas, Daphne, and certain ferns. 2 parts sharp sand, 2 parts loam, 2 parts peat moss, 1 part leaf mould or humus and 1/3 part dried palliated manure.

Potting Mixture for most cacti and succulents. 2 parts sharp sand, 2 parts loam, 1 part broken flower pots or soft brick broken into small pieces, ½ part leaf mould or humus, 1-5 inch flower pot of bone meal to each bushel of the mixture, 1 5-inch flower pot of limestone (ground) to each bushel of the mixture.

Earthworms:
Feeding earthworms (Lumbricus terrestris or Helodrilus caliginosus) with generous amounts of organic mulch each year can transform your soil into a rich and nutritious substance. Earthworm's pull partly decomposed organic material down into the soil.

The organic matter is then broken down further inside the earthworm, before being excreted as 'worm casts'. These are easily converted into nutrients by the soil's microorganisms. The nutrients are readily taken up by developing plants.
Worm casts have a nutrient level and organic matter level much higher than that of the surrounding soil. Each day worms produce nitrogen, phosphorous, potassium, calcium carbonate and many micronutrients in a form that all plants can use.

Organic matter eaten by earthworms consists of rotting plant material and animal parts. They also eat soil harmful microorganisms such as bacteria, fungi, and nematodes. Earthworms will feed on roots or other parts of plants that have been decayed by other organisms; but they do not feed on healthy plants. In addition to recycling organic matter, worms are great for improving soil structure; their borrowing action helps to improve aeration, moisture retention, and water penetration.

Air:
Many people forget that a crucial element in soil is air. Air is the driving force in stimulating soil life. Microorganisms, earthworms, biotic activity, all rely on a good supply of air. That's the reason for the standard caution against working the soil too early in the year. Tilling wet soil will destroy its structure, compact the soil, and squeeze out the air. When you compress the air out of the soil, you kill everything in it. So treat your soil gently, avoid walking on it when it's wet this applies especially to lawns.

Utilizing Ashes
Those spent ashes at the bottom of your fireplace can be recycled as a great source of nutrients for your plants. Collect the ashes and keep them in a sealed container to use in the spring. When your plants are in full bloom in the spring, sprinkle the ashes around the flowers and vegetables. The ashes have all kinds of minerals that keep plants healthy all season long.

Wood ash is also an excellent material to add around the garden. Fruit trees certainly benefit from having them mixed into the soil around the base of the tree.

Sand:
Sand may be described as sharp, soft, fine or coarse.
Sharp and soft refers to the shape of the grains irrespective of size. Fine or coarse refer to the grain size irrespective of shape.

Sharp sand is the most useful germination medium available. It is better and more environmentally friendly than perlite and is reusable in making good quality potting mixes.

To prepare the sand you can start with any grade, but the coarser it is, the less work you will have. Take a kitchen sieve and place a couple of cups of sand in it. Fill a large bucket with water. Now jiggle the sieve in the water so that small particles get washed out into the water (they settle at the bottom eventually). Keep doing this until no more particles wash through the holes. Keep the sand that is in the sieve - it is called 'coarse sharp sand'. This process is important, as it eliminates the small sand particles and silt that lock up the structure of the sand. Without removing this fine stuff most seed will rot rather than germinate.

During summer it is also possible to dry the sand and sift it dry to get the bulk of the fine stuff out. It should however still be washed at least once.

For difficult or slow seed it is recommended to sterilise the sand just before use by baking on a shallow tray in the oven at 200deg C for 2 hours.

Lawn sand is a combined weed killer and lawn fertiliser, (comprising ammonium sulphate, iron sulphate and fine sand). It should be applied between April and September in dry conditions, but preferably when rain is expected within a couple of days. Follow the application instructions on the packet, but do not exceed the stated application rate otherwise the grass may be killed. The grass may black but quickly recover. Annual use, will also keep worms, and therefore worm casts off the lawn.

Fertilize with Epsom salts:
Use this old household remedy to give some plants a boost.
Many gardeners are familiar with benefits of applying Epsom salts to tomatoes, peppers, and roses but if you are not then let me explain the benefits. The purpose is to improve magnesium content in the soil but is also used as a foliar feed, in order to have healthier foliage, bushier plants and to improve the yield and size of flowers and fruits.

The History and Science of Epsom salts
Epsom salts are a natural mineral, discovered in the well water of Epsom, England, and has been used for hundreds of years, not only to fertilize plants but also to treat a range of human and animal ailments. Chemically, Epsom salts is hydrated magnesium sulphate (about 10 percent magnesium and 13 percent sulphur). Magnesium is critical for seed germination and the production of chlorophyll, fruit, and nuts. Magnesium helps strengthen cell walls and improves plants' uptake of nitrogen, phosphorus, and sulphur.

Sulphur, a key element in plant growth, is critical to production of vitamins, amino acids (therefore protein), and enzymes. It's also the compound that gives vegetables such as broccoli and onions their flavours. Sulphur is seldom deficient in garden soils because acid rain and commonly used animal manures contain sulphur, as do chemical fertilizers such as ammonium sulphate.

The causes and effects of magnesium deficiencies vary. Vegetables such as beans, peas, lettuce, and spinach can grow and produce good yields in soils with low magnesium levels, but plants such as tomatoes, peppers, and roses need high doses of magnesium for optimal growth. However, plants may not show the effects of magnesium deficiency until it's severe. Some common deficiency symptoms are yellowing of the leaves between the veins, leaf curling, stunted growth, and lack of sweetness in the fruit.

Gardeners add magnesium when they apply dolomitic lime to raise the soil's pH. However, this product (46 percent calcium carbonate, 38 percent magnesium carbonate) breaks down slowly, and the calcium can interfere with magnesium uptake. For soils with a pH above 7, many gardeners use Sul-Po-Mag (22 percent sulphur, 22 percent potassium, 11 percent magnesium) to increase magnesium. Although dolomitic lime and Sul-Po-Mag are inexpensive ways to add magnesium, Epsom salts' advantage over them is its high solubility.

Applications of Epsom salts can be given to the degree of 1 or 2 tablespoons of Epsom salts mixed with 1 gallon of water and applied at planting, and as a foliar feed at flowering time and fruit set.

Roses
Many rose growers agree that Epsom salts produces more new canes at the bottom of the plant (bottom breaks) and darker green foliage. Recommendations on how much to use vary, but generally you can apply 1/2 cup of granules in spring before buds first begin to open and 1/2 cup in autumn before leaves drop. Apply a foliar spray (1 tablespoon per gallon of water per foot of shrub height) after the leaves open in spring and again at flowering.

Tomato and Peppers

Magnesium deficiency in the soil may be one reason your tomato leaves yellow between the leaf veins late in the season and fruit production slows down. Test your soil every 3 years or so to check on nutrient levels. Epsom salts can keep plants greener and bushier, enhance production of healthier fruit later in the season, and potentially help reduce blossom-end rot. Apply 1 tablespoon of granules around each transplant, or spray a solution of 1 tablespoon Epsom salts per gallon of water at transplanting, first flowering, and fruit set.

However, don't rely on Epsom salts alone to correct large soil magnesium deficiencies, but rather use it as a supplement to soils with adequate or slightly low magnesium levels to boost plant growth, flowering, and fruiting. For severely magnesium-deficient soils, use dolomite lime or Sul-Po-Mag.

Garden Design:

Many people think about garden design only in terms of plant choices. But picking plants is the last and often easiest part of putting a garden together. Before the plants are put into place the fencing, buildings, paths, paved areas, steps, lawns, archways, etc. should be put into position. The modern concept is to create outdoor rooms, which can be used by all the family for specific purposes. You may have a play area, eating area, areas to sit and take in the beauty and serenity, areas to grow food or to keep livestock. This approach to garden design can break down the plan into manageable portions, otherwise, the design as a whole could appear to be to daunting for most of us to undertake.

Choose a design that fits the architecture of your house your personality, and your needs. Gardens have many different atmospheres or styles. Seeing the things other gardeners have achieved can often spark off new ideas for one's own garden. The haphazard abundance of an English garden or the sparse elegance of a Japanese garden, the influence of the formal, stepped stone terraces of Renaissance Italy, the elegant grandeur of classical French garden are styles that can be created in other locations. Open up your mind to realize how you can achieve a similar atmosphere. Though it would not be possible to reproduce classical French or elegant Italian hillside landscape in a small city garden, a sense of classical formality is within the reach of everyone with the use of just a few stone steps, a small fountain, an architectural evergreen shrub or piece of topiary and some well-positioned urns. But let the site speak for itself. Walk around your garden, notebook in hand for jotting down questions, ideas, thoughts, and inspirations. Sit down here and there and visualize what you'd like to see in various areas.

Study pictures of beautiful gardens in magazines and books. This is a fine way to get ideas and discover your favourite garden style. Build arbours and pergolas to separate spaces, contribute height, add charm, and provide cosy places to sit and admire the view. Remember, trees and shrubs, in addition to hard landscaping, provide structure to a garden and are therefore termed the "bones" of your design. Changes in ground level may already exist and can be accentuated by building steps and walls at these points. Raised beds are invaluable for adding interest to a flat area, and variety can be introduced by arranging plants of different heights.

Certain design styles have evolved in response to a particular climate or geographic conditions. The native plants that thrive in hot and dry climates define a Mediterranean style, but it also reflects certain building materials and architectural styles associated with the Mediterranean area. This style of garden is characterized by warm, earthy tones in the structures and containers, specifically terra cotta, combined with dry-climate plants like erigeron and lavender, drought survivors such as cacti and the agave family.

Even in a seemingly random, informal garden, the various elements must work together and appear to be whole, rather than disjointed pieces. One method of achieving unity is through repetition, whether it be shapes, colours or materials. For example, you might have tall containers, filled with bushy plant material, anchoring either end of your long, narrow balcony or deck, thus unifying the entire space, regardless of what's planted in-between. Another way to achieve unity would be to pick a dramatic shape, for example, the sword-shaped New Zealand flax (Phormium tenax), and repeat it at intervals down your balcony or around your patio. The eye won't be able to resist this rhythm.

One dramatic container, a grouping of similar containers, or some other element such as a garden sculpture, all give you a focal point, which provides a means of organizing. Anything that draws one's eye acts as an anchor.

Try positioning your focal point arrangement 'off-centre' in your garden space, to create more interest and avoid the boredom of the expected. In addition to a handsome grouping of plants, a focal point can be something that contrasts with the surroundings, such as a weathered bench or a vividly coloured birdhouse. A focal point can also draw the gaze away from an unattractive view.

Formal or informal

There are basically two roads to follow when seeking balance in the garden: symmetrical and asymmetrical. Formal landscapes have symmetrical balance. A formal design is best used on flat ground or when working with a central feature, such as a fountain or front door. Formal gardens, such as Mediterranean gardens, consist of symmetrical compositions balanced about a central axis. Modernistic gardens with concrete, glass and steel structures make use of materials that when softened with sympathetic plantings, can become as stately as any of the conventional gardens of formal design using conventional materials. Informal gardens, such as wildlife gardens, are inspired by nature and use soft, flowing curves and shapes.

Some characteristics found in Formal Gardens are:

Geometric patterns, maze-like pathways
Mass and uniform plantings.
Intentional, designed use of floral and vegetation colour, texture and height.
Trimmed vegetation, hedges, sculptural use of plants.
Classical structures such as columns, arches, fountains.
Classical artefacts such as urns and statuary.
Outdoor "rooms" used for dining, entertainment.
Captive animals in birdcages and fishponds.

Make a Plan

Draw up design plans to scale, using pencil on vellum over graph paper (four squares per inch). Use tissue over the vellum layer for idea sketches before drawing out the final plan. It may take several attempts to achieve the one satisfactory design; the final plan may take the best elements from each sketch. Your plans don't have to be so elaborate, however. After all, a plan is simply a map for you to follow in your garden. As long as you can understand it, that's all that matters. And while planning for spring, summer, and autumn glory, don't forget to add plants with winter interest—beautiful bark, berries, textures, form, or colour. If you have the space, use conifers and broad-leafed evergreens that retain their needles or leaves all year round, as well as ornamental grasses, winter-blooming trees, shrubs, perennials, and bulbs. Plant shrubs like firethorn (Pyracantha) and beautyberry (Callicarpa) that keep their stunning fruits late into the season.

Calculating wind exposure, light patterns, and drainage is another important part of site evaluation. In addition to being influenced by regional climate, each garden has its own microclimate, determined by the hardscape, dominant plant species, and topography. Only careful, year-round observation will enable you to fully gain enough knowledge to get the best out of your plot and enable you to place plants where they will succeed and give their best performance.

If the garden will be viewed from more than one spot — say, from the street and from your front window — decide which view is the more important one. Once you're comfortable with the picture from that angle, you can adjust the balance of elements to suit the secondary view. Be patient because this may take some time and experimentation. Plus, the balance may change as your garden matures.

It can be a tricky matter to determine whether a landscape is balanced or not. You'll probably rely more on intuition than conscious calculation. While there are complex mathematical formulas you can follow, the best solution may be to simply step back and take a good look, just as a painter would do with a piece of art.

Take a look at these examples to get a feel for this design principal:

	A landscape takes on a formal look when it has a centrally located focal point, such as this tree. Elements on either side of the focal point are placed symmetrically.
	When a focal point is positioned off-centre, a design is asymmetrical and therefore informal. In this case, the horizontal feature (shrubs) balances the vertical feature (tree).
	The gazebo balances the much larger tree on the right. Although it is smaller in size, the gazebo's stiff, solid form carries as much visual weight as the tree's spreading canopy.
	Not only is this landscape unbalanced, it also has too many competing focal points. The result is a "busy" picture that is visually ambiguous and unsatisfying.

Colour is very personal thing and everyone interprets the moods that colours create in different ways. Colour choices is first and foremost about personal preferences and though many people prefer to adder to set design rules regarding colour and how the colours mix and compliment each other, or clash, as those hot oranges do with delicate pink. Throughout history some of the most eminent gardeners have taken down the barriers of convention and created the most fantastic colour combinations with disregard for past rules. Light is the major factor in colour perception. Soft colours look wonderful in the early morning, in the evening and dull or damp weather. In the Mediterranean sunshine, the same colours would look blanched, whilst strong, bold, vibrant colours that look sensational in hot climates are thought overpowering in a soft light. A background building or fence will also influence colour tones by reflecting or absorbing light; it will influence our view of the colours of plants grown in front of it. As well as geographical factors, there is a natural progression of dominant colours through the seasons. Be bold and experiment, if things turnout not as successful as one had imagined, they can be changed!

Many successful colour schemes are created with the use of two or three chosen colours such as red, orange and yellow, but can be equally exciting using just one colour such as an all white flower theme. The key to creating a successful white garden lies in the realization that a white garden is not predominantly white, but also green. The various textures of the foliage act as a foil to the stark-white blossoms, muting their brilliance with a calm and cool effect. Grey-leaved plants, such as lamb's ears, santolina, and artemisia, also perform a beneficial role: Used in moderation, these "almost whites" act as a bridge between dark and light and serve to link the two serenely together.

In limited colour schemes, foliage shapes and textures come into much more prominent play. For a single colour garden to be successful it needs to be set off from the rest of the landscape, it just wouldn't work if it were merely a portion in an otherwise colourful landscape.

Plants and colours go in and out of vogue, therefore you should grow what you like, in the colours you prefer and be bold enough to do your 'own thing'. Please yourself and your garden will never be a disappointment to you. Unless you are an expert, keep your design simple. If you overdo things it will look cluttered and fussy. If you are on a tight budget, work with what you've got. By simply reshaping a lawn and adding new plants can transform a garden.

Bright or hot colours (e.g., red, yellow, orange) make objects look closer. They also tend to create a vibrant and exhilarating atmosphere.

Subdued colours (e.g., blue, purple, green) make objects look farther away. They also create a visually cool and calming atmosphere.

Colours from opposite sides of the spectrum (e.g., blue and yellow, red and green) are complementary. White and silver reflect light and are often used in dark corners to lift and brighten up the area; this effect can also be achieved with plants that have shiny foliage.

Yellow is best used as a focal point, as when used with other colours, is more readily noticed. Yellow exudes warmth, sunshine, cheer and happiness.

White goes with almost any colour. It brings out colour from the adjacent plants. If you have a shady area, use either white flowers or light variegated foliage to brighten the area. It also can look spectacular on its own, choose different varieties of plants, all having white flowers or foliage.

An area without a structural focal point can still have a focal point; it can be achieved instead with colour. A vibrant coloured plant or group of plants with rich and dynamic colour such as red can take centre stage giving balance and injecting interest especially in a garden where most of the colours are far more muted.

Try to make your garden a journey of discovery with hidden treasures and secluded places to sit.

Think about views, framing them, hiding them and creating some from the house into the garden.

Don't just think flat! It is more interesting to introduce varying levels in a garden, in terms of both planting and structures.

Altering the shape of your garden by creating false perspectives is a clever and easy way of working in a better design. Horizontal lines will make the site seem wider while vertical lines will decrease its length. Attention may be drawn to a particular spot, within or beyond the garden, by creating a dynamic or moving line such as a curving path that leads to a focal point.

A simple tip is to imagine that you are an artist preparing to pain a picture. Get the background in before you start to introduce the foreground elements, build up your picture one step at a time.

In the garden before you begin to even think about plants, clear the site, prepare the soil, add the structures and when at last you feel satisfied, the real joy and excitement of planting can begin.

To make a border appear longer, plant brightly coloured flowers and plants in the foreground. Hot, fiery-colours shorten the distance they also help to make a dramatic and exciting atmosphere. Plant pale colours at the back of the border it will give the impression that the garden is longer/ wider.

Plant textures, particularly that of foliage, plays an essential role, not only for visual impact but also because its mass and duration far outlive the more transient attractions of flowers, seed heads or fruit, though these too provide texture. The overall effect of growing together groups of plants with markedly different textures is far greater since the distinctive texture of each plant is emphasized and enhanced by that very contrast. Leaf size, forms and surfaces, branch shape and the variety of shades of colour introduces yet another dimension to the over-all effect. Varying foliage surfaces influence the way that light is reflected, absorbed or diffused so that the massed effect of matt leaves, for example, will be notably different from that of glossy leaves, which give rise to glittering reflections in bright light. Glossy leaf plants are especially useful to reflect light into dull, dark corners. Texture plays a notable part in planting success. The principles of texture apply equally to flowers, seed heads as well as inanimate objects such as stones, rocks, pebbles, and wooden structures.

If your garden slopes away from the house, put progressively taller shrubs down the slope – an effective way of seeing more of the garden.

Divide a long narrow garden into a series of 'rooms' using screens, hedging and trellis; this adds intrigue to the design.

Direct garden the beams from night-lights into trees for a magical backdrop to the garden.

The use of mirrors in the garden

Mirrors are an easy and effective way of making a small garden feel larger. A cleverly placed mirror can add depth to your urban oasis and be used to give the illusion of hidden corners or a doorway to another garden room! Using mirrors to reflect sunlight into shady corners is also very contemporary and easy way to brighten up the space.

Glass is a great material to use in the garden as it works so well with natural light. It can be used underfoot, as a screening device, to reflect light and as a table surface. Use glass floor bricks to add colour and interest to a plain patio surface - place lights underneath for an added element of depth.

Glass can also be used to great effect as a screening device in the garden and for this you may want to consider sand-blasted or frosted glass with reduced transparency.

While glass is an incredibly durable and hardwearing material, it is also highly breakable! You should use toughened glass where possible in the garden especially if there are young children about -specialist outdoor glass suppliers will be able to advise you on this. Also, when placing mirrors around the garden keep out of the reach of little fingers!

Paths and walkways:

Path basics:
The types of paths you need to create are dependent on the traffic they are to endure. The practical sort that are used for places people need to go, such as from the garden gate to the front door need solid foundations, a generous width, and they should take the shortest possible route.

Choosing a surface:
There are many different surfaces that you can use for paths, including:
Gravel: Gravel is a popular choice for front paths, drives and seating areas, as it's cheap, quick and easy to lay. Rake gravel over a base of pounded-down rubble.

Brick: A well laid out brick path gives character to most garden settings particularly to the cottage garden environment. Combinations and patterns used when laying a paved brick area can make for a variety of pleasing effects. Engineering bricks are often recommended for well used garden paths as ordinary house-bricks will crumble and turn to rubble after continued frost. There are other types of strong bricks with cut surfaces, which are fairly weather resistant and will serve you at reasonable cost.

Cobbles: Cobbled sets need cementing in place and though decorative, can be quite difficult to walk on so they make a good surface for paths that aren't designed for those in a hurry.

York stone: York stone is beautiful-looking paving for seating areas, but don't use it where you need to walk regularly in winter as it's dangerously slippery when wet.

Bark: Bark is ideal for temporary paths and it's a good alternative to lawn or paving in shady spots where other surfaces grow green slime, however it will need to be topped up at regular intervals.

Wood: Wooden decking or sleepers make good paths near a pond or bog garden, or as an informal 'bridge' over a stream or ditch. However they can become extremely slippery especially in wet conditions. Tack wire netting over the decking to make it non-slip or alternatively power wash the timber twice a year to prevent slipperiness.

Paving slabs: Paving slabs are a good all-round choice. Use them for seating areas and serious paths, or sink them in grass or gravel as stepping-stones.

Gravel Paths:
The size and grade of gravel is important when laying a path. If you intend the pathway for pedestrian use only then a 10mm, 14mm or 20mm "single sized" gravel is the usual preference for aesthetic reasons. However if for example a wheelbarrow is to use the route then a single sized material is too easily displaced under the load of the wheel and a 20mm "graded" product would be preferred. (A graded product has a wider range of particle sizes than a single sized product).

Most paths, excluding grass and stepping stones 4 to 5 sq. ft. or larger, require a base of coarse crushed stone to stay level for years to come. Soil type and climate determine how deep to make it. In general, figure on a base 4-inch (10cm) deep in mild-winter climates with well-drained soil, and 5 to 8 in. deep if you live where the ground freezes.

Improve drainage in heavy, clay soil by placing a 4-in.-dia. PVC drainpipe down the centre of the path, enclosed within the gravel base. Drain holes should face down.

Prepare your path so water drains off the surface. You have two options: Install the path so the finished surface is 1/4 to 1/2 in. (6.35-12.7mm) above the adjacent grade, or slope the path away from your foundation or driveway 1/4 in. per foot of path width.
Apply a levelling course—usually 1 to 2-inch (2.5-5cm) of sand—over the base so you can move a stone or brick around until it's nested just right. An optional layer of landscape fabric between the gravel base and sand prevents sand from filtering through the gravel.

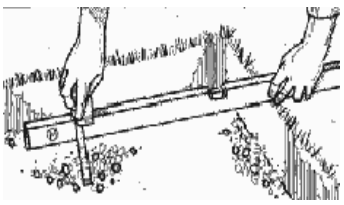
Use professional-quality masonry edging to hold bricks, concrete pavers and small stones in place.

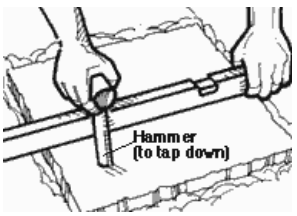
How to Lay Garden Paving:
Every garden has its own personalized touches that make it unique. In many cases, a garden can achieve added beauty by accenting it with an imaginative walkway, patio or any type of paved area. However, make sure your paved areas enhance, rather than take away from, the beauty of your garden.

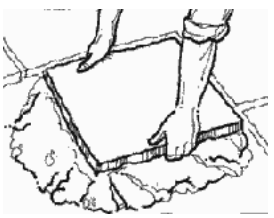
The success of your paved garden is based not only on the materials you choose, but how you use them. Many different choices can affect the outcome, so it is important to make all the right decisions that personally suit you. Your paved work can be as intricately detailed or as simple as you wish.

Choosing a Pattern:
Bricks- Choose a paving pattern that suits your garden. Most people have found that, when it comes to garden paving, simple is best. One common pattern used in small areas is called the stretcher bond, a pattern used in building walls. (see figure 1). It is simple, effective and does not look distracting in a small garden. The herringbone (figure 2) and basket weave (figure 3) patterns are better suited for paving larger areas because they are more detailed and can be better appreciated in larger areas.
If you decide on coloured slabs, don't use too many different colours together, otherwise the paving is too fussy and will become the dominating feature rather than complimenting the overall garden design.

Don't construct a paved area that is too big for the garden because then it unbalances the whole garden design. For small gardens, choose small stones, slabs or bricks and no more than 3 different paving materials. Too much variety makes for a distracting, cluttered paved area.







Step 1. Lay a Bed of Gravel: Dig a level area about 3 to 4 inch (7.5cm-10cm) deep plus the thickness of the paving material. This must cover the entire area you plan to pave.

Lay about 3 to 4 inch of hardcore or gravel, and level as much as possible. Tamp down as firmly as possible. Make sure that if the paving is to be attached to the house, it will lie just below the damp-proof course.

Step 2. Mortar: Once your area has been prepared with a level bed of gravel, you are ready to add your mortar. Follow the manufacturer's instructions in mixing the mortar. It is best to mix it in a wheelbarrow for easy mobility. Using a small shovel, distribute about 5 scoops of mortar in the area where the piece of paving will be placed. It should look like a five on a dice. (Remember, the amount of mortar used will be proportional to the size of the paving piece.) Level out the scoops of mortar as much as possible. When laying bricks, instead of using scoops of mortar, you can cover an entire area with 1 to 2 inch (2.5cm-5cm) of levelled mortar before lying.

Step 3. Level the Area: Once the area has been arranged with paving slabs or bricks, make sure they are level with a slight slope. This slope will ensure proper draining of rainwater. Position a small piece of wood under one end of the spirit level to provide the slope when covering a large paving area. Use a sprit level that is at least 2-ft (60cm) long so that it can be rested across more than one slab or an area of bricks to give a true reading to help keep the entire paving area the same level. Tap the slab on either side or pack more mortar under it until the slab is level with the other slabs.

Step 4. Space the Pieces Evenly: When your paving pieces are level, make sure the spaces between each paving piece are equal. To ensure that the spaces are equal, use spacers such as small, equal-sized wooden blocks.

Step 5. Fill the Gaps: After paving slabs or bricks have been spaced; brush into the cracks a dry mix of sand and cement to fill up all the gaps. If preferred you can use instead a small pointing trowel to fill in the gaps with a slightly dryer mortar mixture. Use the trowel to press the mortar down just below the top of the paving piece, keeping the mortar as smooth as possible for neatness. Clean off any excess mortar from the paving slabs before it dries completely.

Paths & Patios

Make a flight of steps look more formal by placing two matching containers at either side of the bottom or top step. They can be planted up with bay, roses, box or dwarf conifer, alternatively stand large decorative pots such as terracotta filled with stones to give weight and stability.

To soften the effect of a large, paved area, take up one or two slabs and plant into the soil. Before adding the plants, prepare the soil well adding some compost and manure to introduce nutrients.

To age new bricks, brush them with milk or yoghurt.

Raised Beds:

Raised beds do have many advantages. In heavy clay, just raising the soil helps to improve drainage. The raised bed is also convenient and can be attractive: they are also a solution to several other problems that may arise.

No soil compaction because raised beds prevent you walking on the growing surface
Easy access – walk around the beds on paths.
Access to crops from both sides of the beds.
Deep beds for those crops that require the extra depth.

A raised bed may be ready to plant into several weeks before the normal garden plot, especially during a cool, wet spring.

Raised beds will allow excess moisture to drain away and therefore over-watering is less of a problem.

They are often the answer for disabled gardeners for they are more convenient, making kneeling or bending too far unnecessary.

Raising a bed can even be a temporary situation, that way it is possible to change the configuration from year to year, and a good method especially when growing vegetables.

There are so many materials suitable for retaining wall of raised beds. You can use landscape timbers, or railway sleepers for a more rustic look, bricks, stone or you might want to use interlocking concrete blocks.

Start your raised bed by digging the first (original) layer of soil then add a layer of well manured soil, and work that in thoroughly through the original layer of soil to root depth.

It's important that the organic matter is worked all the way through the soil, or you could have a problem with a perched water table. Simply tossing on a layer of organic matter can actually result in problems: layers of wet and dry areas with different porosity prevent water from penetrating the soil uniformly.

Decking:

Decking has found favour in the garden in recent years. It is an excellent alternative to paving as it is durable, light and gives the garden a modern, contemporary feel. It can be built in almost any shape, colour and size, designed to suit personal tastes and budgets. It also enables a level seating area to be constructed in a sloping garden. Although it is possible to construct simple decks in your garden, seeking professional advice is recommended when constructing complicated designs or high, raised structures.

Which type of wood to use

Decking can be made out of either softwood or hardwood. The most popular type of timber used in the UK is softwood that has been pressure treated with a suitable preservative. Pressure treating involves deeply penetrating the wood with preservative by an industrial process that provides long-term protection against rotting and should last about 25 years. Standard components and decking boards are readily available in DIY stores, timber merchants and garden centres. Ready prepared decking kits are also available. Hardwood decking boards do not require pressure treatment.

Softwood suitable for decking

When using softwood, check that it has been pressure treated to avoid rotting.

North American western red cedar: straight grained, few knots but a tendency to split and dent.

British spruce/European white wood: straight grained and few knots. Use for out of ground components only.

British pine/European redwood: clearly visible grain. Lower grades can have lots of knots.

British/North American Douglas fir: a prominent, wavy grain, the heartwood is naturally durable.

British/European larch: a prominent grain, sometimes knotty.

Southern pine: visible grain with few knots.

Hardwood suitable for decking

Hardwoods are generally more expensive, have a tighter grain and will not require pressure treatment with preservative because they have natural durability sufficient for decking applications. They can be more colourful than the beige colours of the pressure-treated softwood, although colour will fade when exposed to sunlight.

Teak: very durable with high strength, mid-brown.

Iroko: coarse grain, but not very visible, durable, brownish beige.

European oak: broad, straight to wavy grains, durable, pale beige.

Opepe: an insignificant grain but the wood can have an irregular coarse texture, very durable.

Jarrah: straight grain but not strongly marked dark brown.

Karri: stripped grain and very durable.

Balau: fine even texture, very durable and strong, beige.

Decking boards are usually available in sizes from 75mm wide to 150mm wide. Laying the wider boards is usually quicker because they cover a greater area. Each board, whether it is plain or grooved, should also have the edges rounded off to help any water to run off easily.

Site preparation

After working out the size and orientation of the deck, clear and prepare the site. Failure to do this properly will result in weeds growing up through the cracks between the boards and will look unsightly. Start by clearing the area of all vegetation and turf. Compact and level the ground leaving a gentle slope towards the outer edge of the deck to allow for drainage. Then lay a weed-suppressing membrane over the surface and cover with gravel. Now you are ready to begin.

Pergolas:

Pergolas can be a great feature in a garden; they are also practical and decorative. They provide support for climbing plants, give the garden structure and help break up its flat canvas. They are ideally suited for linking different parts of the garden, providing secluded areas and creating summer shade. Their open aspect makes them particularly suitable for adding interest to smaller gardens, where more solid shapes, such as walls or fences, would make the limited space feel cluttered.

Select the site for your pergola carefully. Take time to view the site from every angle before deciding the pergola's final position. Pergolas make an excellent feature, especially for joining two different parts of the garden, for example, the vegetable plot and the lawn.

Start by clearing all vegetation in the location of the pergola, or, if being sited on a patio, remove the paving where the uprights are to be positioned. Make sure the site is level. Measure out the area of ground where the pergola is to be situated. Many garden centres and DIY stores offer pergolas in kit form, which makes the construction much simpler for those who believe the task too daunting. It is always advisable to consult a professional when undertaking a major building project.
However, here is a guide for constructing a small pergola.
Identify where the posts are to be positioned. Mark the exact positions of the posts. Ensure these are arranged so that they are square with one another.

Tools required
Clamps
Drill
Plumb line
Post and pipe level
Saw
Screwdriver
Set square
Spade
Spirit level
Stepladders
Tape measure

Power tools such as screwdrivers and saws can be used to reduce the workload with some of the repetitive tasks. It is also possible to hire them. Always follow the manufacturer's safety instructions.

Materials required
Ballast and cement
Bolts to support the frame
Stainless steel screws - countersunk
Wooden posts - 85mm x 85mm x 3m (3.3in x 3.3in x 9.8ft)
Wooden cross members - 33mm x 33mm x 1.8 m (1.3in x 1.3in x 5.9ft)
Wooden beams - 45mm x 95mm x 3m (1.7in x 3.7in x 9.8ft)
All sizes and quantities are dependent on the design

Constructing a basic pergola
The basic principle of constructing a pergola is to make a timber-frame that consists of horizontal beams attached to vertical posts.

As a general rule, a pergola should be supported by posts every 6ft (1.8m). This distance should be reduced if the pergola is to support heavy loads.

Dig out the holes with a spade for all posts, these should measure 1ft x 1ft (30cm x 30cm) x 2ft (60cm) deep. Prop the post upright and then do the same for a neighbouring hole. Place a cross member on top of these two posts then place a spirit level on top to check the posts are level. Infill or backfill the holes as necessary until the posts are level. Repeat this operation with the remaining uprights until all are level. Whilst working on the uprights, nail lengths of scrap batten on to each post so that they stand unassisted.

Mix a fairly stiff mixture of concrete, using just sufficient water to bind the ingredients together. Ask a friend to steady the post as the concrete is placed into the hole, compacting the mixture with a piece of wood around the post, taking care not to move the post from its position.

Recheck that the post is level using a plumb line or spirit level placed on the upright. Repeat these procedures with the remaining posts. Leave the pillars propped in position by the spare batten for two days to allow the concrete to harden fully.

If the pillars have been positioned in the correct place the building of the framework should be straightforward. The cross posts should be joined to the upright posts with halving joints cut out at the end of each cross member. Bolt these into position and continue for the remaining cross members.

Four hands are better than two, so ask a friend to assist you to fasten the beams across the top of the pergola, attaching these by mortise joints screwed on to an upright at either end. Paint the pergola with a coloured stain if required and coat with clear water repellent.

Path side planting:

Cottage gardens are full of detail, and one of the best ways of adding interest to a cottage garden path is by outlining it with a formal or informal row of plants. It also makes a good contrast with whatever is the other side, whether it's a lawn or a jumble of flowers.

There are many different plants you can use, including:

Box Globes: Box (Buxus sempervirens Suffruticosa) Globes, being evergreen, give the garden year-round detail. Plant them in a border or better still grow them in classy terracotta 'long tom' flowerpots and stand them in position. This way you can move them around the garden if necessary. Clipped globes of box 45cm (18in) in diameter should be spaced six feet apart, add a formal note to the edge of a riotous, cottage flower border. They also look good where a path runs along the edge of a lawn.

When a row of box globes are planted very close together the 'topiary' effect disappears and they look like a low hedge that didn't quite turn out right. Besides looking over-fussy, they are difficult to trim. A row of clipped dwarf box edging might be worth considering instead.

Forsythia: Forsythia makes a solid, late spring-flowering hedge that grows just tall enough to stop you seeing over the top, so it's good for dividing the garden into smaller 'rooms' and looks splendid when in flower.

A row of forsythia bushes adds a slight air of mystery to a path, as you need to look round them to see the garden beyond. When space is short you have room to grow flowers in-between them. Trim them into conical shapes after flowering each year to keep them looking tidy.

Planted roughly 60-90cm (2-3ft) apart, forsythia makes a superb formal, clipped, flowering hedge that suits a cottage garden perfectly. It will look less strident if you cut an occasional arch or peephole so you can see through into the next garden 'room'.

Lavender: Lavender create a fragrant, evergreen, dwarf hedge, which can be upright and clipped or allowed to spill gently over the path for a more romantic effect, depending on the variety you choose.

Repeating the same plant regularly at intervals along a narrow path side border creates a 'link' that pulls a typical random mixture of cottage garden plants together, adding a sense of order to apparent chaos.

A continuous row of lavenders planted 30cm (1ft) apart makes a classic, scented cottage garden, path edging, and attracts bees in droves. Trim the plants lightly each year in late summer as soon as the flowers have faded, to stop plants from becoming woody.

Lawns:

Get rid of boring stretches of grass; change the shape by adding curves, zigzags or making an island bed. Alternatively, create a focal point by planting a specimen tree.

Curved lawns give the garden a more casual look while straight lines are suitable for a formal look.

To make curves or to form a circle, drive a small stake into the ground and attach some string to it. At the opposite end of the string, attach a funnel filled with sand. Pull the string taut to the length required, and then use it to make an even curve. The sand will fall making a visible line marking out the shape.

The right type of grass - one that suits your needs and likes the local weather - will always give better results. Grasses vary in the type of climate they prefer, the amount of water and nutrients they need, their resistance to pests, their tolerance for shade, and the degree of wear they can withstand. New grass varieties and mixtures come out on the market every year, ask the expert at your local garden centre about what's right for your particular area and needs.

To prepare ground for a new lawn, rototill the topsoil to a depth of two to three inches. You can usually rent tillers at your local machine and garden hire store to make this job much easier. Then grade, water well and apply a fertilizer high in phosphorus. If you are starting from seed, apply seed using a drop spreader to ensure even coverage. Then lightly rake the seed into the soil to prevent it blowing away. Once the grass is 2 inch (5cm) high, you can begin mowing.

Laying a Lawn:

Turf has the advantage over seed in that you can have a lawn almost instantaneous. From soil preparation to final layout, it's possible to install a modest-sized sod lawn in one day. If you buy turf from a reputable local grower, you are guaranteed to get a grass that grows well in your area. The grower may offer several choices, from low to high maintenance.

You can lay turf at almost any time of year, even when the ground is slightly frozen or during the heat of summer (although you'll need to water more in summer). In comparison, only spring and autumn offer sufficiently favourable conditions for sowing most seed lawns.

Turf is especially useful where patches of lawn have become bare, weedy, or damaged. Winter use of street salt in northern regions is one major cause of damage. After removing the threadbare turf and preparing the soil for planting, you can buy a roll or two of sod at a garden centre and place it over the area. Again, a seeded lawn would take several weeks to fill in and look lush.

If erosion is a problem on a slope, no matter how gentle or steep the incline, turf is the better option. Its healthy, heavy root mat will withstand water runoff even before the lawn is fully established.

On delivery day, water the soil to make it moist and damp but not muddy. Turf should be put down no more than 24 hours after it has been cut at the farm, because the rolled turf will heat up and begin to biodegrade.

Inspect the turf before the delivery truck leaves. Shake it to make sure it doesn't fall apart. The turf should be green and the soil moist. If you don't like the appearance, refuse to accept it and send it back.

Suppliers usually transport turf on pallets carrying 50 to 75 square yards each. To avoid a lot of heavy lifting, ask the driver to place pallets in convenient places around your property (but don't let them drive over walkways or patios, because the combined weight of the truck and the sod can cause damage).

Begin to lay the turf along the longest straight line next to a sidewalk or driveway. When preparing the soil, leave the soil level 3/4 to 1 inch below the level of that straight surface to make a neat, smooth transition from grass to pavement.

Butt and push the sod's edges and ends against each other tightly, without stretching. Stagger the joints in each row like bricks, and avoid gaps or overlaps. On slopes, place the turf pieces across the slope.

After lying the first row place a plank of wood over the top so that you can stand or knell on it to lay your next row. This spreads your weight and avoids walking on the new lawn.

Use a large knife to trim the corners. Avoid leaving small strips at the outer edges, because they won't retain moisture.

After installation, roll the entire area with a lawn roller (available from machine and garden hire stores) one-third full of water to press the sod roots into the contact with the soil.

Mowing high - that is, keeping your lawn a bit long - will produce stronger, healthier grass with fewer pest problems. A lawn's ideal length will vary with the type of grass, but many turf grass species are healthiest when kept between 2-1/2 and 3-1/2 inches. You may have to readjust your mower - most are set too low.

When mowing, the advice often offered is that you should remove lawn clippings or they'll make thatch: -

According to research, thatch is often produced more by the misuse of strong fertilizers and pesticides than by clippings alone. Thatch is a layer of dried grass clippings that builds up on the soil surface. As long as this layer is less than 1/2 inch (2.7mm) it's harmless and in fact has some of the same benefits as mulch returning fertility to the lawn. A healthy soil biota can easily decompose the normal amount of clippings to keep the thatch layer from building up. But earthworms, which perform much of this task, are especially vulnerable to popular lawn chemicals.

However, all grass forms a layer of dead plant material, between the grass blades and the soil. When this has built up to a greater depth than the safe zone, raking the lawn or using a machine that slices through the thatch layer to break it up can reduce it. Sprinkling a thin layer of topsoil or compost over the lawn will also help.
For a healthy lawn, mow frequently. Short clippings are tender and rot quickly. Set the mower blade high -- thicker lawns shade out weeds. Adjust the pH to 6.5 to 7.5, the range preferred by most grass species.

Get your lawn in shape for summer by first aerating and then fertilizing it. Aeration is the removal of small cores of soil from your lawn, which helps to break up compact dirt and packed mulch. Even more important, these holes allow vital air, water and fertilizer down to the root area. You can purchase a machine for this task or hire one from your machine hire dealer.

One easy way to aerate your lawn is by wearing a pair of shoes that have spikes on the soles. Pads containing spikes that simply fit under your shoes are available from garden centres, but if you have a pair of golfing shoes (with steel spikes) then these are ideal. Wear them when you spread the fertilizer.

Most lawns need to be fertilized every year, because they need more nitrogen, phosphorus, and potassium than soils usually contain. These three elements are the primary ingredients found in most lawn fertilizers. It's important not to over-fertilize - you could do more harm to your lawn than good - and it's best to use a slow-release fertilizer that feeds the lawn slowly. It's also important to check the soil's pH. Grass is best able to absorb nutrients in a slightly acidic soil, with a pH of 6.5 to 7.0. Acidic soil can be "sweetened" with lime; soil that's not acid enough can be made sourer by adding sulphur.

Watering properly will help your lawn grow deep roots that make it stronger and less vulnerable to drought. It's best to water only when the lawn really needs it, and then to water slowly and deeply. This trains the grass roots down. Frequent shallow watering trains the roots to stay near the surface, making the lawn less able to find moisture during dry periods.

For a healthy lawn, mow frequently. Short clippings are tender and rot quickly. Set the mower blade high -- thicker lawns shade out weeds. Adjust the pH to 6.5 to 7.5, the range preferred by most grass species. Fertilize only if the lawn really needs it.

The Cottage garden:

Cottage gardens are all about charm and character, a style that is essentially informal, miles apart from immaculate lawns and regimented borders. The cottage garden style means generous planting, a representation of rural bliss: a sea of blooms, with paths meandering between. Planting is personal with the emphasis on the pleasure of growing plants and enjoying their form and fragrance. A medley of colours and textures all crammed into the borders.

Initially the cottage garden was constructed for its utilitarianism, every bit of growing space was used for the families needs. Flowers, fruit, herbs and vegetables were packed together into even the smallest plots. The gardens extolled in Helen Allingham's paintings, the writings of Flora Thompson and by the influential landscape gardener William Robinson, were idealized visions of rural contentment.

Incorporate wildflowers and herbs as well as the more traditional cottage garden plants. Planting in clumps will provide large blocks of colour to introducing rich patterns of colour and movement. Don't just restrict yourself to planting tall plants at the back and smaller ones at the front - some taller plants in amongst the middle of planting areas can look very effective.

Grow Hollyhocks beside walls and fences, and climbers in amongst hedges or trees, or up walls and fences. Sowing annuals can fill in gaps in the planting. Many flowers also featured in traditional cottage gardens are self-sowing; leave old flower spikes in tact for the plants to self-seed.

It would be a mistake to say that the cottage garden is a low maintenance garden; it requires care and attention like any other garden. Frequent deadheading is required to maintain a long season of bloom, dividing and replanting to avoid one of two invasive plants taking over and though weeds have competition, weeding is necessary from time to time.

Laying out the Cottage Garden

A classic cottage garden has a straight path to the front door, a simple fence and perhaps an arch over the gate, the path or the doorway. A climbing rose or a wisteria would adorn the wall above the front door. The path would be edged with plants that spill over to soften the edges. A few evergreen shrubs will provide permanent green backdrop to show off the flowers, and contrast with autumn foliage and spring bulbs. In winter when the rest of the garden sleeps, they will be there to inject interest and colour. A tree will give scale to the garden, and lift the eye over the flowers. Deciduous trees have more than one season of interest as most provide some autumn colour and many have lovely flowers and fruits. The framework of branches will continue to provide the needed height in winter, without the disadvantage of blocking winter sunlight in a smaller plot. Deciduous flowering shrubs will provide summer interest, and some will give you autumn foliage colour and berries throughout winter.

A cottage garden is not complete without roses. Species and heritage roses that have stood the test of time, plus the modern roses bred for ease of maintenance and disease resistance give you roses without all the work roses can require. There are wonderful climbers to adorn arches, pergola or fence. Work roses into your overall scheme, and let them play their part, and they will contribute immensely to your garden.

Hard landscaping, such as paths, seating areas and containers, are there to help you enjoy the garden. Hard surfaces contrast well with the flow of the planting.

Several different climbers can share the same support, whether it is a tree, pergola or arbour. It’s a good space-saving technique that creates colourful features for months on end and adds height to the garden.

Containers are the convenient way to add lots of extra colour around buildings, close to seats and benches.

Objects such as old chimney pots, old watering cans and bottomless metal buckets can be recycled to make authentic, aged features that all add to the character of a cottage garden.

The Water garden:

When attempting to imitate or even improve on the effects of nature, landscapers of past and present have contrived diverse and ingenious water effects, from the huge, elaborate fountains of the great gardens of Europe to artificial lakes and the glassy, contained effects of formal pools, reflecting traditional or modern sculpture. Water in the smaller modern garden challenges the ingenuity of gardeners and professional landscape designers alike. The sound of water in the garden can completely distract one from the roar of traffic through the busiest of roads that may be only a matter of feet away. Still water designs on a grand scale to mirror sculptures, trees or buildings can have a truly magical effect. Plants growing in, and beside, still waters add to reflection, enhancing the beauty and tranquillity of the scene. Whether you opt for native wild plants or exotic flora the picture they help create can be breathtaking. Grading the shallows into a small marshy patch also gives a good habitat for damp-loving plants and a haven for aquatic creatures.

Building a Pond:

First, you need to think carefully about where you will place the pond. If the site has trees overhanging, you will be driven mad by leaves falling into the pond. In a small stretch of water they will cause serious problems, as eventually they will sink to the bottom and foul the water, making conditions unsuitable for wildlife. To overcome the problem it will require a constant effort to clear away fallen leaves, and a lot of time frequently cleaning out the pond.

Don't site your pond in full sun; partial shade is best. A pond that sits in bright sunlight for most of the day does not provide shelter from the sun for fish or other pond life. If the site is too shady, the plants won't flourish (water lilies and other water plants prefer plenty of sunshine). Avoid hollows or low-lying areas. They may seem a natural choice but in heavy rain a low-lying pond will act as a drain for the rest of the garden. This could pollute the water and may even cause the pond to flood. Choose a sheltered site, especially if you intend to have a fountain. In strong winds, water will blow from the fountain lowering the level of the pond.

Next you must decide the size and shape of the pond. The shape can be either formal with symmetrical lines, either square, rectangular, oval or round. The shape of the pond will depend very much on the garden design. Normally the formal pool fits into a landscape that has straight paths, clipped and manicured bushes and shrubs, and an overall balanced type of planting. Informal pools are more natural looking; they are usually irregular and random in shape with curves that enfold them into the surrounding landscape.

Next you must decide which material your pond will be constructed from. A pre-formed pool formed in glass fibre or reinforced plastic are easily installed. The more rigid types tend to be more durable and come in a greater variety of shapes and sizes. The main drawback being that size is limited. If you buy a pre-formed pool, then be aware that however big it looks standing up at the garden centre, it will look half the size when in the ground. Many pre-forms are not deep enough to successfully over-winter your fish, especially in northern areas. Koi because of their eventual size, require a depth of at least 6 ft (1.8m) if they are to thrive.

In southern areas the water in shallow pools can get overly hot, and in winter they may easily completely freeze up. Besides shallow waters allow for fast, fluctuating temperature changes, which can be eventually fatal for fish. Care should be taken to ensure that the pond remains level by keeping a carpenter's level on the pond edge at all times while filling. If the pond moves and the level is affected, stop filling, and re-level, backfilling with sand or soil.

Pond Liners

By using a liner, you have the flexibility to design your pond just as you wish. Good quality modern pond liners are strong and durable, and carry a guarantee of up to 20 years. Go for the best quality liner that you can afford. Polythene is the cheapest material but is only suitable as a temporary pond, or bog garden. It does not stretch like other lining materials, and is best used in double thickness. Make sure that any polythene not covered by water, (over-lap at the perimeter of the pond), is covered with edging material, as any part exposed to the sun hardens and cracks, making it extremely brittle.

P.V.C. liners are often double sided offering the choice of two colours, blue or black on one side and brown on the reverse. Remember that a light colour tends to show up algae growth and if you have fish then their colours will be pale; this is because their defence mechanism makes them less conspicuous to predators. Butyl liners are normally black, and carry a long guarantee. This rubberised material comes in several grades of thickness, and can be successfully repaired if punctured. It can also be extended if necessary by joining extra material when installing a very large pond. After installing a liner, be sure to keep any reasonably sized off-cuts as they are useful to underlay waterfalls or for joining another pond at a later date.

You must use an underlay to fit under the liner to protect it from sharp stones and tree roots. Pond liner underlay made of polypropylene or polyester is available from aquatic and garden centres but you can lay a 2-inch (5cm) layer of soft sand. Don't use old newspapers or carpets, because they will rot away and don't support your liner.

The best way to visualise the size and shape of the pond is to lay a hosepipe on the ground to define the edges. Then you should look at it from different viewpoints to make sure that it fits well into the position you have chosen. When you are quite satisfied that all the criteria have been met, you are ready to start digging the pond. Most ponds have a shelf or shallow ledge around the perimeter, where baskets of aquatic plants, suited to growing in shallow water can be positioned. After completing the excavation it can be measured for the liner.

Calculate the amount of liner you need to purchase by measuring the depth, length and width of the hole. Measure the depth at its deepest point first. Next measure the width of the pond at its widest point, and to that figure, add twice the depth. Then add 2-ft (60cm) for edging. Determine the length of the liner needed in the same manner: measure the length at the longest point of the pond and add two times the depth, plus two feet for edging. Liner width = pond width + 2 x pond depth + 2 feet.

1. Mark out the shape of your pond using a rope or length of garden hose.

2. Check with a spirit level as you dig to make sure that your pond is level.

3. Use a hose to gradually fill the liner with water, weighting the liner with stones around the edge.

Start the process by draping the liner over the excavation; making sure it is roughly fitted to the shape, by folding it in the right places. Place a few bricks or large stones on the liner around the edge to hold it in place. You will need to walk over the liner to carry out miner adjustments inside the hole, so you must take off your shoes to avoid any possible damage to the liner.

Make sure the edge of the pond is perfectly level; Use a 2" x 4" board and carpenter's level to span the pond. Move the 2" x 4" board around the pond making sure the pond edge is level in all directions. Remove any stones, roots or debris that could cause the pond to look uneven or that might cause damage to the liner. Once the liner is in place and full of water, it is too late to fix (water lapping over the edge at one end, and a cliff-face of exposed liner at the other end!!).

Start filling with water only when you are satisfied that the liner is fitting well. As water fills the bottom of the pond, walk around, and smooth out any wrinkles, and adjust the folds as needed. Continue to adjust the liner until the pond is full.

You might now want to trim off any surplus liner, leave at least 12-inch (30cm) overlap beyond the pool edge. If you taper the depth around the perimeter you can incorporate a bog garden and plant right up to the water's edge. After the finishing touches have been made allow the pond a chance to settle down over the next few days. Leave the stones or bricks in place for two to three days to allow the liner to settle into shape.

After letting the pool settle you are ready to finish the edges of your pond. Paving stones are a popular choice or why not plant a marshy border for an informal natural pond? Water contains chlorine and other chemicals, which are harmful to aquatic life so you must wait at least two weeks before you add fish. You can reduce the waiting time by using a water treatment. Now is also the time to install your pump, filter box and UVC, which will keep your pond in tip-top condition.

Concrete pools usually take the formal shape and if properly constructed, can last a lifetime. In addition, they can be constructed with vertical walls to increase the ratio of gallonage to surface area. However, this material is generally expensive and requires skill to install. When hiring contractors to do the work, ask for references and check them out. Whether you or someone else builds a concrete pond, a poorly constructed pond will cost more to maintain, repair or replace than it did to install. This is the main reason for the popularity of the new synthetic construction materials.

The concrete should be 4 to 6 inch (10-15cm) thick, depending on the subsoil; chalk and rock will not subside, but clay will shrink and should be slightly thicker. Once the dimensions are established and the outline is laid out, dig out the soil for the entire pond. Use a mix of 3 parts ¾inch (18mm) ballast to 1 part cement, 2 parts clean sharp sand; mix with water containing integral waterproofing liquid to make the concrete waterproof; or waterproofing powder may be used.

If the pond walls are nearly vertical, shuttering will be required to hold the concrete in position, and should be constructed of strong material that will not give with the weight of the concrete. These are removed after the concrete has been poured, and the concrete must be tamped well down to remove any air pockets. Sloping walls allow the concrete to be 'battered' with a spade into place. Concrete reinforcing bars must be cut to size and fitted into the construction.

The strength of a concrete pond is in the steel reinforcing. Use reinforcing mesh, particularly on the sides and top edge. The pond must be poured all in a single day and in one piece. Start with the bottom, then the sides, shelves, and, lastly, the top and any coping around the edge.

A concrete pond can incorporate features that cannot be put into other types of pond. A drainage pipe and valve can be installed in the bottom to allow for easy cleaning. Water lily beds and marginal planting beds can be built into the base and sides so that planting containers are unnecessary. Marginal shelves will need about 9ins (21½cm) of water over them so the depth so take this into consideration when building these.

Once the pond is built, it must be treated to correct the basic nature of concrete, which affects the pH of water. New concrete contains a considerable quantity of lime, which means that it is toxic to fish and most plants. Apply a sealant, which will prevent the free lime entering the water. A sealant will achieve this when applied to the dry surface of the concrete, carefully following the manufacturer's instructions.

Apart from neutralising the lime it also seals the concrete. Rubber based and liquid plastic paints can also prevent the escape of free lime, although their main purpose is as a waterproof pond sealant. These must only be applied after a suitable primer, without which the paint will just peel away, again carefully following the manufacturer's instructions. To ensure that the pond is seasoned correctly introduce a few tadpoles or small fish, and if they show no ill effects the pond is safe to be stocked with plants and more expensive fish.

Cement block and brick construction ponds are ideal for raised ponds. Whether using concrete blocks or hard house bricks, they should be thoroughly soaked with water before use. Lay a line of mortar onto the concrete base after it has set, and commence laying the walls. Leave the inside joints a little rough to act as a key for the rendering; the outside should be neatly pointed unless that too is to be rendered over.
Allow the mortar to set for a day before applying the rendering to base and walls and complete in one operation. At this stage the top or capping can be added. As rendering is not successful if laid on a dry surface, wet all surfaces prior to this process. Follow the curing process as for concrete ponds.

Water Features:

When creating a bog garden, think big. Small areas are prone to dry up quickly.

If you are building a natural pool to encourage insects and animals, make sure they are able to get in and out easily – incorporate shallow, sloping sides for them to use.

To maintain clear water without sophisticated filtration systems, a block of barley straw attached to a rope or you can fill an old pair of tights with the straw. For a short period the straw will float, but then gradually sink. The rope will aid the straws removal when it is finished. Adding floating plants such as water lilies and duckweed will shade out enough sunlight and those along with plenty of oxygenating plants will keep the pond water crystal clear.

Do not over-stock a pond with fish allow them space to grow. A crowded environment results in stressed fish with serious health problems, which will greatly reducing their life span.

New water plants often contain tiny duckweed plants, which, once in situ, can multiply at an alarming rate. If you don't wont your pond covered with this floating plant, rinse all new plants under the tap before putting them into the pond.

Always line planting baskets to help keep soil around the roots. A bit of sackcloth does the job well.

Use a stout, twiggy, stick to remove blanket weed from a pond. Push the stick into the water and twist, the fibrous weed will wrap around the stick and can then be pulled out.

Make your own fishnets from pieces of net curtain. Cut the material to double the required size. Fold in half and sow along the two seams. Make a hem at the top so that a piece of strong wire can be fed through forming a hoop. Secure the wire to a stout bamboo cane or broom stave.

Fountains:
Fountains make a wonderful addition to a formal pool, they introduce water surface movement, and the gentle fall of the water as it splashes down into the silent waters inspires calmness, serenity, and tranquillity to the overall concept of a water feature. However, fountains are not recommended in ponds where water lilies are growing, they dislike the disturbance of the water created by a fountain. Fountainheads may be installed in an existing pond, yet a pond is not necessary for the creation of a fountain. Almost any water-holding container will accommodate the required essentials.

The height of the throw is dependent upon the capacity of the pump. The easiest type of fountain unit to install is the self-contained submersible, electrically operated pump. Fountainheads should be installed slightly above the surface of the water to achieve the full effect of the spray pattern. Normally pumps will throw a fountain pattern to a height of around 6-ft (1.8m) which can be adjusted by a built-in flow regulator. At this height the approximate spread of the fall would be in a radius of 4-ft (1.2m), this should be taken into account when positioning the fountain in the pond. A variety of heads are normally available for attachment to the pump.

Waterfalls:

There is something magical about a waterfall, they can be either modest or spectacular, but the concept is still the same. Most ponds benefit greatly by the inclusion of moving water and a waterfall, even a modest one, can transform the scene into something quite breathtaking. The informal type of pond, with a rockery background, invites a waterfall. It is in keeping with nature, and beneficial to the pond inhabitants.

Liner - When possible, use a liner in one piece, for both pool and waterfall. Be especially careful if placing rocks or stones on the liner that they do not tear or puncture it. Do not trim the liner until the waterfall has run for seven days to allow for any changes that may be needed after pool has settled.

Cement - Pack soil firmly where the waterfall will be located. Lay tie rods and wire mesh reinforcement. Cement (using a fibreglass additive to mix) a four-inch thick concave trough into the pool. After the cement has hardened, place rocks and stones into place with additional cement.

Submergible Pumps - To determine which pump would be best suited for your waterfall, determine how high the water must be pumped vertically from the bottom of the pool. Select a pump that will turn over the total gallonage of your pond at least once an hour at this height. This will give a pleasing proportion of water movement in relation to the size of pond.

Be sure your waterfall, when running, will not have more capacity than the pond. Generally, the base pond should be four times the size of the waterfall. Waterfalls will make more "noise" if some of the rocks jut out with a hollow space behind the falling water.

To incorporate beautiful water features into a garden doesn't mean that you must have a pond. Small gardens or those with very young children can still enjoy a water feature by positioning a fountain over rock or stones to make an attractive, compact and safe means of enjoying moving water. A half-barrel can be used for water plants, a shallow dish with large stones arranged as a surround makes gives a reflection of the immediate area. A tiny spout, perhaps with a lion's mask, mounted on a wall, the water falling into a dish that drains into an hidden reservoir to be pumped back up to the spout can look charming.

Planting:

Trees: - Let's start with Burlap plants. Closely examine the root ball on the plant that you have purchased. Did the nursery wrap twine around the ball to hold the plant secure? This should be removed completely. Pay close attention around the stem of the plant where it emerges from the root ball, as diggers often wrap the twine around the stem several times as they tie the ball. This is extremely important because if the string is nylon, it will not rot and will girdle and kill the plant two or three years after planting.

When Burlap plants are stored in the nursery for extended periods of time it becomes necessary to re-burlap them if the bottom starts to rot before the plants are sold. If the plant that you buy has been re-lapped it is possible that there could be nylon stings between the two layers of burlap, check the stem carefully. Is the root ball wrapped in genuine burlap, or imitation burlap made of a non-biodegradable plastic material. Genuine burlap will rot quickly underground and does not have to be disturbed before planting. If you're not sure or suspect a poly type burlap you don't have to remove it completely, but you should loosen it around the stem of the plant and cut some vertical slices around the circumference of the ball.
If the native soil isn't suited to the tree or shrub, then they are best grown in a container that may be sunken into the ground; this is a better option than trying to change the soil with amendments.

Plants that are grown in containers (especially those with tightly wound root balls) should be loosened and some of the soil shaken off the roots prior to planting. The plant roots need to be in contact with the soil in which they will be growing...not the mix that was used at the nursery. Nursery growing mixes are generally bark based, and are formulated to dry out quickly, to prevent over watering in a nursery container. Most nurseries irrigate once or up to three times daily, and if the soil isn't completely dry after each irrigation, the plant will drown. If you leave this root ball intact after the plant is planted, the roots still dry quickly because the soil in the root ball is porous and water can easily pass through, leaving the plant parched. When planted with the soil ball intact, the roots can begin to die quite quickly, while the surrounding native soil may still appear damp for weeks. Plants can be virtually dead within a few weeks, and still have green leaves for a long time.

It is a mistake when planting trees and shrubs, to introduce large amounts of compost and other amendments around the roots. Research has indicated that in general, roots of ornamental trees and shrubs were consistently larger in the ground where additional composts where not added. The amendments seemed to encourage roots to stay in the vicinity of their planting holes and not grow out into the surrounding soil, leading to stunted root systems. The conclusions reached were that it's best to let the roots begin to grow in the native soil right away and to use organic matter on the surface as mulch, rather than mixing it with the soil.

Removing the native soil and replacing it with soil amendments causes problems with water movement in and out of the root zone. An example of how this works in reality is after a torrential downpour. There is water everywhere, and it is not going to soak into that harder more compacted soil, so it is just flowing across the top of the ground searching for the lowest point. When it reaches our newly planted tree surrounded by loose organic matter, it is going to seep in until the planting hole is completely filled with water.

A similar problem occurs when gravel is placed in the bottom of a bed to increase drainage. In reality, it decreases drainage, as water moving vertically through soils, stops when it reaches a different layer, even if the layer is more permeable.

Only after the soil reaches saturation capacity, will the water move through the gravel. Some plant will die if the soil becomes saturated for even a short period. This is especially true when plants are actively growing and in need of a regular supply of oxygen to their roots. By using this planting technique it has actually created a French drain around the plant, stifling if of oxygen for long periods of time. This is especially true if the bottom of the hole is clay, even though gravel has been added for drainage, there is nowhere for the water to go, and the plant is going to suffer and likely die.

The primary purpose of a good planting area is to provide sufficient air to the plant roots. As a general rule, if you are planting trees and shrubs in individual holes, do not add any soil amendments...simply fluff the existing soil. If you are planting in large beds, use all of the organic amendments that you can afford but these should be thoroughly mixed with the existing soil, and not simply piled on top. This allows for an extensive well-prepared root zone in which the plant roots will remain for most of their lives.

No matter what kind of soil you have, be careful not to install your plants too deep. They should never be planted any deeper than they were grown in the nursery. Planting too deep is a common problem, and thousands of plants are killed each year by gardeners who just don't understand how critical the planting depth is.

It is a mistake when planting a bare-root tree, to prune away some of the branches to balance the top with roots lost when the tree was dug up. When a bare-root tree begins to grow, it's able to limit new shoot and leaf growth to the capacity of the root system on its own. Pruning takes away some of the healthiest buds and robs the tree of stored energy. If, however, a new tree has a broken limb, prune it back to the nearest strong bud or side shoot. After the tree has grown for a season and recovered from the stress of transplanting, begin pruning for a balanced shape with well-positioned main limbs. Use the least number of cuts possible.

Plants should never be potted up into pots without drainage holes; a layer of gravel will do nothing to stop the soil becoming waterlogged. If the soil in the bottom of a pot stays wet, a plant's roots will get waterlogged and rot. But it's the holes in the bottoms of containers that allow the water to flow through. In fact, any gravel in the bottom reduces the volume available for potting soil, as well as making everything heavier than it needs to be. All that is required is a small fragment of terracotta over the pot's drainage holes to keep the soil from slipping out. If the pot rests in a shallow saucer, don't habitually keep the saucer full of water or roots in the bottom layer of soil will be damaged.

After planting an evergreen shrub, spray the foliage every day for two weeks.

Use annual climbers to cover a bare trellis while the slower-growing plants get a chance to establish.

Protect tender perennials from frost by lining a pot or basket with straw and placing it over plants when frost is likely to strike.

For a large pot planted with a shrub, such as Box (Buxus) or Bay (Laurus), surrounded by lower growing plants, keep the shrub inside a plastic pot rather than in the pot soil, you can then replant around it regularly without disturbing the shrub’s roots.

Planting in shade:

Shade is measured by the amount of light cover an area receives. Depth of shade can be measured from total to partial and various degrees of light and dappled. Areas may have shade for only a short period of the day, but dense shade is by far the most difficult type of shade in which to garden. The problem is that plants need light to photosynthesise and produce food; so only those plants with low metabolism are able to survive.

You have no doubt noticed that most of the woodland perennials flower in the spring. This is an evolutionary adaptation that was derived by the lack of leaves on deciduous trees in springtime. Plants that grew underneath the large deciduous trees found that they had to grow and flower while the leaves were absent and light was abundant. Once the trees leaf out and the amount of light diminishes, the flowers are through with their moment of glory and once again retire until the following year.

Light or partial shade is an ideal condition to grow a wide variety of garden plants. Light shade occurs where there are smattering of large and small trees, where indirect rays of light can filter through the canopy of branches. Increased light can be accomplished by selective removal of trees and shrubs, or through removal of many of the lower tree limbs.

Generally, plants that prefer cooler conditions benefit from sun in the morning and afternoon shade during the heat of the day, while plants that love heat benefit from shade in the morning and prefer to bask in the hot afternoon sun. Plants do not fall into neat groups, but by careful selection even the most shaded garden can enjoy colour and interest at some point of the day or season.

Lets begin with a few choices that would make good ground covers or low growing specimens: - Adonis amurensis, A.brevistyla, Alchemilla mollis (lady's mantle) Ajuga reptans, Anemone narcissiflora, A.nemorosa, A.sylvestris, A.ranunculoides, A.rivularis, Anemonopsis macrophylla (False anemone), Asarum, Astilbe, Brunnera macrophylla, Campanula isophylla, Cardamine enneaphyllos, C.pentaphyllos, Convallaria majalis (Lily-of-the-valley), Dicentra, Epimedium grandiflorum, E.x pubigerum, E.x versicolor, Filipendula ulmaria, Galium odoratum (Woodruff), Glaucidium palmatum, Geranium macrorrhizum, G.wallichianum, Heleborus viridis (Green hellebore), Heloniopsis orientalis, Heuchera cylindrical, H.micrantha, Hostas, Lathraea clandestine (Toothwort), Lamium maculatum, L. orvala, Lysimachia, Melittis melissophyllum (Bastard balm), Myosotidium hortensia (Chantham Island for-get-me-not), Pachyphragma macrophyllum, Tellima grandiflora, Trillium chloropetalum T. erectum, T. ovatum, T. sessile, Uvularia grandiflora (Bellwort, Merry-bells), Veronia spicata.

Low growing and ground cover plants preferring deep shade: - Epimedium x warleyense, Geranium nodosum, Lamium maculatum, Meconopis cambrica (Welsh poppy), M.ntegrifolia (Lampshade poppy), M.quintuplinervia (Harebell poppy), Mertensia pulmonarioides, Petasites japonicus, Pulmonaria officinalis, P. saccharata, Scopolia carniolica,

Tall perennials preferring partial or dapped shade include: - Anemone x hybrida, A. hupehenis, Aruncus dioicus (goatsbeard), Astilbe, Campanula lactiflora, Cimicifuga simplex, Euphorbia schillingii, E. sikkimensis, Euratorium purpureum (Joe Pye weed), Dicentra Spectabilis (Bleeding heart, Dutchman's trousers), Digitalis ferruginea, Doronicum columnae, Eupatorium rugosum, Filipendula rubra, F. purpurea, Gentiana asclepiadea (Willow gentian), Geranium sylvaticum, Helleborus argutiflius, H.foetidus (Stinking hellebore), H.niger (Christmas rose), H.x hybridus (Lanten rose), H.x sternii,

Inula hookeri, Nepeta sibirica, Smilacina racemosa (False spikenard), Strobilanthes atropurpureus, Veratrum nigrum,

Tall perennials for deep shade: - Actaea pachypoda (White baneberry), Chelone oblique (Turtle-head), Meconopsis betonicifolia M. grandis (Blue poppy), Persicaria campanulata, Polygonatum x hybridum (Solomon's seal), Geranium phaeum (Morning widow),

Annuals and biennials for shady areas: - Collinsia grandiflora, Digitalis pururea, Impatiens walleriana, Lunaria annua, Myosotis sylvatica, Nicotiana x sanderae,

Shrubs for Shade: - Acer palmatum, Anopterus glandulosus, Ardisia crenata (Coralberry, Spiceberry), Azaleas, Clethra barbinervis, C.delavayi, Corylopsis glabrescens, C.pauciflora, Crinodendron hookerianum (Lantern tree), Enkianthus perulatus, Eucryphia milliganii, Fothergilla major, Gaultheria mucronata, G.shallon, G.x wisleyensis, Ledum groenlandicum (Labrador tea), Lindera benzoin (Benjamin, Spice bush), Mahonia aquifolium (Oregon grape), M.japonica, M.x media, Pieris floribunda, P.Formosa, P.japonica, Potentilla fruiticosa, Rhododendrons, Scarcococca hookeriana, S.humilis, Skimmia japonica, Telopea truncata, Vinca major, Zenobia pulverulenta,

Rock plants for partial or dappled shade: - Andromeda polifolia, Arenaria balearica, A.montana, Cardamine trifolia, Cassiope, Chrysogonum virginianum, Cornus canadensis, Cyananthus lobatus, C.microphyllus, Daphne blagayana, Dicentra cucullaria, Dodecantheon meadia, Epilobium glabellum, Gaultheria cuneata, G.procumbens, Gunnera magellanica, Haberlea rhodopensis, Hylomecon japonica, Jancaea heldreichii, Jeffersonia dubia, Lewisia, Linnaea borealis (Twin flower), Lithophragma parviflorum, Nertera granadensis (Bead plant) Omphalodes cappadocica, Oxalis acetosella, Parochetus communis, Phlox adsurgens, P.divaricata, Phyllodoce x intermedia, P. caerulea, P. empetriformis, Polygala chamaebuxus, Ranunculus alpestris, Sanguinaria canadensis, Saxifraga cotyledon, S.cuneifolia, S.exarata, S.hirsute, S.oppositifolia, S.sancta, S.sempervivum, Shortia galacifolia, Soldanella alpina, S.villosa, Stylophorum diphyllum, Synthyis stellata, Tiarella cordifolia (Foam flower), Trillium rivale, Vaccinium vitis-idaea, Vancouveria hexandra, Viola riviniana,

Rock plants for deep shade: - Anemonella thalictroides, Asarum europaeum, Cassiope mertensiana, Chiastophyllum oppositifolium, Cortusa matthioli, Cyathodes colensoi, Epigaea gaultherioides, Galax urcelata, Hacquetia epipactis, Jeffersonia diphylla, Maianthemum canadense, Mitella breweri, Omphalodes verna, Ourisia caespitose, O.microphylla, Pachysandra terminalis, Polygonatum hookeri, Pratia pedunculata, Ramonda myconi, Shortia soldanelloides,

Bulbs for Shade: - Anemone blanda, Arisaema consanguineum, A.griffithii, A.jacquemontii, A.sikokianum, A.triphyllum, Brimeura amethystine, Camassia leichtlinii, Cardiocrinum giganteum (Giant lily), Cyclamen africanum, C.cilicium, C.coun, C. graecum, C.libanoticum, C.hederifolium, C. mirabile, C. purpurascens, C.rohlfsianum, Eranthis hyemalis (Winter aconite), Erythronium americanum, E.californicum, E.dens-canis (Dog's-tooth violet), E.hendersonii, E.oregonum, Fritillaria acmopetala, F.camschatcensis, F.pontica, F.verticillata, Galanthus elwesii, G.gracilis, G.ikariae, G.nivalis(Double common snowdrop), G.rizehenis, Hyacinthoides hispanica (Spanish bluebell), H.non-scripta (English bluebell), Hymenocallis narcissiflora, Ipheion uniflorum, Leucojum aestivum, L.vernum (Spring snowflake), Lloydia serotina, Nectaroscordum siculum, Nomocharis pardanthina, Notholirion campanulatum, Scilla scilloides.

Topiary:

Topiary the art of fashioning living plants into ornamental shapes is often a feature of the grand country houses and great estates, with their spectacular gardens containing magnificent sculptured hedges and geometric shaped trees and shrubs. Many of the old cottage gardens too have their living works of art. Peacocks and all manner of animal creations rise above the packed, colourful borders to create a masterful picture. Topiary has been practised for more than 2000 years and can be traced back to the Greeks and Romans. It became fashionable in Europe in the late 16th Century when many of the grand palatial residences were built. Topiary is an art form that anyone with a pair of shears can create. The effect can be stunning; topiary can add character and individuality to any garden. Today's topiaries have become popular garden features once again and take on a variety of shapes from formal to playful. Teddy bears, cats and many other forms now join the more traditional shapes

The art of Topiary seeks to control the growth, to form from it the shapes we desire. Also to control the extent of growth annually in order to maintain those shapes once they have been achieved. The practise is to increase the surface density of the pieces - to promote a very even and close finish on the exterior and hopefully a strong and relatively rigid structure beneath.

With most species used for topiary and in most climatic zones, there are definite seasons of growth (spring and summer) and a dormant period (autumn/fall and winter). Aesthetically, the topiary pieces look best when trimmed to the tight lines of their allotted forms. This means that they look at their best just after they are clipped and before fresh new growth blurs the outlines of the shapes once more.

To maintain the creations at optimum sharpness of outline for the longest period is achieved by cutting the growth off at the end of the growing season. This is a popular technique used most often in large collections where maintenance must be kept to a minimum because of the shear number of pieces and the amount of work involved. In UK conditions most clipping work is tackled in late summer. Therefore this then gives the longest period of time - right round until the following May/June in which to view and enjoy the tightly clipped shapes.

When topiary is still in its formative stages, clipping is generally undertaken more than once each year to provide the best results. This may be particularly necessary where the species used is very vigorous in growth and continually blurs the outline, or when very finely detailed features need to be maintained. In these cases, trimming may be required every four to six weeks.

Beware of trimming in adverse weather conditions. Severely cold, frosty conditions would not be the appropriate time to trim. Some varieties such as Box (Buxus sepervirens) can be severely damaged if cut during icy periods. With this species it is traditional to trim after the last possibility of night radiation frost has passed - normally at the end of May/beginning of June. Any new growth made thereafter has time to harden sufficiently before cold conditions return in the winter.

Many gardeners are temped by good spring weather to trim in April. Unfortunately the plants are immediately prompted to produce fresh growth, which is often killed or severely damaged by hard late spring frosts during May. Clipping too late in the growing season also prompts the dangerous production of tender new shoots. Old box growth however, is of course relatively hardy.
Yew is generally clipped more than once a year for a tighter, more controlled effect. A trim of the first big flush of new growth can take place in July.

A second tidying cut to any new shoots produced is undertaken in September. With this species, if a single trim a year is made, then any time after the end of August will do, but preferably before the worst winter conditions begin. Early, rather than later clipping, should always be the aim.

Shrubby honeysuckle (Lonicera nitida) and Privet (Lgustrum aquifolium) species are such vigorous growers as to need repeated trimming during the growing season. While Beech (Fagus silvatica) and Hornbeam (Carpinus betulus) require only a single trim from late August to stay neat. Their golden Autumn/Fall foliage should be retained through much of the winter to enhance their decorative effect.
Holly (Ilex aquifolium) and some other large leaved evergreens are often trimmed in late spring and perhaps again in late summer. These species often have very large leaves, which may look unsightly if trimmed using hedge clippers. They are often tackled more slowly, removing individual shoots with secateaurs.

Never be too ambitious when embarking on topiary; an identifiable sphere, cone or small bird shape is better than an unidentifiable mass! Although topiary experts are often able to create simple forms without the aid of a frame, for novices a wire frame will give guidance for successful clippings. Today we are able to purchase frames of all manner of shapes and sizes. After choosing the desired shape, place the wire frame into the ground or container, over and around an existing shrub and clip around the frame using topiary shears. It is then a matter of clipping the new shoots that grow beyond the framework.

Creating topiary is not something that can be executed in neither a weekend nor a season; it may take up to 10 or 15 years to achieve its true potential. Moderately young evergreen shrubs that are naturally full, fairly fast growing and shear well produce the best topiaries. Other suitable trees and shrubs are: Bay (Laurus nobilis), Cypress (Cupressus macrocarpa), Hornbeam (Carpinus betulus), Juniper (Juniperus), Thuja (Cupressus plicata) and Yew (Taxus baccata). One solution for those who loose patience with anything that takes time to fruition, is to purchase a container-grown specimen, grown and shaped to maturity by the nursery, though naturally they come at a price!

Propagation:

Seeds
The smaller the seed, the shallower it should be planted.

Mix small seeds with dry sand for easy sowing.

To collect seeds, place the ripe seed heads in a paper bag and shake.

Seeds that are still in the pod should not be stored in airtight containers. They need a flow of air around them. When the pods are dry, remove the seeds and put them into a paper bag.

Conserve moisture and maintain an even temperature by covering seedling pots with cling film or polythene bags. Push short pieces of wood or twigs into the compost around the pots to keep the cover from touching the seedlings. Take off the covers from time to time and turn inside out to remove the condensation building up.

If the light levels are too low where your seeds are growing, stand the pots on kitchen foil so that they benefit from the reflected light.

Seeds with hard coats can be soaked in water overnight before sowing.

Warm up the soil before planting seeds, by putting a sheet of black polythene over the bed. Keep it in place by weighting it down with stones. When you are ready to plant, remove the cover.

Make a mini-greenhouse. Cut an empty 5 litre plastic water bottle in half, you then have two small propagators to place over your seedlings.

Cuttings
When taking cuttings, place them into a plastic bag until you are ready to plant them. The bag helps to retain moisture and helps to keep them fresh.

Stem Cuttings: - These are pieces of growth taken from the aerial parts of the parent plant, and can be either side shoots or the tips of main shoots. They may be soft wood, half-ripened wood or ripe wood. Soft woodcuttings are taken from young tender growth of the current season; half-ripened cuttings are made from semi-ripened wood that has been grown for some time and become slightly woody or firm; ripe wood cuttings or hard wood cuttings are made from mature wood at the end of the growing season and are chiefly used for the propagation of trees and shrubs.

All stem cuttings are prepared by removing the lower leaves, and then cutting straight across the stem, just below a joint or node. The cutting should be about 3 inch (7.5cm) long.

In the case of ripe wood cuttings they can be made with a "heel" of the older wood attached at the base and be up to 10 or 12 inch (25-30cm) long.

Inserting the Cuttings
No mater how well the preparation of the cuttings is, they will not root properly unless they are inserted correctly. When the cutting is made it causes a wound, which must heal and in doing this new tissue is formed to cover the damaged area. Under favourable conditions the wound will heal and grow roots and so provides a means to continue a separate existence.

Sometimes cuttings will put too much effort into healing the damage at the expense of root formation. They may appear to be growing yet will not produce roots. High soil temperatures, or a coarse rooting medium may cause this. Open and coarse planting mediums allow too much air to penetrate to the base of the cutting. The use of very coarse sand has been found to create such development problems.

Leaf-bud Cuttings: - These are made from half-ripened wood and consist of one leaf with a dormant bud at its base and also a portion of the stem. They are planted in the same way as stem cuttings, but with the leaf and bud just above the surface of the rooting medium. This type of cutting is used particularly for the propagation of camellias and some other evergreens. It has the advantage of providing a greater number of young plants from one piece of growth than are by stem cuttings.

Bud or Eye Cuttings: - These are similar to leaf-bud cuttings but with no leaf attached, and are made from dormant ripened wood in autumn or winter. Ornamental and fruiting vines are propagated from this type of cutting. Make each cutting of woody stem with a single dormant bud or eye about 1 ½ inch (38mm) long. Take off a strip of bark and wood on the side opposite to the bud, and then insert the cutting on its own in a small pot of potting compost with the bud just at soil level.

Leaf Cuttings: - Many plants can be propagated from leaf cuttings these include Begonias, gloxinias, saintpaulias, streptocarpus and echeverias. Remove the leaf from the parent plant with the leaf stem attached and, after cutting the end of the stem cleanly, insert it into the compost or sand so that the leaf blade lies flat along the surface. After the roots have formed a young plantlet will grow from the base of the cut leaf stalk.

Root Cuttings: - There are several plants both shrubby and herbaceous that can be propagated by root cuttings; perennial phlox, verbascum, hollyhock, romneya, eryngium, gaillardia, anchusa and Oriental poppy to name a few. Lift a complete plant during the dormant period and cut sections of the fleshy roots into pieces about 2 to3 inch (5-7.5cm) long. Insert the root cuttings into pots or new planting locations. Large quantities of cuttings of the same kind can be tied into bundles and placed in sand or soil to root.

Pipings: - using pieces of the young tip growth called pipings easily propagates Carnation and pinks. This type of cutting does not require trimming. Hold the growth or shoot in one hand and then pull out the tip of the shoot with the other hand. Insert the shoot in sandy soil around the edge of a pot and place in a sheltered location. Alternatively place shoots into a jar of water. The water should cover only the lower third of the shoot, allow roots to form before planting.

Division: - This is the simplest method of increasing stock, particularly when it is not possible or wise to propagate by seeds. Many plants require a shoot or young growth with roots attached in order to form another plant that will be exactly the same as the parent.

The division of most plants is carried out during early spring when growth is active, and it is only necessary to retain sufficient rhizome or underground stem to supply the immediate needs of the divided portion until it has become established. Shrubby plants can only be divided if they have a compact habit and produce new growth by branching or making suckers from below ground.

Tubers: - Tuberous-rooted plants, such as peonies, require special treatment and careful handling when being divided.

Dividing peonies should be done in early autumn. The eyes or growth buds can easily be seen on the tubers, and each division should consist of an eye and a tuber. If large numbers of a certain variety are needed, plant them out in well prepared soil in a nursery bed with the eye about 2 inch (5cm) below the soil level.

For small numbers, lift an established crown and divide it into several portions by using two hand forks back to back, and pushed well between the roots. Gently lever them apart to avoid snapping too many rootlets. Peonies in particular do not like root disturbance and several years will often elapse before the divided crowns will flower freely.

Offsets: - Another large group of plants, which includes tulips, daffodils, crocuses, gladioli and bulbous irises, produce their annual growth and flowers from a bulb or corm. These plants do produce seeds and can be propagated by them, but usually three or five years elapse before the seedlings reach flowering size. However, these plants also produce offsets, complete but smaller new plants that are produced along side and attached to the parent bulb, these can be used in preference to seed.

Propagation by Budding and Grafting:

Grafting is the formation of a permanent union between two or more closely related plants or plant parts. The objective is to fit the pieces of tissue together in such a way that they will unite and subsequently grow away as one plant. Grafting is an all-embracing term, which covers a wide variety of different grafting techniques. Budding is a contraction of the term bud grafting and refers to techniques of grafting using a single bud as the graft scion.

The two pieces of plant tissue used to produce a grafted plant have quite distinct roles to play:

The rootstock (sometimes called the under stock or stock) is the lower portion of the graft, which will provide the root system for the new plant. The root system may consist of an intact small plant derived from seed propagation, cuttings, layering or some other method of propagation. In the case of some plants such as climbing plants, the rootstock may consist of a short piece of woody root removed from an established plant.

The scion is a short piece of stem with 3-4 buds of the clone or cultivated variety to be propagated which will form the branch framework for the new plant. In the case of budding (or bud grafting), the scion consists of one single bud.

The interstock or intermediate rootstock is sometimes used in the grafting of certain fruit trees where it is known that some degree of incompatibility exists between the rootstock and scion. The plant selected as the interstock must be fully compatible with both rootstock and scion in order to overcome problems of incompatibility. The practice of grafting using an intermediate rootstock is known as double working.

Cambium tissue is the main layer of meristematic tissue in the stem of the plant. It is located as a thin layer of tissue between the phloem and xylem tissues, immediately under the bark. To ensure a successful graft union it is essential that the cambium of the rootstock be placed in close contact with the cambium tissue of the scion. The grafter must fit the tissues together correctly and bind the grafted plant with tape to ensure that the tissues remain in close contact.

The rootstock and scion must be botanically closely related if a graft is to be successful.

Grafting of clones within the same species is usually successful. Grafting of species within the same genus is frequently successful. However, there are many instances where closely related species cannot be grafted. For example, all species within the genus citrus can be readily grafted onto each other; within the genus prunus there are some species such as peach (prunus persica) and apricot (prunus armeniaca), which can be grafted, together, but apricot and almond (prunus amygdalus) cannot be successfully grafted.

Grafting of different genera within the same family is sometimes successful, but there are many more failures than successes. In the grafting of citrus, the trifoliate orange (poncirus trifoliata) can be used as a rootstock for the orange (citrus sinensis). The quince (cydonia oblonga) is widely used commercially as a rootstock for pear cultivars (pyrus communis). There are also many examples of inter-generic grafting within the family solanaceae; tomato (lycopersicon esculentum) can be grafted on potato (solanum tuberosum); it can also be grafted onto tobacco (nicotiana tabacum).

Grafting is used as a propagation technique where plants cannot be economically propagated by other simpler propagation techniques. In the commercial production of clones or cultivars of fruiting and ornamental trees, propagation from seed is not possible due to colonel variation and with many types propagation from other vegetative means such as stem cuttings is not possible at present.
A wide range of fruit trees and ornamentals such as Japanese maples, conifers and flowering peach are grafted simply because it is the only sure way that they can be commercially produced in large numbers. Grafting is not nearly as important with true species since these can usually be raised economically from seed.

Using rootstocks of known and predictable performance will control the growth and performance of many fruit trees. The 'Malling' rootstock series for apples were the first 'colonel' rootstocks. In 1912, the East Malling Research Station in England began a program to select and classify a series of vegetative propagated apple rootstocks. The vigour rating of these selections ranged from very dwarfing to very vigorous in their effect on the scion.

Many fruit trees that are raised from seedlings may take six or more years before fruit is produced, as the juvenile phase of tree development is not capable of triggering fruit production. Various grafting techniques which use physiologically mature scion tissues for grafting shorten the period of juvenility and result in the tree coming into bearing much earlier in the life of the tree. Many grafted fruit trees will commence fruiting in the second year after grafting.

Dwarfing rootstocks appear to hasten fruit development and vigorous rootstocks may create slowness to start fruit production. In citrus production, fruit size is strongly influenced by the rootstock. The largest navel oranges are produced on sour lemon rootstocks, and the largest Valencia oranges are produced on trifoliata orange rootstocks.

Grafting can create interesting and unusual plant effects. Budding desired varieties onto a tall, well-developed rootstock stem could produce standard trees. Grafting can create weeping standard trees pendulous or prostrate growing forms onto tall, strong-stemmed rootstocks; e.g. weeping roses, weeping grevillea, weeping beech.

Two or more closely related fruits can be grafted onto a single rootstock to produce a multiple fruit effect with branches belonging to two or more different named varieties known as a family tree"; e.g. orange, lemon and grapefruit together on the one tree; two or more apple cultivars on the one tree.

Not everyone has the space to plant more than a single fruit tree. The tree then provides itself with perfect inter-pollination and the luxury of choice as in the case of apples, from dessert or cooking fruit.

Fruit:

If you plant the pips/seeds of an apple it will in time produce a tree that bears small, sour apples like its wild forebears, and therefore a waste of your time and garden space. It therefore makes perfect sense to buy a ready-made tree, one that can possibly bare fruit in the same year that you plant it. Choose a variety of apple that you like and with the type of rootstock suitable for your needs. The rootstock is crucial to the trees ability to flourish in the environment where it is to grow, and will ensure that it will only attain a height that your garden can afford.

When choosing fruit trees such as apples you must take into consideration the pollination period crucial to fruit production. Trees unless they are self-fertile must have a companion from the same pollination group. For example – 'Cox's Orange Pippin', 'Elstar', 'James Grieve' and 'Bramley' will pollinate each other. Apple varieties fall into three groups – early, mid-season and late flowering. The following combinations also give ample pollination - E (early) and M (mid), or M (mid) and L (late). However, a combination of E (early) and L (late) are unlikely to produce fruit, as the flowering periods are too far apart for our friends the bees to transfer pollen from one tree to another.

Fruit Rootstocks:
Apples: - As apples do not do well on their own roots, it is necessary to bud or graft them onto the roots of wild apples. Grafting involves splicing the branch of one apple tree onto another, or onto "root stock." The spliced branch is held on with tape or coated with wax until it starts to grow. Most of the apple trees planted before the 1950s are on standard rootstock, which means they grew to be very large. Now there are essentially three broad categories of rootstocks that will determine the height of your trees: dwarf, semi dwarf, and standard. There are numerous types of dwarf and semi dwarf rootstocks, before you purchase your tree, you should review the characteristics before making a final decision.

Trees on semi dwarf rootstock will reach a height that is only about 60 to 75 percent the height of a standard size tree. Apple trees on dwarf rootstock have the advantages that they bear fruit earlier, can be planted closer together and are easier to spray and harvest. For example, a 'Bramley' grafted on to an M27 rootstock would grown into a bush, never more than about 8-ft (2.4m) tall, while a 'Bramley' grafted on to an MM111 rootstock would grow into a full tree, about 18-20 ft (5.4m-6m) tall. Both would bear the well-known Bramley apples. The choice of M27, M9, M26, M25, MM106 and MM111 rootstocks allow a variety of trees to suit all growing situations and preferences. Using dwarfing rootstocks like M27, allows the planting of several trees in a smaller area rather than one tree on a vigorous rootstock.

Therefore, the shape of tree ultimately required, such as cordon, bush, standard or espalier is determined by the choice of the rootstock.

Apricot Rootstocks: - MARIANNA 26-24 (Mari.) A standard rootstock for apricots, plums, prunes, most almonds. Mature trees comparatively small, 15-20 ft. can be kept smaller with summer pruning. Shallow root system, much more tolerant of wet soils than Nemaguard; is not tolerant of hot soils. Has tendency to sucker. Resistant to oak-root fungus, root-knot nematodes, root rot.

MYROBALAN 29C (Myro.) Excellent, all-around rootstock for apricots, plums, almonds. Shallow but vigorous root system tolerates wet soils and is widely adapted; is more deeply rooted than Marianna.

Resistant to root-knot nematodes and has some resistance to oak-root fungus. Un-pruned tree height of standard varieties 15-25 ft., but can control size further with summer pruning. Produces few suckers.

NEMAGUARD (Nema.) A standard rootstock for nectarines, peaches, apricots, plums, prunes, almonds. Vigorous, resists root-knot nematode. Excellent for well-drained soils. In heavy or poorly drained soil, plant on mound or hill. May not be winter hardy below 5°F. Trees that are not pruned will attain a height of standard varieties 15-25 ft., size can be controlled further with summer pruning.

CITATION (Cit.) Apricots and plums dwarfed to 12-18 ft. Very tolerant of wet soil; not drought tolerant (induces early dormancy in dry soil) so needs very regular water in hot climates; mulching can help retain soil moisture. Resists root-knot nematodes. Induces heavy bearing at a young age. Very winter hardy. Strong and well anchored.

ST JULIAN A: - Produces moderately vigorous, productive trees, to 15-ft (4.5m) coupled with early fruiting. It does well on heavy, wet soils, with better resistance to Phytophthora and bacterial canker.

TORINEL ® - A cross of two varieties of Prunus domestics obtained by INRA-CTFL in France. Medium-low vigour, earlier production. Surface root system, adapts well to heavy soils and is prey to ashpyctic soils. Highly compatible with all varieties. Tolerates some Nematodes.

MRS 2/5 - (P. cerasifera x P. spinosa): - Vigour lower than Mirabolano. Produces some root-suckers but fewer than those of other plum trees. Adapts well too poor soils too, providing it receives sufficient water. Combines well with other varieties. Induces good vigour and productivity, and fruit of reasonably good size.

GF 31 - (P. cerasifera x P. salicina): - Very strong (better than Mirabolano) and begins production early. Sensitive to marshy conditions and Verticillium. Suitable for dry, droughty land.

Cherries: - A mature sweet cherry tree may be up to 10m (30ft) tall with a corresponding spread, too large for the average modern garden. To overcome this, named varieties are propagated on to rootstocks by budding in July and August, or by grafting in March. Depending where you live you can find cherries grafted onto various rootstocks suited to the conditions for your particular country. Seedling 'Mazzard' and the 'clonal Malling' F 12/1 rootstocks are often used, as is 'Colt' which is a semi-dwarf rootstock producing sweet cherry trees 12-16 ft (3.6m-4.8m) high / sour cherries 10-12 ft (3-3.6m) high. 'Gisela' was developed in Germany; it produces a true dwarf tree 12-16ft (3.6m-4.8m) approximately 40% of standard size.

These rootstocks are also able to give protection against many diseases. If you live in the UK and intend to grow cherries but have limited space then you must go for the bush, half standard and fan forms on 'Tabel' (very dwarf), and 'Colt' (semi-dwarf) rootstocks.

Pear Rootstocks: - Up until the 17th century pears had been grown grafted onto pear stocks, or crab apple stocks, or even hawthorn stocks. Thomas Hanmer along with John Evelyn, were amongst the first in England to realise the value of grafting onto quince stock, which is now the preferred rootstock. This practice was already widespread in France and probably originated there.

The quince is used extensively in European countries as a dwarfing rootstock. Quince A stock has been the standard rootstock used to produce semi-dwarf pear trees, and Quince C for dwarf such as those necessary for cordons. Pyrus is used for vigorous growth. Perhaps one drawback of using quince rootstocks is that they are sensitive to low temperatures and susceptible to Fire Blight. Quince C has a shallow root system, and should only be planted in rich fertile soil. Pear varieties grown on this rootstock may require a support system such as a stake or trellis system to prevent the tree from leaning.

As some varieties do not knit well on these stocks, what is called a compatible variety is grafted on to the stock, and then the incompatible kind is in turn budded on to the compatible variety. These trees are expensive and are called 'double-worked' trees. "Williams Bon Chretien", for example, is incompatible on Quince A, so "Beurre Hardy" is grafted on to the Quince and then the "Williams" on to the "Beurre Hardy".

Bark Ringing & Scoring:

Reasons for either bark scoring or ringing insufficient space for tree development is the most common reason for using growth - controlling techniques. This situation develops when there is more vigour than anticipated, this may be due to: -

The wrong rootstock was chosen for the cultivars.
The scion vigour was not integrated in the spacing decision.
Trees were planted closer than they should have been.

Ringing, Scoring and root pruning may be helpful in controlling vegetative growth in these types of plantings.

Bark Ringing
Bark ringing is a more drastic step than scoring which entails cutting out a ring of bark 1/8 in. (3mm) wide all round the trunk. This method is used to try to force fruit trees and some other woody plants to flower. A complete ring is cut around the trunk below the lowest branch and another ring is cut right below the first. The bark between the rings is removed and the scar should be covered with grafting wax.

Scoring and bark ringing breaks the flow of nutrients, photosynthates, and growth regulators between the tree canopy and its roots. The score will heal, but prior to healing it will reduce both the length and diameter of the new growth. Additionally, it will enhance fruit set and increase flower bud formation for the next season. Enhanced fruit set will also help reduce growth. However it has on occasion been noted that sensitivity to winter injury of the wood in the scored area has taken place.

Scoring
Scoring very simply, is the process of making a single cut with a knife (a linoleum knife works very well) completely around the trunk of the tree somewhere between the soil and the lowest scaffold branches.

This process is done when new growth is approximately 4 to 6 in. (10cm-15cm) in length, usually about 10 days after petal fall. More than one time around the tree provides no additional benefit. Scoring later in the season reduces the effectiveness, and likely will provide no benefit if done after June drop. Caution is advised when selecting trees to score. Weak or moderately vigorous trees may loose much more of their vigour by the scoring treatment, and this effect may last for several years. On vigorous trees, scoring may be performed in successive years, but careful assessment of the previous season's growth should be made each year prior to treatment.

For information on all aspects of fruit growing consult the "Fruit Growing Guide" a Mrsgreenfingers publication available from http://www.mrsgreenfingers.co.uk

Tree damage repair:

The trunks of ornamental and fruit trees may suffer damage from grass mowers and by rodents such as rabbits and hares. Provided that the trunk is not totally 'ring barked', and provided that the damage is attended to promptly, it is frequently possible to repair damage by use of techniques such as bridge grafting and inarching. This involves inserting a number of vigorous young scions from higher up in the tree into the damaged area to form a 'bridge' over the damaged area to enable the translocation of water and mineral nutrients across the damaged area.

During the healing period the damaged area should be covered with plastic film to prevent water loss and Hessian over the top to prevent overheating in warm weather.

Insects & Pests:

Organic Pest Controls: - Many of us who garden with the idea of working with nature, would choose to use products in our gardens that are safe or less harmful to the environment, ourselves and the creatures who live their lives in and around our gardens. We hope to avoid substances that destroy indiscriminately, choosing commodities instead that are destructive to specific elements only. Wherever possible we try to harness organic methods in the upkeep and cultural processes in our gardens.

Pesticides may also kill beneficial organisms, which serve important functions such as controlling pests, providing nutrients to the plants and aerating the soil. This disrupts the natural ecological balance between the beneficial and destructive organisms and encourages more pest and disease attack. This drives the need for even more pesticides and fungicides and so begins a cycle of dependence. These chemicals can be effective but generally only in the short term and persistent problems usually mean the plants are 'stressed' and trying to survive in an unhealthy environment.

By creating a good environment in the way of soil improvement, good horticulture practises to sustain healthy well-developed plants, will go a long way to enable the plants to better withstand pest and disease attacks. Variety helps the balance, stick with one type of plant massed into a single area and you are inviting trouble. Vary your planting and this will control the population explosion of many pests.

In our bid to control or eliminate those creatures and disease which damage or ruin our crops, we must look to enhance the environment, encouraging natural predators, companion planting schemes and setting up physical barriers, we are able to avoid strong chemicals the limit of their destructive influences we do not necessarily completely understand. It is of course a long-term approach but one that can only benefit both the environment and us.

In some cases the attacks on our plants may be sporadic and unpredictable, but most of the more serious pest attacks can be expected to cause damage to certain plants year after year. Often the severity of the attacks depends on the weather conditions. A mild, wet autumn is often followed by a severe infestation of leatherjackets in the spring, and hot weather is ideal for the explosion of the greenfly and other aphid populations.

An important factor is to learn to recognize the more common pests and be able to differentiate between pests and their predators so that we can encourage the latter to live in or visit our gardens. Organic gardening relies on several overlapping strategies rather than the power of a single highly toxic chemical to kill the pests. We must encourage the pest's natural enemies such as ladybirds, lacewings, spiders and tiny parasitic wasps. Many beneficial insects that feed on garden pests need nectar and pollen for food during part of their lifecycle. Growing a year-round supply of suitable flowers close by will maintain the insect populations throughout the year. Keep the insect eating birds visiting your garden by providing them with safe nesting sites, offer safe hiding places for frogs and hedgehogs.

Biological Control of garden and greenhouse pests is becoming more and more popular with professional and amateur gardeners and used in the right way and at the right time it is an alternative to chemicals, effective and yet safe for children, pets and wildlife.

Herbal Sprays- Many organic gardeners are familiar with using sprays made from aromatic herbs to repel pests from the garden plants. Several recent studies confirm the repellent effect of such sprays.

The essential oil of Sage and Thyme and the alcohol extracts such as Hyssop, Rosemary, Sage, Thyme, and White Clover can be used in this manner. They have been shown to reduce the number of eggs laid and the amount of feeding damage to cabbage by caterpillars of large white butterflies. Sprays made from Tansy have demonstrated a repellent effect on imported cabbageworm on cabbage, reducing the number of eggs laid on the plants. Teas made from Wormwood or Nasturtiums are reputed to repel aphids from fruit trees, and sprays made from ground or blended Catnip, Chives, Feverfew, Marigolds, or Rue have also been used by gardeners against pests that feed on leaves.

Sticky traps- Paper or cardboard covered with a sticky material like castor oil, natural gum resin, or vegetable wax -- are useful. Place 6- by 6-inch (15cm) sheets on sticks in a vegetable bed to attract flying insects. You can also wrap a stiff paper band (at least 3 inches (7.5cm) wide) covered with sticky material around a tree trunk and leave it in place for a few weeks; it will keep insects from crawling up into the branches.

Pests can usually be divided roughly into three categories:

Those, which cause so little damage that control, are unnecessary.
Those, which normally cause little damage but are liable to increase under certain conditions, such as hot weather, rain, etc. Keep these pests under observation and should be dealt with if they show signs of increasing.
Those, which cause severe damage every year. Take preventive measure before they appear, or destroy them as soon as they are first seen.

Ants- Ants are harmless and are only looking for sweet nectar or the sticky substances that are produced by such creatures as aphids. In themselves they do not generally harm plants but their presence is a clear sign that other more damaging pest are around.
Control- Pyrethrum power in a puffer canister for applying to ant's nests and runs.

Ant Deterrent: - Deter ants by spraying with vinegar around door and window frames, under appliances, and along other known ant trails. Ant invasions can often be deterred from the kitchen by washing counter tops, cabinets and floors with distilled vinegar. Do not use vinegar near plants, as it will kill them.

Aphids- These tiny soft-bodied creatures are the most abundant pests in the garden, and most plants, including vegetables, are liable to attack by one or more species of aphids. Aphid's feed by sucking the sap from a plant and by congregating in their hundreds and in some instances thousands, on tender young growth, they can quickly suck the life out of the plant or at least stunt and disfigure the growth. To add to this they can also transmit virus disease, which can often wipe out an entire crop. They excrete honeydew that attracts ants, which in turn, protect the aphids from predators.

Aphids may or may not have wings and may be green or brown. Eggs that hatch in spring produce mostly female aphids. These first generation females feed in masses on plants, and can give birth to live young without a male. Then later in the season, new generations mate and produce eggs during autumn, which will hatch the following spring.

Ladybird larvae can eat aphids rapidly and in large numbers. Lacewing moths and their larvae also devour aphids. There is a way, in most cases, to easily control aphid populations (until the beneficial insects arrive several weeks later) without the use of chemicals.

Many people are discovering that the control of aphids and other pests is within the general management of the land, enrichment of the soil and good horticulture husbandry, clearing away debris and waste after harvesting crops, weed control, all assist in controlling many pests. However, a garlic spray or a weak application of Insecticidal soap should help to eliminate these sapsuckers. Insecticidal soap also controls red spider, white fly and many other pests.

Insecticidal soap- One of the most useful sprays in the garden. The commercial varieties work a little better than the homemade version of a tablespoon of dish washing liquid in a quart of water. It must be reapplied at least once a week, more if there is a heavy rain or a heavy infestation. This is a great control on all types of aphids and whitefly.

When watering your plants, spray water on the leaves of the aphid-infested plants, using slight pressure (be careful not to injure the plant). The purpose is to hose off the aphids. Do this early in the morning or later in the day, when the sun isn't shining directly on the leaves. Then repeat this procedure every two or three days. This will reduce the population and minimize plant damage until the predators come. If predators are washed off, they won't be harmed. The aphids, however, take a long time to find the plant again, and once on the ground are more likely to be eaten before they can recover their bearings.

Chafer Grubs- Surprisingly, masked chafer grubs cause well 0ver 50% of all lawn-grub damage. We tend to blame Japanese beetle grubs, since the adults are so visible and destructive. By contrast, the adult masked chafer is not often seen, as it feeds at night. The grub is flat and curved. It feeds on grass roots, resulting in brown dead patches.
Control- There is a good biological control in the form of a parasitic nematode, which can be purchased from the Garden Centres. Easy and simple to use just spray onto the grass where in time, each grub in your lawn becomes a hatchery for 35,000 or more juvenile nematodes that search the soil to find live grubs to infect. If you have a large number of grubs in your lawn – either masked chafer grubs or Japanese beetle grubs (or if you are not sure which) – products such as Grub-Away offers excellent control for the current growing season and right through next spring. They also kill flea, weevil larva or other insects. After entering the host's body, the nematode releases bacteria, which kill most insects within 48 hours.

Codling Moth- (Cydia pomonella). Plants affected Apples, pears, and less frequently, quinces, walnuts. Adult codling moths emerge in late May and lay eggs on or near developing fruits from June to mid-July. After hatching the small white, brown-headed caterpillars bore into the fruits and feed in the core region. The pest over winters as non-feeding caterpillars under loose flakes of bark and they pupate in spring. The maggot's exit hole is often visible in the side of the ripe fruit or at the 'eye' end, opposite to the stalk. When the fruit is cut open you can see the frass-filled core and tunnel of the maggot.

Control- Pheromone traps. More accurate timing of spray applications can be achieved using a codling moth pheromone trap, which are sold by most garden shops. This open-sided box is hung in the tree in early May. The bottom of the box has a sticky sheet on which you place the pheromone pellet, which exudes a scent similar to that produced by virgin female codling moths to attract mates. Male moths lured into the trap get stuck. If you count the trapped males every week and follow the instructions that come with the trap you can calculate the best time to spray. A pheromone trap on its own cannot control codling moths, but on isolated trees it may catch enough males to reduce the females' mating success so fewer fertile eggs will be laid.

Cut Worms- The cutworm attack many types of vegetables, especially lettuce and brassicas.

Control- Biological Pest control: There are several types of beneficial insects available which, when released, will attack a particular pest species. The trichogramma wasp lays it's eggs on the eggs of cabbageworm, cut worm, corn borers, and others. The larvae feed on the eggs and destroy the host eggs.

Earwigs- Earwigs can be a real pest in the garden, second only to snails and slugs. They eat almost anything soft. They do have some good points however, as they eat insects such as aphids. Unfortunately they also feed on soft plants. They can do quite a lot of damage if there is a high population.

Control-Earwigs are nocturnal, coming out to feed at night, and running back to hide in a moist, tight fitting place during the day. You can trap them by putting out moistened, tightly rolled newspaper or corrugated cardboard in the evening. In the morning dispose of the paper and the trapped insects.

Flea Beetles- Flea beetles can do extensive damage to many crops. There are a number of species of Flea beetles, they are tiny little black or black and yellow, insects that hop when you touch them, much like a flea. They chew little holes all over the foliage, and left unchecked, can cause crop failure. Flea Beetles are most active in hot weather conditions, and seem to disappear once the weather turns cool.
Control- A natural way to control flea beetles is to start early, while the plants are still small, sprinkling Diatomaceous Earth (DE) to the leaves. As the name implies, diatomaceous earth consists of tiny little diatoms from the ocean that have been dehydrated into a powder. It is available in many garden centres, or nurseries, or web sites and is relatively inexpensive. The powder is razor sharp to soft-bodied insects and soon inflicts fatal damage. The most important thing with using this control is that you are vigilant about re-applying it after rain.

Leatherjackets- The larvae of the harmless Cranefly or Daddy-long-legs are the notorious and destructive Leatherjackets. They feed underground on many types of plants roots, bulbs and tubers, and are a common pest on the lawns, where they cause patches of grass to die.

Control- A good way to deal with them is to soak the grass with water or it can be done after a heavy rain, lay sacking or a sheet of black plastic weighted down with bricks or some other reasonably heavy objects. This will bring them to the surface where they can be collected and disposed of. If this seems an unpleasant task then the biological control is an option.

Mealy Bugs- A common soft bodied, 2-7 millimetres, oblong, waxy white insects move very little, and look like cotton tufts. They mature slowly and live in colonies that are usually located at stem joints. Like aphids, mealy bugs excrete sticky honeydew. Mealy bugs are fairly easy to control, since they reproduce and move slowly.
Control- By spraying the plant with a strong stream of water. Spray with non-detergent soap and water with a drop of alcohol mix.

Millipedes- Snake Millipedes are often mistaken for wireworms and they feed on the roots of many plants. They can destroy the sown seeds of peas and beans, and often extend the damage caused by slugs and wireworms.
Control- A biological control involves a predator beetle Cryptalaemus.

Red Spider Mite-These minute orange insects feed on leaves, turning them dull with yellow mottling, often with a covering of fine webs. Common under glass, but they can also attack outdoor plants such as fruit trees, especially in hot dry seasons.
Control- Discourage them by regularly misting or hosing foliage to keep humidity high. Under glass introduce Phytoseiulus persimilis a predatory mite.

Scale Insects resemble small, discoloured blisters on stem or leaves. Their bodies are protected by scale, which varies in shape, and colour according to the species, and they live their lives sucking the sap through elongated mouthparts. Brown Scale is chestnut brown, about 1/8-inch long and very convex, often found on bark of plums, peaches and soft fruits. The Mussel Scale is flatter, grey and shaped like a mussel shell, is found mainly on apple trees but can occur on other trees or shrubs. Cushion Scale is prevalent under glass attacking orchids but also infests camellias and magnolias. The Rose Scurfy Scale is a flat, white scale found encrusting the stems of roses, especially in sheltered places.

Control- Easily controlled with biological treatments. For hard scale use Chilocorus. Soft scale use parasitic wasp Metaphycus helvolus available from the Garden Centre.

Slugs and Snails are an absolute menace in the garden. Not only do they gorge themselves on our plants, they leave behind the most disgusting, slimy trail. On food crops, once they have slithered their way over the plants, greatly reduces our enthusiasm to eat and enjoy them ourselves. Conventional slug pellets do work but they are life threatening to other creatures in the garden.

Control- Slug pellets certainly do destroy slugs and snails but they are life threatening to other creatures in the garden, other creatures that we would like to encourage because they work with us, helping to eliminate other pests that would otherwise feast on our crops. Safer methods appeal to organic gardeners and gardeners with an interest in conserving nature and the environment.

Beer traps work well, just put some beer into a shallow container that has steep sides, the slugs love the stuff and when they have drunk their fill they simply drown. Seeing their stranded brethren does not seem to deter their fellow snails from slithering into the same fate. Milk or grape juice works just as well! Another good trap is to place a half of either grapefruit or melon skin with the flesh removed of course. Place them upside down on the ground; here the slugs gather over night; these can be collected the next morning and disposed of. There are several traps available from Garden Centres, usually constructed from polypropylene or plastic which incorporate the same principle as the home made beer trap but might be considered more aesthetically pleasing piece of equipment. There are also physical barriers such as plant collars, sprays and tapes to protect selected plants. Lay boards in the garden to trap slugs and snails. Check your trap early in the morning and remove the slugs and snails as they collect.

Drenching the soil with wormwood tea keeps them at bay.

Another good trap is to place a half of either grapefruit or melon skin with the flesh removed of course. Place them upside down on the ground; here the slugs gather over night; these can be collected the next morning and disposed of.

Naturally occurring microscopic nematodes which seek out and kill slugs are available in a liquid which when mixed with water and applied with a gardening can, give protection for up to six weeks. It is able to kill young and small slugs under the soil (90 % of the population).

According to a recent study it has been possible to reduce slug and snail damage dramatically by watering in the morning instead of the evening. The study showed that lettuce watered only in the morning had only 1/5 the damage that lettuce watered in the evening had.

Vine Weevil- The adult weevil is a dark, oval-shaped beetle like insect, with a blunt snout and distinct antennae. The weevils make U shaped notches from the edge of leaves. The adult weevils emerge from the soil in late May or early June through mid-July. Adults feed for 4-5 weeks in order to produce the 300+ eggs that are dropped into the ground under the plant. The eggs hatch within 2 weeks and the larvae then tunnel into the soil. The larvae are the real problem, attacking the root system of the plant from late summer until the following spring. The larvae can grow to be about 1cm in length, are creamy white in colour with a dark head and are crescent shaped. They then tunnel deeper into the soil to protect themselves from frost and pupate in the spring.
Understanding the lifecycle and feeding practices of the weevil is the key to keeping the pest under control. Since adult weevils feed on leaves during the night and look for dark, moist spots during the day to rest, trapping them in these areas can be quite effective.
Control-Hand picking- with the aid of a flashlight, pick-off the adults in the evening as they come out to feed.

Beneficial Nematodes- Rather than attacking the adults, beneficial nematodes go after the larvae in the soil and are a safe and natural method of control. The entomopathogenic nematodes, Steinernema and Heterorhabditis spp., have been particularly effective especially in potted plants. A few things are critical in order to get good control:

Timing & Temperature - Beneficial nematodes require a soil temperature of at least 60 F to work. Gardeners often miss the critical period in the spring since the weevil larvae pupate fairly early, before the soil warms. The late summer and early autumn is the best time to apply nematodes.

Moisture - The root zone around the plant must be moist since nematodes do not swim and require water to carry them through the soil. Water the area before and after application.

Whitefly- There are two kinds of this small triangular shaped white fly, one effecting greenhouse plants and the other affecting brassicas. Both feed on sap on the underside of leaves causing stickiness and yellow mottling.
Control- Glasshouse whiteflies can be controlled with sticky yellow traps or encarsia parasitic wasps, while cabbage whitefly can be tackled by jetting them off with jets of water from a hose.

Winter Moth Caterpillars- Mottled umber moth (Erannis defoliaria), winter moth (Operophtera brumata) and March moth (Alsophila aescularia) have wingless females which after emerging from their chrysalis stage in the soil, must climb the tree to mate and lay their eggs.

Control- Grease bands are sticky coated paper that can be cut into the required length, wrapped around the trunk of fruit trees from September – through to December and from March onwards. Alternatively apply Fruit Tree Grease, paint on lower trunk of fruit trees and any tree supports. The grease traps the wingless females before they reach the branches. Winter moth is the most common of these moths and it emerges as an adult during November to mid January.

Apply grease to fruit trees such as apple, pear, plum and cherry. On unprotected trees the eggs hatch at bud burst and the pale green or yellowish brown looper-type caterpillars feed on the leaves, blossoms and fruit-lets.
Note: Grease bands give no protection against codling moth (Cydia pomonella) and other pests that can fly onto trees.

Wireworm- (Agriotes lineatus) this creature, which grows to about 25mm long, spends four years living in the ground. During the summer they pupate, this stage lasts for three weeks, to emerge as adult Click beetles. They feed on roots particularly potatoes and other root crops, making tunnels about 3mm in diameter. They are usually widespread in grassland so will be frequently found when it is brought into cultivation. It is believed that after five years of cultivation their numbers drop considerably.

Control: -
1 Lift main-crop potatoes before September, as most of the damage is done at this time.

2 Crush any that are found when digging.

3 I have heard that a trap made of squares of potatoes attached to skewers, buried in the ground is a good way of catching them, these can be pulled up and the infested potato destroyed. I must admit that I have not used this method, but it is one I might try.

4 Keep down weeds, as this is the sort of territory that the beetle likes to lay its eggs.

Insect Stings:

To relieve the pain or itchiness resulting from an insect such as a wasp sting apply urine or vinegar on the area.

Natural Mosquito Repellents:

Avoid perfumes and ordinary skin creams, as sweet oils and most perfumes attract mosquitoes.

For an effective Mosquito repellent, splash plain rubbing alcohol on your skin and allowing it to dry will deter mosquitoes from biting.

Use half vanilla (has to be pure vanilla) and half water and for a mosquito and tick repellent.

Dab lavender oil on your pulse points; it smells great on you but repels insects.

Vegetables:

Crop Rotation
Soil, which is repeatedly used for growing vegetables of the same nature, deteriorates after a few seasons. Therefore a rotation system, which changes the use of the land each year, is good for both the soil and the crops. One crop may have a profound benefit on the soil for another, because of the feeding it has received and for the elements it may leave in the soil after the crop has been harvested. Growing crops of the same type without rotation can cause severe problems to that variety due to a build up of toxins, residues left in the soil; these can be harmful to that particular crop but not to others. By operating a rotation system it will ensure a regular working of the land in a structured manner. With balanced feeding of the soil, each section will greatly benefit from a fresh start and there will be a reduction in the incidence of soil-borne pests and diseases. Rotation also reduces fertilizer needs, because alfalfa and other legumes replace some of the nitrogen that some crops remove.

The rotation system may be a simple one; crops are changed year by year in a planned sequence. It can consist of four equal plots; one might be used for members of the cabbage family (brassicas), the second for root crops – carrots, turnips and potatoes; the third for members of the legumes, peas and beans; the fourth can be a group that contains onions, celery, cucumber, spinach, leeks, sweet corn, marrows and lettuce. An annual rotation will mean that no type or family of vegetables is grown on any one area for more than one in four.

Weeds are unwanted plants in gardens in general, but certainly must not be allowed to thrive in the vegetable garden. They reduce available moisture, nutrients, sunlight and growing space needed by the crops. Their presence can reduced crop growth, quality and yield. In addition, they can make harvest difficult. Weeds also provide cover for diseases and insect pests.
Garden weeds are hard to control because they grow rapidly, produce vast numbers of seeds, and spread aggressively by vegetative structures (e.g. runners, forming new plantlets) and/or seeds. There are several methods that should be used in a combined, coordinated effort to control weeds; they include both cultural and mechanical methods.

Organic Mulches: Some of the most commonly used organic mulching materials are manures; bark chips, sawdust, grass clippings, leaves, and newspapers (shredded or in layers).

Inorganic Mulches: Black plastic is the most frequently used inorganic mulch. Clear plastic is of little use, as it does not exclude the light that aids weeds seeds to germinate. Inorganic mulches can increase the soil temperature by at least 6 to 8^0F. Therefore, their greatest value is early in the growing season when soils are naturally cool.

Mechanical Methods
Since emerged weeds present at seeding or transplanting are capable of growing rapidly, it is important to kill all weeds prior to planting. Weeds that emerge after planting should be removed early before they are past 3 inch (7.5cm) tall. A continuous weeding programme should continue throughout the season to ensure that weeds are eliminated from the vegetable beds. Generally this is done by hand and by using a suitable tool is a quick and easy operation.

Planting: - Not all crops are harvested at the same time; some crops are planted after others have been harvested so best use of the available ground is made.

This is illustrated by the planting of a crop of broad beans planted in November to be harvested in June, after which a crop of leeks could then take their place. Those crops which grow quickly such as lettuce, spinach and radish are generally planted between the likes of broccoli which is harvested in March and those crops which must be planted later when the soil warms up around May time.

To make full use of the available space, quick growing crops can be sown at the same time as those who are slow growing such as parsnips and parsley, for these have a very slow germination period.

Experience will help and guide the gardener to make the best use of the land. Timing is one of the basic skills in successful crop cultivation and one, which will enable the greatest use of land resources.

Soil Preparation: - When preparing the soil for sowing, the depth of the furrow or drill will depend on the size of seeds- the smaller the seed the shallower the drill, and the heavier the soil the shallower the drill. In average soils, drills ½in. (12mm) in. deep suits the seeds of parsley, lettuce and carrots; 1-in. (25mm) deep drills suit beetroot, spinach and turnips; peas and beans require 3in. (76mm) drills. Most seed packets however do give precise instructions as to the best sowing methods for those particular seeds.

For more information about growing vegetables consult "Organic Secrets" a Mrsgreenfingers publication available from our web site.

Container Gardening:

Even the smallest patio, balcony, courtyard, roof terrace or porch can boast a crop of vegetables or a garden of flowers, all achievable by planting them into containers. In larger gardens they may be used to enliven dull spots in borders, as eye-catchers to close vistas, as pointers around the garden, to draw attention to a particular area or simply as decorative ornaments. Planted containers are useful to mark an entrance, such as either side of a doorway or positioned on gate piers, to furnish a terrace, patio or outside sitting or eating area, to line a pathway as a means of introducing a note of formality.

There is hardly anything, which cannot be grown in a pot – including trees and shrubs. Container planting allows tender plants to be moved to shelter for winter protection. A greenhouse, conservatory or even frost-free garage can be used to protect them in the colder months. Containers which must stay out of doors all the time can be separately planted for winter and summer, or have a permanent colony of staple plants to which seasonal extras are added. When used in groups, pots in varying sizes and heights look best, this works well especially in small areas such as a courtyard or terrace where the illusion of a lush garden is desired. Once the plants are growing well, producing lots of foliage and flowers, many of the containers will not be visible, creating the visual effect of well-stocked borders.

At first sight creating a green paradise out of a few square yards of empty space may seem a daunting prospect, but with imagination and some know-how even the most unpromising gloomy corner can be transformed into a delightful garden area, offering a place of repose amid the bustle of daily life. A small terrace can be given a warm and intimate character with brightly coloured plants.

Climbers planted in pots from which they are able to scrambling up walls, and wall fixed planters containing cascading plants will decorate the plainest of facades. Planter boxes, urns, wooden barrels, hanging baskets and large flowerpots are just some of the containers that can be used. The container gardener is limited only by his imagination. Consider the following guidelines when choosing your container.
Avoid containers with narrow necks.

Cheap plastic pots may deteriorate in UV sunlight and terracotta pots dry out rapidly. Glazed ceramic pots are excellent choices but make sure your pot has adequate drainage. Holes should be 1/2 inch across. Line the base of the pot to prevent soil loss. The best medium for this is polystyrene chips, these do not add weight to the pot, important if you intend to move the pots around, or are to be sited on a roof garden or balcony. Filling deep containers with a good depth of the chips avoids the need to add more compost than is necessary for those shallow rooting plants; it also reduces the over-all weight.

Wooden containers are susceptible to rot. Redwood and cedar are relatively rot resistant and can be used without staining or painting. Avoid wood treated with compounds such as creosote, these are toxic and can damage the plants. One advantage of wooden containers is that they can be built to sizes and shapes that suit the location.

Remember that small pots restrict the root area and dry out very quickly. The size and number of plants to be grown will determine the size of the containers used.

In hot climates use light-coloured containers to lessen heat absorption and discourage uneven root growth.

Set containers on bricks or blocks to allow free drainage.

Line hanging baskets with sphagnum moss for water retention. Keep baskets away from afternoon sun.

Growing Mixture
Most container gardeners choose a potting mix rather than loam. In addition to draining quickly, compost mixes are lightweight and free from soil-borne diseases and weed seeds. Various types of composts can be purchased from garden centres. However, when planting trees and shrubs they require something with more substance such as John Innes No 3. When you add compost to the containers, leave a 2-inch (5cm) space between the top of the soil and the top of the container, this will prevent the compost from being washed away by rain or when watering the plants.

Sunlight
Depending on the type of plants you are growing, will determine how much sunlight the plants require. When growing vegetables and they are in fact popular plants for container gardening, leafy vegetables such as cabbage and lettuce can tolerate the most shade, while root crops such as beets and carrots will need more sun. Fruiting vegetables such as tomatoes and cucumbers need the most sun. The amount of sunlight needed by flowers varies depending on the varieties being grown. For shady areas, ferns make wonderful pot grown plants even without flowers they can look pretty spectacular.

Fertilizer
Since potting mixes drain water rapidly, fertilizers will be washed out of the container as you water. Lighter mixes will require more frequent fertilizing than heavier mixes. It's a good idea to use a dilute liquid fertilizer with every other watering. There is a wide selection of fertilizers available so choose one suitable for the plants you are growing. Liquid fish emulsion or liquid seaweed are great plant boosters, but remember that you need to provide your plants with a variety of nutrients. Check the labels on the products in you garden centre to be sure that they contain a complete, balanced solution that includes trace elements.

Watering
Regular watering is essential for all plants grown in containers. Especially in an exposed location, container plants loose moisture quickly. Some plants will need to be watered daily, especially during hot, dry weather.

What to Grow?
Container gardening can be just as creative as any other form of gardening and doesn't have to be just simply plonking a few pots around and hoping that they will look good. Its all about style, you need to think about what sort of a look and feel you want, look at the surrounding architecture and by taking some of the elements of that style, you can use the space and any restrictions or limitations you have to create the perfect setting.
For a formal look, plant a structured evergreen shrub, such as boxwood (Buxus spp.) or Sweet bay (Laurus nobilis), in classic ceramic or stone containers with simple lines. Choose pots that are at least 18-inch (45cm) and position one on either side of a doorway or flanking the start of a walkway or pathway. The dense foliage of these shrubs allows you to prune them into conical, cube or globe shapes for added architectural interest.

Formality doesn't have to be stark or monochromatic. Use a classical stone urn with full, curved sides and fill it with vibrant colours. If you have a small container, elevate it on a pedestal or column to highlight it. One characteristic of a formal style is repetition; so if you have the space, repeat the same container along a wall or surrounding a patio.

When looking at container plant combinations, choose to companion those plants that have the same water and light needs. Also consider the growth habits of the plants you combine; if some grow at much faster rates than the others, they make overtake the container. One of the benefits, however, of planting in containers is that you can easily pull out a plant that is not doing well or is not keeping up with the others.

Under planting is especially useful when growing plants in containers. Many plants that either grow tall or don't produce much growth around their base lend themselves to being combined with a low-growing companion to fill in the arrangement at soil level. Under-plant your roses with alyssum - not only will you enhance the beauty of your container, alyssum also attracts beneficial insects, which will help ward off aphid attacks on your rose.

Experiment with different arrangements in your garden area - the beauty of containers is that if you don't like a particular arrangement or the plants are not doing well in that location, you can just move them. Try putting containers at different levels within a grouping for more interest (raise them on boxes, pedestals or upturned pots). For a significant impact, use all the same colour plants or ones of dramatically opposite colours (like purple and yellow). Do your homework, research some different looks and styles and then be guided by what you like best.

Roses – How to grow and Prune:

There cannot be many gardens, which do not have at least one rose amongst its list of plants, for few gardens would be complete without the beauty and fragrance of these splendid flowers. Blooming from spring until autumn, they have never lost their appeal and charm; they are as popular today as they have been throughout the centuries. All over the world, gardens devoted to roses have become places of pilgrimage. There are so many different kinds of roses to choose from, to suit tastes, gardens of any size, climate or aspect.

Most of us who grow roses are scarcely aware of the heritage, of which we are beneficiaries, because it has been through selective breeding throughout the centuries, which has given us the overwhelming choice of variety, colour, form, scent and growing habit. Two geographical groupings which, at first, developed separately, have had—both in their separation and in their ultimate combination—the greatest impact on rose history: The European/Mediterranean group of species and their hybrids, and the Oriental group of species and their hybrids.

The European roses are primarily the following: Gallicas, Albas, Damasks, Damask Perpetuals, Centifolias, and Mosses. The mainstream Oriental groups are Chinas and Teas. The European sorts—with one important exception—have only one season of bloom per year, while the Orientals repeat bloom more or less continuously. During the 1830s work continued in earnest on the breeding between the Oriental roses and the Europeans. It was the Englishman Bennett, a cattle farmer converted to rose breeding, who applied the laws of heredity of his previous occupation to the breeding of roses. Due to the laws of genetics, the first progeny of crosses between once-bloomers and repeat-bloomers the next generation bloomed only once. As they were crossed with each other, however, and then back to the Chinas and Teas, repeat-blooming hybrids began to appear. These were crossed with Damask Perpetuals. More crosses with the new material were made as work continued in all groups of roses.

Never before the 1830's had such a diversity of disparate roses been available--and never since. Almost every available species, no matter how obscure, had varieties and sub-varieties of varying colour or form due to breeding of sports. A new group of roses appeared in the 1970s originated from crosses made between certain Old Roses and Modern Hybrid Teas and Floribundas. Combining the charm and wonderful fragrance of an Old Rose, with the colour range and summer-long flowering of a Modern Rose they drew together the outstanding voluptuous beauty of the Old but stretched out the flowering season, providing the modern gardener with the very best of both worlds. These are the English Roses, with strong fragrant blooms; even more fragrant than many of the Old Roses, with colours ranging from white, cream to shades of pink, yellow, apricot to peach, lilac to crimson, purple and many shades of mauve.

Budded and Own-Root Systems

Most of the roses purchased today are a two-part plant. The part you see above the ground, stems, leaves and flowers belong to the named variety but below the soil the roots belong to something quite different. To many gardeners this might be a puzzle, why should the two be different?

The answer lies in the fact that certain roots give a sturdier, well-balanced, more predicable root system than the varieties own roots. In many instances they are also able to produce a stronger growing plant. But that is not the whole story; the roots themselves have uniformity both in size and shape, and this factor is an advantage for commercial growers for packing and shipping purposes.

It was somewhere around the turn of this century that the practice of budding came on the scene. Some roses, primarily certain hybrid teas, are stronger growing and more productive as budded plants. And a few varieties, Gallicas are a prime example, have better plant form when budded: the budded plant develops into a recognizable bush with all canes springing from a single point, whereas own-root plants tend to colonize into spreading clumps of stems.

Own-root plants are grown from cuttings, which is quite easy to do: both roots and canes would then be one complete variety. Budded plants are a union of two roses: canes belong to one rose (the variety you purchase), roots to another. What are the differences?

Budded plants begin life as cuttings of selected types of roses known to produce good root systems; these are known as the rootstock. After the rootstock cuttings have rooted, growth buds (sometimes called "growth eyes") of the desired flowering variety are inserted into them; once a bud has formed a union with the rootstock, all rootstock above the bud is cut off, letting the bud grow. After a year or more, you have a full-size plant ready for sale.

One disadvantage budded roses have is that if they are not planted at the correct depth then the roots might send up suckers and if these are not removed then eventually because they are suckers from a stronger plant, they will take over and the variety which is above the soil will be overwhelmed. The same course of events will happen if top growth is killed but roots survive, re-growth will be of the rootstock.

Own-root plants eliminate the budding step. Cuttings of the desired varieties are planted; each variety grows on its own roots. The majority of roses grow well on their own roots—often as well as budded plants, though they may take a bit longer to become full-size bushes. Own-root root systems vary from one rose to another: some are as well balanced as those of budded plants, while others are distinctly lopsided or stiff. Many of the old roses (now collector's roses) such as the moss roses, Centifolias, damask, rugosa, hybrid perpetual, and virtually all miniatures are grown from suckers or by divisions.

Hardwood or ripened cuttings are prepared from ripened growth during late summer or early autumn. They should be about 12-inch (30cm) long. Make a cut just below a leaf node and just above a leaf node at the top of the stem. Dig a small narrow trench in a sunny position in the garden, on well draining soil. Allow about 4-inches (10cm) between each cutting, at a depth, which covers about 9-inches (22.5cm) of the stem. Firm the soil by treading. Leave the cuttings in the bed for about a year, by which time they should be well rooted. The bed needs little attention but do make sure that the cuttings do not dry out and that they are kept free from weeds.

Roses for Very Poor Conditions

You can still grow roses even if you have only a few hours of sun every day, many roses can be grown even in very poor conditions. They will require large quantities of well-rotted farmyard manure or compost before planting and during the life of the plant. As a general rule the once flowering shrubs are much more successful than the repeat flowering varieties. The best would be the species and their hybrids: R.pimpinellifolia, canina, eglanteria, and the rugosa and their species. Ramblers are more successful than the climbers, but some very tough climbing varieties that also fit the bill. Compassion, Constance Spry and Maigold are just three of the strong climbers that do well in poor condition. For planting in coastal areas choose shorter petalled flowered varieties.

Roses for Shaded positions
Roses will not grow in deep shade but a number of varieties will do quite well in partial shade, provided they are not planted too close to the roots of trees. Albas are the best, but the Gallicas, Damasks, Centifolias and Rugosas should do quite well. Species and some other shrubby type roses will be drawn to the light and so may become attractive climbers.

Climbing roses for shady walls, North facing or less than 4 hours sun per day: Alberic, Barbier, Ena Harkness, Dense de Feu, Felicite-Perpetue, Golden Showers, May Queen, Mme Gre`goire, Staechelin, Mme legras de St Germain, Mmn Plantier, Mmn Alfred Carriere, Maigold, New Dawn, Mermaid and Veilchenblau.

Roses for Hedges
Roses can make a wonderful hedge either mixed in with a normal hedge or as an attractive flowering boundary. An upwind rose hedge that has strong, fragrant flowers can perfume a garden, filling the air with their heavy scent, and bar intruders with their wicked thorns. R. eglanteria is such a plant with small, single, pink blooms, blush centres, and a plethora of bright red hips that last well into winter. It will take some shade and can be trained to climb.

Rugosa roses are among the toughest of all garden roses. They originated from the orient centuries ago but it was not until the 1970's that breeders began to create many new exciting varieties by crossing them with garden roses. Rugosa roses are dense and robust in form, very thorny, and the leaves are roughly textured and deep veined. The flowers are usually large, opening wide; they may be single to fully double appear fragile - somewhat like crinkled silk.

Most of them repeat flower well later in the summer. Plump rose hips appear following the flowering period and foliage turns an attractive bronze in late season. Rugosas make wonderful hedges but also look good as specimen plants in mixed shrub borders. They are able to grow under very poor conditions with the ability to withstand sea spray, which makes them popular in northern climates and coastal areas. Rosa 'Hansa' belongs to this group; it makes up an impressive hedge. Large early summer flush of intensely clove-scented crimson flowers, repeats occasionally in summer with a smaller flush in autumn.

The flowers are produced in such fabulous profusion that the plant can have a tendency to sprawl under the weight of its own massive thorny canes. Another with beautiful flowers is 'Agnes' with fully double, rich yellow and amber blooms of the old-fashioned type; this one will reach a height of 8-ft (2.4m). Rugosas are very disease resistant and do NOT therefore require nor appreciate being sprayed with chemicals, which terns the leaves yellow. An impenetrable barrier can also be created with- Cerise Bouquet, R. sericea pteracantha, R. pimpinellifolia and hybrids, R. paulii, R. Macrantha and many of the species roses.

Climbers and Ramblers for growing into Trees, over Bushes and Hedges and smothering unsightly features: Almost any rambler is excellent but the best are: Albe`ric barbier, Bobby James, Ce`cile Brunner Clg, Dr W.Van Fleet, Fe`licite` et Perpe`tue, Francis E. Lester, Kew Rambler, Long John Silver, May Queen, R. filipes, 'Kiftsgate', Paul's Himalayan Musk, R. mulliganii, R. banksiae lutea, R. banksiae lutea, R. banksiae banksiae, R. wichuraiana ramblers and Wedding Day.

Containerised Roses
If you want to grow roses in a container, make sure the pot is as large as possible a minimum of 25 litres or half a barrel and ensure continued watering and regular feeding. Generally, the smaller roses are more successful.

Dead heading - Remove the flowers as they die, this will not only to keep the plant looking good, but also to encourage speedy repeat flowering. With a variety that produces many flowers in a cluster, each bloom can easily be snapped off and, when the last bloom has died, cut the stem back to the first full sized leaf. Alternatively, 12" (30cm) or more of the stem can be removed if you want to restrict the size of the plant during the growing season. This is particularly important in hot climates. If the variety normally produces attractive hips then the flowers should not be removed.
Pruning –Firstly remove any dead, diseased or very weak growth from the plant. Remove stems that have become very old and woody and that are not producing vigorous new stems.

Hybrid tea roses - these are the large flowering varieties. Late February or early March is the time usually set aside for pruning roses. Prune these roses back to three to five of the strongest (young) canes. Then shorten the canes in this manner. Any cane that is the size (diameter) of pencil, prune back to 4 to 8 inch (10-20cm) from the ground; canes the size of your little finger prune back to 8 to 12 inch (20-30cm) from the ground; and canes the size of your forefinger should be pruned back to 12 to 18 inch (30-45cm) from the ground. Any of the larger canes, thumb sized or larger, prune them back to two feet or less, if possible.

Floribunda roses - these are the bushy small flowering type roses. Simply head the bushes back to about 15 to 18 inch (37.5-45cm) from the ground. Thin out a few of the canes for good air circulation and better light exposure.

Climbing roses - the previous year's flowering shoots should be reduced to 3 or 4 buds or about 6" (15cms). Train them against a wall, fence or on a trellis. Climbing rose canes have a tendency to grow upward, pull them down and train them outward so as to open-up and space the canes. This procedure should result in a lot more flowers and a much better looking plant. Ramblers should be left to ramble at will unless they need to be constrained, in which case treat them as climbers.

Shrub roses - Repeat flowering bush / shrub roses should be cut down by between 1/3 and 2/3. Non- repeating shrubs need little if any pruning.

Pruning Trees, Shrubs and Other Plants:

Spring is the time to think about pruning many plants in the garden. However, never prune for the sake of pruning, prune only the plants that need pruning. Roses are a good example of plants that need to be pruned, so are raspberries, clematis and sometimes hydrangeas, lilacs and others. Some plants resent pruning and therefore irreparable damage can be cause if they are pruned. So here are a few suggestions of plants that benefit from being pruned and possible ways of doing it:

Aesculus parviflora (bottlebrush buckeye): - This is a suckering shrub. Cut out congested, old stems at ground level in late summer or early autumn to encourage the development of fresh ones. If the pruning is left until spring there is a risk that the plant will bleed. This applies to all members of the well-known horse chestnut family.

Andromeda polifolia (bog rosemary): - Occasionally, cut out old stems after the flowers fade, in early summer.

Artemisia abrotanum (lad's love/southernwood): - Cut out frosted and congested shoots in early spring.

Artemisia arborescens: - Prune this deciduous or evergreen species in the same way as A. abrotanum.

Buddleia alternifolia: - As soon as flowers fade in latter part of early summer, cut back by two thirds all stems that produced flowers. This prevents the shrub becoming congested with old wood.

Buddleia davidii (butterfly bush): - Regular pruning in early spring is essential: cut back all the previous season's shoots to within 2-3 inch (5-7.5cm) of the older wood. This encourages the development of fresh shoots that will bear flowers later in the same year.

Buddleia globosa: - Prune immediately after the flowers fade in early summer. Cut out dead flowers, and 2-3 inch (5-7.5cm) of the old wood.

Bupleurum fruticosum: - Cut back shoots fairly hard in late winter or early spring. This encourages the development in later spring and early summer of fresh, young shoots.

Caesalpinia: - Shorten overly long shoots in later winter.

Callicarpa. During early and mid-spring, thin out overcrowded bushes, retaining as much of the young, healthy wood as possible.

Calluna vulgaris (heather/ling): - use secateaurs to cut back long shoots in early spring. Alternatively, trim over them with garden shears to remove dead flowers immediately they fade.

Calycanthus (allspice): - During spring, thin out overcrowded bushes, retain as much of the young and healthy wood as possible.

Carpenteria californica: - Shorten long, straggly and weak shoots after the flowers fade in mid to late summer.

Caryopteris x clandonensis (bluebeard): - In early spring, cut back shoots produced during the previous year – weak shoots to soil level and stronger ones to healthy buds. This encourages the development of fresh shoots from ground level.

Cassinia: - Prune these heath-like shrubs in early spring to keep them shapely; shorten the longest stems.

Ceanothus (Californian lilac): - Prune spring-flowering evergreen types, when grown as bushes, after their flowers fade. Shorten the longest shoots to keep the plant neat and shapely. When evergreen varieties are grown against walls, cut back strong side shoots to 1-2 inch (2.5-5cm) from the main branches as soon as flowering is over. Prune late summer and autumn flowering deciduous types in spring: cut out thin shoots and prune strong stems that produce flowers during the previous year to 6-12 inch (15-30cm) from the old wood.

Chaenomeles (Japanese quince/cydonia): - Plants grown, as bushes in borders require little attention, except the removal of thin and congested shoots after the flowers have faded.

Chimonanthus praecox (winter sweet): - When grown as bushes in a border, little attention is needed other than thinning shoots in spring. However, when grown against a wall, cut out flowered shoots to within two buds of their base after their yellow, spicy-scented flowers have faded.

Chionanthus (fringe tree): - after the flowers fade, during mid-summer, thin crowded bushes by cutting out weak and spindly shoots.

Cistus (rock rose): - During their infancy, nip out the growing points from young shoots to encourage the development of bushy plants. When fully grown these plants dislike being pruned: if old wood is cut, fresh shoots do not develop from it. Old, leggy, unsightly plants are best dug up and replaced.

Clematis - The main purpose in pruning is to help plants produce the maximum number of flowers and at the height, which they can be enjoyed, so annual pruning is recommended. Sometimes older, neglected plants can be cut back into older wood and new buds may break, though growth from old wood will likely be weak and slow. Not all clematis can be pruned in the same way. There are three methods that can be applied to major groups depending on the time of year the plant flowers. Some clematis flower on the previous years wood, those are the earliest flowering varieties, but the later flowering types must make new growth in order for flower buds to form. A few plants are not strictly bound to the following groups but may cross lines. Training shoots horizontally not only keeps the flowers within eye level, but also provides better coverage of the support, and the reduced flow of sap encourages more flowers.

GROUP A: Early-flowering Clematis. Plants in this group bloom in early spring, generally in April and May, from buds produced the previous season. Prune these back as soon as possible after bloom but no later than the end of July. This allows time for new growth to produce flower buds for the next season. Remove shoots that have bloomed. You can prune out more stems to reduce the size of your plant if it has become untidy, or to form a good framework of branches. Do not cut into woody trunks.

GROUP B: Large-flowered Hybrids. Large-flowered hybrids bloom in mid-June on short stems from the previous season's growth and often again in late summer on new growth (these blooms are smaller). Prune in February or March by removing dead and weak stems, then cut back remaining stems to the topmost pair of large, plump green buds.

This cut could be a few inches to a foot or two from the stem tips. You may be able to force a flush of new growth from the base by cutting the stem back to 18 in. (45cm) immediately after the flush of bloom in June.

GROUP C: Late-flowering Clematis. Plants in this group flower on the last 2 –3 ft. (60cm-90cm) of the current season's growth. Some types begin blooming in mid-June and continue into the autumn. This is the easiest group to prune since no old wood needs to be maintained. In February or March cut each stem to a height of about two to three feet. This will include removal of some good stems and buds. Eventually the length of the bare stem at the base will increase as the vine matures.

Evergreen vines may need some pruning if the cold winter weather has caused any damage. Wait until new growth starts, so you will know how far to cut-them-back.

Colutea arborescens (bladder senna): - Completely cut out weak, twiggy and thin shoots in early spring. Cut back strong shoots to within a few buds of the old wood.

Cornus (dogwood): - The tree forms need no regular pruning, but C. alba and C. Stolonifera, which are grown for their attractive young stems, should be cut back to within 2 inch (5cm) of the ground in spring.

Corylus maxima 'Purpurea' (purple-leaved filbert) and C. avellana 'Aurea': - In late winter or early spring, cut back vigorous shoots to encourage the development of fresh shoots and attractive leaves.

Daboecia cantabrica (St Daboecia's heath): - Use garden shears to clip off dead flowers in late autumn, after the flowers have faded. In cold areas leave pruning this ericaceous plant until spring.

Deutzia Cut out all flowered shoots to their bases as soon as the flowers have faded, in mid-summer.

Dipelta floribunda: - After the flowers have faded in early or mid-summer, cut a few of the old stems to ground level to encourage the development of further shoots.

Elsholtzia stauntonii (mint shrub): - In late winter, cut back fairly hard all shoots that flowered during the previous year. At the same time, cut out weak and twiggy growths.

Erica (heath/heather): - Use garden sears in spring to trim off dead flowers from summer-flowering types. Clip winter and spring-flowering types as soon as their flowers fade.

Fabiana imbricata: - To encourage a bushy shape; shorten long shoots as soon as the flowers have faded.

Forsythia (golden bells): - Prune yearly after the flowers have faded in spring. Cut out straggly and misplaced shoots, and shorten long and vigorous stems. If pruning is neglected, the shrub becomes choked with old wood, reducing the number of flowering shoots.

Fuchsia magellanica (hardy fuchsia): - Cut back all shoots to ground level in spring to encourage fresh shoots.

Garrya elliptica (silk-tassel bush): - When grown as a bush it needs little pruning, other than occasionally cutting out a few shoots so that it retains an attractive shape. If grown as a wall shrub, cut back long, econary shoots in spring.

Helianthemum nummularium: - Shorten straggly shoots and cut off old flower heads as soon as the flowers have faded.

Hydrangea arborescens (hills of snow): - During late winter or early spring, cut back by a third to a half all shoots that produced flowers during the previous year.

Hydrangea macrophylla (French hydrangea/mop-head): - There are two forms of this deciduous shrub –Hortensia (Mopheads) and Lacecaps. The old flower heads should be removed in early spring by cutting back to the first pair of new buds. In late winter or early spring, cut out to their bases some of the oldest stems in the centre of the bush to open up the shrub enabling air circulation to the centre of the plant.

Hydrangea paniculata In late winter or early spring, cut back by half all shoots that flowered during the previous year. If the shoots are cut back by two-thirds, larger flower heads are produced, but the shrub's life may be reduced.

Hypericum: - During late winter or early spring, shorten the previous season's strong flowering shoots by a quarter of their length. H. calycinum (rose of Sharon) can be cut down to within a few inches of ground level in early or mid-spring every few years to keep it compact.

Kerria japonica (Jew's mallow/Japanese rose): - After the flowers have faded, cut out the old wood to strong, new growth. Alternatively, sever them at soil level to encourage the development of strong growths from the shrub's base.

Kolkwitzia amabilis (beauty bush): - After the flowers have faded in early summer, completely cut out flowered shoots to encourage the development of fresh growth.

Laurus nobilis (bay/laurel): - Specimen bushes and standards, in gardens and large tubs, need clipping with secateaurs two or three times during summer. Rejuvenate neglected and old shrubs in late spring by cutting them back severely.

Lavandula (lavender): - Use garden shears to clip over plants in late summer to remove dead flowers. Where plants have been neglected and become straggly, prune them hard back in spring. This encourages the development of shoots from the shrub's base.

Leycesteria Formosa (Himalayan honeysuckle): - In spring, cut out to ground level all the shoots.

Lupinus arboreus (tree lupin): - In late winter or early spring, remove old, worn-out stems and cut back to a quarter of their length strong growths that produced flowers during the previous year.

Lycium barbatum (Duke of Argyll's tea/matrimony vine): - Occasionally thin out the shoots in summer after the flowers have faded. Cut back any neglected and excessively large shrubs in spring.

Philadelphus (mock orange): - After the flowers fade, cut out all shoots that have produced flowers. Leave young shoots, as these will produce flowers during the following year.

Pieris: - Remove dead flowers. At the same time, cut out straggly shoots.

Pittosporum arbuscula and P. fruticosa (five-finger/shrubby cinquefoil): - These shrubby plants need little pruning, other than cutting out straggly, old and weak shoots at their bases after the flowers have faded.

Pyracantha (firethorn) Grown against a wall these shrubs will need to be kept in shape. Shorten long side shoots in mid-spring, but take care not to cut off too many that would subsequently bear flowers.

Rhamnus (buckthorn): - During late spring, thin out old wood on evergreen types to keep them shapely and to ensure light and air can reach the shrub's centre. Prune deciduous species in winter.

Ribes (flowering currant): - Annually cut out all old wood to ground level in spring.

Romneya (Matilija poppy/tree poppy): - These sub-shrubby perennials need little pruning, other than cutting out frost damaged shoots in mid-spring.

Rosmarinus officinalis (rosemary): - Cut out dead shoots in spring and shorten the tips of long, straggly shoots. If plants become overcrowded, cut them back in mid-spring.

Rubus (ornamental brambles): - During late spring, cut to ground level all old stems on those species grown for their coloured stems. This will encourage the development of fresh ones. For others, cut to ground level a few of the old stems as soon as the flowers have faded.

Raspberries, blackberries, Loganberries: - The old canes that produced berries last year should be cut back to the ground. The canes that grew last year, but did not bear fruit, will bear this year.

Sambucus (elder): - Thin out bushes in mid-spring to keep them neat and shapely. Where forms such as S. racemosa and S.nigra are grown for their colourful leaves, cut all the stems back to ground level each spring.

Santolina chamaecyparissus Lightly clip off old flowers with hand shears, as soon as they fade. Rejuvenate old plants by cutting them hard back in late spring.

Sarcococca (sweet box): - When shrubs become crowded. Cut out a few of the old stems to ground level after the flowers have faded.

Syartium junceum (Spanish broom): - Lightly trim young plants several times during summer to encourage bushiness. When established, shorten stems to a third or half of their length in late winter or early summer.

Spiraea x arguta (bridal wreath/foam of May): - On young and semi-mature shrubs, cut back flowering shoots as soon as the flowers have faded, leaving one or two young shoots at the base of each shoot. As a shrub develops, cut out as much of the old wood as possible in late winter, leaving the previous year's growth to produce flowers during the current year.

Spiraea x bumalda and japonica: - Prune all stems to within 3-4inch (7.5-10cm) of the ground in late winter or early spring.

Spiraea thunbergii + S. vanhouttei: - Prune in the same way as for S. x arguta.
Stephanandra Cut out old and spindly shoots in late winter or early summer.

Symphoricarpos (snowberry) During late winter cut out a few of the oldest stems to ground level and cut out crowded stems.

Syringa (lilac): - Each year, use secateaurs to cut off faded flowers. Later, during winter cut out weak and crossing branches. Where lilacs have been neglected, rejuvenate them by cutting the entire plant to 2-3ft. (60-90cm) above the ground during mid-spring. This will mean that the shrub will not flower again for two or three years. Remove any suckers during summer.

Tamarix (tamarisk): - Prune the spring-flowering T. tetranda immediately the flowers have faded. Cut back by half to two-thirds of previous season's growth. Prune the late summer-flowering T. pentandra in late winter or early spring, again cutting back the previous season's shoots by half to two-thirds.

Weigela: - Each year, after the flowers have faded in mid-summer, cut out to soil level a few old stems. If this is not done, the shrubs soon become a tangled web of old shoots that produce small and inferior flowers.

The Seasons:

There is something reassuring about the cyclical pattern of the changing seasons. The gradual but certain changes that each period brings to the garden, ensures that the beauty of nature abounds in the rich collage of form, colour and composition. Those who have acres of land on which to garden, may choose to set aside specific areas that excel in any one particular season, for example the spring garden, where magnificent magnolias, azaleas, rhododendrons and camellias, will for a short period of the year make a breathtaking display.

For the majority of gardeners with a much smaller area this would be impractical, it would certainly limit the pleasure that a garden is capable of giving. With limited space, it is generally preferable to create an all-season garden where the landscape changes with the passing of time, and each season will bring its own interest and beauty to be admired and enjoyed.

Since no individual plant is at its peak for all twelve months of the year, its impact in a group will alter as the year progresses. Therefore when planting up the garden, ensure that each grouping sustains year-round interest. Ideally, you should provide a succession of 'feature' plants so that as soon as one plant in the group is finished its triumphant flourish, another begins to blossom. If these performers have a background of relatively unchanging support from attractive shrubs and trees the garden will rarely if ever be dull.

To achieve a succession of interest throughout the seasons, when shopping for plants, spread out the visits to the Garden Centres over the year. This allows you to see what and which plants are performing at that particular time. Many outlets make a display of current season plants that are looking their best. From these you may discover some that you hadn't previously considered.

Seasonal Advice for the Spring Gardener:

Early spring flower garden: -

Plant bare rooted shrubs, trees, roses and hedging when weather conditions allow.
Move shrubs or other plants that have outgrown their current position. Always prepare new planting site first. Water well after replanting.

Rake out hedge bottoms and burn pest-harbouring debris.

Keep compost heap fully covered to exclude chilling rain, which inhibits waste from decomposing. It also prevents rain from leaching away much of the nutrients.

Fences, pergolas and gazebos may require maintenance, check for rotting at soil level.

Kitchen garden: -
Check Brussels sprouts when picking over them remove any yellow leaves and firm each plant against wind rock. Taller plants may need to be stalked.

Chit tubers of seed potatoes by placing them in egg cartons or seed trays, eye-end at the top, in a light, cool but frost-free location.

Shallots can be planted in a sheltered position 6-inch (15cm) apart in rows 12-inch (30cm) between the rows. Cover the bulbs to prevent birds from pulling them out.

Take cuttings of currants and gooseberries.

Cover clumps of rhubarb with tubs or buckets to force early stems.

Cut back raspberry canes planted in the autumn or winter to about 6-inch (15cm). Blackcurrants planted during the last four or five months should be pruned back to within 2-inch (5cm) of the soil.

Greenhouse garden: -
Ventilate greenhouses on warmer days.

Water plants sparingly in the morning if they appear dry and avoid wetting foliage.
Check fuel levels regularly on paraffin and bottled gas heater.

Start begonia and gloxinia tubers, planting them close to one another in shallow pots or boxes.

Sow cucumber seeds in 3-inch (7.5cm) pots; exclude light until they have germinated.

General advice
Give lawnmowers an overhaul: sharpen summer-worn cylinder blades with DIY attachments. Remove caked on mud, then clean and oil all moving parts.

Dig over vacant soil, ready for planting.

Clean out nesting boxes ready for the new breeding season.

Move houseplants to windowsills during the day to give them plenty of light.

Begin the general routine work of – hoeing, sowing, thinning and planting.

Stake herbaceous perennials before the foliage grows too thickly or to difficult to handle without breaking. Strong, twiggy sticks are ideal but there is some excellent thick wire support frames now available that are ideal, they will become completely concealed once the foliage bushes out.

Late spring:
Begin to mow the lawn at regular intervals; the cutting blades should be set high so as not to damage the grass roots.

Flower Garden: -
Prepare soil for sowing hardy annuals in April.

Don't miss out on those important seed sowing dates, it's a good idea to organise your seed packets into sowing date order.

Lift and divide any congested clumps of snowdrops.

Plant out lilies, gladioli, gattonias and other summer bulbs.

Trim winter flowering heathers as soon as the flowers fade. Cut back lightly and never into old wood.

Finish pruning roses.

Prune back summer flowering clematis, cutting to just above the lowest shoots.

Stretch black cotton over crocus and polyanthus if birds attack and shred the petals.

Prick in bone meal around narcissi, scallas, tulips and other spring-flowering bulbs to encourage fine blooms next year.

Give herbaceous borders an overhaul; cut back dead stems to just above swelling crown buds and fork lightly around clumps, working in a balanced fertiliser.

Continue to prune early-flowering shrubs after they have finished flowering. If required, cut back branches of evergreen shrubs to improve the shape.

Feed roses and lilies with liquid fertilizer.

Window boxes and hanging baskets can be planted up. They will require regular watering from now on.

If you are intending to plant summer bedding, spring bulbs can be lifted in late spring. Heel them in some corner of the garden where they won't be disturbed the beds can then be prepared for the summer display.

Kitchen Garden: -
Prepare seed potatoes by putting them into trays with the eye uppermost and leave them in a cool, bright position to develop shoots.

Buy onion sets to plant out later in spring, or plant them in small pots if your soil is too cold and wet.

Sow crops of parsnips, early salad carrots, leeks, spring onions, peas, lettuces, radishes, beetroot, summer cabbage, corn salad, kale, parsley and broad beans when the conditions are suitable, i.e. when soil can be raked to a tilth and doesn't clog.

Force rhubarb by covering crowns with large pots or buckets.

Keep hoeing between rows of seedlings, thin out where necessary.

Plant out Brussels sprouts, Cauliflower, Leeks, Marrows, summer cabbage, and Squash seedlings that have been raised under glass and hardened off.

Sow broad beans and dwarf French beans when the danger of frost is past, cloches may be used at night to give protection. Also sow Beetroots, Broccoli, winter Cabbage, Chicory, Courgettes, Cucumbers, Fennel, Kohl Rabi, Lettuce, Radish, Swedes and Swiss Chard.

Thin out shoots of raspberries, leaving six or seven canes to each plant. Mulch both raspberries and black currents with clean straw.

Erect cages or netting over soft fruit to protect it from birds. Top dress blackberries, raspberries and other cane fruits with ¾ -oz. per sq. yd. dressing of sulphate of potash. Plant strawberries in a well prepared soil.

Pick off and burn blackcurrant buds that resemble grapes- these are infected with big bud mite.

Greenhouse Garden: -
Sow seed of summer bedding plants such as petunias in a heated propagator.
Tomatoes and peppers can be sown now.

Summer:

Summer in the garden is the most prolific season for flowers and scents and a time when beauty abounds. Whilst shrub interest is diminishing the perennials and biennials are proving their worth. Annual flowers are then used to fill empty places in the borders, and tubs, pots and baskets overflow with their rich colours. Many annuals if allowed to self-seed will emerge year after year in random scatterings, often creating a more pleasing display that the original planting. Roses, clematis, geraniums, lilies the list is endless, are in abundance in an overwhelming display of colour and beauty.

Seasonal Advice for the summer gardener:

Flower Garden: -
Regularly deadhead to prolong flowering period.

Continue to cut the grass on a regular basis.

Sow seeds of perennials in rows about 9-inch (22.5cm) apart and thin the seedlings later.

Mulch border plants, and continue hoeing amongst all the border plants.

Remove any suckers from roses.

Remove dead flowers from lilacs, rhododendrons and azaleas.

Take softwood cuttings of shrubs and alpines.

Feed and top dress plants in hanging baskets and tubs.

Propagate by layering.

Mulch border plants, especially phlox and Michaelmas daisies, and continue hoeing among all the plants in the borders.

Lift late flowering tulips and heel them in until the foliage has turned to creamy-yellow, these then can be lifted and stored.

Kitchen Garden: -
Lift shallots and autumn-sown onions and lay them on the surface of the soil for a few days to dry.

Pick board beans and peas.

Sow seeds of winter radish and cabbage.

Remove side shoots from tomato plants and stake well.

Continue successional sowings of vegetables.

Pick peas and, as soon as they are harvested, clear the haulms away and add them to the compost heap.

Gather herbs for drying. Collect them on a dry day towards the middle of the day when there is no moisture on the plants.

Lift early varieties of potatoes.

In a good summer last sowings of peas can be made.

Water cucumbers and marrows well.

Remove side shoots from tomato plants and stake well.

Spraying outdoor tomato plants with Bordeaux will help prevent blight.

Begin to propagate strawberries by selecting good runners, peg them down either directly into the soil or in 3-inch (7.5cm) pots sunk into the soil. Cut off unwonted runners.

Autumn Colours:

After the colourful and bountiful days of summer when displays of summer bedding and perennial plants are fast fading, the plants now grabbing our attention are those revealing rich and vibrant colours. These are the trees and shrubs whose leaf colour change can lift the dreary days before winter, playing a last finale in the seasons closing symphony. They in their turn will take us out of the current year, giving us some of the most breathtaking displays with their truly magnificent autumn colours. With the right plants we can enjoy a blaze of fire until late in the season, as burnished leaves shimmer with vibrant hues of brightest purple, flame red, brilliant orange, gold and butter yellow. Though autumn colour on a grand scale is not possible in a garden setting of modest size, by choosing trees and shrubs with care, those of us with limited space can still bring some of the drama into our own gardens at this time of year.

Leaf Colour Change
Autumn colour is spectacular and unpredictable. It relies on a complex and variable combination of climatic, environmental, genetic and physiological factors.

What makes the green leaves of summer change to clothe the branches with magnificent autumn hues. The change occurs because the leaves stop making food or chlorophyll, the element that gives leaves their green colour. Chlorophyll is such a strong substance that it masks other pigments present in the leaf, but as the level of chlorophyll in the leaf diminishes, the other pigments are then revealed. The intensity and colour range also the duration of the autumn colour is affected many factors; amongst these are the rate of chlorophyll destruction, and the rise of sugar levels. While photosynthesis has slowed, sugars are still being produced and lower temperatures mean that these are moved around the plant more slowly.

The sugar in the leaf is converted into a substance called anthrocyanins, and these give us the bronze and red colours. More light increases anthrocyanin production so clear, bright, autumn days, means more vivid autumn leaf colour. Cold but frost-free nights delays leaf fall and reduce the rate of sugar removal from the leaf, this intensifies foliage colour.

In autumn leaves undergo a process called senescence where the leaf tissue begins to die. Dead cells form in an abscission layer at the base of the stalk (or petiole) and the twig to which it is attached. The leaf will fall off when the abscission layer completely covers this point. Beech (Fagus sp.) and hornbeam (Carpinus betulus) do not form this layer and their dead leaves remain on the tree until the following spring.

Seasonal Advice for the autumn gardener:

Flower Garden: -

Plant spring bulbs in readiness for the start of the new season.

Sow hardy annuals such as Sweet peas in pots placing them into a cold frame. The seedlings should be ready to plant out in the following March.

Seeds of favourite perennials such as lupin should be collected now and scattered where they are to grow next year, or they can be sown into pots and put into a cold frame.

Peonies can be planted up until November. Choose a position in full sun and plant in rich deep soil.

Remove summer bedding plants from the ground then fork over and sprinkle bone meal at the rate of 2 oz per sq. yd. The cleared area will then be ready to plant bulbs for a spring display.

Divide irises.

Move pots of plants indoors before first frosts. Those that are to remain outside must be lagged as a precaution against damage or frost.

Cut down spent perennials.

Lightly fork borders and apply mulch.

In cool areas, lift tender perennials such as Dahlia tubers. Cut off all but about 6-inch (15cm) of stem and hang, stem down to dry completely. Plunge them into a box of sand and store away from damp, frost and heat.

Take cuttings now of evergreens such as privet, laurel, rosemary and sage. Take pieces about 6 to 9-inch (15cm-22.5cm) long with a heel of old wood attached. Insert these into a frame or under a cloche, they should have grown a good root system by next spring and then they can be transplanted to their growing position in the garden.

Transplant over-crowded evergreens. Prepare the new planting hole to the correct size in advance and insert a stake to steady the new planting.

Lift the corms of gladioli as the foliage dies down.

Prune rambler roses.

Prune the stems of tall roses after flowering has finished; shorten shoots on standard rose heads.

Use cuttings of roses to increase your stock. Cuttings should be about the thickness of a pencil and current seasons growth. Cut just below a leaf joint, and remove the lower leaves. Cut the top just above a leaf joint, the cutting should be about 9 inch (22.5cm) long. Dig a trench 6 inch (15cm) deep, one side straight the other at 45-degree angle. Add 2-inch (5cm) layer of sharp to the trench to help drainage. Insert the cuttings into the sand allowing 6 inches between each, propping them against the straight side of the trench, refill with soil.

Watch out for mildew on roses, delphiniums, chrysanthemums and Michaelmas daisies, spray with organic fungicide if necessary.

Dig up gladioli, cut back the tops and store in a dry, frost-free place.

Collect seeds from nasturtiums, place into paper bags or envelopes, label and store in an airtight jar or plastic box.

Trim lavender and prune wisteria.

Kitchen Garden: -

Sow seeds of winter lettuce, winter spinach and turnips.

Draw earth up around leeks to blanch stems.

Plant spring cabbage and garlic.

Finish lifting potatoes, carrots and beetroots. Other varieties of vegetables such as parsnips, turnips, celery and leeks, benefit from some frost, so need more time in the ground.

Protect the forming heads of cauliflowers by bending the outer leaves over them.

Take cuttings of red and blackcurrants. Insert them into a trench to root over winter.

Black currents bushes that are three years old or more should be pruned back by a third immediately after the leaves have fallen.

Cut out the fruited canes of blackberries and tie in new ones.

Dig over vacant vegetable plots and add plenty of well-rotted manure.

Prune loganberries as soon as the crop has been taken off.

Put a grease band around the trunks of fruit trees. The band should be at head height but if the trees are small, band each bough. These bands trap wingless insects that crawl up the bark.

General advice: -

Scarify lawns and apply an autumn fertilizer. Fill in hollows and carry out deep spiking, using a suitable fork or aerating machine. Renew worn patches with new turf.

Continue to cut the lawn with the mower blades set high.

Clear up fallen leaves and add them to the compost.

Clip hedges and shape topiary.

New hedges can be planted.

If it's possible to net the pond do it now to help catch any falling leaves that would otherwise enter the water.

Cut out old and unwanted growth from greenhouse climbers.

Clean out and disinfect the greenhouse.

Winter:

During winter, flower interest in the garden is likely to be minimal, but 'Winter Jasmine', Jasminum nudiflorum has wonderful bright yellow flowers throughout winter and early spring. Mahonia japonica and several of the Viburnum flower from late autumn through to spring.

It is now that the bold shapes and foliage colour provided by evergreens, such as conifers, holly and ivy, come into their own. Shrubs such as Cornus alba with its colourful glistening red young stems, Rubus biflorus and R. thibetanus with their arching white bloomed young shoots, brighten up dull, dismal days.

Seasonal Advice for the winter gardener:

Flower Garden: -

Continue to plant bare rooted trees and shrubs.

During early winter many trees and shrubs are readily propagated from hardwood cuttings at this time of year. Select a stem about 12-inch (30cm) long. Cut the top just above a leaf joint, and dip the bottom part into a hormone rooting power. These can be inserted into a shady, well-drained bed for rooting to take place; most will root within 12 months.

Giant leaves of Gunnera manicata should be folded over the crown of the plant to provide protection from the cold. In really cold areas the leaves may be cut off the plant and laid over the crown with a covering of straw then netted to keep the cover in position.

Tender climbers can be offered protection with unwonted conifer branches. These are held in place with netting or wires. Garden fleece or sackcloth is also useful for covering tender plants.

Cover tender rock garden plants with glass to protect them from winter damage by excessive wet. Woolly-leaved plants especially need protection.

Plant lily bulbs in pots in readiness to move into the garden when weather conditions improve.

Kitchen Garden: -

Force rhubarb by covering one or two crowns with a box, up turned pot or barrel and cover the outside with straw, bracken or hay.

Lift artichokes, celery, leeks and parsnips if the ground is not frozen.

Sow lettuce seeds in cold frames or under cloches.

Start winter pruning fruit trees after leaf fall.

Spray fruit trees with tar oil wash against insect eggs and hibernating grubs.

Grease-band any fruit tress that were not done last month. Renew bands that have trapped many insects.

Keep fleece handy to protect any remaining crops from frost.
Sow seeds of Broad beans for an early crop next summer.

Harvest leeks, radish, Brussels sprouts, and lettuce, celeriac, cabbage, parsnips, celery and winter spinach.

Continue to lift and store beetroot, carrots, turnips and swedes.

Clear away old crops and fork over soil; add farmyard manure now.

Make a trench for next year's runner beans. Gradually fill it with organic waste. Cover in spring before planting or sowing.

Cut canes of blackberries that fruited in September down to soil level, then tie in new canes that grew this year to the vacated spaces.

Lift and divide old rhubarb plants with a sharp spade, then replant each section.

Take hardwood cuttings of trees and shrubs. Take lengths of stem, about 12in (30cm) long, removing the soft growth from the tip and making a straight cut just below a bud. Make a slit in the soil in a sheltered position, and then insert the cuttings up to at least half their length to root. In heavy soils fill the base of the slits with grit and sand to improve drainage. For trees like poplars and willows, shoots several feet long can be rooted: these should be supported with canes. Other plants that can be propagated now: Virginia creeper, forsythia, roses, deutzia, privet, buddleia, Viburnum Lonicera, dogwoods and Russian vine.

Greenhouse Garden: -

Cut back the stems of chrysanthemums when they have finished flowering but keep the compost moist.

Take root cuttings of plants such as anchusa, Oriental poppy, phlox, gaillardia and perennial verbascum.

Ventilate greenhouses on warmer days.

Water plants sparingly in the morning, and avoid wetting foliage.

Check fuel levels regularly on paraffin and bottled gas heater.

General advice: -

Clear snow from branches of trees, particularly evergreens, where the weight can cause the boughs to break.

Clean out ditches, gulleys and drains to prevent a build-up of surface water.

Apply preservative to exposed wood.

Clear ponds of autumn debris, service electrical pumps and stop feeding fish.

Building or repairing paths, steps and walls can be carried out, but do not lay concrete during frost.
Bring all watering equipment, hoses and sprinklers indoors.

Turn off the mains water supply to outside taps and insulate them.

Collect fallen leaves from under roses, as these could harbour disease.

Dig over vacant soil, ready for planting.

Clean out nesting boxes ready for the new breeding season.

Move houseplants to windowsills during the day to give them plenty of light.

Rake up fallen leaves from lawns, paths, patios and borders.

Use a rake to scatter unsightly worm casts on the lawn.

Prune deciduous trees to shape now that they are without leaves.

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