Introduction
The Chrysanthemum has been in cultivation for over 3000 years but not in the forms which we would recognise today. In the 4th century AD they arrived in Japan and it is to the Japanese that we owe much to the development of this wonderfully versatile flower. Its ability to last well as a cut flower have made it a valuable commercial crop in its many modern day forms. The Chrysanthemum is also a reliable garden plant for flowering late summer through to winter and is the choice of flower for many dedicated and competitive gardeners who fill the show benches in the autumn with their astounding and much admired colourful blooms and sprays. Over the years many books have been written on growing Chrysanthemums so these brief notes are only intended to be a general guide and aimed at those of you who may be new to growing Chrysanthemums and are starting with fresh stock of new rooted cuttings as opposed to taking cuttings from their own stools (the term used for the cut back Chrysanthemum root) kept overwinter from the previous season. The National Chrysanthemum Society has in itself produced a few publications, especially aimed at the more serious Chrysanthemum grower and potential exhibitor with the “Week by Week Cultural Guide” being a good introductory booklet.

Range of varieties
The wide range of varieties available means that there should be something for everyone's taste. Although out of fashion for a while the old Korean and Rubellum Chrysanthemums are becoming more popular. These hardy varieties are probably the easiest to grow as once planted they can be left in the garden from year to year in all free draining soils where they will blend especially well into the herbaceous or mixed border, The Charm and Cushion Mum types make perfect subjects for growing in pots where, depending on the variety chosen, they could flower up until the end of the year, either using 1 plant per 15cm pot minimum size or 3 plants to a 25-40cm pot,

The more traditional Bloom and Spray varieties, often referred to as florist Chrysanthemums, are the ones associated with the show bench. Flowering from September to December depending on variety and stopping date (see later) they come in a wide range of forms and colour blooming outside without protection, under covers for exhibition or inside in a greenhouse or conservatory depending on variety.

General Culture
Chrysanthemums will perform better in an open position in well drained soil and, although not particularly a fussy crop, careful attention to detail is required to produce good quality blooms and sprays, especially for exhibition. The later
flowering Greenhouse Chrysanthemums are generally grown in pots throughout the year so that they can be grown outside in the open during the summer months and then brought into the greenhouse or conservatory in the autumn for flowering up until Christmas depending on variety.

It is not essential to have a greenhouse to grow Chrysanthemums though having one does open up the range of varieties that you can choose from but more importantly allows you to take delivery of your plants earlier enabling you to “stop” the varieties at the correct time for showing. Where you have a heated greenhouse you will be able to take delivery of Chrysanthemum cuttings from mid February whereas with a cold greenhouse we would not advise delivery before mid March in the South and early April in the North. If only a cold frame is available then we would suggest delaying delivery until early April in the South and and mid-end April in the North. For those of you with no facilities for growing on then our suggested delivery time would be the end of April in the South and early May in the North though this may mean that suggested stopping dates are missed for certain varieties and the resultant flowering time delayed.

**Receiving your plants.**

Plants received from us before 1st May should be potted on into a 9-11 cm pot (3 1/2 to 4 1/2") pots using a good reliable compost, ideally with an amount of John Innes Compost added, or alternatively planted into boxes or trays at about 10cm apart. Place in a well lit cooler part of the greenhouse, preferably on a shelf to prevent the plants becoming drawn. The aim is to encourage root growth and short stocky plants. "Earlies" can be kept in boxes or pots until planting out time, but if "Lates" are being grown in pots, a move into a 12.5cm to 15cm pot (5" or 6") is necessary. Again a good compost could be used, ideally incorporating John Innes No. 2 or using this on its own.

When the weather is suitable plants should be moved into a cold frame for hardening off. Watch out for frost, and be prepared to cover frame with sacking, etc. if severe frost is expected. If plants do happen to get frozen, spray with COLD water and thaw out gradually.

Plants received after May 1st can be either potted up or planted into boxes for a week or two prior to planting in their flowering positions. This will enable them to develop a better and stronger root system and be hardened off before being planted out into the full exposure of the outdoor environment.

**Planting Out-Early Blooms and Sprays**

Beds for early flowering varieties should ideally be prepared in the Autumn or Winter incorporating well rotted manure if possible or another organic alternative. A couple of weeks before planting, a good balanced fertiliser such as Vitax Q4 or Fish, Blood and Bone should be applied at the rate of 75-100g (3-4oz) per square metre forking this lightly in to the top10-15cm. Planting out of hardened off plants should not be carried out until end of April-early May in the southern counties and
not before mid May in the Midlands, North and Scotland. Plant firmly about 45cm (18") apart taking care not to damage the tender root hairs. Stake with bamboo canes and tie up at once. Failure to do this may result in broken plants later. Protection from cold winds which can be a problem at this time of year will help give the plants a good start. While growth proceeds keep the ground free from weeds, and see that tying is carried out as necessary. Ensure plants are well watered to keep them growing strongly, but be careful to avoid over watering. This is particularly important for young plants. All types of plants respond well to a balanced feed applied at rates prescribed by the manufacturer. Growers tend to have their own strategy when it comes to feeding though all would maintain the importance of having a strongly growing plant at all stages with no checks in growth. Throughout the early stages it is also important to keep an eye out for any potential pest and disease problems as these are much easier to prevent and control at these early stages of plant development than when the plants are larger.

**Potting and Growing on Late Blooms and Sprays.**

With the LATE flowering (indoor) varieties, the cultivation is slightly different. POTS are used throughout the growing season normally starting in a 3.5" pot of quality compost ideally mixed with at least 50% John Innes No.1, and when full of root, moving into a 5" or 6" pot of John Innes No. 2. or a 50:50 mix with a good reliable alternative. For exhibition a loam based compost is generally found to produce plants that are more compact in habit with more refined blooms. The same procedure as with the earlies for hardening off in the cold frame is followed with plants being caned and tied in as growth develops. A purpose standing out area is desirable with posts and wires to which the plants canes can be tied onto to prevent the pots blowing over. Final potting is commenced when the 5" pots are full of roots, usually about the end of May or early June, into 20-25cm pots (8" or 9"). Using the loam based John Innes No.3 should give consistent results though a 50:50 mix with a good quality potting compost is a mix we use ourselves. Firm the compost in well and make sure the pots are not overfilled as this will make watering easier. Commence feeding after about 5 weeks either with a top dressing to the pots or by using a liquid fertiliser. Check regularly for pests and diseases and treat accordingly as soon as symptoms are seen though some growers will have a regular spraying programme in place.
“Stopping” Chrysanthemums-Early Blooms and Sprays.

The act of ‘Stopping’ your Chrysanthemums (pinching out the growing tip) is done at the end of May and when the plants are growing away strongly. This should ensure that the Earlies will flower before the frosts get too keen. However when you are growing for Show purposes it is important to adjust the stopping date so blooms are fully developed for the required show date. Whether blooms or sprays “stopping” encourages the earlier production of side shoots which will in turn bear the flowers. For exhibition purposes the timing of stopping is fairly critical as varieties vary in the length of time they take from being stopped to producing a perfect bloom. e.g. The “Chessington” family need to be “stopped” approx 2nd week April in the north east to have blooms at maturity for a mid-September show where as the “Courtier” family would be “stopped” in 2nd week of May. For shows earlier than mid September the stopping date would need to be brought forward. For general garden use “stopping” when the plants are 15-20cm (6-8”) high will give satisfactory results but the serious exhibitor will keep their own records from year to year to assist their timing for shows.

As a guide our catalogue includes a suggested stopping date for each variety which is based on growing in the North East of England for flowering mid-September. If, at the time of stopping, there are signs that the plant is already forming a bud then it is of paramount importance to pinch back more than just the growing tip to perhaps less than 12-15cm (5-6”) to remove the budding tendency. These dates are intended as a guide only and are based on aiming for show dates of early/mid September and early/mid November in the North East of England. Please be aware that depending when your order is received and the period you request your order for some of these suggested dates may have been missed. This will not affect the plant, but will result in them flowering later than would be otherwise expected. Due to longer day length, growers in the south of the country should delay these suggested dates by a few weeks whilst more northerly growers than ourselves would need to stop a week or so earlier. If you are not aiming to grow for shows then these stopping dates become much less critical with a delay in stopping only resulting in a corresponding delay in flowering. The serious grower will keep their own records from year to year to assist them in timing for shows.

Once “stopped” the plant will be encouraged to produce side shoots. When these are about 5cm (2”) long and blooms are required for the show bench it is best to remove the weaker ones to leave 2, 3 or 4 shoots. At this point it is advised to have canes available for the individual stems as this will help give the flowers more.
space to develop and prevent damage to the blooms and spray heads as they reach maturity. More stems per plant can be allowed for garden use and cutting though the resultant flowers will be smaller. The number of growths produced by each plant will, to a degree, depend on how well the plant is growing. When thinning down to the required number of stems it is advisable to do this over a week or so to avoid a rush of energy up the remaining stems. At this stage, spray chrysanthemums can be left to develop naturally. Continue to keep the ground free from weeds whilst ensuring the plants are well watered and regularly fed and it is suggested that a routine spraying programme is carried out. Although all early varieties will flower outside, for exhibition purposes the best blooms will be achieved by growing under some form of protection from wet and windy weather.

“Stopping” Late Chrysanthemums – Blooms and Sprays

Just like the Earlies, stopping is again only necessary if flowers are required for a specific time or show. Without stopping, the plants will make what is called a “natural break” with the resultant stems providing a succession of flowers through November and December. Again our catalogue includes suggested stopping dates though you will find with late flowering varieties we occasionally provide two stopping dates, particularly for late flowering varieties. Exhibitors will tend to flower on what is termed the 2nd crown buds as this gives the plant a longer growing season, a bigger root system and therefore generally better flowers. Perfectly good results when growing for pleasure can however be achieved on later delivered plants by just using the later date given for the 2nd stop.

As with early flowering varieties when the side shoots elongate, one has to decide the number of blooms each plant will be allowed to carry, remembering if you want large blooms obviously you cannot expect as many per plant. Remove surplus shoots gradually, until you are left with the number you require to flower - for general use, usually about six stems per plant, or for showing, about three per plant. These shoots should be tied in regularly, adding more canes as necessary. About the end of September, plants should be moved into the greenhouse which should have been prepared to receive them. The pots should be scrubbed clean and the plants sprayed with a combined insecticide/fungicide, making sure that you spray thoroughly underneath the foliage. Allow to drain, and then take into the greenhouse. Give plenty of air by leaving vents and door open for the first two weeks after housing, to acclimatise the plants. After this, ventilate as necessary, in fact it does no harm to keep a little air on all through flowering time. Heating will normally not be required until about mid-November except for frost protection.

“Disbudding” Bloom Chrysanthemums – Earlies and Lates.

To ensure bloom type Chrysanthemums produce good sized flowers on long stems it is necessary to secure the main flower bud. Having secured the desired number of flowering stems on each plant any further side shoots that develop can be removed. Keep these shoots clear of side shoots, and eventually a cluster of buds will appear at the top of each stem.
DIS-BUDDING then takes place by carefully removing all but the central bud on each stem, ensuring that this has not been damaged by insects, etc. - if so, allow a side bud to develop instead. DON’T dis-bud all at once - remove the buds over a week or so to prevent a sudden surge of energy rushing to the bud. This will also help the blooms develop more evenly.

**Spray Chrysanthemums**

Although disbudding is not necessary on spray varieties it is a different matter if you are growing for exhibition. In this case the central terminal bud is removed and 5 or 6 of the side buds allowed to develop at the top of each stem, these being selected for evenness in height, development and spacing with the aim of having as even a head of flowers as possible. This is not necessary unless growing for showing.

**Feeding and Watering**

All plants will benefit form regular feeding and Chrysanthemums are no different. It is worth applying additional feeding about 5 weeks after planting to keep the plants growing strongly. Liquid feeding is the most common method of doing this applying a high nitrogen fertiliser and then a more balanced feed up until the stage where the flower buds begin to swell. At this stage switch to a feed higher in potash to help intensify flower colour, strengthen stems and, to a degree, toughen up the blooms to make them more resistant to marking and damping off. We find the Chempak range of plant feeds to be particularly useful for feeding Chryanthemums and Dahlias starting off the season with Chempak No.2 (High Nitrogen), Chempak No 3 (balanced) and Chempak No.4 (High Potash for flowering).

An alternative when growing in pots is to apply a top dressing such as Vitax Q4. Keep a careful check on plants at all stages to avoid any pest or disease outbreaks.

**Flowering Time**

Chrysanthemums will flower in the garden but for show quality blooms and sprays some form of cover with protection from winds is desirable. Plants should be covered before the first colour starts to show. When cutting flowers it is better to cut early in the morning when temperatures are cooler and plants less stressed making sure they have been well watered within the last 24 hours. It should go without saying that this is the time to select the best plants for next years stock. Any producing inferior blooms should be discarded.

**Charm and Garden Mum varieties.**

Flowering naturally from September through to December depending on variety, these are ideal for growing in pots, either 1 plant to a 15cm pot or 3 plants to a 25-40cm pots or at the front of
Borders, particularly with the September flowering varieties. All varieties will benefit from at least one pinching out of the growing tips to produce bushier, more dome shaped plants with more flowers. A second pinching can be given but this will have the effect of delaying flowering. Later flowering varieties may need some protection though we have had them flowering outside in late November in a sheltered, sunny spot. A John Innes based compost tends to give the most compact plants. Regular feeding will help give a very eye-catching Autumn display.

**Korean and Rubellum varieties.**
The Rubellum and Korean types are some of the easiest to grow being ideal for the Herbaceous border bringing an abundance of autumn colour. Some varieties will flower well into the winter! They are also an invaluable late season source of nectar and act as a magnet for Butterflies and Bees. The plants can grow quite bushy so need plenty of space but are often strong enough to support themselves. We have found them to be very hardy surviving outside with no protection and flowering very freely year after year. Once received, pot into a 9-11 cm pot and grow on frost free initially. The growing tops can be removed when the plants are growing strongly and about 15-20 cm high. Harden off before planting outside in borders. These can be left in the ground over winter protecting the base with spent compost, bracken or straw in colder areas. Clumps may need dividing or fresh cuttings taken after a few years to re-invigorate the planting.

**Over wintering Stools.**
Although Chrysanthemums are relatively hardy (down to 4°C) it is advisable to lift all roots (stools) after flowering other than the more hardy Korean and Rubellum types. Even these will benefit from a winter mulch and may struggle in cold wet soils over winter. When outdoor blooms and spray varieties have finished flowering, cut the top growth down to 15cm (6”). Lift the cut back plants carefully and shake off any soil from the roots. Trim the roots back and tidy up the stools by removing green shoots and leaves leaving just the stems shortened to about 8cm (3ins). Don’t forget to label the stools clearly. The stools can then be boxed up into shallow trays, sitting them on a 5cm layer of compost and, once in, covering the roots lightly with more compost. The trays of stools can then be put into a cool, light and airy place such as a cold greenhouse or conservatory which is frost free. There is no need to water the stools in but make sure that the compost does not dry out totally over winter. Plants grown in pots can be cut back in the same way once flowering is finished and moved into a cold greenhouse, or some other sheltered place and, as above, kept dry. Alternatively they could be knocked out of the pots and treated as described earlier.

In early spring, the overwintered trays can be brought into a moderately heated greenhouse and watered to encourage new growth. This will encourage the basal shoots to grow and
within 3-4 weeks there will hopefully be string green shoots ready for taking as cuttings allowing you to produce your own plants for the coming season.

**Pests and Diseases**

Some of the more common pests and diseases associated with Chrysanthemums are listed below:

**Aphids/Greenfly** cause distortion of the foliage and is the main cause of spreading viral diseases.

**Blackfly/Melon Cotton Aphid** – a more difficult to control member of the aphid family which is more common in the greenhouse.

**Capsid Bug** causes distortion of the growing tip by puncturing resulting in mottling and ragged looking leaves. Often the damage is only seen long after the pest has been present.

**Earwigs** often harbour in the tops of canes, wood panel fences and split wooden stakes! Being nocturnal the evidence is only obvious by the leaves and/or petals being eaten in an irregular pattern. Seal cane ends with cane caps, or putty. Vaseline on stems will prevent earwigs from getting into blooms.

**Thrips** cause a puckering of the foliage and can badly mark the flowers, particularly pinks and whites. The yellow sticky traps available for use in greenhouses can help monitor a potential problem though blue ones are by far the best.

**White Rust** is by far the most serious disease affecting Chrysanthemum growers up and down the country. Pale yellow green spotting on the upper surface of the leaf is the first tell tale sign. Yellowish brown/white pustules soon accompany this on the underside of the leaf. Remove and burn affected leaves as soon as possible. As spores need moisture to germinate and spread, keeping the humidity as low as possible will help as will keeping foliage dry and ensuring plants are well spaced to ensure adequate ventilation. Good hygiene is important at the end of the season. Stools can be kept with the safest way of cleaning stock being to use hot water treatment on the dormant stools. After trimming back all green growth, immerse stools in hot water at 45 degrees Celsius for a maximum of 5 minutes. Stools should then be immersed in cold water before planting up ensuring no cross contamination can take place.

**PLEASE NOTE** No Chemical names have been mentioned as these are constantly under review. Please seek advice from your local garden centre or nursery for the best products currently available. Always use pesticides and fungicides safely and do not exceed recommended dosage rates.

These brief notes are intended as an introductory guide only. Enthusiastic growers and exhibitors will have developed their own individual techniques, feeding regimes and stopping dates depending on their own situation. They will all have one thing in common in that they will keep records of what they have done so adjustments can be made, if need be, for the following season.

**HALLS OF HEDDON,**

WEST HEDDON NURSERY, HEDDON ON THE WALL, NORTHUMBERLAND, NE15 0JS
Tel 01661 852445
www.hallsofheddon.co.uk