

– Cultivation, Post-Harvest Handling and Packaging –

Cultivation

A marketable flower consists of three parts, each having to be perfect: the bloom, the stem and the leaves. In order to achieve this, the following are important:

Parent Stock

Flowers should be grown from selected, high quality, virus free, vegetatively propagated planting material or seed, free from pests and diseases. The use of inferior parent stock is very much a false economy, as it gives rise to the production of inferior, poor quality blooms, unsaleable on the UK market.

Protection

Some kind of protection, for example, shade, plastic cover or greenhouses, is normally required during the growing period. Some of the low value summer annuals and wild flowers, such as orchids and heliconia, may be grown outdoors with little artificial protection in favourable climates.

Soil and Water

Soils do not have to be highly fertile. However, irrigation and good drainage is essential at all times. Water should be of the highest quality. Overhead irrigation should be avoided in order to prevent diseased petals, leaf scorch and chemical deposits on the leaves, which can render stems unsaleable.

Support

With the possible exception of roses, which have hard, woody stems, all flowers require support during development to ensure strong, straight stems.

Treatment

All operations, such as disbudding, pest and disease control, need to be carried out with meticulous care and attention to detail.

Harvesting

It is vital that all flowers are cut early in the morning to ensure that they remain turgid and as cool as possible. As soon as stems are cut the water flow within the stem is interrupted and the cut bloom needs to be stood in water immediately, placed in a cool shaded area and transported to a cooled packing shed with the minimum delay. The correct stage of harvest depends

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upon the species and variety but, generally, few flowers develop correctly if harvested immature.

Pre-Treatment

Many flowers, particularly the woody varieties such as roses, hollow stemmed varieties such as chrysanthemum, and latex exuding varieties such as euphorbia, require some form of hot water treatment of the stem base to encourage uptake of water and nutrients. Woody stems need to be dipped into near boiling water for 30 seconds; others are placed into water heated to 45°C for 15 minutes.

Some very sensitive varieties, such as carnation, need to be treated with an ethylene inhibitor such as silver thiosulphate (STS) by standing in a solution for some hours.

In all cases, blooms need to be stood in deep clean water and treated with a biocide such as household bleach at 1,000 ppm to prevent fungal and bacterial infections.

Most leafy plants, such as chrysanthemum, produce sufficient carbohydrate naturally by the process of photosynthesis and can be harmed by the addition of sugar in the standing solution. However, most others will greatly benefit by the addition of 1.5% to 2% sugar dissolved in the standing water. Proprietary 'nutrient' solutions are available for many different varieties and some include hormones to give added life.

Storage

At all times, cut flowers should be kept as cool as possible. Many tropical species, such as anthurium and orchids, need to be stored at relatively high temperatures to avoid low temperature damage - usually around 12 to 15°C. However, most species will respond to rapid pre-cooling to between 2 and 3°C, followed by storage at 3°C.

Cold storage has a desiccating effect on flowers and it is important that the atmosphere is maintained at a high humidity. Modern stores, utilising water as the coolant, such as the 'Zero' cooler or 'Humistore', maintain such an ideal atmosphere and, by the nature of the cooling action, freezing damage is eliminated.

All flowers should be kept in store in buckets and packed on the day of shipment.

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Grading and Packing

The packing and grading areas need to be as cool as possible. Only the highest quality of flowers should be selected for export and these graded according to species - stem length and size of bloom being the main features, along with leaf condition and appearance and strength of stem. There should be as little variation as is practical in each graded box.

Many flowers are now sleeved in plastic or soft paper sleeves to protect delicate blooms. Others, such as gerbera or anthurium, require individual special treatment.

As a rule, all cut flowers need to be firmly placed in the container and fixed with a wooden or sponge rubber sleeper to prevent movement.

All markets are now sensitive to the inadvertent introduction of injurious pests and disease. Any sign of infection will render the entire consignment prohibited for importation and liable for destruction.

Containers

Non-returnable fibreboard telescopic containers are now universally used for flowers. Dutch standard cut flower boxes, of which there are 30 standard sizes, are universally accepted. 'Air boxes', which are specifically designed for air freight, as they fit air pallets exactly, may also be used.

Air freight costs are based on a 'theoretical weight', calculated by IATA on the basis of the box size, as shown below:

Code	Size (cm)	Volume	IATA Weight
Dutch standard box:			
AA	120 x 46 x 29	138	27 kg
A	120 x 46 x 25	118	23 kg
B	120 x 36 x 25	90	18 kg
C	120 x 36 x 19	67	14 kg
Air box:			
21	106 x 35 x 36	118	21 kg
18	106 x 35 x 30	100	18 kg
15	106 x 35 x 24	79	15 kg
12	106 x 35 x 20	65	12 kg

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Consequently, bulky but lightweight species are charged at a higher 'unit' weight than heavier species packed in the same sized box. For example, 700 carnations in an "A" box with a true weight of 21 kg will be charged at the same rate as 200 chrysanthemum in the same box but with a true weight of only 14 kg - both being charged as being 23kg.

Whichever container is chosen, the most important aspects to consider are:-

- durability - must be strong enough to withstand the rigours of transportation.
- presentation - first impressions are very important. If it looks good, buyers will pay the highest prices.

Packaging, ideally combined with high quality printing and presentation, needs to be of the highest quality and strength. It cannot be overstressed that the finest quality blooms leaving the farm frequently end up on the rubbish heap, unsold, due to economies in packaging. An export carton must be able to withstand rough airport handling, frequent changes in storage atmospheres and temperatures, fluctuating humidities and customs inspections.

Transportation

Fluctuation in temperature must be avoided at all times. Thus refrigerated or insulated vehicles need to be used to transport flowers to the airport, where facilities should include cool storage warehouses.

Handling at the receiving airport needs to be undertaken by specialists to ensure correct handling and rapid clearance and transportation to the market.

Although the ambient temperatures in the UK rarely give rise to high temperature heat problems, in winter, frost and freezing can be major problems, requiring temperature controlled distribution.

Few distributors are specialists in flowers; most handle mixed loads of fruit, flowers and vegetables. Frequently these commodities are mixed in for bulk transportation to distant markets, giving rise to potential problems such as ethylene contamination and physical damage to cut flowers. The importance of using reliable clearers and distributors cannot be overemphasised.