Propagation aids

The propagation of many plants requires higher temperatures than may realistically be maintained in the greenhouse. To save on fuel bills, therefore, propagation aids are often used to provide the extra heat required. They may also increase the success rate when sowing seed or rooting leafy cuttings. Choose a propagator for the greenhouse that is large enough to hold at least three standard seed trays.

An electric power supply in the greenhouse is essential if heated propagators, mist units, or soil-warming cables are to be used. Mist units require a mains water supply as well as a power supply.

Unheated propagators are of limited use in the greenhouse but usually provide sufficient humidity for rooting up, softwood, or semi-ripe cuttings in summer. On a small scale, a similar effect is created by enclosing a pot of cuttings in a clear plastic bag.

Heated propagators

A heated propagator should have a heating element that is capable of providing a minimum compost temperature of 15°C (59°F) in winter and early spring, when temperatures outside may fall below freezing.

Some small heated propagators are designed for window sill use. Usually holding just two seed trays, they are generally too small to be of practical use in the greenhouse and often do not have a thermostat. They may not generate enough heat in a cold or cool greenhouse, since the heating element is intended to operate in a room indoors.

Heated bases

These are designed to be used with unheated propagators or ordinary seed trays, either of which may be placed on the heated base. A plastic hood must be placed over seed trays to maintain warmth and humidity. Heated bases do not raise the temperature as efficiently as heated tray propagators (see below).

Heated tray propagators

These have a self-contained heating element in the base, and are best when fitted with an adjustable thermostat.

Mist units

Cuttings may often be rooted more rapidly and in greater numbers in a mist unit than by using other more conventional means. Mist units, which are normally used mainly by specialist horticulturists, automatically maintain a high humidity around cuttings and are useful for difficult plants.

The easiest and most convenient mist units to use are self-contained, enclosed ones that include a heating element, thermostat, sensor, transparent cover, and a misting head. The constantly humid atmosphere created by the misting head provides a suitable environment in which to root cuttings quickly — by maintaining a constant film of water on the propagating material. Heat loss by evaporation is also reduced, and there is also less risk of the cuttings being affected by fungal diseases because, when the misting head is in operation, most disease spores are washed out of the air and from the leaves before they can infect plant tissues.

For large numbers of plants, a mist propagation unit is more practical. Some units are designed for use without a cover on an open greenhouse propagating bench; they are used in conjunction with soil-warming cables and also require a specially constructed greenhouse bench. If sited in a greenhouse where a mixed collection of plants is grown, however, the high humidity created by an open mist unit may prove unsuitable for some types of plant. In this situation, it would be preferable to install a closed mist unit.

Soil-warming devices

An electric horticultural blanket or a heated tray filled with moisture-retentive matting or sand will also create the basal heat and high humidity needed for successful propagation. More expensive still are soil-warming cables intended primarily for heating the substrate in a conventional propagator or on a mist bench in the greenhouse. Such soil-warming cables may also be used to heat the air in an enclosed space, such as a cold frame or home-made propagator. The safest system to use is a cable with a wired-in thermostat that is connected to an insulated, fused socket. Buy a screened cable, as it is much less dangerous if the cable is accidentally cut.

Soil-warming cables are sold in lengths that are designed to heat a given area. A 75-watt cable, for example, measures 6m (20ft) and provides enough heat for a bench area of 0.75sq m (75sq ft) in a greenhouse that has some form of heating. A cable with a higher wattage would of course be needed for use in a similar area in an unheated greenhouse or in a cold frame that is outside the greenhouse.

The cable should be laid at a depth of 5–8cm (2–3in) in a series of "S" bends (ensuring that the loops do not touch) in a bed of moist sand.

A WINDOWSILL PROPAGATOR

Portable propagators should be used indoors, where they will retain the high humidity needed to germinate seeds or root cuttings.

PROPAGATING BLANKET

This specialized horticultural blanket is made of electric wires encased in aluminium foil to provide an even spread of heat. When not in use, it can be rolled up and stored.
Cold frames and cloches

Cold frames and cloches relieve pressure on greenhouse space, but they are also extremely useful in their own right. They are likely to be used most intensively in spring to harden off plants raised in a greenhouse, but they may also be used throughout the year to grow a wide range of crops. In the colder months, they are useful for protecting winter flowers, overwintering the seeds of hardy annuals sown in autumn, and sheltering vulnerable alpines from the worst of the wet weather.

Cold frames

The most popular type of cold frame has glass (or clear plastic) sides as well as glass “lights” (frame tops which contain the panes of glass), although sometimes timber and brick are used for the construction. Glass-to-ground models usually have a metal framework.

Frame lights

Choose a frame that has removable or sliding “lights” for easy access; some also have sliding front panels, which may be useful for extra ventilation. Hinged “lights” that are wedged open still provide protection from heavy rain but sliding “lights” are often removed entirely during the day, leaving the plants completely vulnerable to heavy rain. Lightweight aluminium frames with their “lights” wedged open may be at risk in strong winds, however, so choose a model which has a hinged top and adjustable casement stays to secure the “lights” safely.

Wooden frames

Traditional timber frames are now difficult to obtain and are usually expensive, but may be made cheaply at home from second-hand timber. The wooden sides retain heat well. It is not very difficult to fix soil-warming cables (see p.580) to the inside of the frame to provide extra warmth. Paint or stain the wood to preserve it.

Aluminium alloy frames

These are widely available and relatively inexpensive. They vary considerably in design but are usually sold packed flat for easy transportation and assembled on site. Aluminium alloy frames let in more light than either wooden or brick frames, but they do not have such good insulating qualities and may not be as strong or robust. It may be necessary to use ground anchors for lightweight frames.

HOW TO USE COLD FRAMES

Planting in the frame

Plants may be grown directly in the cold frame, if required. Always prepare the base with a thick layer of drainage material, such as broken crocks or coarse gravel, before adding a 15cm (6in) layer of good garden soil or compost.

Protecting crops

Here, the cold frame has been placed directly onto the soil in the vegetable plot. Vegetables are growing through slits in a plastic mulch (see “Plastic film mulches”, p.503) laid on the surface of the soil.

VENTILATION METHODS OF COLD FRAMES

Hinged lights

Hinged tops may be wedged open on warm days to prevent the plants from overheating.

Sliding lights

Sliding tops are less vulnerable to gusts of wind but plants are not protected from heavy rain.

Brick frames

These are rarely used nowadays but they may still be built at home if a cheap supply of old bricks is available and if the “lights” can be made. Brick frames are generally warm and draught-proof.

Suitable sizes

The minimum practical size for a cold frame is 1.2m x 60cm (4 x 2ft). Often, however, the frame has to fit into whatever space is available (as near the greenhouse as possible), so choose the largest affordable frame that fits the space.

Height is important if the frame is to be used for plants in pots or for tall vegetable crops. In order to increase the height of a frame temporarily, raise it on loose bricks.

Insulation

The range of plants that may be successfully overwintered in a frame is increased if the frame is well insulated. The frame needs to be draught-proof; there should be no gaps around the glass or framework, and the top and any sliding front panels must fit well.

Glass-to-ground and plastic-sided frames may need insulating in cold weather with sheets of expanded polystyrene or bubble plastic (see “Flexible plastic insulation”, p.574). Cut the sheets to size, and place them against the inside of the frame.

On cold nights, particularly when a sharp frost is predicted, frames may require additional outside protection: use layers of hessian or old carpet to cover the tops, tied down firmly or held in position with pieces of heavy timber. This protective covering should always be removed during the day, otherwise plants may suffer from lack of light. Alternatively, use several layers of thick, clear plastic sheeting or bubble plastic for extra protection – this may be left in place during the day since it does not reduce the light to the same degree.

Ventilation

Good ventilation is essential in warm weather. Most frames have “lights” that may be wedged open to allow fresh air inside; often, the “lights” also slide along to allow more ventilation, and are eventually removed completely when young plants need to be hardened off.

Light

Aluminium frames (but not brick or wooden frames) may be moved around the garden to take advantage of the best light at various times of the year. If a frame is permanently sited, it should be positioned where it will receive the maximum amount of light in winter and spring, provided that the site is not too exposed.

Frames need shading in summer but, for year-round use, one that lets in as much light as possible is best.

Glazing materials

Horticultural glass is the best glazing material for cold frames; it transmits light well, allows the frame to warm up quickly, and retains heat better than most plastic materials. Broken or cracked panes should be replaced at once, so a frame that allows the individual panes to be replaced should be chosen. Some are glazed using glazing clips or glass panels that slide into the framework; this makes glass replacement fairly simple.

Where glass may be a potential danger for children or animals, or where the cost of the frame is the main consideration, use plastic glazing material.