

THE PROPAGATION OF HOLLY [*Ilex Aquifolium*] UNDER DOUBLE GLASS

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The use of double glass frames is not new. Before misting techniques came into favour some 20 years ago, double glass frames were in fairly general use for the propagation of a wide range of plants, notably conifers, broad-leaved evergreens, deciduous shrubs and herbaceous subjects.

It was altogether by chance, while rooting certain conifers under double glass, that I discovered the conditions and the routine methods adopted were favourable to the rooting of the common English holly and its many cultivars. Since it needs no expensive electrical equipment, electricity, or water and requires a minimum of attention, I still prefer this method to mist propagation. It is foolproof and labour saving. Once the cuttings are rooted, they can be left *in situ* for several weeks without fear of nutrient starvation.

Success in rooting under double glass depends on a number of favourable factors. (1) properly constructed frames, (2) a suitable rooting medium, (3) growths at the right stage, (4) use of root-inducing auxins, (5) maintenance in the frame of moisture-saturated atmosphere, and (6) prevention of wilting by shade conditions and high humidity.

Construction of Frames. For the benefit of our younger propagators, familiar mainly with mist techniques, and probably not acquainted with the construction and use of double-glass frames, let me explain how they are set up. The frames used are of the standard English type to take 6 ft. by 4 ft. lights. The height at the back of each run of frames is 18-20 inches and at the front 12-14 inches. The runners at 4 ft. 1 inch centres are movable to facilitate working in the frames while inserting cuttings.

Inside the frames and running lengthwise with them are fitted two boards 4 ft. 11 inches apart to support Dutch lights. These boards are of 7 inch by 1 inch timber and are made level with each other. This is imperative as the Dutch lights must be dead flat when in position, otherwise water vapour, when it condenses on the inside of the glass, would tend to run to the lowest point and drop off. It is vital to the system that the inside of the glass is kept uniformly misted over, since this gives a clear indication of satisfactory humidity within the frame.

Aspect of Frames. To obtain the maximum heating effect from the sun's rays the frames should be faced towards the south, but if this is not convenient to the general layout of the

frame yard, a westerly aspect appears to be quite satisfactory. To avoid excessively high temperatures within the frames and possible scorching of the cuttings, the glass of the English lights must be heavily shaded until dull conditions are common in October, when the shading should be removed. No scorching of the foliage will take place so long as the inside of the Dutch glass is misted over, even although the temperature between the upper surface of the Dutch light glass and the inside of the English lights is around 90°-95°F.

Rooting Medium. The medium that has consistently given me the best results is a mixture of three parts by volume of springy sphagnum moss peat and one part by volume of sharp sand, such as is used for making concrete. The peat should be broken down thoroughly and well-moistened before mixing with the sand. The medium is placed inside the 7 inch deep wooden boards in the frame to a depth of 3-4 inches when lightly firmed. Avoid packing the medium as this may create problems when inserting the cuttings and may also affect the moisture/air relationship during rooting. Between the top of the medium and the inside of the Dutch light glass should be a space around five inches. Previous to the insertion of the cuttings, wet the medium thoroughly, then allow it to drain for at least a day.

The Cuttings and Their Preparation. Many of the former failures to root hollies can be traced to the use of either immature growth or to too old wood. My own experience indicates that, at least for double glass propagation, mid-to the end of August is the optimum time to take cuttings, but a better guide is to delay starting propagation until the current shoots have stopped growing and the terminal, or last leaf on the shoot, has become hard and leathery.

The growths selected for cuttings should be of moderate vigour, rather than over-vigorous, free from leaf miner toms, and preferably of current season's growth. If such growths are in short supply as can happen with the Hedgehog or Porcupine varieties (*Ilex aquifolium* 'Ferox'), two-year-old wood may be used and will root satisfactorily and just as readily as current wood. Each cutting, when prepared, should measure from 3-4 inches in length, be cleanly cut under a node and then wounded by cutting off at the base on one side of the stem, a thin strip of tissue about one inch long so as to expose the cambium layer.

Before inserting the cuttings, dusting the wounded area and base of each with a root-promoting auxin is desirable, although not essential. I used to use a 1% home-prepared indolebutyric acid powder, but now obtain equally satisfactory results from the proprietary rooting powders, Seradix No 3 and Rhizopon AA. The former contains 0.8% IBA, the latter 1%.

To insert, the prepared cuttings are just pushed into the moist medium to a depth of 1-1½ inches and at a spacing of 2x2 inches. Any difficulty experienced in the insertion would suggest that the medium has been over-compacted. On completion of the 'sticking', give a thorough watering, then cover with the Dutch lights and then the shaded English frame lights. No further watering is likely to be necessary for several weeks. So long as the inside of the Dutch lights are mist-coated, leave well alone.

Once the cuttings are rooted, start giving air by propping up alternate Dutch lights, but leave them in position until growth becomes really active in March-April, when they may be removed entirely. The English lights, however, should be left on the frames until all risk of frost has passed, ventilation being given on favourable occasions. An occasional watering will be necessary until planting out takes place, which may commence towards the end of April. As the young new growths of holly are very tender and easily damaged by frost and drying cold winds, some protection is desirable. This may be given by covering with nets over a light framework or by wooden lath frames.

RESEARCH INTO BUDDING ACERS AND OTHER DIFFICULT SUBJECTS

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Nurserymen have difficulty in obtaining a high proportion of successful unions when budding ornamental cultivars of Norway maple on to seedling rootstocks by the traditional shield or T-budding method, and low percentage stands are not uncommon even after re-budding when earlier buds have died. In the past, this problem has not been pressing because where buds have failed, rootstocks have been grown-on to produce the common Norway maple which has been used for general amenity purposes. The current demand from new development corporations and other large-scale buyers for large numbers of high quality trees of specified cultivars has, however, shown the need to improve techniques of tree production.

Chip budding. Potential for improvement lies in the replacement of traditional shield budding by chip budding, which involves the substitution of a wedge-shaped piece of scionwood bearing the bud for a similar shaped piece of rootstock tissue, rather than the addition of the bud shield to the rootstock tissue.