

difficulties, but which may, however, be overcome if a few rules are observed. For example, plants of *Anchusa caespitosa*,¹ (as distinct from *A. angustissima*, which often masquerades under the name of *A. caespitosa*), have retailed over the last few seasons for prices ranging from 10s.6d. to 21s.0d. Yet it can be rooted with the ease and speed of plants which are retailed in the 3s.0d. to 4s.6d. bracket. A small area of stock bed consisting of well-drained media raised to an elevation of 15 inches above ground level is desirable. A garden frame can be used for the stock bed if convenient materials for a retaining wall for the bed are not available. The stock plants should be set at 18 inch intervals; a well-established stock plant can be expected to produce upwards of 50 cuttings in a season. The stock plants can be covered with frame lights in extremely cold or excessively wet weather in winter. Shoot cuttings are collected with a very short portion of stem below the rosettes of leaves and the cuttings can be expected to root at any time in the growing season. Much the best results are obtained from cuttings inserted in late April or early May as these will grow away without the check that later struck cuttings often experience. The use of IBA in talc seems to lead to a marginal improvement in rooting performance.

The timing of the preparation of quite a range of alpines is of very great importance. *Gentiana sino-ornata* and its hybrids are often propagated commercially by division of the roots in early spring. Further increases in stocks can be achieved by propagation from cuttings, which again will root over a long period in the growing season. Only those cuttings rooted earlier in the season, however, are likely to develop resting buds which are essential for the young plants to over-winter. Much the same is true of *Cyananthus lobatus* and *C. integrar*. The question of timing is further illustrated because later-struck cuttings display a considerable impetus towards flower-bud production instead of making vegetative growth.

¹Ed. Note: *Anchusa caespitosa* Lam = *Pentaglottis caespitosz* (Lam) Tausch.
A. angustissima Koch = *A. ochroleuca*
A. angustissima Bourg. ex Nym. = *A. undulata*

PROPAGATION OF MINIATURE ROSES BY GRAFTING

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Preparation

Preparation for the grafting of miniature rose trees starts at the beginning of November. The second-grade miniature rose trees are pruned fairly hard, potted up into four-inch 'long toms' and placed into a cold frame or glasshouse where they are given a cold period for about four weeks.

The grafting pit is prepared in early December with about 9 inches of peat. We like to get the peat at a temperature of

80°F, with an air temperature of 72°F. The peat is watered to keep the inside of the grafting pit humid, care being taken to ensure that the peat is not so wet that excess water can be squeezed out by pressure. Air and soil thermometers should be placed in a convenient position in the pit in order to keep a regular check on temperature. Two dutch lights, one on top of the other, are placed the length of the grafting pit in order that the condensation particles which form on the glass are smaller thus preventing too much water from falling on the grafts. In mid-December the miniature plants are brought into the glasshouse to a temperature of 70° to 75°F. This alternating cold and hot treatment seems to stimulate more rapid growth.

The stocks used for miniature rose propagation are *R. multiflora* and *R. canina*. The stocks are left outside in a cold frame after being laid in rows and covered with sand just over the neck of the stock.

The scion material should be ready immediately after Christmas or early January. The material should be firm, showing a good bud at the top but not necessarily in colour. Then, provided the stocks are opening, grafting can begin.

Grafting

When the scion material is taken from the mother plant two or three leaves should be left on the mother plant in order to reduce the check to the plant and encourage it to produce more scion material. Care should be taken to bring in only the amount of material that the grafters can deal with at any one time.

The tops of the stocks are removed leaving the neck about 1 inch long. If the roots are long these can also be trimmed to about 4 or 5 inches in length. Then on the stock itself a cut is made on the neck of the stock, about $\frac{3}{4}$ inch long, opening the bark slightly to the left and right of the cut. A scion is then made from the scion material by making a cut, placing the knife above and behind the bud and bringing the knife through at about a 22° angle. The scion is then cut off from the rest of the material about $\frac{1}{4}$ inch above the bud. When inserting the scion the bud should be lower or just level with the top of the stock; also a "church window" should be clearly visible in order to give a stronger union. The scion is then tied on with either cotton or fine string. The grafts are laid in rows fairly close together in the grafting pit, the roots being covered to leave 1½ inches of the top of the stock showing. Before putting the double dutch lights in position over the grafts Captan is sprayed over the grafts to prevent fungus attack. This operation is repeated every other day until the grafts to prevent function is repeated every other day until the grafts have made union.

Care of grafts

All the grafts should have callused and united and the bud should have started to grow within seven days.

During this period the dead leaves should be picked off each morning. In the callusing period shading with hessian or newspaper should be done immediately in case of bright sunlight to prevent temperatures soaring. Air is put on the pit about the 8th day after callusing has taken place but only for two to three hours on the first day, increasing an hour each day for the next five days. After the 13th day the dutch lights can be taken away and the plants can be syringed down occasionally in case scorching should appear. At all times the glass-house should be kept humid to prevent the plants scorching after the eight-day period within a humid atmosphere. The plants are then potted up into 4-inch "long toms" when the shoots are 1 to 1½ inches high. After two weeks growth these shoots can then be used for further scion material thus cutting down the number of mother plants needed.

BUD-GRAFTING MAGNOLIAS

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The idea of propagating magnolias by bud-grafting stemmed from five main sources:

1. Mr. Neil Treseder had started research on a comprehensive book on "Temperate Magnolias and Their Hybrids", and had commissioned an artist to paint a set of the best forms to use as illustrations.

2. We knew that a few grafted plants of selected clones of Asiatic magnolias existed, and that these had reached flowering maturity considerably sooner than seedling plants of the same type (e.g. *Magnolia campbellii* subsp. *mollicomata* convar. *williamsiana* 'Lanarth').

3. Mr. Treseder anticipated that the coloured illustrations in his book would stimulate a world-wide demand for plants of selected clones.

4. Early in 1967 Mr. Treseder carried out investigations into the propagation of magnolias by bud-grafting, including methods used in America and Japan. He learned that Japanese nurserymen were achieving considerable success by direct budding onto two-year *M. kobus* seedlings in open field conditions whilst still in their seedling rows.

5. We knew that an unfulfilled demand existed for selected clones of the Asiatic magnolias and that we would be able to produce bud-wood from most of these after negotiations with their owners.

We therefore started by planting up some *M. sieboldii* in a prepared bed in a sunny greenhouse and proceeded to shield-bud these in August, 1967, tying the buds in and sealing with polythene strips, in order to copy Japanese procedures as closely as possible. The results were disastrous with only approximately 2% take.