

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**

D. KNUCKEY

*Treseders' Nurseries (Truro) Ltd.,  
Cornwall.*

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.

Dismayed, yet undaunted, we decided to try again in September and October, 1967, using as understocks two- and three-year pot-grown seedlings of *M. campbellii* subsp. *mollicomata* and *M. sargentiana* var. *robusta*. Once more we shield-budded, but this time tied the buds in with cotton and placed the plants in a tent of thin 'breathing' polythene inside a sunny, unheated greenhouse. The results this time were promising with approximately 60% take, but with an overwinter loss of a further 10%.

More than a little encouraged we prepared for 1968, buying in seedling stocks from various sources and potting them in preparation for budding from August onwards. We turned one of our glasshouses over especially for the project, with benches soil-heated at 70°-75°F, overhead lighting with 25 watt tungsten filament bulbs at 3-foot intervals on battens that could easily be raised with the plants as they grew. The lighting was on a time switch set to give a twenty-hour daylength and to cut in at dusk, with an intermittent 2 seconds in 2 minutes timer; this was sufficient to keep the plants in growth and cut down electricity consumption. Being in a frost pocket we also installed a thermostatically-controlled warm air heater set at 55° - 60°F as insurance against frost damage.

We commenced budding again in August 1968, using both shield-budding and chip-budding methods, again tying with cotton, and keeping the plants in a polythene tent under glass, watering being kept to a minimum. Once more we had approximately a 60% take. We continued budding in September-October and November-December, using shield-budding, chip-budding and veneer-grafting of small well-ripened shoots, tying in with cotton, but this time waxing over the whole area of the buds and grafts. In some cases, especially with evergreen types, we left a triangle of leaf blade attached to the petiole and found that growth of the bud was induced sooner. The take by March, 1969, with very little overwinter loss, was between 75% and 95%, according to variety and material used.

### *Conclusions*

1. There appears to be no incompatibility, even between evergreen and deciduous species. The Japanese successfully bud *M. grandiflora* onto *M. kobus*.
2. Budding from September to December, using well-ripened budwood has been more successful than earlier budding in August.
3. Keeping the budded area as dry as possible proved of prime importance. Polythene ties tended to trap moisture with subsequent bud decay.
4. Overwintering the plants under artificial light and heat cut down the winter loss, encouraged growth and will, we hope, promote earlier maturity.