£1465 in year two. The selling price of 10 to 12p, depending on the age of the plant, has been applied. At this price the purchase of stock for mass ground cover purposes would be attractive for municipal authorities and industrial site planting and may indeed rival the grassing of areas in view of the high maintenance costs of the latter.

## THE BUDDING OF HAMAMELIS

G. V. PURCELL

*L. R. Russell Ltd., Windlesham, Surrey*

The successful budding of quality plants like *Hamamelis* is naturally more important to me as a Specialist Propagator, than the routine budding of standard nursery stock like roses and other main varieties. From a commercial aspect it should also be very important to all nursery owners.

Everyone knows the quotation that, "big oaks from little acorns grow." May I therefore suggest that "big profits from little *Hamamelis* could grow." By this method of production you can obtain a good saleable end product in the same time it takes to produce a rose. The main difference being that you can sell the *Hamamelis* at 6 to 10 times the price which you could obtain for the rose (currently *Hamamelis* sells for approximately £3.00 to £5.50 and the rose for around 50p).

I should emphasise that the budding itself is not a new way of producing these plants, as I understand it was done in the pre-war period. I will now endeavour to explain the whole operation with the aid of slides to illustrate the sequence of events.

First, we have to find the appropriate understock — in this case we use *Hamamelis virginiana*, the north American species. Although it was first introduced into this country around 1736, it is now virtually impossible to obtain here — or in Europe either, in the quantities required by the trade. We, therefore, have to rely on our American friends to produce the understock for us, in our case Gulf Stream Nursery, Inc. I should, however, mention here that in 1972 I did carry out experiments with de-budding onto *Distylium racemosum* an evergreen member of the *Hamamelidacae*, as an alternative understock Results were promising at first but subsequent scion growth was very slow. However I intend to continue experimenting to resolve the growth problem of this particular understock.

When the *H. virginiana* stocks arrive they are usually very thin and often do not improve as much as one would like in order to make the budding operation as easy as possible.

**SLIDE NO. 1** Here we see the stock; note how thin it is and how low down one has to make the "T" cut. I should, however, point out that the thickness of the stock will not affect the result of the take. It may try the patience of the best of us, but a dedicated propagator, with the skill of a surgeon, will soon overcome this problem.

**SLIDE NO. 2.** Here is an ideal piece of material from which we can obtain 3 good buds. This is about the maximum you will be able to find as the fourth one is usually soft. When collecting material from old stock plants, generally you will only obtain two good eyes — unless they have been well fed. With young maiden plants, however, you will obtain similar material to that shown on the slide. This incidentally is *H. mollis* 'Pallida', which is fast becoming the most popular cultivar.

**SLIDE NO. 3.** The next step is to sever the bud from the piece of material selected. This is done in the orthodox manner by starting from the top of the material. The thin sliver of wood is removed from the back of the bud to reveal a good plump eye base.

**SLIDE NO. 4.** In most cases you will find that the thin sliver of wood will not come cleanly away in one piece, it will have to be worked on from both ends of the bud as shown on this slide. This may take time but when one becomes accustomed to the material, the operation becomes easier for the experienced operator.

**SLIDE NO. 5.** Now here is probably the most important part of the operation, the insertion of the bud into the stock. It is more difficult to get the bud inserted correctly, to be held firmly and squarely, than it is to provide the bud.

To secure the bud in the stock I use German Fleischhauer R.20 rose ties, using two per bud. The lower half of the bud is secured first, and when this tie is firm, the second tie is fixed making absolutely sure that it overlaps the lower one to prevent any moisture entering the "T" cut. When attempting to secure with the R.20 ties it is essential that they are stretched to their full capacity before making contact with the stock and bud. The only pressure which is brought to bear on the bud, before the pins are pushed home, is a direct force pushing the bud firmly against the stock leaving no room for sideways movement of the bud. I assure you that the bud will tilt to one side or the other if these steps are not followed.

One might ask "Why not use raffia?" but this would require the subsequent operation of cutting the tie and possibly risk cutting the stock — extra work is also unprofitable. It is possible that rubber tie strips could be used, but not having used this material I would hesitate to recommend them.

**SLIDE NO. 6.** This shows a small batch of *H. m.* 'Pallida'; the leader is 4 feet high. These were budded in August 1970 and the best were sold in autumn 1971. All had good leaders and four or five strong growth points to make fine quality plants. Commercially they retailed as follows: 1½ to 2 ft. at £2.75, 2 to 2½ ft. at £3.25, and up to £5 or £5.50 for the very best large plants.

**SLIDE NO. 7.** Leader growth here has reached 4 ft. 5 ins. on a variety we call 'New Red' which was obtained by Mr. John Russell in his travels. It starts off deep red and eventually changes to an orange-brown. As yet we do not market this one, but it is very free flowering and a good strong grower, somewhat similar to *H. m.* 'Carmine Red' with larger flowers and good autumn foliage. Also included in this batch is *H. m.* 'Coombe Wood' which is a delightful form of the species with larger flowers than the type but still sweetly scented. *H x intermedia* 'Jelena' showed the most vigor and at the time the slides were taken had reached 4 ft. 8 ins. in height.

The previous two slides have shown some well-grown witch hazels which obtained 3 to 4 ft. in height as maiden plants. Of course, they did not do this naturally but were encouraged with extra feeding which at the moment I cannot disclose, as experiments are still continuing to ascertain the best results. I must, however, point out that only one feed was necessary in late May, 1971, to produce 4 ft. plants. They were not given any extra feed of any kind in 1972.

To sum up therefore:

(a) Provide the best available understock.
(b) Retrieve only good quality buds.
(c) Operator's skill in trimming to reveal the eye-base.
(d) Form the T-cut carefully and low down on thin stock.
(e) Insert the bud squarely and secure firmly to the stock.
(f) Try to encourage extra growth by selective feeding.

This spells; PROFIT

## DISCUSSION

In reply to a question regarding the success of the technique, Gerry Purcell indicated that out of 250 in the first year of operation only 12 failed and in the subsequent year only 10 out of 150 failed. Latterly failures had been due to trials with the Fleischauer budding tie which had not proved successful.

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**Editorial Note:** Subsequent slides demonstrated maiden growth early in the year and the way in which growth developed. Certain comparisons of the rate of growth of various cultivars was also demonstrated.

Jim Wells and Ron Dool indicated that hamamelis could be successfully propagated from cuttings if treated in the same way as deciduous azaleas; i.e. achieve growth before the winter and store at 33° - 35° F. (Pete Vermuelen)

## NARCISSUS PROPAGATION

H. J. EATON

*Ministry of Agriculture, Fisheries, and Food*
*Agriculture Development and Advisory Service*
*Rosewarne Experimental Horticulture Station*
*Camborne, Cornwall, England*

**Abstract.** The "twin scale" method of narcissus propagation is described and the results of a number of experiments dealing with different sizes of segments, cultivars, and storage temperatures are reported, with details of the number and weight of bulbs obtained by natural increase and by twin scaling after two growing seasons.

### REVIEW OF LITERATURE

Bulb propagation by various methods of cutting or sectioning the bulb has been studied for many years at a number of centres. The early work dealt largely with hyacinths but more recently various methods of sectioning have been used successfully with narcissus and other bulbs. During the past two years, following earlier work by Alkema at Jaarverslag Laboratorium voor Bloembollenonderzoek, Holland, and by Brunt at GCRI, England, we have tried out the "twin scale" method of narcissus propagation on a number of cultivars, using various segment sizes and storage temperatures to find the most satisfactory method for large scale propagation of new seedlings.

### MATERIALS AND METHOD

Bulbs for dissection must be free from pests and disease and not bruised or damaged by lifting. "Round" or "double-nosed" are the easiest to dissect but any type can be used. Dissection should be carried out in July or August; later dissections will survive but make poorer growth.

Selected bulbs are first washed in a solution of 0.5% formaldehyde (40%) to remove soil and give surface sterilizing. The nose of the bulb is then cut off about ¼ to ⅓ from the tip and the body of the bulbs dissected downwards into 8 to 16 segments shaped like the segments of an orange and each held together by a portion of the basal plate. The basal plate of each segment is