during February and March. It is hoped to overcome this problem by incorporating grit with the compost to enable it to drain more freely and use a base fertiliser with a longer period of nutrient release.

Before decrying the fact of condensation on the inside of the house one should remember that a certain amount is beneficial during cold weather as it helps to slow down the heat loss of the house through the polythene.

During periods of bright sunlight in the spring it was found beneficial to apply shading to prevent leaf scorch on young stock. The main subjects affected were hybrid rhododendrons that had started producing the new season's growth.

The fifth house erected was used to force deciduous azaleas of Knap Hill and Exbury types. Stock plants 2 to 2½ feet high were housed in January, and were planted directly into the soil which had previously been cultivated and dressed with peat. To provide frost protection in the house a small paraffin heater was used. This produced 6000 B.T.U. per hour and enabled the frost to be kept out down to 27° F. Flower buds were rubbed out as they appeared. Vegetative growth started to appear during the first week of April, thus advancing our propagation programme by nearly six weeks against stock plants growing outside. A far more even type and size of cutting was produced without too much elongation of the internodes. The maximum number of flushes of growth was four, although some variability among varieties was apparent.

The experiences of the past months have proved very fruitful, and it is envisaged that the number of houses will be increased this year. To provide a better method of watering and liquid feeding other than overhead spray lines several of the houses will be adapted to a system of capillary sand beds. Propagating facilities are to be increased in the nursery and a larger house to our own specification is to be built. This will contain bottom heated mist beds and closed cases for the propagation of deciduous and evergreen azaleas and rhododendrons.

OVERWINTERING OF DECIDUOUS AZALEA CUTTINGS

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The advent of the modern aids to propagation, i.e. mist units, bottom heat and rooting hormones made the task of rooting azalea cuttings fairly straightforward, but this was only half the story; the stumbling block to 100% success was getting the rooted cutting through

the winter and into growth the following spring. So often one ended up with a depressing batch of dead twigs.

The first time I encountered the "overwintering problem" was in 1962, and we hoped to overcome it by avoiding any unnecessary root disturbance. This method entailed taking cuttings in July, using fairly firm material and inserting them in a rooting medium in a deep wooden tray. The trays of cuttings were then placed on the mist bench. Rooting took place slowly by present day standards and eventually the trays were transferred from the mist bench to a cold frame for the winter. A few survived to grow the following spring but by no means enough to make it a worthwhile proposition.

The next attempt took place in 1966 and the theory this time was that cuttings taken much earlier in the year, i.e. before July, would be well-established young plants, mature enough to overwinter.

Stock plants were chosen and, after potting, brought inside a cold house where they were watered and syringed regularly to promote new growth. This treatment resulted in a batch of cuttings which were ready for insertion on the 16th April. Rooting time with these softer cuttings was reduced to 6 weeks, when the cuttings were put into 3½ in. plastic pots and encouraged to keep growing during the months of June and July. This type of plant overwintered more successfully but still left room for improvement. Growth was slow to start the following spring and losses during winter still amounted to some 20 — 25%.

As is often the case further developments were accidental; the main crop at the time was *Camellia* and in an attempt to reduce the length of time necessary to produce a saleable plant, I read all the articles I could find that were connected with growing plants in a controlled environment. By chance, one such article was, "The Efficient Production of Deciduous Azaleas from Cuttings" by D.G. Leach in the Royal Horticultural Society's Rhododendron and Camellia Yearbook for 1968. This article dealt with two techniques of growing azaleas with the aid of artificial illumination. Artificial illumination! Of course! This was the answer, the key to success.

The usual batch of azaleas were by this time potted and standing on the greenhouse bench, in leaf but with no visible signs of new growth, so all that was needed was to suspend a series of 100 watt tungsten filament bulbs 3 ft. above the bench and spaced at 6 ft. intervals.

Work on this was completed by the end of August and the lights switched on. Initially illumination was continuous from dusk until dawn and this treatment had the surprising effect of starting the plants into growth, so that by November nearly all had 6 to 9 in. of new growth. With the onset of colder weather vegetative growth ceased but plants still retained their leaves so were, in fact, not **deciduous** azaleas but **evergreen**, and they remained in this semi-dormant state throughout the remainder of the winter. In spring we had a batch of

leggy cuttings some 12 to 15 in. tall. These were pruned back by about half their height and then planted in peaty soil under lath shades.

This method was by far the most rewarding, giving the following results:

> Young plants surviving in 1969, expressed as a percentage of cuttings taken in 1968 — Exbury, 70%; Mollis, 64%; Ghent, 50%.

Propagation facilities vary from nursery to nursery, so I do not think it wise to recommend a blue print for azalea production; instead I have summarized the important points, as I see them, in order of priority:

(1) The lights should be in position by the beginning of September and the time switch adjusted so that the plants have an 18-hour day. Azaleas also grow well under Grolux fluorescent strips — these being rated at 40 watts — they are cheaper to run but more expensive to install.

(2) The glasshouse or frame should be frost-proof; in fact the higher the temperature the better. With a temperature of 55° to 60° F and an 18-hour day the plants would continue to put on new growth throughout the winter.

(3) Cuttings should be soft and still hairy — approximately 2 to 3 in. long. I believe it is still worthwhile to have stock plants in pots because they are easier to manage and one can regulate growth to get the right type of cuttings, although I have now found that it is not strictly necessary to force stock plants for early cuttings. The right type of cutting taken in July roots and grows without any difficulty.

(4) The initial theory of minimum root disturbance should also be borne in mind as azalea roots are by nature delicate fibrous things — very easily broken. Any root damage particularly in the move from the propagation bench, is bound to result in a check to the plant and obviously should be avoided.

This makes me think that the ideal site for azalea propagation would be a frost-proof frame that could be wired for misting units, bottom heat, and lighting at the appropriate times. Cuttings would then occupy the frame from June of one year to April or May of the next year.

PLANT PROPAGATORS' QUESTION BOX

BRIAN HUMPHREY, *Moderator*

The subjects discussed include, in order, the following:

1. Control of Red Bud Borer
(*Thomasiniana oculiperda* Rubs.)