

- (9) Is there a more effective method of plant handling and storage than crates or pallets and what is the merit of each?
- (10) What is the ideal height for a cold store?
- (11) The best method for storing seedlings is in the horizontal position. Is it safe to do so?
- (12) What physiological changes take place in evergreens when in store in darkness? Is it better to keep the lights on all the time?
- (13) What is the best method of sterilizing this type of store?

I feel that there is a very great future in Cold Storage in Nursery Practice, and that the more information we can obtain on these and other questions the more widely it is likely to be used. This would be of immense importance to the trade.

### **SOME IDEAS ON ECONOMICAL PLANT PROPAGATION**

M. G. ADCOCK,

*Hillier's Nurseries, Winchester, England*

When Mr. Garner asked me to talk about the problems and priorities for research and experimentation, I was quite concerned about what to say, being a very practical tree and shrub propagator myself. Time and facilities to experiment seem to be the commercial propagator's bugbear.

I think most of the propagation techniques have been, and are still being developed by trial and error on the nursery and sometimes under very poor conditions. It would be a great help, therefore, if a scientific mind, together with laboratory conditions, could assist us with some of the problems of modern and economic plant production. Into this field must come *hormones*. It is almost impossible to compete in commercial plant production without them. The time to produce a root is sometimes shortened by weeks and the root system produced is far superior as a transplant to cuttings rooted and untreated. I think a larger range of hormones should be available to the propagator than at present exists, in both liquid and powder form.

As these hormones produce adventitious roots I often wonder is it possible for a hormone to produce a good callus — thereby making our grafting percentages higher both inside and out, with maybe just a tape to hold the scion in place. Is it possible? I don't know.

Quite a lot of interesting work has been done with hardwood cuttings using I.A.A. 24 hr., soak and callused in a warm atmosphere, then put outside to be planted in early spring, but a lot more could be done and with many different plants. We find difficulties with *Cornus alba siberica* normally layered, but if it can be induced to root when layered, possibly with different hormone treatment, it would root suc-

cessfully. More work is needed in this field. The commercial man doesn't have time!

Ideally, of course, it would be much more economical if we could root many of the plants now grafted, i.e. limes, beech, ash, and all their forms, but this seems to be at present not possible, and if it were possible there is no guarantee they would grow well on their own roots, so, to be more economical with grafting, we try, where possible, to graft on bare roots. This saves hours of work, pots and compost, but does bring in another problem. When the union is made and the scion starts to grow away on spring-grafted plants and conditions outside are unfavourable for planting, the answer would seem to be cold storage, as used quite a lot on the Continent and in the U.S.A.

I think a lot more problems could be solved and the plants produced more cheaply; for instance pre-callused hardwood cuttings held in a cold store until May or even June would root more readily than put into cold, wet soil in February or March. Our bare-root grafts can be planted when we are ready under much better conditions for both plants and planters. Stratified seed germinating too early can be held over until one is ready to sow. Dormant scions, cold stored and worked onto active roots stocks outside at a later date than normally possible may bring better results. A lot of experimenting could be done both in holding saleable stock for despatch and in propagation techniques.

One of the most important things that has happened to horticultural propagation in recent years is the possibility of producing anywhere on the ground a congenial atmosphere for plant production. What a chance here for experimenting with polythene. We have, ourselves, made some startling disclosures with successful rooting of many crops normally produced on glasshouse benches, such as Magnolias, Rhus and plants of this calibre. These were produced in polythene tubes with portable mist lines. It seems that with the correct timing and hormones anything can be rooted. It is possible in the future the conventional glasshouse may be obsolete.

I would like to take these ideas still further and try grafting in tubes of white polythene, either potted or bare-root stocks possible grafted and then planted in the beds, then cutting slits in the polythene to give air when ready, and complete removal of polythene when hardened. These plants could then grow on without further check. Removal from glasshouse to planting site and re-establishment would be eliminated. These are just some ideas that could be done. I am sure this must be cheaper production than an elaborate set-up, but I would like to know more about possible techniques with polythene.

ROBERT GARNER: The speaker will be interested to know that the "bin treatment" developed at East Malling for fruit rootstocks can be applied to a number of forest trees. Many

difficult trees and shrubs could possibly be successfully propagated by taking large hard wood cuttings after the winter chilling period, giving a heavy hormone dip, placing in a temperature of 70° — 75°F for one month and then planting out in the field.

## THE FUTURE OF MIST AND CAPILLARIES

MARK T. WALLIS,  
*Scott's Nurseries, Merriott, Somerset*

It was five years ago that a day visit to the Pershore College was arranged by the Bristol branch of the Horticultural Trades Association. On that day there were three displays there that were to alter my growing methods more than anyone could have imagined at the time — especially as I was not there! These displays featured

1. The Bloxer\*.
2. Various rooting media.
3. Capillary beds.

We now have nearly two acres of capillary beds in and out of doors using the N.I.A.E. method, this way we have a tank and ball valve maintaining water level in channels spaced five feet apart, 3 inches below the surface of the sand.

We have had three main problems to solve:—

(i) Removal of rain water. This, we have overcome by laying a land drain beside each bed.

(ii) Wind blowing plants over. This, we have only partially solved by caning and then supporting the tops of canes in strips of netlon held between two wires. For lower plants we sometimes use wind-breaks of some sort. This, must be a bigger problem when a soil-less compost is used.

(iii) The sand we use, obtained from Rockbear, Devon is inclined to pack hard and needs to be loosened between each crop. I hope we shall find a better sand to overcome this.

The biggest problem of mist propagation was weaning. I am sure the Bloxer and use of a high proportion of peat to sand in the rooting media has solved this with a few exceptions; these are *Skimmias*, *Loniceras*, *Osmanthus* and *Daphnes* which will only root successfully in pure sand. Why do these not root in peat-sand mixtures? Is it timing which I have found to be the case with *Eleagnus*, or is it that the peat remains too wet?

Now in what other ways can we improve and widen the use of mist?

With extra light at the beginning or end of the season and correct hormones I can see no reason why most hard wood trees should not root with worthwhile results. We have heard today about Birch and I have rooted *Acer Wisley Red*.