

THIRD SESSION

WHAT WE WANT TO KNOW COLD STORAGE IN NURSERY PRACTICE

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Cold storage in British nurseries is in most cases a very new technique, particularly where jacket-cooling, as used in Europe for the storage of plant stocks, is concerned.

Having used this system with considerable success since 1965 we feel that it is most important to enquire first how much further we can go in cold storage techniques. Answers to the following questions would considerably extend the economic utilisation of the cold stores.

- (1) Hardwood seed has been stored in Europe for twelve months; conifers much longer, up to about 4 years. Is it possible to extend this without losing viability?
- (2) What method of storage is most suitable? We have found that mould has developed in containers but surprisingly not in sacks.
- (3) What is the optimum temperature for various species — conifers and hardwoods? We have used 32°F here down to 28°F. On the Continent, I believe, temperatures down to -5°C are used.
- (4) Humidity is an important factor; 94-96% is normal at Tilhill. Is there any difference in requirements for conifers and hardwoods? Roses seem to attract mould more readily than most subjects; is it desirable to reduce humidity for these?
- (5) Storage enables us to plant at any month of the year but what is the maximum length of time that plants can be stored without damage and does this vary according to species? Nine months is the longest we have successfully stored so far.
- (6) What variation in storage methods is possible? Conifers for example are stored vertically. Can they be stored in a horizontal position which would save storage space? I understand that the Germans say this is bad but I have seen no evidence. We find a good container is available in second-hand wooden beer crates which are now no longer used by the brewers; hardwoods have been stored horizontally in a 7 ft. stack for six months successfully.
- (7) To what extent can fungi be controlled in such stores? This would appear to be linked to temperature in that the lower it is, the lower the risk of fungi.
- (8) What about scion and budding materials where method and length of storage are concerned?

- (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

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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-