

PROPAGATION FOR SPECIALIST USE

The Forestry Commission tree improvement program depends on the successful vegetative propagation of selected plus trees chosen for future seed orchards. The methods vary from species to species, but in practice Western red cedar, (*Thuja plicata*), Lawson cypress (*Chamaecyparis lawsoniana*), Western hemlock (*Tsuga heterophylla*) and Sitka and Norway spruce (*Picea sitchensis* and *P. abies*) are raised from cuttings, while Scots pine (*Pinus sylvestris*), Douglas-fir (*Pseudotsuga menziesii*), and European and Japanese larch (*Larix decidua*, *L. leptolepis*) are raised by grafting. The different techniques required have been discussed in recent forestry literature.

RECENT DEVELOPMENTS IN COLD STORAGE AT TILHILL

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The cold stores at Tilhill are of Danish design, that is an indirect cooled house, or jacket cooled. The stores, one of 10,000 cubic feet capacity and one of 22,000 cubic feet, were both constructed by our own labor working to plans sent from Denmark. The advantage in having such facilities, as many members know, is that nursery stock can be stored bare-root for many months, which means that a greater bulk of stock can be stored; also it is much easier to control humidity than in a direct-cooled house.

Mr. Dufresne, who is a refrigeration expert from Denmark, will be giving a separate paper on technical questions on jacket cooled stores, and I am sure he will answer any questions that members put to him. The first question to which we wanted an answer was, "How long could stock be stored and still remain viable?" For our trial we used 2-year seedlings *Picea abies* (*P. excelsa*); these were tied in bundles, bare-root, and put horizontally in slotted crates. Seedlings were put in the store in December, 1968. We transplanted 200,000 of the stock on 25th August, 1969 and achieved a 90% take. The plants were not damaged by autumn frost and made 3 to 5 inches of growth.

As it was too expensive to run our large stores, the balance of the stock, approximately 20,000, was transferred to a mobile refrigerated

Ed's note. Mr. Jackson then showed slides of his cold store, his methods of stacking and of transplanted cold stored plants including *Larix europea*, *Fagus sylvatica*, *Acer platanoides* and *Picea abies* (*P. excelsa*).

lorry, also jacket cooled. These plants were then held until the main stores were restarted in November and were then transferred. We transplanted this stock in January, 1970 and achieved a 70% take. We then potted 25 of the remaining plants on the 19th May, 1970 and of these 24 have survived. I have a sample of these plants for members to see, also a sample of the original plants as first stored in December, 1968. The temperature of the store was held at 32° F. and humidity at 94 to 96%. Although this trial only covered one species we were quite pleased with the results. Obviously much more information is needed on other species before any large storage of plants can be carried out.

Storage was another question about which we needed to know more. We had been storing conifers in racks in an upright position, as this was recognized practice. The drawback to this method is that a lot of storage space is lost. As we had large numbers of *Picea sitchensis* we decided to use crates to store the plants. The bare-root plants were tied in bundles of 50 and stacked horizontally in the crates. Size of crates was 2 ft. x 2 ft. x 3 ft. 10 inches, in order to fit our lorries. The crates were stacked 5 high on 5 in. floor pallets so as to permit a hand stacker to handle the crates. The stacks of crates were three deep with a gangway wide enough to handle the stacker. The plants were stored quite safely for five months. Using this method plants can be brought out of the store on the stacker 2 to 3 crates high and taken straight to the lorries where they are transferred to rollers fitted to bed of lorry. The crates are then pushed to front of the lorry and stacked.

We have had no major trouble with stock stored in this manner. It is important to ensure that stock is brought into the store with the foliage as dry as possible, and that plants with damage caused by lifting should be watched as mould can form on damaged parts. Thiram dust is blown through the store by hand blower to control mould.

I have with me several plants which have been in cold store for up to eight months for members to see.

GENERAL INFORMATION ON COLD STORAGE OF NURSERY PLANTS IN JACKET-COOLED STORES

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In 1956 the first jacket-cooled store room for nursery plants was erected for the nursery exporting company, Danplanex, of Rødekro, Denmark, and today cold storage of nursery plants has become indispensable for the modern European nurseries. During the past