Figure 2. *Cedrus deodara* 'Aurea' one year from grafting.

PROPAGATION OF DWARF ORNAMENTAL CONIFERS

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Te Kuiti

Annual production in our nursery is in excess of 30,000 dwarf conifers in containers.. I consider, by specialisation, we have been able to concentrate all our efforts on aspects of production and problems associated with the various species and cultivars.

I have been told that dwarf conifers are nature's freaks and it would appear, by the inability of most forms to set seed, that nature tends to conserve her species. We have found on rare occasions when a dwarf conifer does produce cones, the resulting seed is usually not viable or, if viable, plants true-to-type cannot be produced, e.g. *Pinus mugo* and *Thuja orientalis* 'Aurea Nana'.

Having observed the results of imported grafted dwarf conifers, I am convinced that grafting should not be practised unless cultivars are impossible to propagate economically by cuttings. In the same way an apple tree will respond to rootstock vigour, a dwarf conifer grafted onto a strong-growing seedling will lose its character.

All of our conifer cuttings are propagated under glass. We have an all-purpose house with heating cables on all benches which run at a temperature of 21°C. (70°F). We also have intermittent mist on half the benches.

We use a standard propagating medium of 2/3 pumice and 1/3 Irish peat. This gives us adequate drainage under mist conditions and sufficient water retention elsewhere. We have attempted to reduce the cost of our medium by introducing different types of sawdust in varying proportions but have found it too water-retentive over the long period it takes cuttings of some conifers to root.

While many propagators advocate large cuttings, in my opinion small cuttings ensure that the dwarf character of the plant is retained. Over several seasons we observed that by taking large cuttings from stock plants of *Chamaecyparis lawsoniana* 'Forsteckensis' any growth made the next season was progressively smaller and more different to propagate, but where smaller cuttings had been taken from different plants the annual growth rate was better and we had an appreciably better take. Since our discovery that many conifers are affected in this way we have, wherever possible, used the nursery row as a source of material.

Propagation commences in late summer starting with the more easily rooted cultivars. Where possible we try to make all our cuttings of wood that is somewhere between semi-mature and mature but the type of wood tends to vary depending on the species being taken. For example we have successfully taken very soft cuttings of *Juniperus communis* 'Depressa Aurea' but correspondingly soft cuttings of *Juniperus chinensis* 'Blaauw', due to the nature of the species, have been equally unsuccessful.

All of our cuttings are wounded and Seradix 3 (IBA 0.8 %) is used on all cultivars regardless of the type of wood used.

As most of our material is collected from the nursery row, it is relatively free from disease but all of our cuttings receive one application of Benlate fungicide after they have been set in trays.

In my experience, it is difficult to get two propagators who agree on the benefits of using mist on conifers. This, I feel, is mainly because for too long we have considered conifers as plants that, in the process of propagation, cannot be hurried. For many years I subscribed to that theory and we used bottom heat and manual misting usually once or twice a day. Since installing mist we have found the time taken for rooting has been greatly reduced. Some forms, however, cannot be hurried.

We tube our cuttings straight from the bench into a 1:1 mixture of soil and used propagating mix.

In summary I should like to say that I have been deliberately vague as to the specific time in which to take any particular dwarf conifer cuttings because I believe that climate and the particular state of one's stock plants, along with the method used, are more important in most cases. Timing is of paramount importance with *J. chinensis* [*J.* x *media*] forms and *Chamaecyparis ob-*

tusa forms. Here I feel, through unsuccessful experiences of attempting to emulate other propagator's timing, that a variation in climate from area to area is, perhaps, the key.

PEAT/SAWDUST MIXTURE AS A PROPAGATING MEDIUM

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While the properties of peat have been well researched and are known to all nurserymen, sawdust as a propagating medium has received surprisingly little attention. As far as I can ascertain the only New Zealand literature on the subject was produced by Mr. Charles Challenger of Lincoln College some ten years ago. I find it amazing that a material so readily available and with such obvious potential should have escaped critical analysis.

History. At Duncan and Davies we have been using sawdust as an integral part of the propagating medium for the last 14 years during which time a change was made from "pit" to "container" propagation. Sawdust was considered suitable because it had the following advantages:

(1) *Availability* – Most materials had to be imported from outside the Taranaki region, e.g. sand and pumice from the Waikato area. Sawdust was available from a number of local mills and a regular supply could be maintained.

(2) *Cost* – For a medium which is being used once only, it becomes important to keep the cost at a relatively low level. The extreme cheapness of sawdust, coupled with the excellent results achieved, led to increased trials and usage.

Earlier our mix was comprised of sand/pumice or peat/sand and, with the change-over to plixi trays as containers, these orthodox mixes appeared to be too wet. Trial work done with sawdust showed that here was a material worthy of further investigation. Some problems had to be resolved — whether plants grown in a sawdust mix would transplant into soil, and drainage problems with the container — not to mention the elusive rooting percentage!

Results continued to be highly successful and eventually led to the adoption of a *standard medium* consisting of: 3 parts sawdust, 1 part peat, and 1 part sand (or pumice). This mix has been in use up to the present day and is used on an extremely wide range of plant material.