Table 5. Effect of spacing on rooting of two *Chamaecyparis lawsoniana* cultivars[1] (Inserted 15 / 1 / '69. Lifted 10 / 4 / '69)

Cultivar	Spacing	Mean percentage rooted	"t" (df = 3)
'Fraseri'	Wide	64	
	Narrow	25	
			5.51
'Pottenii'	Wide	89	
	Narrow	68	
			0.188

[1] 4 replications of each spacing treatment

While most of the results presented in this paper have been obtained during trials carried out on a mist bench, other methods may be more economic since conifers take up bench space for a long period (8 to 11 weeks) compared with many other subjects. The cold frame with a sheet of plastic over the cuttings is an example of an alternative method adopted by some nurserymen. An efficient propagation schedule implies the integration of two or more methods, based on thorough knowledge of the response of each of the species and cultivar and the provision of the appropriate environment for rapid rooting.

SELECTION OF MATERIAL WHEN PROPAGATING LEYLAND CYPRESS

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X *Cupressocyparis leylandii*, the "Leyland Cypress", is a bigeneric hybrid having as its parents, *Chamaecyparis nootkatensis* and *Cupressus macrocarpa*. It was first noticed as seedlings amongst a batch raised from seed taken from *C. nootkatensis* in 1888 but since that time it has arisen on a number of occasions, sometimes with *Cupressus macrocarpa* as seed parent. Stock has been maintained by vegetative propagation and today a number of clones exist to which names or numbers have been given. For a long time this tree was considered as little more than a botanical curiosity. Its true worth came to be realized when its fast growth, hardiness and ability to

withstand exposure to wind made it a desirable tree for planting as shelter belts or in windbreaks. This resulted in extensive propagation but in recent years doubt has been thrown on the value of some clones because it is claimed that they are difficult to propagate.

I have had experience in the propagation of this tree over a period of about 10 years with moderate success. At about the time of these reports of difficulties in propagation, I was having trouble in rooting one batch of cuttings. These had been taken from an old tree at least 50 years old which had acquired a reputation for being very difficult to propagate, yet other people who in the past had material from this tree did not have these difficulties. Why was there a difference? Methods of propagation were similar and it seemed that there was only age which was basically different. I decided to carry out experiments to see if there was anything in this supposition. Besides this old tree which was probably clone 2 I had access to other trees of about 20 years of age and others of about 5 years, also of clone 2. Cuttings were taken during November and December prepared about 6 inches in length, their bases wounded and dipped into Seradix 3 and inserted into a rooting medium of equal parts peat and sand. Propagation was carried out in a glasshouse where the propagation beds had bottom heat and where the air temperature varied between 60° and 65° F; the experiments were carried out over a three-year period.

The results obtained were:

50 year old tree gave ..... 5% success,
20 year old tree gave .....34% success,
5 year old tree gave .....94% success.

After rooting, these cuttings were potted; when the pots had filled with roots these plants were moved into larger pots. When 2 years old further cuttings were taken from these plants and these rooted with 100% success. I was able to repeat the experiments with other trees of differing ages and from different sources and always there was a similar pattern of percentages.

It is well known that conifers are easiest to propagate when in their juvenile state and this has been borne out in these experiments. This selection of juvenile material for propagation is extremely important in a very wide range of trees and shrubs and with many difficult subjects this is often the only means by which success can be achieved.

On a commercial scale it is obviously impractical to use stock plants that are two years old but the juvenile state can be retained on stock plants by growing them on the hedge system with these hedges clipped annually. Tests carried out using material from these hedges have given very good results, comparing very favorably with young stock plants.

The experiments recorded are obviously incomplete and roughly carried out. Although I have tested a number of clones, these have

been unnamed and the entire range of named clones need to be tried before any definite results can be achieved. It does seem, however, that my work indicates that when selecting material of "Leyland Cypress" for propagating, it is important to ensure that it be in the juvenile state.

RESEARCH AND THE PRACTICAL PROPAGATOR[1]

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Experience and skill are prerequisites for successful propagation, but nurserymen are becoming more aware of the opportunity offered by research for improving existing techniques and developing new propagation methods against a background of decreasing availability of skilled labor and increasing production costs.

A most important discovery by research workers was the role played by hormones in controlling various responses in plants, including root initiation in cuttings, leading to the manufacture and use of synthetic auxins which have become an essential and singularly effective tool in the nursery.

There is evidence, however, that auxins are not necessarily used in the most effective way by propagators, underlining the need for applied research of the type done at the East Malling Research Station by N. Nahlawi, whose paper entitled, "The effect of dipping depth and duration of auxin treatment on the rooting of cuttings", won the 1970 Graduate Student Award of the Society.

He has discovered relationships between the rooting response of hardwood cuttings of plum rootstocks at a range of IBA (4 (indolyl-3) butyric acid) concentration and their dipping depth in the hormone solution and its site and duration of application. This work demonstrated that in propagation research, as in other biological fields, account must be taken of the fact that plants, or cuttings, rarely respond to one influence, such as auxin treatment, in exactly the same way under different conditions of treatment and environment. For this reason it is essential that techniques are based, wherever possible, on a sound understanding of the mechanism operating within the plant, so that the technique can be exploited with species or in conditions not previously experienced.

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[1]An abstract of a paper in which examples were drawn from the postgraduate studies of N. Nahlawi, which is given in full on page 292