

clearfelling and replanting with radiata". The intention always was to enlarge the area of redwoods for posterity. I think that is now well underway.

Finally, as far as the Libby article was concerned, the only jewel, on omission, was any mention of the Green Lake redwoods in Whaka forest. From memory, they were planted in 1914 or 1915 as a pure stand, and are now magnificent trees in a magnificent setting. There have been two heavy thinnings to my knowledge. Some indications of standing/thinned volume data would have completed the redwood article in a satisfactory way.

Neil Cooper  
Wellington

## Species diversity

Sir,

The last edition of your journal (38/3) included comments and articles on alternative species. In particular Mike Wilcox gave a good overview of the pros and cons. The most revealing comment he made was "Competition from radiata pine – the major impediment to growing other species".

While admitting that I am a committed corporate *Pinus radiata* forester, I also welcome species diversity. Like you I applaud the establishment of eucalypts and Douglas fir in Otago and Southland. Each of these projects is however characterised by the creation of a sizeable resource by a single owner with clear end-use objectives. In addition, the species chosen are the better known and understood alternative species.

I also applaud the farm foresters and small land owners who plant a variety of species on their land in order to create shelter and to beautify the landscape, or just because they like trees.

What concerns me, though, is the pressure for species diversity for diversity's sake and the expectation by some land owners that they will make a fortune by planting "flavour of the year" species.

To quote from Heather McKenzie's article "... occasionally with success, but farmers are still faced with uncertainties in choice of species, seed source, siting and silvicultural management". With respect, I would suggest that she could have added site preparation, weed control, nutritional requirements, rotation length, growth and yield, stand health, processing methodology, market demand and ultimately financial return to her list of uncertainties.

Geneticists have already created new breeds of radiata such as long internode, high density and Dothistroma resistant. With the use of molecular biology that list may well be extended to include radiata pine that is ground durable, resistant to Asian Gypsy Moth etc. Work of this nature is easy to justify when it is based on a resource of 1.3 million hectares. Historically the genetic improvement programme has produced an average volume gain of about 1% per year for each year of research. This modest gain currently costs approximately \$1.5 million per annum yet has a financial return that is justified because of the size of the resource. To get the same financial return from an alternative species with a significantly smaller resource, probably longer rotation and lower yield but perhaps higher stumpage would require annual volume gains so high as to be inconceivable.

What could be more diverse than a species who's silvicultural regime can be manipulated to produce anything from Christmas trees to high-quality finishing grade timber, that will grow on sites ranging from raw coastal sands to heavy clays and in an equally diverse range of climatic conditions?

Before investing large sums on research on alternative species I suggest that careful consideration be given as to what the financial return is likely to be if the same sum was invested into further research on radiata pine. We like to think that we lead the world in our management of radiata. Why not maintain that advantage rather than diluting it by research on species that have little hope of matching the diversity and financial returns of radiata.

But I guess I am now beginning to sound like a "born again" corporate *Pinus radiata* forester.

Paul Smale

## Dennis Richardson thinks aloud

Sir,

When Dennis thinks aloud, he is usually provocative and often controversial. His latest discourse and plea for the aesthetic delights and diversity of forestry, as distinct from plantation management and indigenous paralysis, strikes a responsive chord. Oh for some *schleichwirtschaft* or even *Femelschlag*!

I must take issue with his remarks about the redwoods in Whaka Forest. The Grove has always been a grove since

1948, if not before, and it is not, and never was, a failed larch mixture. On the contrary, and like the old Douglas fir down the Long Mile, it was a very successful use of larch as a nurse – just a glimpse of some higher achievement in forestry. No researchers devoid of common sense would even dream of replacing the Redwood Grove with radiata, and practitioners have always admired Douglas fir. In conclusion, I have never heard of poison-thinned larch.

John Ure

## Travel bags for trees

Sir,

In the August 1992 issue of NZ Forestry I read the short article on "Travel bags for trees" and how they were used to ship millions of young trees around the country in comfort.

Your article reported that the new bag offered some real advantages.

As flexible packages, polythene- and multiwall-type bags cannot protect trees properly during transport and field handlings. I would be grateful if you could give some publicity to this in the next issue of NZ Forestry. Many initial growth problems can then be avoided.

Barerooted stock handling and packaging trials at NZFRI and other institutes world-wide have demonstrated that handling barerooted stock in flexible bags, alone, can have very detrimental effects on initial survivals and especially on growth.

Because of research findings and practical experience I was concerned when NZ Forestry published the article. However before being too critical of the newly advocated bags I felt I should examine the multiwall bags and give them a fair evaluation. This is the reason for the long delay in commenting on your August 1992 publication.

In 1993 I was surprised to see bare-rooted pine seedlings being lifted into polythene bags, in one of our largest nurseries, and left lying on beds awaiting transport, unshaded. Later I was not surprised to hear from several planting gangs that seedlings shipped in polythene and multiwall bags (as described in your article) were arriving at the planting-hole in poor condition. Apart from exposure and several handlings during lifting they were being crushed during transport and when crammed into trailers and onto farm-bike racks for planting site distribution.

During the recent rapid escalation in new plantings much pressure has been

placed on nurserymen to grow, harvest and dispatch very large numbers of trees at short notice. The easiest and cheapest way to transport trees is in bags and many uninformed clients are happy to accept this form of packaging. If bags are handled extremely carefully damage is minimal but some handling damage is impossible to avoid and is not easily detected. Evaluation of root damage of bagged trees, during transport over rough roads, showed that approximately 90% of roots had been fractured (fractures were visible only through a magnifying glass).

Handling and transport damage is difficult to detect and not always apparent until several months after planting when trees fail to establish and grow quickly. By then it is too late to do anything.

Failures and poor growth, due to poor outplanting practices, are often blamed on poor planting. Poor planting techniques that twist roots will not adversely affect initial growth as long as roots are buried. However, roots twisted at planting will not support fast-growing stems, and so they

are prone to topple and develop butt-sweep.

Due to the dramatic increase in plantings well-trained workers and especially experienced supervisors are scarce. Some poorly supervised planting gangs openly confess to planting as many as three thousand, and in a few cases four thousand, trees per day. The reason given for this fast planting, which leads to root twisting and poor tree stability, is that poor pay rates make this necessary. Many experienced land owners now pay planters a daily wage and, with careful supervision and good bonuses for quality, excellent results are achieved.

Mistakes made at planting are long-term. They frequently persist during the crop rotation of 25-30 years and reduce log values significantly.

Attempts to replant (blank) failed trees should not be undertaken unless there are large gaps (two or more adjacent dead outplants). Blanked trees rarely catch up with older trees and are usually removed at the first thinning. Propping or sodding-

up toppled trees is also very expensive and not always successful.

Well handled and planted seedlings get a good start after outplanting and compete better with weeds and are also less likely to be affected by pests and diseases.

I trust these comments on tree handling and planting will help raise awareness of the importance of good outplanting practice.

If readers would like further information on handling and outplanting it is suggested they obtain a copy of "A Fully Integrated System for Planting Bare-rooted Seedlings of Radiata Pine in New Zealand" Reprint No. 1909, from the FRI Library, Rotorua.

**A.R.D. Trewin**

# WHEN IT COMES TO FOREST THE GENETICS, REPLANTING TRAINING AND *for the*

You could be forgiven for thinking that forestry is just another high flying, boom industry.

So, what's all the fuss about?

It's hard to imagine that trees could be the focus of so much time and attention.

After all, idly standing around for thirty years

waiting to mature, doesn't seem that difficult.

Over the years we've learnt that our business is not just about trees.

It's about research into the rapid propagation of genetically improved trees.

It's about continually reviewing our forest

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