

appear to provide ample flexibility for growers, with timing of commercial thinning and clearfelling at their discretion within the bounds of prudent management. The plan may be prepared by an Owners Association, the National Board of Forestry or a private consultant.

Detailed Swedish forestry mensurational information is derived from the ongoing national inventory, carried out in two distinct parts. Long-term strategic forest policy related data are gathered in the National Forest survey, implemented by the Faculty of Forestry at the Swedish University of Agricultural Sciences. The general Forest Inventory, covering all private property over a 10-year period, monitors forest condition. Stands outside the minimum requirements are identified and owners advised.

Given the vast national forest resource of 23 million hectares (57% of Sweden's area), the small compartment size, especially in central and southern Sweden where private growers are dominant, is quite eye-catching. A typical forest we saw, of 74 hectares, had 25 compartments, ranging from 0.6 to 7.9 ha. Age classes, expressed in five-year groups, range from five to 125 years – our grower's forest covers 13 of these possible 25 classes. Swedish private forest growers aim for the widest spread of age classes to even out their financial returns. Herein lies one of the greatest contrasts between Swedish and New Zealand private forestry. While the Swedish rotation is three to four times as long as ours, the Swedish grower's earnings are regular, often even an annual cash crop. Of course, this situation is due to the typical commercial thinning programme of three or four treatments, as well as the wide age class distribution.

This type of forest management, with its regular earning capability, is central to the economic viability of the private forest resource in Sweden. There are over 200,000 owners controlling 50% of the total forest area, with average holdings of 48 hectares. Derivation of an internal rate of return in our terms appears to be irrelevant. If forest growing was isolated as a separate cost, we were told that 1% I.R.R. would be typical. The Swedish forest resource predates ours by several decades, having been established in the mid to late 19th century. It is not, however, a "free" natural forest, as it was systematically planted by the early reforestation movements following devastation of earlier tree crops.

As New Zealand's second crop approaches maturity, investigation into suitable harvesting equipment will intensify. To date most Swedish equipment has not been suited to our conditions, due to the very different requirements.

## Commonwealth Heads of Government Meeting, Kuala Lumpur – Oct. 1989

Amongst the resolutions agreed to by the Commonwealth Heads were three dealing directly with forestry. They were to:

- promote afforestation and agricultural practices in developed and developing countries to arrest the increase in atmospheric carbon dioxide and halt the deterioration of land and water resources;
- strengthen efforts by developing countries in sustainable forest management and their manufacture and export of higher value-added forest products and, in this regard, support the activities of the International Tropical Timber Organisation and the Food and Agriculture Organisation's Tropical Forestry Action Plan, as well as take note of the recommendations of the 13th Commonwealth Forestry Conference;
- support activities related to the conservation of biological diversity and genetic resources, including the conservation of significant areas of virgin forest and other protected natural habitats.

## Resource Management law reform

The new Resource Management Bill is currently being drafted and is expected to be introduced into Parliament later this year.

The reforms proposed will require the new authorities to meet a wide range of objectives related to environmental qua-

lity, sustainable development, ecosystem values, the needs of future generations, and social and economic considerations. There will also be increased opportunities for public participation in developing plans, opposing consents and ensuring compliance.

Central Government will continue to have a general overview on resource management issues, retain a role in the management of hazardous substances and coastal areas, and administer the legislation.

A feature of the changes is giving responsibility for decisions to the community of interest most affected. In this way decisions will be made by those who are closer to the resources and have a clearer understanding of the impact on the environment. (Environment Update, Ministry for the Environment).

## Forestry training at University of Waikato

The University of Waikato announced recently that it was to inaugurate a specific stream of its B.Sc. (Technology) in Production Forestry. To do this it will link with Waiariki Polytechnic in Rotorua which currently has responsibility for training. In addition it is seeking funding support from the forest industry to recruit additional lecturers.

The degree is to be a four-year programme in which one year is to be spent in work experience in the industry, for which students will be paid. A flexible programme is envisaged using current courses in basic sciences, management, economics, computing and statistics with a core group of applied forestry courses.

Behind the specific machinery, however, is the Swedish development process, or "creative triangle" between research, grower and manufacturer. If this process can be further "internationalised" we may find that Swedish skills could be of great value to us.

In forest management and processing, we have much to benefit from further extending our association with Sweden.

**K.M. Jamieson**

## Forestry research funding

According to Dr Colin O'Loughlin, Ministry of Forestry, Wellington, Professor Ferguson's report on the funding of forestry research in New Zealand has been received. It is currently being considered by the Ministry and the industry.

Dr O'Loughlin said the report recommends the setting up of a forest industry research organisation designed primarily to secure funding for the Forest Research Institute in Rotorua. However, the review considers all groups involved in commercial forestry research in New Zealand. The non-commercial aspects may be the subject of a future review.

## Local Government reform

On November 1, 1989 the number of local authorities and special purpose boards in New Zealand decreased from about 600 to 13 regional councils, 73 district councils and one unitary authority. The functions of the previous special authorities in the areas of pest destruction, drainage, water and soil conservation and noxious plants control will be carried out by the new regional or district councils. (Environment Update, Ministry for the Environment)

## Mountain Lands Committee

The New Zealand Mountain Lands Committee has recently been formed as a sub-committee of the Lincoln College Council. Dr Andrew Pearce of FRI, Ilam, was one of the Institute's nominations and has been accepted for the Committee which is to be chaired by the Hon. Sir Clinton Roper.

The Mountain Lands Committee will provide advice to the Minister for the Environment on matters affecting the use and well-being of the mountain lands.

## Paper mountains

A consulting engineer, John O'Grady, is reported in "Environment Update" (Ministry for the Environment) as noting that the national average amount of "rubbish" produced per person has increased from 0.7 to 0.73 tonnes per person per annum in the period from 1982 to 1987. In Wellington, however, the increase has been from 1.29 to 2.0 tonnes per person per annum!



## Soil fertility in the tropics

Sir,

John Halkett's article on tropical forests, in the August issue of NZ Forestry, provided a timely reminder of their continuing inexcusable devastation. However, one aspect of his otherwise excellent article requires comment. It concerns the claim that "the underlying soils of tropical forests are incredibly poor". This is a commonly expressed view, in both popular articles and in some scientific literature. However, it is a generalisation, and, like many generalisations, is not very accurate.

Some tropical forests do grow in extremely poor soils, where a very high proportion of the available nutrients are tied up in the vegetation or are cycling within the biogeochemical cycle. In these situations, as Mr Halkett points out, disruption of the cycle can rapidly lead to ecosystem deterioration and worthless wastelands. Tropical forests also grow in fertile alluvial soils and on young soils from volcanic ash, in regions such as Papua New Guinea, Central Africa and parts of South-East Asia and Central America.

The Amazon basin, about which much current concern is being expressed, contains a wide and complex variety of landforms and associated soils, ranging from fertile alluvial and padi-type soils to extremely infertile ultisols. Thus the

common claim of highly infertile soils across the whole region is not correct. Of course, the other points of concern in Mr Halkett's article are very important and should encourage us all to lend our support to a more sensible approach to the conservation of these forests.

John Adams  
Senior Lecturer in Soil Science  
Lincoln College

## Tropical forests

Sir,

Reading the article on tropical forests I noted that there was little emphasis on the subject of replanting trees on a vast scale. There was a lot about preserving the tropical forests.

When discussing the 'Greenhouse Effect' meteorologists can show graphs illustrating the progressive increase in world temperature; which they assert can be attributed to the effects of the industrial revolution. However the trends are far older than that, and go back to the dawn of agriculture.

Since that time to assist mankind's struggle to grow food each year forests have been ruthlessly cut out and burned! To this day a major component contributing to the 'Greenhouse Effect' is carbon dioxide, much of which could be absorbed if there were more forests to do this.

In rough terms, every man, woman, and child alive requires not only about one tonne of food each year, but also uses about one tonne of wood and wood products. In rich countries much of the wood product takes the form of paper and populations have access to and can pay for fuel alternatives of coal, electricity, and petrochemicals. The use of sawn wood for building and furniture lies between 0.03 cubic metres per capita per year in poor countries, and about 0.4 cubic metres per capita per year in wood rich countries. For the majority of mankind living in poor countries the green weight of fuelwood exceeds the demands for paper in rich countries. It is not easy to cook one kilo of food using less than one kilo of dry wood. Who wants to eat raw potatoes, kumara, rice, or other grains?

Some four billion people in the world will cook their food every day using wood fuel for the foreseeable future. At, say, two hundred tonnes of green wood per hectare one can work out how much area of forest will need to be replaced by planting each year! Some 10 million hectares of fuelwood plantations must be replaced each year if we are to survive; on top of any conservation of rainforests that occurs!

K.D. Marten  
Taupo

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