

these land owners want the trees removed and the stumps eliminated. Despite the poor form, there are still furniture manufacturers, tool handle makers and fuel merchants who want this lumber. It struck me forcibly that we know that we can grow these trees well here and we are told that there is much land in New Zealand which needs to be used profitably but is not really good enough for horticulture, nor even sometimes for pasture farming.

The proof that we can grow hickories in general and pecan trees in particular over a wide range of our soils can be seen in the trees that grow in diverse conditions where salt water is close to the root zone, or there is sloping land of a heavy clay structure, as well as the more traditional deep alluvial soils. These have all produced healthy trees in this country. Apparently the only soils to be avoided are the blue-grey soils of swamps. This family of trees needs air to be able to get to the roots along with moisture. However, floods that lap around the trunks and leave quantities of silt do not harm them at all. Wind is a problem and possums can also be a nuisance on the new spring growth. Most of the pests and diseases found in North America are not in this country, nor are they in Australia.

There are two examples of pecan trees that I would like to illustrate. In the Auckland suburb of Avondale there is a 40-year-old self-sown seedling from a neighbouring pecan tree. The photo shown of this tree was taken when it was less than 40-years-old. The current size is about as follows: height to first limb, six metres; diameter breast height, 160 cm. The soil is a first-class deep alluvial one.

A few miles south of the Bombay Hills in Serpell Road off State Highway 2 there lives a farmer and race horse breeder by the name of Percy Ryburn. The soil here has about 50cm of top soil over clay. In 1981 he was offered a number of very young seedling pecan trees. He planted 87 of these close to his house just because he liked the look of them. He contacted me a few years ago to try to get them grafted to named varieties but they were already quite tall and he did not want them cut back. He is now very pleased with his trees, as some are starting to produce a few nuts, but he particularly likes them for the beauty and shade. He tells me that if he was younger he would plant them "all over the farm", even if it meant fencing off each one to keep the animals from eating the leaves.

The question as to whether the tree is worth growing is best answered from the assistance that I have received from Mr Ian Nicholas and I hope he will not mind me quoting him here. In an effort to find out how good New Zealand grown pecan



A hickory tree in Avondale, Auckland, just under 40 years old – a straight tall tree suitable for milling.

timber is for strength and density I provided Ian with the trunk of a 12-year-old seedling pecan tree from my home in Mount Albert, Auckland. This was carefully dried at FRI, Rotorua and tested against the US Wood Handbook standards for what is described as "true hickory". The last sentence of the report states: "It must be concluded that NZ grown pecan hickory, as represented here, has the potential to produce high-quality impact handles."

I am told that hickory clean white sapwood is sometimes imported into this country at a price of \$1800/m<sup>3</sup> for the manufacture of sulkies for harness racing. This I concede would use a very small quantity and certainly comes under the heading of specialised end-use, but this is not the only end-use for this beautiful timber. Visitors to North America may already have seen fine furniture made from both pecan solids and veneers. (There are several fine examples of this furniture in New Zealand.) We have mentioned the use as tool handles and few people need to be told that hickory handles are still rated the best on the international scene. It is used also in North America to make charcoal for barbecue fuel and has also been used as firewood over many years and appreciated for its great heat while burning. It is also a beautiful amenity tree. Please note that pecan nuts are not generally very good from ungrafted trees and any usable crop should be regarded as a bonus.

There seems to be a situation where no one is planting pecan or other hickory trees for future timber use but relying entirely on the seemingly inexhaustible supply in North America. Such countries as Japan and Taiwan are listed as importing hickory timber from USA and I understand that it is being imported by Great Britain and Europe. If I read the signs correctly there will be a need for pecan/hickory timber at about the time that trees planted now will be ready for milling. The question now is do we take advantage of a potential situation or do we wait for the shortage to be here and then rue the day that we did nothing about it? There is no disputing the fact that the world wants hickory timber. The real question is what do we do about it?

Perhaps the final argument, very relevant at this time, is for erosion control with a potential income. Here is a species of tree that we know grows well in many parts of New Zealand and that has an extremely robust and deep-rooting system. This includes both widespread feeder roots and a very deep tap root. The tree also lends itself to coppicing, which means that after felling, new shoots from the stump can be selected to grow new trees without having to disturb the fragile soil just to remove the stumps. It is believed that this new growth from a coppice will produce new strong trunks with two to three times faster growth than the original tree. I am told by FRI people that hickory (*Carya spp.*) trees are one of a small group in which the faster the growth the stronger the timber.

It seems logical therefore that if a cut was made for tool handles at about year 20 and the new coppiced growth selected and trained upwards, the grower of pecan trees should have a continuing income from his woodlot for many years to come. Progressively, if the trees were planted very close together to force the trunks up towards the sunlight, perhaps the first cut for thinning could be made for firewood at about year ten, the second cut for coppicing at about year 20 with some trees deliberately left for furniture at about year 35 to 40.

## Forest Service memoirs to be published

A book containing a mix of historical chronology and informal anecdotal reminiscences as well as a pictorial record of the Forest Service is scheduled for publication early in the new year.

The book utilises anecdotal material

assembled by freelance writer Brian Mackrell at the instigation of Director General Alan Familton during the Forest Service's final year. This material has been revised and supplemented by former Forest Service staff John Halkett and Peter Berg. They have also written an historical outline of the natural and social heritage which the Forest Service has bequeathed the nation.

The text is complemented by more than 100 black and white photographs which portray the people, places and activities of the Forest Service.

This book is not intended to be a formal history, but rather an attempt to show the human face and range of activities performed by the Forest Service.

"Tree People" will be a limited edition publication and will be sold largely by way of a discounted pre-publication offer.



John Halkett and Peter Berg sorting out photographs for "Tree People".

## *Paulownia* – its potential role in NZ agroforestry

Tony Firth

China is the home of *Paulownia*. Many of its people live a rather drab existence through economic necessity but they do enjoy a good festive occasion and love colour. A common saying amongst the people, who are largely restricted to one child per family, is that if you are unfortunate and are blessed with a daughter rather than a son, plant a *Paulownia* tree. This single tree will eventually pay for a good wedding with trimmings and provide a dowry as well. Meanwhile it will provide colour with its beautiful flowers, nectar for the bees and food for the animals to eat. That of course is in China, with its

distinct continental climate with cold dry winters and hot wet summers, making it ideal for a deciduous species. Under these conditions, *Paulownia* fits well into the "Forest Net" shelter system and "Four Side" (open grown) agroforestry pattern or for city avenue, canal bank or boundary plantings so common in China. Professor Zhu Zhaohua, *Paulownia* Project Leader, China Academy of Forestry, Beijing, sees a rapidly increasing use of the genus for the area to the south east of a line between Beijing and Tibet, at altitudes from 500 m to 2000 m. It has high tolerance to cold winter conditions whilst in its dormant

leafless state and can reputedly withstand  $-10^{\circ}\text{C}$  to  $-20^{\circ}\text{C}$  frosts, dependent on species, of which nine are currently recognised.

*Paulownia* timber of a quality acceptable to the Japanese market is very valuable. In Hunan Province we were shown a small log 4 metres long with mid-length diameter of 25 cm. This, we were told, was worth 600 Yuan or equal to a scientist's salary for two months and this from a 12-year-old tree. Site fertility, as seen, was never particularly good – yet 16-year-old trees had diameters approaching 40 cm. Wood density of *Paulownia* species is low, ranging between  $250\text{ kg/m}^3$  and  $300\text{ kg/m}^3$ . It seasons well, is highly stable, peels well and produces an excellent finish with a silky feel. Utilisation appears extremely broad, ranging from construction to musical instruments, but with strength restrictions due to its low density.

The preferred method of growing this genus to timber size is to concentrate on producing a 4-6 m butt log in the nursery, where plants are set at roughly  $1\text{ m} \times 1\text{ m}$  spacing, regularly watered and fertilised, with the aim to produce a 4-6 m pole without branches. These are root pruned and dug out just prior to leaf fall for outplanting at wide spacing, ranging from 50 to 200 stems per hectare, dependent on land utilisation type. Trees planted in this fashion apparently do not suffer mortality or stability problems but lifting and planting must be time-consuming. This method, however, ensures a butt log free of knots from the time of planting.



Professor Zhu Zhaohua with nine-year *Paulownia elongata* in Beijing.