



**We're not asking you to save the world  
Just to make a stand**

*Quercus leucotrichophora*, (also known as Banj Oak, Himalayan Oak, White Oak) has several characteristics that indicate a high potential to stabilise eroded land and act as a nurse tree for indigenous species.

The tree is endemic in the mid regions of the Central Himalayas, India extending to Pakistan, Myanmar, Nepal, Thailand and Vietnam at an altitude from 1300m - 2200m above sea level.

The Banj Oak was first planted in New Zealand by Douglas Cooke, Eastwoodhill in the 1950's as a single tree.

Since the late 1990's the Ranichauri Eastwoodhill Trust, a registered charity, has been propagating trees, initially from acorns (under quarantine) supplied by Dr Sah Ecologist G B Pant University Hill Campus, Ranichauri, India. The young trees have been sold to interested landowners, Regional Councils and the general public. All funds raised have been remitted to the Himalaya Consortium for Himalaya Conservation HIMCON. The group at village level use the funds to propagate and plant Banj Oaks and other species to conserve their dwindling forests. Money is used to assist with education, water storage and areas they see as important. HIMCON provides an annual report.

To date several thousand Banj Oaks have been planted throughout Aotearoa, New Zealand. The East Coast of the North Island is where the greatest concentration has been planted by landowners, who have by experience come to appreciate the value of the tree and its current and potential valuable contribution on several fronts.

In the almost 30 years of experience with the tree in New Zealand, much has been learned as to its culture and value.

## **PREFERRED SOIL TYPES**

The soils of the mid Himalaya's are fragile, containing broken Mica Schist, Granite etc. caused by seismic upheavals 60 - 70 million years ago.

Today, the soil in which the remaining forests are growing has high levels of organic carbon content, is loamy, acid to neutral and excessively drained. The Banj Oaks have adapted to these conditions sending their roots deep into the subsoil.

In NZ the trees flourish on well drained soils with good moisture, but they will not perform in heavy continuously wet soils including those with high water tables. Banj Oaks planted on steep low moisture content soils in Hawkes Bay are initially slower growing but once their roots penetrate the sub soil they are performing well.

## GROUND RETENTION

The Banj Oak has a deep rooting system which penetrates the subsoil making it a valuable asset in the stabilisation of steep erosion prone land. According to a publication (Forests of the Himalaya's by J S Singh and S P Singh 1992), the Proportion of coarse roots in total biomass is especially higher for Banj Oak (*Quercus leucotrichophora*) than for other species including other oaks (28% vs 15-20%).

Among the various oaks, Banj Oak is known to be the most resistant to tree fall because of its more massive root system (Troup 1921). The massive root system of Banj Oak may also indicate that soils are deeper in the Banj Oak site.

Anecdotally the Banj Oak root system appears to have the ability to draw water up from the sub soil and release it at ground level. To date this has not been scientifically proven but farmers in the lower Himalaya's who still have Banj Oak trees value them as they have observed that the soil under them is always moist, whereas under the Deodar Cedar and Pines the soils are always dry

The annual drop of the large evergreen leaves over the years creates a deep litter high in nitrogen making a perfect bed to establish indigenous species which as we know in the open, unless carefully cared for have a high attrition rate.

The Banj Oak in NZ has shown the ability to coppice on felling of young trees. The following photo shows that this may also be the case with older trees enabling the root system to remain active, and thereby ensuring that the surrounding soil remains stable. In India, research has shown the that trees up to 20cm diameter coppice well but above that the coppice ability weakens. It is yet to be proven that older trees in NZ will coppice well.



Photo 1. Shoots appearing 3 weeks after felling June 2022

## TREE HABIT

A Banj Oak in a forest situation grows tall and straight but grown in the open they tend to throw many lateral branches forming a round headed tree. In India, apical dominance of the Bank Oak is weaker than other oaks. From NZ experience it is recommended that the lateral branches are removed early in the tree life. Lateral branch removal will allow the tree to put its energy into vertical growth.



Photos 2 and 3 of 1 year old trees before and after lateral branch removal.

The following year to leave or remove lateral branches will depend on the intended end use of the tree, e.g. for timber, additional laterals should be removed, whereas if the intention is to form a hedge, laterals would remain.

Should double leaders appear early removal recommended as steep angled double leaders will break out in high winds, thus creating access points for fungal/bacterial infection to enter.



Photo 4. Murray Linnell beside a multi leader Banj Oak at Tutira Regional Park one of the first of 80 Banj Oak trees planted in 2001 at Lake Tutira under the direction of Garth Eyles Hawkes Bay Regional Council.

We have since learned that all trees should be trained in their early years as a single leader. If not, as this example shows, there is the potential for the tree to split apart.

## **CARBON SEQUESTRATION**

To date there has been no scientific work carried out in New Zealand on Banj Oak carbon sequestration. There has and continues to be scientific work on Banj Oak carried out in India but due to the degradation of the forests the results are compromised.

Dr Rajesh Thadani, Delhi, who has spent many years working with the Banj Oak and has produced the following research paper: CEDAR, 2011. Linking Community Development and Carbon Sequestration to Address Forest Degradation in Uttarakhand Himalaya. CEDAR, Dehradun.

He comments that “The Banj ecosystem does sequester a lot of carbon - especially if it’s not disturbed. But given heavy disturbances in Banj forests, rates of carbon sequestration are not that great.”

“However, Banj is really rich in providing of ecosystem services. It supports a very rich soil biota and helps in accelerating by soil formation. Banj soils are fertile - in part because they translocate a relatively small amount of nutrients. Most nutrients are retained in leaves and fall to the forest floor - it’s why the leaf litter is such a good source of compost fertiliser and it is extensively collected”.

The Banj Oak grows faster in New Zealand than India, forming massive canopies of large evergreen leaves. Therefore, it is entirely believable that the Banj Oak would be a valuable tree in Carbon Sequestration.

## **POTENTIAL COMMERCIAL VALUE**

Based on two small trials, from NZ grown Banj oak, is showing potential as an early maturing high quality hardwood timber. This is evident from the trial in small boxes made from the Banj Oak timber (Photos 5, 6 and 7)



August 2018 Peter Maclean a furniture maker from Clive, worked with a small piece of Banj Oak from a 10year old tree, designed and made the 4 tiny boxes Photo. Peter was impressed with the quality of the wood from such a young tree rating it highly.





Later in 2022 Peter constructed 100 tiny boxes from a 15yr old Banj log Photo 5,6 He rated the timber in the top 10% of the 90 species that he had had through his workshop.

The tiny boxes are being sold to raise funds for the Ranichauri Eastwoodhill trust.



In June 2022 a few 20-year-old Banj logs which had been thinned from the main planting at Lake Tutira Regional Park were made available for testing of the oak as timber. The logs were milled by Wilton Hartree (Puketapu) but due to Covid the milling of the logs was delayed until February 2023.



Wilton Hartree's Wood Mizer saw with a Banj Oak log



Timber planks produced from a Banj Oak log



Dressed plank showing heartwood to the bark. The timber planks appear to be behaving well. Once dry, they will be used to make demonstration furniture.

It must be emphasised that this is a small sample and very early days. Should the trial prove successful there is the potential, under the right conditions and in the right location to grow a fast-growing hardwood. The timber could be used for veneer, furniture, flooring, etc. Being a White Oak there is no sap wood the entire log can be used.

## **TRUFFLES**

2017 Southern Woods Nursery who have successfully inoculated suitable species with truffle were approached re a trial with Banj Oak. Suzy Mannall, Director of Southern Woods agreed requesting 100 acorns to carry out the trial which were supplied from selected mother trees at Havelock North. In 2018, Suzy reported that a successful trial had taken place with Banj Oak being inoculated with Black truffle, Burgundy truffle and Bianchette truffle.

The International Oak Society were notified with Roderick Cameron, current President reporting that this was a world first. It remains to be seen what productivity will result from the inoculation.





A 15-year-old Banj Oak in Spring foliage in the park opposite the Hastings District Council head office land.



15yr (2016) Banj Oak (untrained) on steep land at Tutira Regional Park. Based on observation over the last 20 years The Banj Oak has a proven ability to stabilise this type of erodible land.

## **GIRTH MEASUREMENTS FROM THREE LOCATIONS**

Measurements have been taken from Banj Oaks planted at Eastwoodhill, Lake Tutira Regional Park and the authors trees at River Road Havelock North. The trees from the three sites are of approximately the same age: 22 years. The influence of soil type and rainfall on tree growth is clearly exhibited by the following girth measurements.

Tutira with relatively high rainfall and light free draining soil shows the greatest growth with girth ranges from 113 cm to 160cm with an average of 144 cm.

Eastwoodhill Ngatapa Gisborne generally has good winter rain but often very dry summers. There the girth ranged from 118 cm to 137 cm with an average of 127.5 cm.

At River Road Havelock North site, the trees are growing on compacted river silt with a hard pan in the subsoil. In addition, the trees are subject to summer drought. There the girth ranges from 62 cm to 144 cm with an average of 91.cm.



Robert Flanders: A longtime advocate for the Banj Oak standing between one of his 6m hedges sheltering a Kiwifruit block and young trees to be planted as more shelter.

## IN SUMMARY

Based on observations over the last 30 years in NZ, the Banj Oak has a proven ability to stabilise steep land. It is becoming increasingly popular for hedging on horticultural blocks as its roots are non-invasive and the canopy trimmings are light and hence do not require heavy mulching machinery. In the pastoral situation the leaves are palatable to stock, making it a food source in times of drought. Subject to trial results, Banj Oak has the potential to be a fast-growing hardwood, and a producer of truffles.

## TREE AVAILABILITY

For all orders, please contact	<a href="http://www.planthawkesbay.co.nz">www.planthawkesbay.co.nz</a>	Marie Taylor, Plant Hawkes Bay Ltd Mob 0274 424 536
For more details on HIMCON on Facebook	<a href="https://www.facebook.com/BabaJaladhari">https://www.facebook.com/BabaJaladhari</a>	
For information on the Ranichauri Eastwoodhill Trust	<a href="http://www.himalayanoaks.com">www.himalayanoaks.com</a> <a href="https://www.facebook.com/himalayanoaks">https://www.facebook.com/himalayanoaks</a>	David Cranwell - Founder Ranichauri Eastwoodhill Trust Mob 021 50 3000

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