Hearts of Oak

The Oaks of Eastwoodhill

Story & pictures by Garry Clapperton

From small acorns …the oaks of Eastwoodhill show their mettle — surviving and flourishing in the worst of droughts, to burst into vibrant colour in autumn.

EASTWOODHILL Arboretum, which holds New Zealand's largest tree collection, is located on the dry East Coast, at Ngatapa, 35 kilometres north-west of Gisborne. It's an area where climate plays a big part in the life of farmers and gardeners, and arboretum curators.

I've been curator at Eastwoodhill for the last twelve years and have experienced many extremes of weather …from cyclones to drought. Severe events like Cyclone Bola are hard to forget but even the more mundane weather extremes have their effects on Eastwoodhill's trees.

This most recent dry spell has been no exception.

Average annual rainfall was right on target until mid-November — when it all stopped dead. Soil water levels were good following a mild winter and wet spring and the drought became serious for us only in early February.

But watering had to begin in earnest then. At this time of the year hills to the south-west keep any passing rain away from us, and north-west rain doesn't reach us. By mid February, we were battling to get enough water to the trees.

Our poor soils mean many younger trees, and a few mature ones, are under stress. Yet everything has its positive side, even a drought, and we note some species such as oaks, both mature and young, were thriving under the desiccating conditions.

An observation that may come as a surprise to tree planters looking for trees that will sail through frequent dry spells. Oaks don't immediately spring to mind.

ASHES TO ASHES

Our so called top soil is 30 cm of 3,500 year old Taupo pumice, which lies on top of a metre of 30,000 year old Okataina rhyolitic ash. And locals found the 2 mm of Ruapehu ash in 1995 a nuisance!

Below all that is either weathered sandstone or mudstone, which retains moisture right through droughts. That effect showed clearly during the post-Bola period, when we had no effective rain for a year.

Once the deeper rooted trees and shrubs are into this sub-surface material there are few watering problems. What a drought does is to show up trees that are shallow rooted.

STAYING GREEN

On the deep ash of the Parking Green stand ten-year old members of the laurel family, *Sassafras tzumu*, *Machilus thunbergii*, *Litsea sericea* and a *Lindera species* , which in mid-February started losing all the older foliage. An adjacent 14-year old sweet chestnut lost 95 per cent of its leaves.

In the middle of these trees is a twelve-year old pin oak, *Quercus palustris*, the specific name of which means 'of the swamps.' And this deciduous oak from the USA is in fact a tree found naturally in poorly drained flats and swamp edges.

In summer its site is perhaps the driest at Eastwoodhill but this oak remains bright green when all around it are wilting. Young oaks must push their roots down deeply and quickly, for other young hardy trees in the same area — the six-year old crab-apples, maples and three year-old alders — are all showing signs of stress.

BURNING QUESTION

These ash 'soils' of ours — which could well be called growing mediums, not soils — hold almost no moisture in these dry conditions. Trees are unable to find enough to keep their leaves cool, so foliage burns and falls. In winter, this same soil is so saturated with water that vehicles sink!

In an excessively wet winter, deeper roots may drown, resulting in the tree effectively becoming shallow rooted. If a drought summer follows the trees then can't get enough water.

ABOVE: ***A glimpse of Eastwoodhill's Douglas Park from above. The dull orange of a red oak (Quercus rubra) in the foreground contrasts with the brilliant yellow of Liriodendron tulipifera and the deep red of the scarlet oak (Q. coccinea) in the centre.***

Had a moist summer followed a wet winter, they could have grown roots again and survived a drought the following year. But drought on top of an excessively wet winter inevitably means many deaths. A number of old *Eucalyptus ficifolia*, the Crimson flowering gum, are dying about Gisborne and this is probably the reason.

For the planter, it's a good time to look about and observe which of ▶

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your younger trees are thriving and which need looking after. You can then relate those stressed plants to the soil type they are growing on, and check if similar species in different sites are faring better.

PENETRATING THOUGHTS

We have been supplementary watering since Christmas. We have only a limited amount of stored water so sprinkler irrigation is a luxury reserved for the flower garden. Yet when forty year old magnolias growing on ash begin to dry off, I relent and put the sprinkler on for three to four hours. To lose those magnificent spring displays would be tragic.

Gardeners, particularly those on clay soils, envy and admire our pumice top soil for its friable, easily worked blackness in winter. In summer when it's grey, powdery and bone dry they're not so impressed.

And surface tension doesn't let water penetrate. I poured 40 litres of precious water in a depression dug around a young *Pinus banksiana* — 24 hours later it was still sitting there.

Maddeningly, this only happens with irrigation; rainwater gets in okay. Perhaps raindrops pick up something from the air that helps rain penetrate. I've often wondered if I applied a squirt of lux liquid to the irrigation water if it might not get through.

The great bother is that two to three days after watering, the soil is powder again! So I have evolved my own planting style. I'll share that with you in another issue — before the planting season.

LEFT: *The Eastwoodhill upright form of the Pin oak* (Q. palustris) *displays good internode gaps and few branches, well suited for sawlogs.*

RIGHT: *A 14-year old* Quercus palustris *'Horizontalis' has many more branches in a given length than the more upright forms of Pin oaks.*

Our mudstone clays are from slips that have covered the volcanic soils. They guzzle all the water you can pour and leave you wondering if there's a drain pipe hidden down there. Beside one tree is a hole where a waratah standard had been. Just a little hole. I put the hose end in it and ten minutes later it still hadn't filled up!

BIGGER IS BETTER

All this is part of why, when we establish trees, we make sure they get through the

first two years. After that we do not water so regularly.

I feel it important for them to make root growth rather than top growth. Years ago, Sir Victor Davies of Duncan & Davies, in reply to a complaint of tree losses made by Douglas Cook (the founder of Eastwoodhill) wrote that bigger trees would be better than smaller ones in the summer dry situation.

He was right. I try to put in trees with a root system already at least 60 cm deep. If I plant from PB5s, or even PB8s, I can easily lose them. Drying pumice and ash sucks all the moisture away from the soil they were potted up in.

Here at Eastwoodhill you know they have got down to the subsoil and its moisture when 20-year old trees that have been making annual growth of less than 15 cm can suddenly in mid-summer put on a metre of growth. We have to make that tree work hard to get its roots down as quickly as possible.

We have been spoiled for so long with summer moisture that I forgot my own rule and last year planted some potted up plants straight from the nursery. Often when watering these plants, if they have dried out, it's extremely difficult to re-wet the potting mix but the wetness of the soil about leads you to believe everything is fine.

Until the tree dies and when you dig it up you find it bone-dry! We have learnt to shake the mix from potted-up deciduous trees before planting, or else grow them on in the open ground nursery for another two years. I do this for bare-rooted, container and evergreen species.

TRADING PLACES

We have such light soil it's not a problem to transplant them later. I prefer to transplant when trees are 1.5 to 2 metres high. They are strong enough then to need only a sleeve to protect against sheep damage to the bark, and no expensive netting.

I've gotten away with transplanting species that have my nursery friends gasping. The protea family in particular is said be hard to move, but I have transplanted one metre high *Lomatia myricoides* and *Gevuina avellana*, the Chilean Hazel with no problems.

The root system is full and even though soil may fall away, re-establishment causes me no concern after a good watering in. Those who have to deal with heavy clay will not find this suitable of course.

Around the whole of Eastwoodhill, it is the oaks that show their resilience in the face of dry situations. Of all the trees we grow here we have the least problem in establishment and subsequent aftercare of oaks.

Autumn is when we look forward to their strength of colour display but their healthy green foliage powers right through summer droughts, looking fantastic and luxuriant.

The only time I have seen oaks looking tatty during summer was in the 1994/95 summer when strong winds desiccated the young growth. That was the year a *Quercus canariensis* on the skyline and subject to the full force of the north-west winds had only about a 40 per cent leaf cover. We could see right though it!

ACORN HARVEST

Because Eastwoodhill is well known for its oaks, we are visited by many hundreds of people, some of whom come specifically to collect acorns.

Each year we supply three nurseries with over ten thousand acorns of red and scarlet oak, species not so easily collected elsewhere in such large amounts. Multiple plantings of one species will guarantee a regular harvest.

Each autumn thousands of acorns of the common oak fall on cars in our car park. Our Douglas Cook Centre for Education is under the canopy of these oaks and a breeze will cause a thunderous crash of acorns onto the roof.

I always explain this in advance to user groups but often the organiser keeps the information from the participants. They enjoy the startled reaction when the clattering thunder occurs.

We really should be running a few pigs for a few weeks each year.

The most widespread oak in the country would be the common oak, also known as English oak, *Quercus robur*. I label it as common oak at Eastwoodhill in deference to our visitors from Europe; the species is found across Europe, up into Scandinavia and into Turkey.

Some English visitors recently commented to our builder on the absence of English oak in a collection that prides itself on its oaks. The builder didn't know, and so could not point out, the ▶

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thirty growing about the car-park. They had not noticed 'their' English oaks right next to their cars!

The common oak has only given us its glorious yellow autumn show once in the last twelve years. But it was magnificent and worth waiting for the change from its normally dull brown.

GREED & GLUTTONY

Its copious acorn production is also appreciated by the sheep in the arboretum. But acorn poisoning is a danger and I caution smallfarm shepherds to make sure that acorns are not the only fodder in sheeps' bellies.

One oak I have grave doubts about in a grazing situation is *Quercus mongolica*, known as, yes, the Mongolian oak, though it is more commonly found in Japan and Korea.

Sheep ignore the seedlings and turkeys avoid the acorns even though they're just the right size for a snack. That sounds warning bells. There is always one greedy sheep though and we did suffer regular stock losses in Pear Park.

Now we rake up the acorns of this oak and mow off the seedlings prior to putting in the sheep. Lately things have been fine. My advice is to use this oak in a garden setting only.

Beware of rubbish heaps and prunings in the middle of sheep paddocks too. I once inadvertently caused the deaths of 14 sheep in Hawkes Bay by putting wilted *Acer negundo* foliage onto a burning heap in a paddock grazed bare.

It was filled with hungry sheep that should have departed for a freezing works which had gone on strike. Again, it was the few greedy ones that fell by the wayside.

GROWING TALL

Pin oak, *Quercus palustris* is the common autumn oak in New Zealand. It has a good orange colour although we find the colours depend on the soil type they grow in as much as the weather. A mudstone subsoil produces better and more reliable colours than does sandstone.

Two areas in Eastwoodhill with beautiful pin oaks produce only a weak yellow, with orange on these same trees seen in just two years out of twelve.

The pin oak commonly grown in this country is the form *Quercus palustris* 'Horizontalis.' With its dense canopy and weeping branch ends it is a magnificent sight. The inter-nodes — the distance between branches up the trunk — are sometimes less than 30 cm.

It's rarely labelled or sold as 'Horizontalis,' which is unfortunate because it is a good farm and garden form.

We have other forms of pin oak, though sadly we don't know their place of origin in the Eastern United States.

All are tall and upright forms, with inter-nodes of up to two metres. One form sends its branches out at right angles to the trunk, to turn to vertical after a few metres. The other has straight branches but at a narrow angle to the trunk. Both have produced excellent saw logs.

GENETIC FAILURES

We had two specimens of a fourth form of pin oak which had narrow angled straight branches but many were 'included bark co-dominant stems.' This is where two buds arise and grow alongside each other. Because they are restricted for diameter growth between the stems, you will often see a swelling at the base of these 'double leaders.'

The day comes when wind, or the weight of even gentle rain on a windless day, will cause one stem to break away. Sometimes it takes so much of the trunk with it that the trunk breaks across the remaining portion.

The problem can be identified right from when the young twigs are only millimetres in diameter. That's the best

About the Author

For readers who have missed our tree features and the authority and easy style of John Mortimer (who is unwell), Garry Clapperton will be a very welcome new voice in our pages.

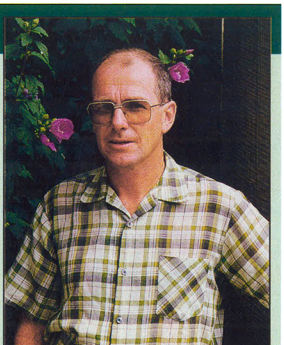
As curator of Eastwoodhill Arboretum, unquestionably this country's finest tree collection, for the past 12 years Garry can speak with an authority and hard won practical knowledge few other tree planters can equal.

As passionate about 'his' trees and about the importance of Eastwoodhill as its founder Douglas Cook — although not so eccentric — Garry Clapperton has lived and breathed plants and trees from the age of ten.

He's involved with Forest & Bird (he was on the local committee at age 14) is a member of the International Dendrology Society and was secretary of the Hawkes Bay Tree Crops Association for seven years.

He has a BSc in botany, has worked as a gardener and a forester and has travelled widely, always "...to see the trees."

But it is his work at Eastwoodhill since 1984 (for almost two years he was the sole full time worker on 100 hectares), and his immense practical knowledge of the thousands of native and exotics he cares for that will endear him to our tree planting readers.



Garry Clapperton, curator of Eastwoodhill Arboretum.

In coming months Garry will share both his passion and his knowledge; bringing you the trials and tribulations, the triumphs and the secrets of looking after and expanding the huge collection of trees that is Eastwoodhill. We are delighted to welcome him to the GT team.

For a review of the recently published *A Man's Tall Dream: the Story of Eastwoodhill* see page 80, this issue.

time to cure it too, by cutting one out with the secateurs.

We removed these two pin oaks altogether, worrying about a cabin beneath, and it also hung over the main lawn. They coloured well and many acorns were collected over the years. That's regrettable because trees such as this damage buildings and gardens, and maybe people.

The fewer seedlings of this form spread about the better for other people's gardens in the future. Some individual trees are simply genetically defective — the claret ash is one!

SCARLET RIBBONS

The scarlet oak, *Quercus coccinea*, has attracted the nurseries in particular. So many acorns have left here over the last ten years that the autumn face of New Zealand in another thirty years is going to be a brighter and deeper red. A pleasing foil for all those pines.

RIGHT: *A 60-year old Scarlet oak towers 40 metres above a similar aged Atlas cedar (Cedrus atlantica 'Glauca') in the cedar Garden at Eastwoodhill.*

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Scarlet oak is more open in its habit than pin oak, with more 'space' within the tree. The branches do not display the weeping habit at the ends and the acorns are bigger and without stripes.

We find it more reliable and dramatic than pin oak. Douglas Cook maintained that scarlet oak needs a hungry site, typically where it is commonly found in the wild. But only because it is the site where competition from other species puts scarlet oak in a winning position. It will grow on good soils as well.

Nurseries have favoured selling pin oak as they have a compact dense root system, easily handled in the open ground nursery. Scarlet oak's sparse root system presents them with more problems but the demand for the colours is now overcoming the previous reluctance to grow it.

NORTHERN EXPOSURE

Similar to both scarlet and pin oak is the Northern pin oak, *Quercus ellipsoidalis*. It is very close to the pin oak but comes naturally from drier sites.

I have not yet seen a mature tree but the colour on a ten-year old tree is as good as that of Scarlet oak and about ten days later. Already it has a fuller canopy of foliage than does scarlet oak.

When the leaves are at their best autumn colour the back light glows through our tree, stopping passing visitors in their tracks —but only if they bother to look up the hill to where the tree grows.

I am constantly amazed at just how many visitors are intent on following the marked track from intersection to inter-

TOP: *The foliage of Scarlet oak is so similar to that of the Pin oak, even experts can be fooled. The form of the two trees differs greatly however, and scarlet oak acorns are longer, lighter brown and without stripes.*

BOTTOM: *The acorns of the Pin oak are smaller and rounder than the Scarlet oak and are striped on the exposed portion.*

From Tiny Acorns...

A number of specialist tree nurseries collect seed of various species from the extensive collection at Eastwoodhill. The arboretum does not sell trees to the public.

Both Puha Nursery from Gisborne and Appletons of Wakefield have collected seed from oak trees mentioned in this article. Try them for specimens of forms discussed in this article.

Puha Nursery, RD 4, Te Karaka, Gisborne, phone 06-862-3819.

Appleton's Tree Nursery, Main Road South, Wakefield, ph 03-541-8309.

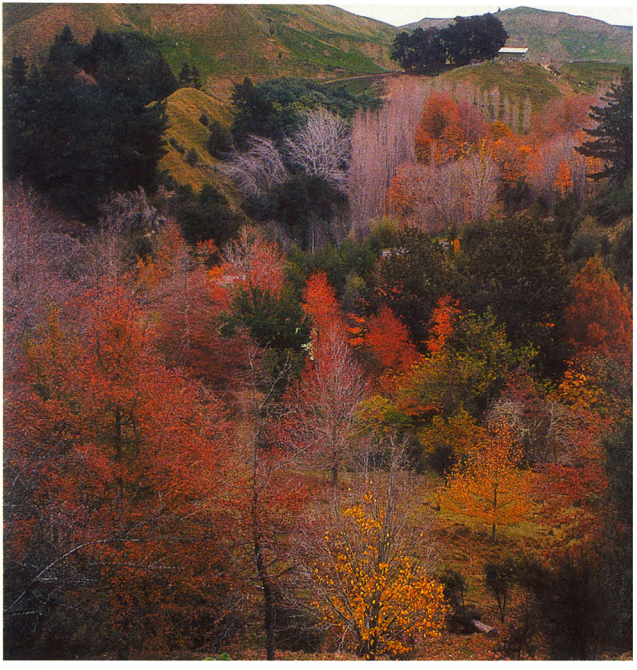
Eastwoodhill's office can be contacted on 06 863-9800.

section and never look about them at the trees. Some behave more like orienteers!

After this intense and almost translucent colour display, the foliage remains a warm red brown for several weeks before the leaves are finally shed. Appletons have been selling this lovely species and I have a dozen coming on in the nursery for a couple of new groves.

So don't assume the mighty oaks are just for well watered sites. Once they get their roots down, these stately trees may surprise you with their ability to withstand the worst of the dry, at least in the conditions we have here at Eastwoodhill.

The question on our minds now is; how long will it last. As I write, the dry is bringing the acorns down early, in mid February. With tucker scarce, at least the turkeys and sheep are going to be happy. The autumn acorn collectors may not be so glad! ■



RIGHT: *A mix of rich autumn colour and evergreens sets the scene for April and May at Eastwoodhill. There is no better time for tree lovers to make the pilgrimage to Gisborne to enjoy the majestic autumn display.*