

Project Update - November 2010 to February 2011

*This project update is a summary of the NZDFI SFF progress report to MAF for this period.
A full copy of this report is available on request.*

Durable eucalypt breeding population establishment and assessment

Weed control is underway throughout all *E. bosistoana* and *E. argopholia* breeding populations planted in 2010. These are on the Marlborough District Council Cravens Road river reserve site, with another on the Martin's property in North Canterbury and a new site planted at the Avery's property in South Marlborough. Overall, there has been high survival and good early growth following a reasonable summer.



Photo 1: *E. bosistoana/argophloia* site on Avery property, Bonavaree at Grassmere, Marlborough – this is our lowest rainfall site!

Seed germination has been variable of the four naturally-durable eucalypt species being propagated for planting into breeding populations this year. At last count there are over 30,000 *E. globoidea* seedlings planned for planting three breeding populations with smaller plantings of *E. quadrangulata* (9,000), *E. tricarpa* (1,500) and *E. argophloia* (4,000) also planned.



Photo 2: Seedlings of three different *E. globoidea* families at Morgans Road Nursery with juvenile foliage displaying the wide genetic variation of this species.

Consultation with landowners to secure sites for planting this year is continuing. Landowners that have confirmed sites for NZDFI breeding populations include:

- Ben McNeill at Waimarama, Hawkes Bay.
- Montfort Trimble Foundation (Rewanui Farm Park) in Wairarapa.
- Avery's in Grassmere, South Marlborough.
- Martin's in North Canterbury.

One further site of 6 hectares is being sought to establish one of the *E. globoidea* populations. If there is any one interested please contact Paul Millen p.millen@xtra.co.nz

An early assessment of is also underway this autumn within the *E. bosistoana* breeding populations planted in 2009 including a study of frost damage and recovery at two sites (Craven's Road River Reserve and Martins in North Canterbury). Last winter, heavy frosts killed some trees at both these sites. However, in spring many damaged trees recovered with vigorous coppice shoots, some growing up to one metre by March 2011. Their survival will be assessed again next year.



Photo 3: *E. bosistoana* seedling recovering with vigorous coppice regrowth following frost damage at Craven's Road river reserve.

Demonstration trial establishment

All three demonstration trials planted last year at Bob Wishart and Meg Gaddum's property north of Gisborne, Clive Paton's property in southern Wairarapa and the Avery's property in south Marlborough are well established.



Photo 4: Clive Paton's inspects *E. bosistoana* in the demonstration trial he planted last year on his southern Wairarapa property.

For this year, over 16,000 seedlings have been propagated at Morgans Road Nursery for planting ten regional demonstration trials of 10 species of durable eucalypts. This will include a trial in the Bay of Plenty as NZDFI have gained support from the Bay of Plenty Regional Council and Bay of Plenty Farm Forestry Association to extend the programme into their region.

Landowners that have already confirmed a site for planting demonstration trials include:

- A second trial at Wishart and Gaddum's in Gisborne.
- Rick Alexander in Central Hawkes Bay.
- Ben McNeill at Waimarama, Hawkes Bay.
- Montfort Trimble Foundation (Rewanui Farm Park) in Wairarapa.
- David Dillon at Waihopai Valley in Marlborough.
- Christo Saggars at Ben Morven in Marlborough.
- Martin's in North Canterbury.

Further sites are under consideration.

***E. globoidea* Heartwood study – R.McConnochie, January 2011**

Back ground

In November 2010, *E.globoidea* trees were felled at the Waikakaho site to produce coppice material for the rooting of cuttings. Trees from a single row planting of Yadboro, Cann River and Boyne provenances were felled as well as trees from an adjacent mixed seedlot stand. Additional trees were felled from the same provenances at the Koromiko trial site. Both plantings were 5-years old. Two 25mm discs were cut from the base of the stem of each felled tree for the collection of heartwood and density data. One disc was used to measure heartwood formation by staining with methyl orange and calculating heartwood percentage.

A bark to bark block was cut from the second disc to determine basic wood density. Green volume was measured using the water displacement method. The blocks were then dried at 105°C and the oven dry weight measured.

Additional 5mm increment bark to bark increment cores were taken from the remaining trees in the provenance rows for density measurements. The samples were processed at the Marlborough Research Centre laboratory.

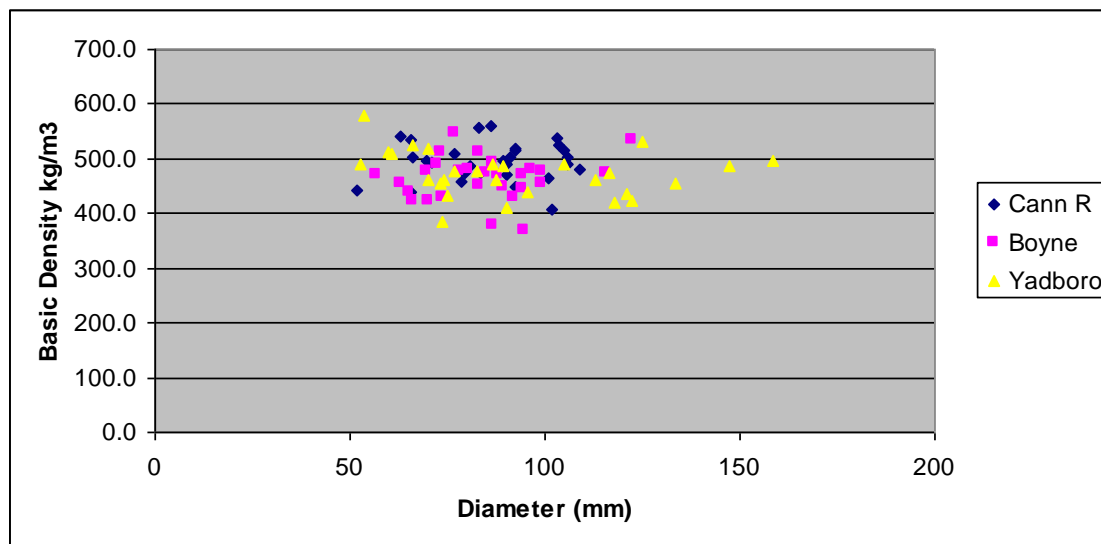
Results

Table 1. summarises the statistics from the basic wood density and heartwood measurements.

The average under bark diameter of the provenance samples varied from 84.0mm to 92.8mm, the largest being Yadboro.

The basic wood density across all provenances ranged from 369.2 – 580.0kg/m³ and a mean of 477.3kg/m³. There was no significant difference between provenances in the density of trees sampled. The correlation between diameter and density is -0.1.

Fig. 1. Basic Wood Density of Provenance Groups



Millner, 2006 reported a mean basic density of 477kg/m³ on 5 year old *E.globoidea* from a trial in the hill country of the Tararua Ranges. These measurements were taken from 5mm increment cores at breast height (1.4m).

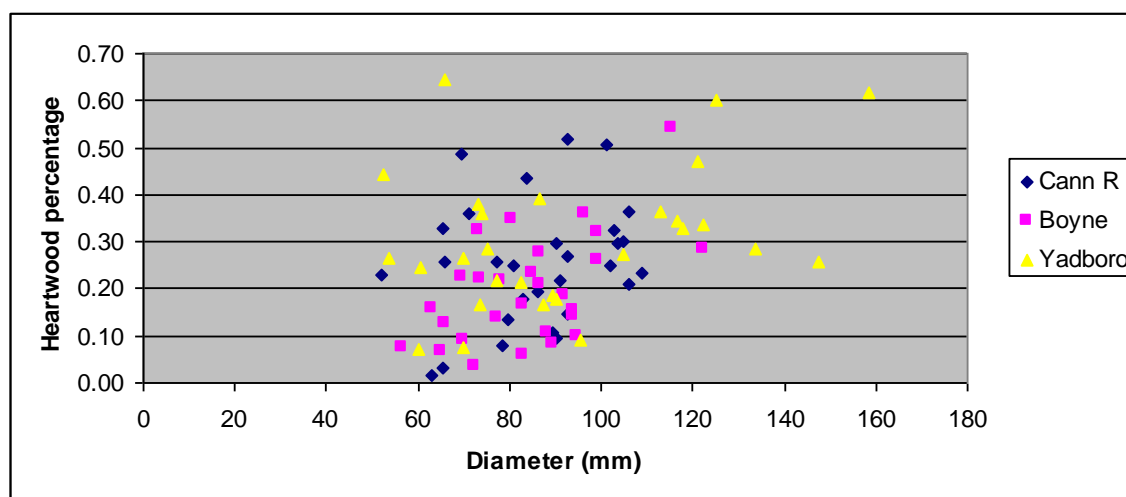
Heartwood was measured on the discs samples only. There was a small significant difference between the Boyne and Yadboro provenances, therefore only a very small gain is likely from selecting at a provenance level. The correlation between diameter and heartwood percentage is 0.4.

The variation between diameter and heartwood development among all samples is large, 7 – 62% of the cross section area. Trees of similar diameter can have very different heartwood development, B3 and B9. There are trees that have good diameter growth and high heartwood, eg. Samples Y8 and B3. Intensive selection of individuals within the breeding populations will capture trees with these ideal characteristics.

Fig. 2. Stained area indicating heartwood zone.



Fig. 3. Heartwood development



Data from 15 trees felled in a 9-year-old stand located at Welcome Bay, Bay of Plenty had an average heartwood percentage of 57% and under bark diameter of 21.5cm. These are disc measurements taken at stump height.

Table 1. Summary of Density and Heartwood results.

Provenance	No. Samples	Mean UB Diameter (mm)	Density Statistics kg/m ³				Heartwood		
			Min	Max	Mean	Tukeys LSD	No. Samples	Ratio	Tukeys LSD
Boyne	35	84.0	369.2	546.0	461.7	A	28	0.20	A
Cann R	37	87.2	408.3	560.0	484.6	A	29	0.25	AB
Yadboro	35	92.8	385.0	580.0	469.2	A	28	0.30	B
Correlations:									
Diameter and Heartwood			0.4						
Diameter and Density			-0.1						

Felled trees are now coppicing. This coppice growth will be cut this month and used by SCION to test vegetative propagation.



Photo 1: Five year old *E. globoidea* coppicing four months after felling in the Waikakaho Valley, Marlborough Regional Forests. Trees were assessed for density and early heartwood with new coppice growth to be used to test propagation by cuttings.

Flowering *E. globoidea* feeds native birds

In November, a small number of trees were flowering prolifically within in the Marlborough Regional Forests five year old *E. globoidea* trial. Both tui and bellbirds were observed collecting nectar from these flowers.



Photo 6: Tui in *E. globoidea* in the Waikakaho Valley, Marlborough Regional Forests.

Extension programme

A leaflet has been developed to provide an overview on the NZDFI tree breeding programme. This will be available soon on line at www.nzdfi.org.nz

Research and drafting of the NZDFI durable eucalypt leaflets is continuing. There has also been some initial progress on regional crop suitability mapping for all NZDFI selected durable species.

Registration application forms are available on line for the NZDFI/School of Forestry professional workshop and field trip on 'Developing a Eucalypt Resource' to be held **3rd & 4th November 2011** at the Marlborough Research Centre in Blenheim. For a registration application form use this http://www.nzdfi.org.nz/whats_new.php

For more information please e mail Paul Millen (e mail contact p.millen@xtra.co.nz) or Maree Way (e mail contact info@nzdfi.org.nz).

2011 Annual NZDFI SFF Project Management Committee meeting to be held on 23rd May

The annual meeting of the NZDFI SFF Project Management Committee is being held at 2.00pm on Monday 23rd May at the Marlborough Research Centre. An agenda will be sent out closer to the meeting date.

All those interested in the project are welcome to attend. Please e mail Paul Millen (e mail contact p.millen@xtra.co.nz) by 6th May to advise if you wish to attend.

