# DIVERSIFIED SPECIES TECHNICAL NOTE

Number: DSTN-019
Date: November 2012

# Preliminary Trials of Rooting of Cuttings from Field-collected Coppice of *Eucalyptus bosistoana* and *E. globoidea*


## Summary

*Eucalyptus bosistoana* and *E. globoidea* are eucalypts from coastal New South Wales and Victoria that have potential for the production of durable timber in New Zealand. These species can coppice, which means that once genotypes are tested, it may be possible to re-generate juvenile copies of selected genotypes using cuttings, tissue culture or a combination of these. However, while there are many examples of successful rooting of coppice material from subtropical and tropical eucalypt species, such as *E. grandis* and *E. urophylla*, there has been little success reported on rooting of cuttings from seedlings or coppice of temperate eucalypt species.

A preliminary trial of rooting cuttings from coppice material was established in May 2010, with four auxin hormone treatments and 10 clones. Overall, there was an average of 21% rooting. The average rooting success rate across the hormone treatments ranged from 15-27%, with the 1% IBA (indole-3-butyric acid) the best treatment and the control (no hormone) the poorest. However, this trial was too small to draw any solid conclusions, with only 400 cuttings from 10 clones distributed over four treatments (an average of 10 cuttings/clone/hormone treatment).

The experiment has been repeated in a replicated trial in 2011, with 30 clones each of *E. bosistoana* and *E. globoidea*. Seven *E. bosistoana* clones that were successfully rooted in 2010 were hedged, and cuttings were set from them. Statistical analysis of the results from 2011 should be possible when rooting success can be assessed.


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## Background

*Eucalyptus bosistoana* and *E. globoidea* are eucalypts from coastal New South Wales and Victoria that have potential for the production of durable timber in New Zealand. These species can coppice, which means that once genotypes are tested, it may be possible to re-generate juvenile copies of selected genotypes using cuttings, tissue culture or a combination of these.

Earlier research for FFR looked at sterilising coppice material for tissue culture of *E. bosistoana*[1]. The results of this tissue-culture research were presented to FFR shareholders in Rotorua on 15th February 2010[2]. While material was successfully put into culture, subsequent growth was poor, and further research would be required to improve this. At this technical meeting, Scion proposed that a further field collection be made of the coppiced *E. bosistoana* material in late autumn to try setting this material as cuttings in the nursery.

This Technical Note summarises results to date.

## Summary of Progress

### 1. Results from setting of cuttings 2010

Coppice shoots of *E. bosistoana* were managed for tissue-culture production, including regular spraying with Shield and Super Shield fungicide/insecticide at a *Eucalyptus* species trial near Blenheim. Mike Menzies went to Blenheim and visited the trial with Ruth on 17 May 2010 to collect the coppice material for cuttings. Coppice material was collected from 10 clones, and stored in plastic bags in a chilly bin. The coppice material was taken to the Rotorua Scion nursery on 18 May, and set on 19 May.

Four hormone treatments were evaluated;


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1. control (no hormone),
2. 1% IBA in talc,
3. 2% IBA in talc, and
4. Clonex gel.

There were 98-100 cuttings per hormone treatment, spread evenly across the 10 clones. There were 7-12 cuttings per clone per hormone treatment (Figures 1 and 2).

**Figure 1: *E. bosistoana* cuttings in the Scion (Rotorua) greenhouse, in May 2010, after setting.**

**Figure 2: *E. bosistoana* cuttings in the Scion greenhouse, in July 2010, showing new shoot growth and roots emerging from containers.**

A summary of the results is given below in Table 1. Overall, there was an average of 21% rooting.

**Table 1: Summary of results of rooting percentage by clone and by hormone treatment.**

| Clone no. | Control | 1% IBA | 2% IBA | Clonex | **Mean** |
|---|---|---|---|---|---|
| 1 | 17 | 42 | 33 | 42 | **33** |
| 2 | 18 | 10 | 20 | 10 | **15** |
| 3 | 42 | 50 | 75 | 83 | **63** |
| 5 | 0 | 0 | 14 | 0 | **4** |
| 6 | 0 | 0 | 0 | 0 | **0** |
| 9 | 11 | 44 | 11 | 22 | **22** |
| 14 | 42 | 83 | 67 | 42 | **58** |
| 15 | 0 | 0 | 0 | 0 | **0** |
| 19 | 0 | 13 | 0 | 0 | **3** |
| 20 | 17 | 25 | 0 | 8 | **13** |
| **Mean** | **15** | **27** | **22** | **21** | **21** |

This preliminary trial was not replicated, so it was not possible to analyse the results statistically. Mean rooting across the hormone treatments ranged from 15-27%, with the 1% IBA the best treatment and the control (no hormone) the poorest. Mean rooting by clone ranged from 0-63%, with clones 3 and 14 the best (63 and 58%, respectively), while clones 6 and 15 failed to root at all. The 1% IBA treatment produced rooted cuttings from seven out of ten clones, while the other hormone treatment produced rooted cuttings from six clones. This failure of cuttings from coppice failing to root for some genotypes is typical even for subtropical and tropical *Eucalyptus* species.

Some clones rooted better with different hormones. For example, the best rooting of clone 3 was through using Clonex and the best rooting for clones 9 and 14 was through using the 1% IBA. Clone 5 rooted only with 2% IBA, while clone 19 only with 1% IBA.

However, these results are on too small a scale (i.e. number of clones and cuttings) to draw any solid conclusions.

The rooted cuttings were potted up into larger containers in spring 2010. These were managed for cutting production for setting in autumn 2011, as part of the ongoing FFR Diverse Species programme.



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## 2. Setting of Cuttings 2011 - Progress

*Eucalyptus bosistoana* and *E. globoidea* trees, aged five years, in the same species trial near Blenheim were felled in November 2010 to encourage the development of coppice shoots. The developing coppice shoots were cut back in January 2011 to encourage shoot development close to the stem.

The coppice shoots were collected for cuttings on 11 April 2011. Coppice material was collected from 30 stumps of *E. bosistoana*, and from 30 stumps of *E. globoidea* (Figures 3 and 4). The *E. globoidea* included 10 stumps from each of three provenances; Yadborro, Boyne, and Cann River.

**Figure 3: Coppicing *E. bosistoana* at the Blenheim site, before collection.**

**Figure 4: Coppicing *E. globoidea* at the Blenheim site, before collection.**

**Figure 5: Rooted cuttings of *E. bosistoana* being managed as hedges in a Scion greenhouse, just after trimming back to encourage more shoots.**

Cuttings were set from the coppice shoots on 12-13 April, and also from seven clones of the hedged cuttings of *E. bosistoana* from the 2010 setting on 11 April (Figure 5). Cuttings were treated with either Clonex or 1% IBA and set in 110 ml containers (Figure 6). There were five replications and up to four cuttings per hormone treatment per clone per replicate (up to a total of 40 cuttings per clone). As at mid-June 2011, it is too early to judge rooting success, and the replication and randomisation makes it difficult to see trends. However, there is some early rooting and new shoot growth for some of the cuttings.


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Some cuttings have dropped their leaves and some have rotted at the base. The rotting ones are being removed to avoid the risk of any fungal contamination affecting neighbouring cuttings. Rooting success will be assessed later in the winter (August/September).

**Figure 6: Cuttings of *E. bosistoana* and *E. globoidea* in a Scion greenhouse after setting in April 2011.**

## References

1. Josekutty, P., Menzies, M., van Ballekom, S., Devillard, C., Nugent, G., Low, C., Hargreaves, C. and Dungey, H. 2009: Prepare technical note – protocol for effective sterilisation of field-collected *E. bosistoana*. FFR Diversified Species work plan September 2009.
2. Gough, K., McConnochie, R., Menzies, M. and C. Hargreaves 2010: Tissue culture with *Eucalyptus bosistoana*. FFR Diversified Species presentation, technical meeting February 2010.