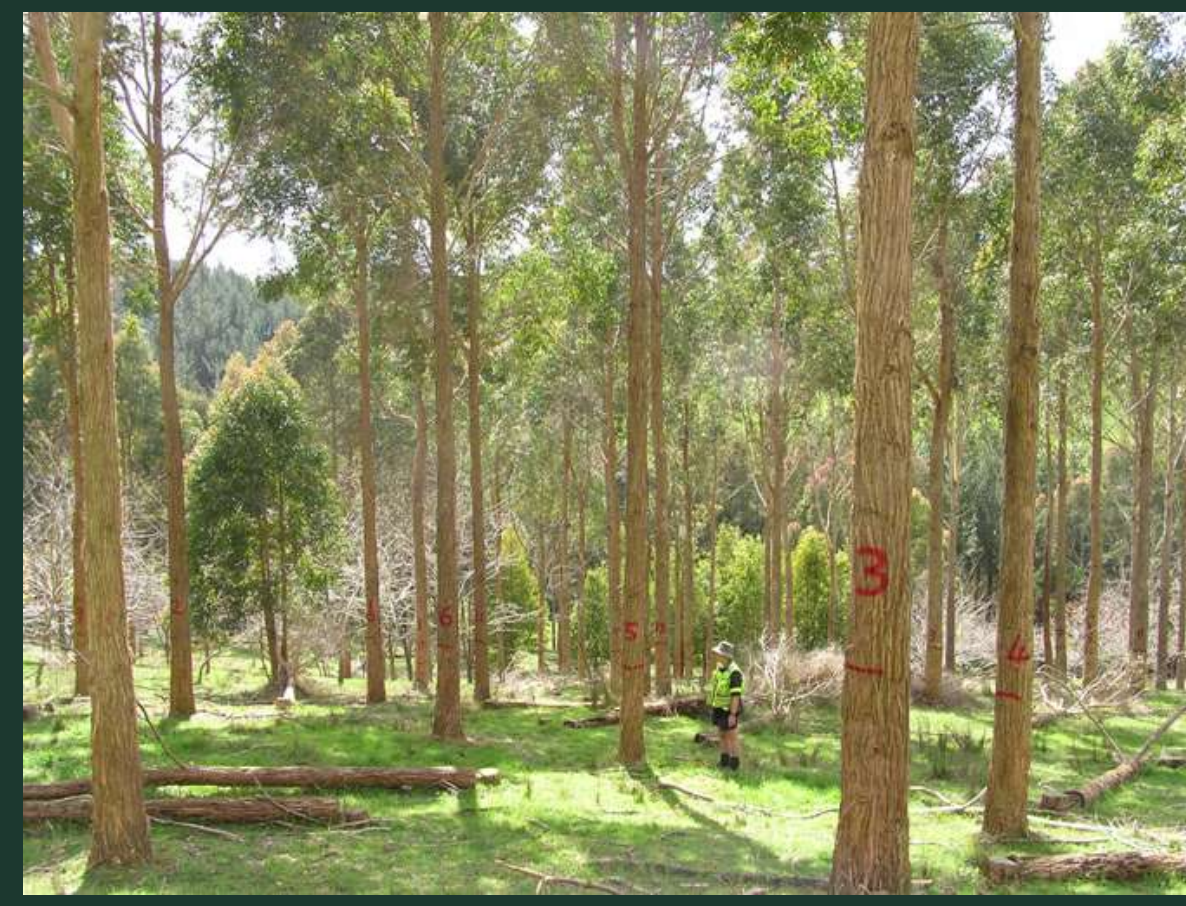
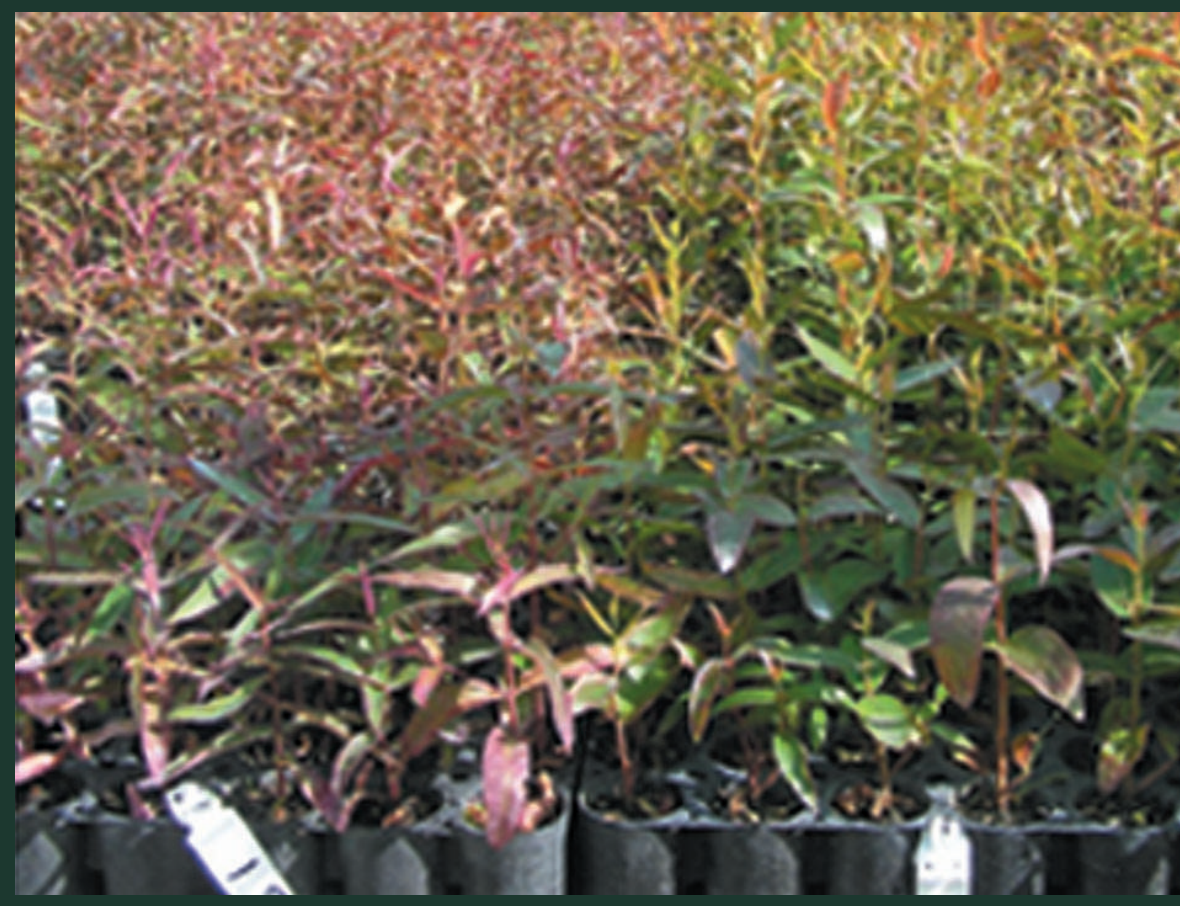


Stringybark Eucalypt Evaluations in New Zealand

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E. microcorys



E. globoidea



E. pilularis

Objective 1: to compare the performance of selected eucalypt species on a range of sites

Objective 2: to assess growth and yield of selected eucalypt species throughout New Zealand

BACKGROUND

For the past two decades much research effort has concentrated on eucalypt species for producing fast-grown, short-fibred pulp. However, the wider eucalypt industry is becoming more aware of the market opportunities of hardwood species for solid-wood end uses, and the need to choose the right species. During the late 1970s and 1980s eucalypt species grown for sawn timber were confined mainly to three ashes, *Eucalyptus fastigata*, *E. delegatensis*, *E. regnans*, and two gums, *E. botryoides* and *E. saligna*. These species, except for *E. fastigata*, have proven to be unsuitable, because of either their sawing problems and sub-standard wood properties or their health problems.

There has been recent interest in evaluating the stringybark group of eucalypts and other species suitable for solid wood use (*E. microcorys*, *E. pilularis*, and *C. maculata*) that exhibit high wood density, high strength and stiffness, hardness, and have good natural durability in ground contact.

RESEARCH ACTIVITIES - OBJECTIVE 1

Nine eucalypt species trials were established in 2003/4, to compare the performance of a select group of eucalypt species across a range of site types in New Zealand.

The species under test are mainly from the stringybark group of eucalypts, but include other eucalypt species that have gained reputations as good sawn-timber species. *Eucalyptus nitens* and *E. fastigata* were included as "controls", as their performance is relatively well-known.

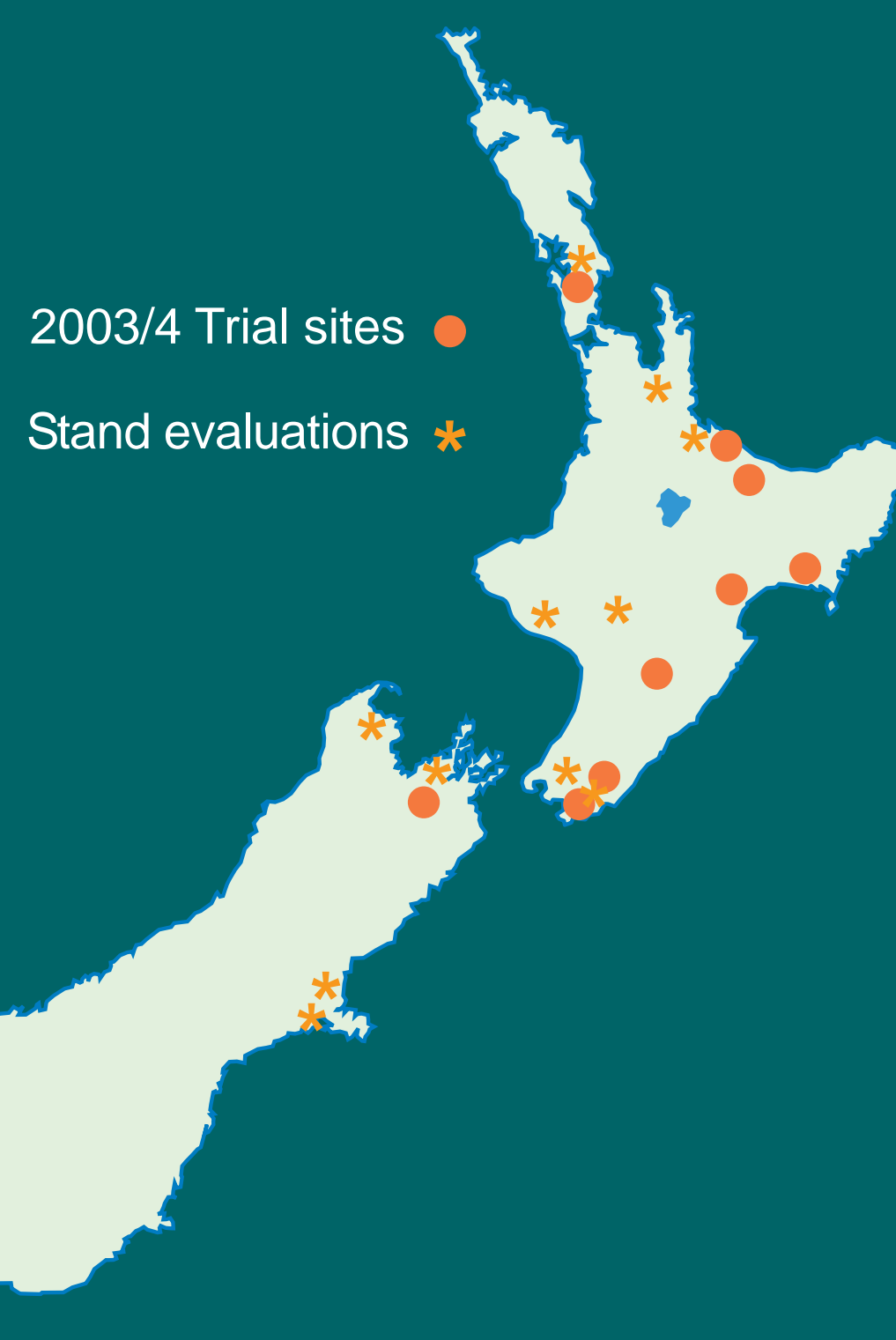
| Group 1 | Group 2 | Group 3 - Controls |
|-------------------------|-------------------------|-----------------------|
| ● <i>E. agglomerata</i> | ● <i>E. baxteri</i> | ■ <i>E. nitens</i> |
| ● <i>E. eugenoides</i> | ● <i>E. blaxlandii</i> | ■ <i>E. fastigata</i> |
| ● <i>E. globoidea</i> | ● <i>E. caliginosa</i> | |
| ● <i>E. laevopinea</i> | ● <i>E. cameronii</i> | |
| ■ <i>E. maidenii</i> | ● <i>E. cladocalyx</i> | |
| ■ <i>E. microcorys</i> | ■ <i>C. maculata</i> | |
| ● <i>E. muelleriana</i> | ● <i>E. macrorhycha</i> | ● Stringybarks |
| ■ <i>E. obliqua</i> | ● <i>E. youmanii</i> | ■ Others |
| ■ <i>E. pilularis</i> | | |

A "main trial" was planted at two sites and seven smaller trials were planted across different site types. The species in group 1 and 3 were planted as 100-tree-plots of 10 x 10 rows at a spacing of 2.8m x 2.8m and replicated two times at each of the two main trial sites, Bay of Plenty and Northland. The species in group 2 are planted as one replication of a 49-tree-plot of 7 x 7 rows at 2.8m x 2.8m, and one to three replications of 25-tree-plots of 5 x 5 rows at 2.8m x 2.8m.

At the other sites either 49 or 25-tree-plots were planted with one or more replications. The species, plot size and number of replications were determined by the number of seedlings in the nursery and the area available for the trial at each site.

CONCLUSION 1:

- An early evaluation of these trials has identified that the fastest growing species overall were *E. nitens*, *E. fastigata*, *E. maidenii* and *E. obliqua*.
- The fastest growing stringybarks were *E. globoidea*, *E. laevopinea*, *E. eugenoides* and *E. blaxlandii*.



| Species | Survival (%) Age 4 years | | | | | |
|-----------------------|--------------------------|----------|------------|-------------|---------------|---------------------|
| | Bay of Plenty | Gisborne | Hawkes Bay | Wairarapa-R | Wairarapa - L | Opotiki Age 3 years |
| <i>E. agglomerata</i> | 56 | | 0 | 78 | 86 | |
| <i>E. baxteri</i> | 48 | | | | | |
| <i>E. blaxlandii</i> | | 33 | | | 100 | |
| <i>E. caliginosa</i> | 78 | | | 67 | | |
| <i>E. cameronii</i> | 73 | 33 | 68 | 53 | | |
| <i>E. eugenoides</i> | 69 | | 64 | 44 | | 82 |
| <i>E. fastigata</i> | 89 | 73 | 88 | 53 | | 88 |
| <i>E. globoidea</i> | 87 | 100 | 40 | | 82 | 74 |
| <i>E. laevopinea</i> | 80 | 45 | 46 | 71 | 77 | 78 |
| <i>E. macrorhycha</i> | 76 | 50 | 40 | 100 | 69 | 76 |
| <i>C. maculata</i> | 58 | 67 | 0 | 68 | 60 | |
| <i>E. maidenii</i> | 95 | 44 | 92 | 86 | 63 | 96 |
| <i>E. microcorys</i> | 73 | 89 | 0 | 63 | 47 | 86 |
| <i>E. muelleriana</i> | 84 | | 12 | 63 | 47 | 55 |
| <i>E. nitens</i> | 84 | | 100 | | 82 | |
| <i>E. obliqua</i> | 79 | | 68 | 100 | 76 | 81 |
| <i>E. pilularis</i> | 68 | 61 | 0 | 95 | 73 | 84 |
| <i>E. tenella</i> | 76 | 56 | | | | |
| <i>E. youmanii</i> | 83 | 44 | 92 | 96 | 84 | 64 |
| <i>E. wandoo</i> | | | | | | 20 |

| Species | Height Measurement (m) at 5 sites, ages 4 and 3 yrs | | | | | |
|-----------------------|---|------------|-------------|---------------|---------------------|-----|
| | Bay of Plenty | Hawkes Bay | Wairarapa-R | Wairarapa - L | Opotiki Age 3 years | |
| <i>E. agglomerata</i> | 2.0 | | 1.3 | e | 4.1 | fg |
| <i>E. baxteri</i> | 3.0 | | | | 5.7 | c |
| <i>E. blaxlandii</i> | | | 1.9 | cde | | |
| <i>E. caliginosa</i> | 2.2 | | 1.8 | de | 5.9 | c |
| <i>E. cameronii</i> | 3.4 | 3.5 | 2.8 | abcd | 7.7 | b |
| <i>E. eugenoides</i> | 1.9 | 4.2 | 2.6 | abcd | 5.4 | cd |
| <i>E. fastigata</i> | 3.7 | 5.3 | 2.6 | abcd | 5.4 | cd |
| <i>E. globoidea</i> | 2.6 | 2.8 | 1.4 | e | 5.2 | cde |
| <i>E. laevopinea</i> | 1.7 | 3.1 | 2.2 | bcde | 4.2 | cd |
| <i>E. macrorhycha</i> | 1.9 | 2.2 | 1.5 | e | 3.1 | ef |
| <i>C. maculata</i> | 1.9 | | 2.9 | ab | 5.6 | cd |
| <i>E. maidenii</i> | 3.4 | 5.6 | 1.9 | de | 1.9 | h |
| <i>E. microcorys</i> | 1.6 | 3.2 | 1.9 | cde | 1.8 | h |
| <i>E. muelleriana</i> | 2.1 | 7.8 | 3.2 | a | 9.4 | a |
| <i>E. nitens</i> | 3.3 | 4.2 | 1.9 | cde | 8.0 | b |
| <i>E. obliqua</i> | 2.8 | 4.2 | 1.9 | cde | 4.6 | def |
| <i>E. pilularis</i> | 2.8 | | | | | |
| <i>E. tenella</i> | 1.8 | | | | | |
| <i>E. youmanii</i> | 2.0 | 2.7 | 1.9 | cde | 4.2 | ef |
| <i>E. wandoo</i> | | | | | 2.4 | |

RESEARCH ACTIVITIES - OBJECTIVE 2

The growth and form of promising species for high quality sawn timber, such as the stringybarks, *E. microcorys*, and *E. pilularis*, have been evaluated by establishing sample plots in plantations and evaluating farm-forestry plantings.



E. pilularis



E. globoidea

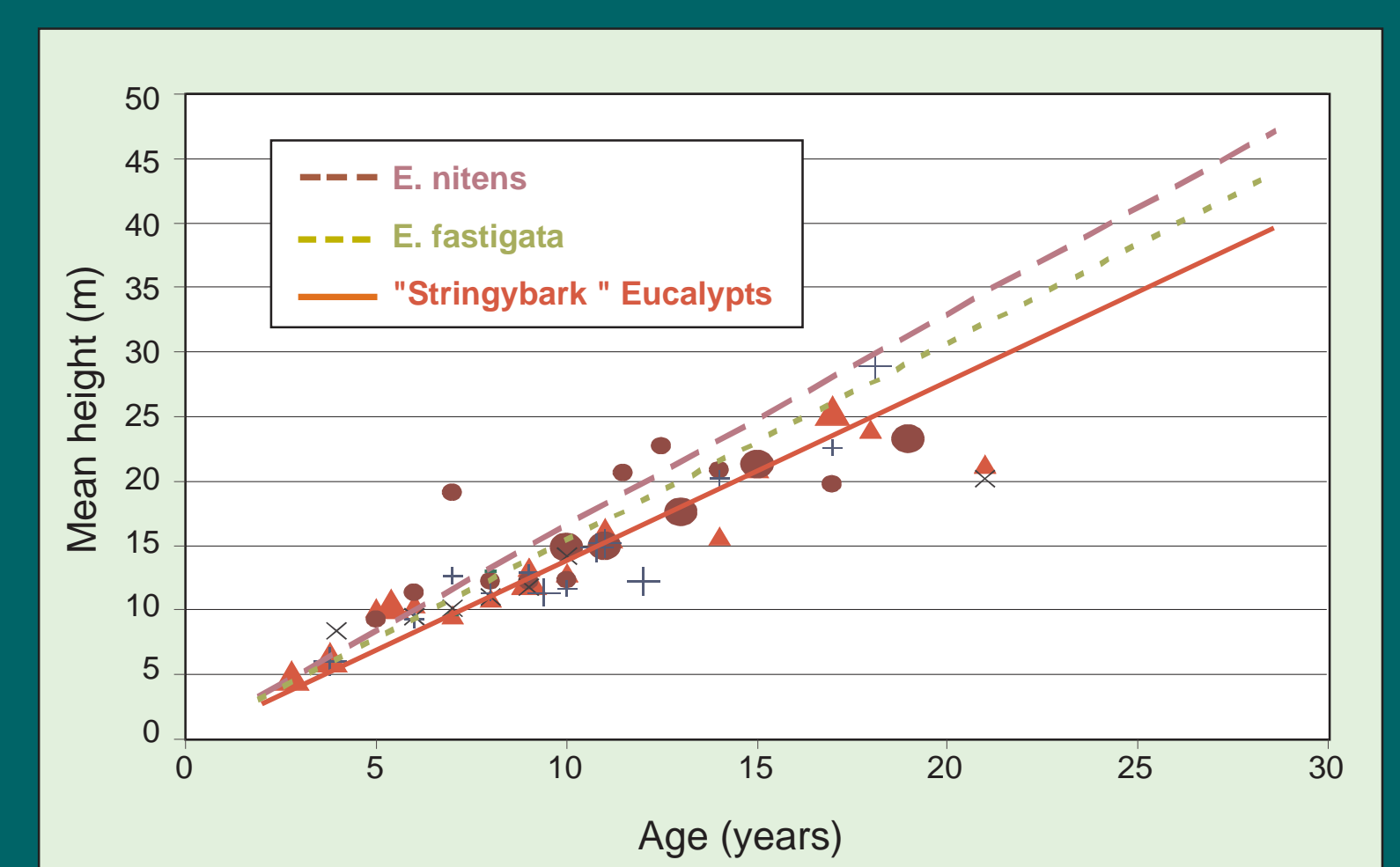
Growth Data

Data was collected from approximately 14 locations, including sample plots and individual tree assessments.

Data was collected from 44 sample plots of *E. globoidea*, *E. microcorys*, *E. muelleriana*, and *E. pilularis*.

Individual tree measurements were collected from farm forestry stringybark plantings such as *E. agglomerata*, *E. blaxlandii*, *E. laevopinea*, *E. youmanii*.

Data has been compared with the national averages for *E. nitens* and *E. fastigata*.



CONCLUSION 2:

- Stringybarks grow successfully throughout New Zealand.
- Cold hardy species are surviving in Southland (*E. blaxlandii* and *E. youmanii*).
- Consistent growth patterns for several species on many sites.
- Height growth of stringybarks is slower than *E. nitens* and *E. fastigata*.