THE ABOVE-GROUND BIOMASS COMPOSITION AND NUTRIENT CONTENT OF COMMERCIAL EUCALYPTS AND THEIR USE IN MANAGING SUSTAINABLE INTENSIVE FORESTRY IN SOUTH AFRICA

by

MARTIN ANTONY HERBERT

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PREFACE

This dissertation comprises my own unaided and original research work, except where specific acknowledgement has been made. The data used and its analytical findings have also not been submitted in any form to another university.

M. A. Herbert

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ABSTRACT

A study was undertaken of the biomass composition of ten eucalypt species growing on five sites in the timber growing regions of southeastern Mpumalanga. The species comprised *E. deanei, E. dunnii, E. elata, E. fastigata. E. grandis, E. macarthurii, E. nitens, E. saligna, E. smithii* and *E. viminalis*. The average tree height was 19.3 m and dbh 15.9, with stocking at 1494 stems/ha and merchantable yield at 153 t/ha. The sites had been established under commercial conditions seven years earlier as a series of identical site-species trials, and differed widely with respect to air temperature and effective precipitation. The soils were derived from granite, and either shallow and rocky (Glenrosa form) or deep and friable (Inanda forms). Sample trees were felled at the height of summer, separated into the biomass components of leaves, branches, on-tree dead matter, bole bark and bole wood, and weighed for fresh mass. Sub-samples were taken of each component for laboratory determinations of moisture and nutrient content, as well as bole wood density.

Statistical analysis of the results show significant differences between species and sites as well as site-species interactions for the tree mass of biomass components, and nutrient composition and water content. While overall *E. smithii* and *E. dunnii* produces the largest biomass, there are strong site interactions due to the varying degrees of site specificity required by different species. The proportions of the different biomass components differ between species and across sites, with the bole mass fraction increasing as growth rate improves. Biomass moisture is highest in bark and leaves, especially for the Viminales species group of the genus *Symphyomyrtus*. This group also has the highest wood density, while density within the stem is remarkably uniform for most species. Density generally increases with tree vigour. Nutrient concentrations are greatest in leaf and bark, and least in bole wood, and are strongly influenced by soil nutrient status. There are considerable differences between species, with the subgenus *Monocalyptus* showing generally the lowest values. Models are developed to estimate biomass components from tree mensurational parameters and their nutrient content from soil variables.

Nutrient budgets are developed on an equivalent tree mass basis to estimate the quantity of nutrients required to grow biomass. Nutrient quotients of the biomass produced per unit of nutrient are calculated to compare the efficacy with which biomass is produced per species, and comparisons made for average growing conditions across the study region. While the most economical subgenus is *Monocalyptus*, the most efficient of current commercial species is *E. smithii*, followed by *E. nitens, E. macarthurii, E. grandis* and *E. dunnii*. Nutrient export during harvesting exceeds natural inputs, is exacerbated by 60% on average when retaining bark on logs, and more than doubled if slash is burnt. Further research is required into estimating soil reserves and extending the study to other site types.

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LIST OF ABBREVIATIONS USED

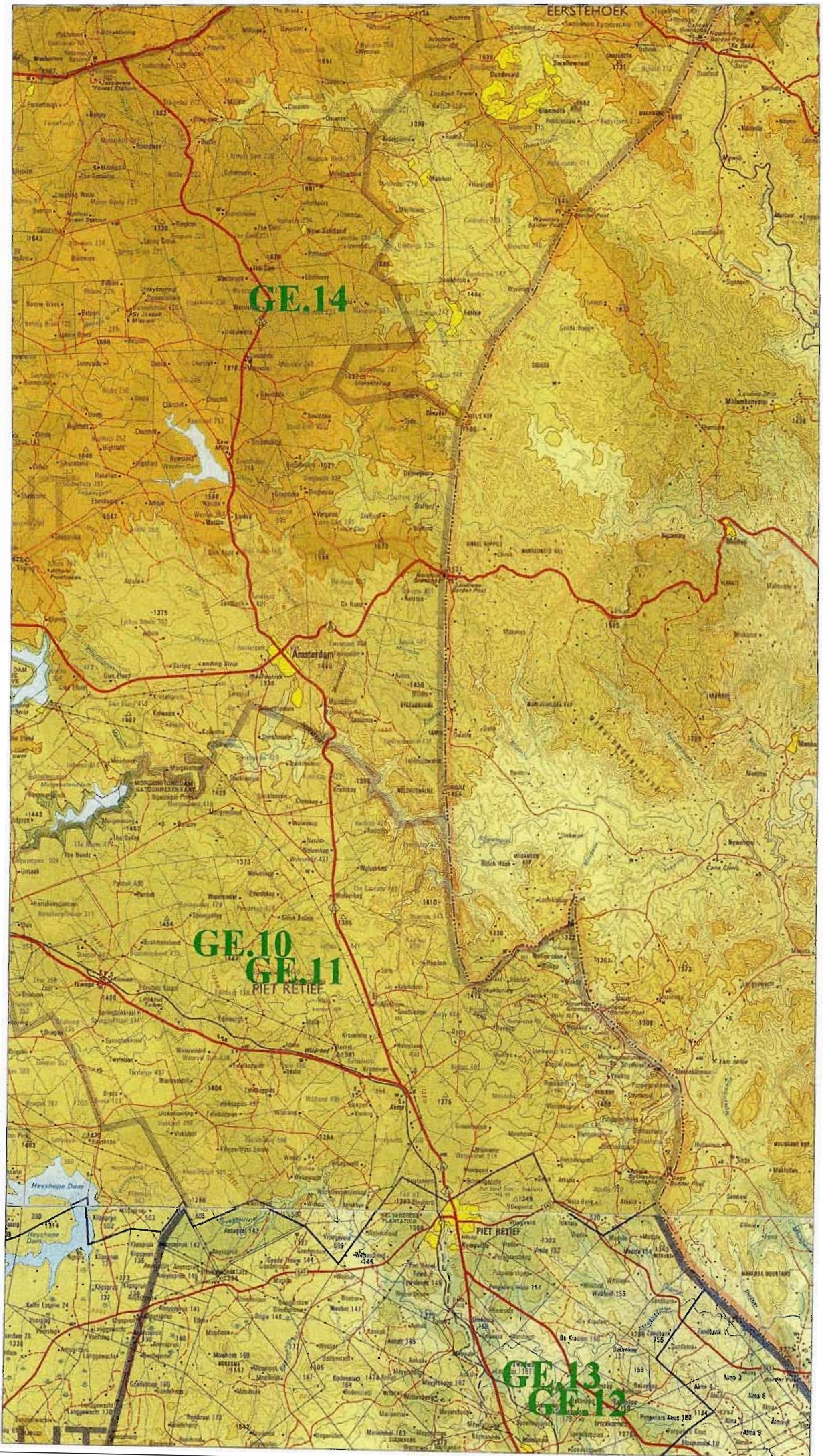
TERM	ABBREVIATION / SYMBOL
General	
Mean annual precipitation	MAP
Mean annual temperature	MAT
Soils	
Clay	Cl
Sand	Sa
Silt	Si
Effective rooting depth	ERD
Exchangeable acidity	EA
Organic carbon	OC
Species	
E. deanei	*E. dea*
E. dunnii	*E. dun*
E. elata	*E. ela*
E. fastigata	*E. fas*
E. grandis	*E. gra*
E. macarthurii	*E. mac*
E. nitens	*E. nit*
E. saligna	*E. sal*
E. smithii	*E. smi*
E. viminalis	*E. vim*
Statistical	
Estimate	E'mate
Correlation coefficient	r
Degrees of freedom	df
F-distribution	F
Generalised linear model	GLM

Highly significant	*
Least significant difference	Lsd
Student's t-distribution	t
Variance ratio	VR
Very highly significant	**

Tree measurement

Breast height diameter	Dbh
Form factor	F-factor
Height	Ht
Over bark	ob
Under bark	ub
Volume	Vol

MAP 1. LOCATION OF STUDY SITES



1. INTRODUCTION

Since the late 1970's, there has been a sharp increase in the global demand for hardwoods, especially *Eucalyptus* species. Forest management have been able to significantly boost yields through using intensive silvicultural techniques of site preparation, fertilizing at planting, weed control and short rotations (Schönau, 1984). Extensive and traditional forestry practices (*viz* long rotation selection cutting) have in effect been replaced with plantation tree cropping. In order to satisfy timber processing requirements, afforestation in South Africa has had to extend over a wide range of climatic and edaphic site conditions (Herbert, 1993). This in turn has necessitated the employment of a number of diverse eucalypt species in achieving optimum site-species matching (Schönau and Purnell, 1987).

Considerable research has gone into site and species matching in South Africa, with sites generally being classified in terms of their soils, topography, climate, and/or other factors influencing plant-available soil water (Grey, 1983; Schönau, 1988; Herbert, 1993; Louw, 1995). Due to the strong seasonality and drought-prone nature of the climate, and the necessity to confine forestry to those areas where precipitation is sufficiently and consistently high, sites are often selected for fast-growing and demanding eucalypts on the basis of soils being able to offset these limitations (Schönau and Fitzpatrick, 1981; Herbert, 2000). Consequently, the soils chosen tend to be deep, well-drained and apedal, with the accent on high soil water storage capacity, as determined by texture and effective rooting depth (ERD). Such soils are invariably highly acidic, dystrophic and strongly dependant on their topsoil for fertility, especially nitrogen (Lowe, 1997).

There are, in addition, some particular areas of concern. Site-genotype matching is judged almost solely in terms of timber yield, and without sufficient consideration of the most efficient and effective use of the site's natural resources. As the pressure on production costs increases, the possibility of utilising side branches and stem bark for chipping and/or as bio-energy and heating resources becomes increasingly attractive. However, the impacts on the site of high-yielding short rotations are not well documented nor understood in South Africa, and there is a need to provide benchmarks as to the nutritional budgets contained in biomass, and estimate the potential impacts of harvesting on site resources for the local timber industry. Such information will remove some of the existing uncertainty over the feasibility of improving and even maintaining soil fertility, and thereby ultimately securing sustainable timber yield.

Accordingly, there is an important need to investigate site nutrient budgeting as affected by species/genotype, site conditions and harvesting practices, particularly for commercial short-rotation eucalypts. Strategies need to be developed to optimise the use of the site's nutrient resources, manage harvesting slash, make best use of natural nutritional resources and ensure a favourable balance between inputs and outputs. One of the ways of achieving this is to provide data on the size and nutrient content of the above-ground biomass components, *viz* the leaves, branches, dead matter, bark and bole wood. Furthermore, by gaining an understanding of the interactions between the physical mass of biomass components, their nutrient content and site factors, site-specific models can be constructed to estimate the effects of intensive forestry on site nutrient status, and support the development of sustainable management practices and potential fertilization and other amelioration programmes.

In addition to nutritional concerns, growth modelling over the past 20 years has come to rely increasingly on quantifying and understanding the relationships between water balance, carbon allocation and nett primary biomass production (Running and Coughlan, 1988; Landsberg and Waring, 1997). Dynamic yield prediction models require meaningful (i.e. real) data on the physical mass of biomass components, and methods for estimating these from easily obtainable mensurational parameters. Such data may also be used to gain understanding of the relationships between biomass components and merchantable timber, and is of particular use to tree breeders.

This study aims to primarily provide an initial source of reference for a range of commercial and semi-commercial eucalypt species grown in South Africa under intensive silvicultural regimes, specifically in terms of the species above-ground biomass component's size and nutrient content per biomass component. Furthermore, it seeks to gain some understanding of the interactions of site on these, in order to help optimise silvicultural operations and management of the site's resources. Accordingly, the following key questions may be defined:

1. What are the above-ground biomass profiles of commercial eucalypt species in terms of their leaf, branch, dead matter, bark and bole wood masses ?

2. What are the above-ground biomass profiles of commercial eucalypt species in terms of their leaf, branch, dead matter, bark and bole wood nutrient contents ?

3. How do the water contents of biomass components compare per species and across sites ?

4. How do bole wood densities compare within the stem per species and across sites ?

5. What are the inter-relationships between biomass component physical masses ?

6. What are the relationships between biomass component physical masses and tree mensurational parameters per species ?

7. What are the relationships between biomass component physical masses and tree foliar nutrient status per species ?

8. What are the relationships between the site's soils and the nutrient content per biomass component per species ?

Based on the findings from the above questions, initial nutrient budgets will subsequently be developed to estimate nutrient budgets using the parameters:

1. Eucalypt species employed.

2. Harvested biomass.

3. Soil conditions.

While root growth and mass is also of obvious importance in examining carbon allocation and characterising tree growth and nutrient dynamics, the implementation of below-ground studies is logistically very difficult, expensive and time consuming. Due to such constraints, no root excavations and below-ground biomass sampling were carried out in this study. It is hoped that follow up work for process growth modelling will subsequently be undertaken in this regard.

2. STUDY METHODOLOGY

As silviculture (Boden, 1984; Schönau, 1984), tree age (Attiwill, 1979; Bradstock, 1981; Grove and Malajczuk, 1985a,b; Laclau *et al.*, 2000, 2001) and site (Lambert and Turner, 1983; Specht, 1996) are all known to influence biomass development and/or nutrient uptake, study sites needed to be selected where these factors could be controlled and/or quantified.

An ideal opportunity to compare maturing short-rotation eucalypt species was afforded from a series of near-identically designed site-species trials (GE series) laid out by the Institute for Commercial Forestry Research in southeastern Mpumalanga in 1984 (Schönau and Purnell, 1987). Each trial consisted of four replications of a 3 x 4 rectangular lattice planted at a spacing of 3.0 m x 2.0 m (1667 stems per ha). Total plot size comprised 5 x 5 trees, with inner (measured) plots of 3 x 3 trees. Treatment species are shown in Table 2.1.

TABLE 2.1. TRIAL TREATMENTS

Species	Seed origin
Acacia mearnsii De Wild	Bloemendal seed orchard, ICFR
Eucalyptus deanei Maiden	RSA Commercial 1983
Eucalyptus delegatensis R. T. Baker [1]	Australia 31301 - 31305, Pilot Hill, NSW
Eucalyptus dunnii Maiden	Australia 13329, northwest of Kyogle NSW
Eucalyptus elata Dehnh.	Selected trees, SAMTMA programme
Eucalyptus fastigata Deane and Maiden	RSA Commercial
Eucalyptus fraxinoides Deane and Maiden [2]	Australia 13362 and 12115
Eucalyptus grandis W. Hill x Maiden	RSA 30261
Eucalyptus macarthurii Deane and Maiden	NTE Commercial (cleaned run 140)
Eucalyptus nitens Deane and Maiden	Australia 32076 - 32091, Big Badja Mt. NSW
Eucalyptus saligna Sm.	RSA 24564
Eucalyptus smithii R. T. Baker	Australia 12131, Mt. Dromedary, NSW
Eucalyptus viminalis Labill.	RSA 31203

1. Trial GE.14 only. *2. Not at Trial GE.14.*

The trials GE.10-15 were initially conceived as a transect of paired sites (deep and shallow soils) across a gradient of climates. However, the second paired site at Woodstock (GE.15) was accidentally felled in 1988. The trials were situated on the Huletts Plantations (Pty) Limited (now Mondi Forests) farms Eedlegesteente (GE.10 and 11) near Idalia and Speenkoppies (GE.12 and 13) near Moolman, with the fifth belonging to Lotzaba Forests Limited (now Sappi Forests) at Woodstock (GE.14) near The Gem - see Map 1. Prior to planting, all sites were ploughed and harrowed (complete cultivation) as well as ripped to a depth of 50cm along the planting line. Seedlings raised in 128 polystyrene trays received 75g 2:3:2(22) starter NPK fertilizer, applied in a ring (radius 20cm) around each plant at time of planting, and then repeated in the following spring. Due to a shortage of seedlings, *E. delegatensis* replaced *E. fraxinoides* at GE.14. Repeated blankings were carried out in order to try and achieve maximum survival, but mortality was still relatively high for *E. elata*, *E. fraxinoides* and *E. fastigata*. The trials were kept weed free till canopy closure. Details of site conditions are given in Table 2.2.

TABLE 2.2. SUMMARY OF GENERAL SITE CONDITIONS PER TRIAL SITE

Parameter	**Site**				
	GE.10	**GE.11**	**GE.12**	**GE.13**	**GE.14**
Latitude	26°50'	26°50'	27°08'	27°08'	26°23'
Longitude	30°39'	30°40'	30°55'	30°54'	30°40'
Altitude (m)	1 407	1 320	1 240	1 174	1 645
MAT (°C) [2]	15.6	16.1	16.5	16.9	14.4
MAP (mm) [2]	960	875	895	875	870
Effective precipitation	Extra high	High	High	Moderate	Very high
Lithology	Biotite granite	Biotite granite	Biotite granite	Biotite granite	Leucocratic potassic granite
Soil Form/Family [1]	Inanda / Himeville	Glenrosa / Kilspindie	Inanda / Himeville	Glenrosa / Kilspindie	Inanda / Himeville
Average texture	SaCl	SaClLm	SaCl	SaClLm	SaCl
ERD (cm)	> 150	25 - 35	> 150	25 - 35	> 150
Equivalent soil depth	Ultra deep	Very shallow	Ultra deep	Very shallow	Ultra deep
Previous land use	Virgin veld	Virgin veld	Agriculture	Virgin veld	*Pinus taeda*
Landscape position	Ridge crest	Lower midslope	Midslope	Footslope	Plateau
Slope (°)	2	7	4	9	1

[1] *Soil Classification Working Group (1991).* [2] *Estimated from altitudinal algorithms.*

The lithology of GE.10-13 comprises Pongola Sequence medium-coarse grained biotite granite and porphyritic granite, as well as leucocratic biotite granite (Walraven, 1989). At GE.10 and GE.12 this has weathered very extensively, with deep, friable and well-drained saprolite beneath the soil proper. The soils are Inanda form, with humic topsoils of 25-30 cm thickness overlying red apedal B subsoils to a depth of approximately 140 cm. Quartz stone lines are absent or thin and discontinuous, and eucalypt tree rooting is probably in excess of 6 m deep.

Conversely, the "shallow" sites at GE.11 and GE.13 comprise extensive and poorly weathered rock close to the surface, with a dominance of porphyritic material (mainly quartz). Their lithic soils are classified as Glenrosa form, are moderately to poorly drained, and there is evidence of up-slope water accumulation in the upper profile. Rooting is mainly in the A horizon, with very few and isolated roots penetrating within the fissured rock and poorly-drained substrate. Hard and continuous rock is within approximately 3m of the surface.

The Woodstock site (GE.14) is derived from Pongola Sequence leucocratic potassic granite, and has similar edaphic conditions to other "deep" sites of GE.10 and GE.12. However, there are also scattered signs of weak plinthic processes (concretions) at depths of 80 cm - 130 cm, but no continuous hard plinthic layer is present. Although the previous stand was planted to *Pinus taeda*, *Acacia mearnsii* was grown on the site at a still earlier date.

In broad climatic and edaphic terms (effective precipitation, plant available water, soil depth and texture, soil drainage status) of improving site quality for tree growing, sites may be ranked as follows:

GE.13 < GE.11 < GE.12 < GE.14 < GE.10

These five trial sites were selected for investigation as all were planted in the same year and season (February - March 1984), used the same genetic stock within species, used selected uniform seedlings raised in the same nursery and with the same techniques (thus same root systems), as well as receiving the same attention to optimum operational details in the intensive silviculture applied at establishment. Direct and un-compromised comparisons are thus able to be made between species on the same trial site, as well as investigation of the effect of site *per se* on a range of species biomass components and their nutrient contents.

E. delegatensis and *E. fraxinoides* were not included in this biomass study, as they were not planted at all sites, and the survival of *E. fraxinoides* was also generally very poor. *A. mearnsii*, not being a eucalypt, was also excluded from the study. Table 2.3 summarises the species selected for the biomass study.

TABLE 2.3. CLASSIFICATION DETAILS OF SPECIES SELECTED FOR BIOMASS STUDY

Species	Subgenus	Inclusae [1]	Group number [2]
E. deanei	*Symphyomyrtus*	Transversae	13
E. dunnii	*Symphyomyrtus*	Viminales	25
E. elata	*Monocalyptus*	Radiatae	11
E. fastigata	*Monocalyptus*	Regnantes	9
E. grandis	*Symphyomyrtus*	Transversae	13
E. macarthurii	*Symphyomyrtus*	Viminales	26
E. nitens	*Symphyomyrtus*	Viminales	26
E. saligna	*Symphyomyrtus*	Transversae	13
E. smithii	*Symphyomyrtus*	Viminales	27
E. viminalis	*Symphyomyrtus*	Viminales	27

1. Chippendale (1988). *2.* Pryor and Johnson (1971).

2.1. Field procedures

Biomass studies are acknowledged as being costly in manpower, time and finance. In order to economise on the scale of operations, it was decided to sample only one tree per species from each plot within three of the four replicates per trial site. Sampling three trees is significantly more meaningful than two (potentially 50% improvement in accuracy), as it allows improved control on sampling anomalies or error and provides a "third point" on curvilinear trends, while the improvement from three to four increases accuracy by only half this margin. The relatively small sample size is also justifiable in that a representative mean tree is used per plot, which is also in line with the general questions formulated in Chapter 1.

The data base for each parameter of each species thus comprises:

3 plots per trial x 5 trial sites = 15 samples

Following measurement of trials GE.10 - GE.14 in October - December 1990 (at about 6 years and 10 months of age), the mean square diameter breast height (dbh) (1.3 m) of each plot in each trial was calculated. As it was intended to still continue monitoring trials GE.10 - GE.14, a single undamaged healthy tree which corresponded as closely as possible to the measured plot mean dbh was selected from amongst the potential 18 buffer trees in the surrounds of each plot.

Destructive sampling of these selected trees across successive sites was carried out between mid-December 1990 and early March 1991. The sample tree of each plot was felled at ground level, and measured for total height and height at the crown base (5 cm over-bark stem diameter). The tree's components were separated into leaves (including petioles), branches (including stem above bole wood cut-off point - 5 cm over-bark top end diameter), on-tree dead material (branches and decorticating bark), fresh bark and bole wood (the latter two to a minimum tip diameter of 5 cm over-bark).

The fresh mass of each component was gravimetricly measured-in-field to the nearest decagram using a large suspended cradle and attached spring scale. Sample disc sections (3 cm thick) were cut from the bole wood at 1.3 m, 25% and 75% of bole length and from the crown base (5 cm over-bark diameter). Each component was sub-sampled and sealed within 30 minutes of felling for subsequent moisture and nutrient determinations. Two separate foliar samples were taken, the first of *select* leaves (most recent fully-formed mature leaves on outer-branchlets and in upper third of the crown - i.e. as per normal foliar sampling for nutritional diagnosis). The second sample was from *bulked* leaves, i.e. all leaf types in terms of age, crown position and damage status). Two soil samples (0-25 cm) were collected from the mid point of inter- and intra rows adjacent to each tree, and pooled as a single sample per plot.

2.2. Laboratory procedures

Biomass sub-samples from the field were transported to the laboratory and weighed for wet (fresh) mass to the nearest milligram. The bole wood discs were then submerged overnight in water and measured for volume by displacement. All samples were then dried in a forced-draught oven at 105 °C, this being reduced to 60 °C for leaves. Following drying, samples were re-weighed for dry mass.

After the wood had been measured for volume and wet and dry mass, each set of four discs per sample tree was completely milled, bulked and then sub-sampled for a single "bole wood" sample.

After dry milling, chemical analysis (per unit dry mass) of biomass samples was undertaken as follows:

Nitrogen (N) was determined by the micro-Kjeldahl method.

All other elements were ashed at 500 °C overnight, followed by digestion with 6 M HCl, filtered and made up by volume in 0.6 M HCl. Calcium (Ca), magnesium (Mg), potassium (K), sodium (Na), manganese (Mn), iron (Fe), copper (Cu) and zinc (Zn) were determined using a Varian Spectre AA-10 Atomic Absorption Spectrometer. Phosphorus (P) was determined colorimetrically using a Skalar segmented flow auto analyser. This latter method was also used for boron (B) and aluminium (Al) determinations, but the results proved somewhat erratic and were discarded for this study.

After air drying, soil samples were analysed as follows:

Soil texture was determined by sample dispersion in Calgon solution (sodium hexametaphosphate and sodium carbonate), sonication (300 W) and dilution in water, and weighed for oven-dry mass following pipetted sampling of suspension solution on a time basis.

Soil organic carbon (OC) was measured by loss on ignition (Donkin, 1991).
pH was measured in 1 M potassium chloride (KCl) solution.
Exchangeable soil Ca, Mg, K and Na was measured using 1 M ammonium acetate.
P was determined as Bray 2 P.
Exchangeable acidity (EA) (pH 8.4, per kg soil) was measured using 1 M KCl extract titrated against 0.001 M sodium hydroxide solution.

2.3. Statistical procedures

Statistical analysis of numerical data was undertaken using the Genstat® 5 programme (Release 3.2, Second edition, 1996) produced by the Statistics Department, Rothamsted Experimental Station. These comprised analysis of variance, correlations and multiple linear regressions. As soil conditions within trials were selected for their uniformity within and between blocks, the laboratory analyses of biomass and soils showed relatively little variation within treatments, and any anomalies were queried and re-submitted for analysis. In addition, it was also possible to compare laboratory results with an earlier "run" comprising a single bulked sample drawn from each of the three plots per species treatment per site (Herbert and Robertson, 1991). This procedure resulted in a very "clean" data set, which helped considerably in promoting meaningful statistical analysis of the data.

Each of the original site-species trials comprised four replications of a 3 x 4 rectangular lattice. As treatments were reduced to 10 species, and only three replications were used in the biomass study, the individual trial designs became statistically incomplete and unbalanced, and thus blocks had to be combined into single replications of 10 units each, yielding 30 plots per trial site. Such a simple arrangement would yield the following analysis of variance structure per trial:

Source of variation	Degrees of freedom
Replications	2
Species	9
Residual	18
Total	**29**

While this arrangement provides adequate degrees of freedom for deriving the residual (error) term and controlling its mean square value, it does not provide any information on the effects of Site differences on Species. Accordingly, a more satisfactory statistical design incorporates Species and Sites in the same analysis of variance model, as shown below:

Source of variation	Degrees of freedom
Site	4
Species	9
Species x Site	36
Residual	100
Total	**149**

This latter model allows treatment means to be tested between species and across sites, while simultaneously minimising mean square residual values by employing 100 degrees of freedom (instead of 18) - a far more satisfactory analysis of variance structure, and the one selected for this study.

Relationships between site, biomass and nutrient concentration factors were examined using correlation analysis and multiple linear regressions. The generalised linear model (GLM) employed by Genstat assumes that the distribution of variates is normal, and thus alerts users to skewed distributions. As all variates incorporated in the GLMs were parametric and the data drawn from "mean" trees per plot, any abnormal distributions were related to "outliers" in the data sets (e.g. an unusually large tree). Due to their disproportionate influence (high leverage), in those few instances where they occurred, "outliers" were accordingly individually excluded from the analysis.

While examination of the correlation matrix's simple coefficients indicates the significance of linear relationships between variables, when fitted as terms in a multiple regression their inclusion in the final model depends on the degree of overall agreement between explanatory variates in explaining the response variate. While it is generally true that inclusion of more explanatory variates in the model is able to account for more of the variance in the Y variate, the statistical significance (t-value) of these is correspondingly lowered. In addition, it is also unwieldy to have models with many terms. Accordingly, it is desirable to only include significant explanatory variates which optimally account for the maximum amount of variance. This is measured by R^2, expressed in terms of the regression analysis of variance as:

$$100 \times [1 - (\text{Residual mean square} / \text{Total mean square})]$$

Genstat is able to sequentially modify declared regression models in order to achieve the biggest improvement in R^2. Select terms in specified declared formulae are dropped from the current model if they are already there (i.e. if unsuccessful), or are added to it if they are not. For each term, the residual sum of squares and the residual degrees of freedom are recorded; then Genstat reverts to the original model before trying the next term. The current model is finally modified by the best term, according to a criterion based on the variance ratios. Terms are added or dropped depending on their variance ratio and the degree of reduction achieved in the residual mean square.

Correlation and regression analyses were undertaken for individual species (n = 15), groups of related species (Transversae: n = 45; and Viminales: n = 75) and all combined species (n = 150).

3. RECORDED STUDY DATA

The study's complete unprocessed data base consisted of 150 individual plot records for ten eucalypt *species* replicated three times (*plots*) across five *trial* sites GE.10 - GE.14 (italicised names are defined field headings). The plot numbers refer to the original trial allocations (i.e. 1-48), although only 30 plots from three of the four replications were used per trial in this study. Each record contained the following fields, as shown in the associated referenced Appendices A1 - A3.6:

A1. *Soil physical and chemical parameters*:
Soil textural units, pH, exchangeable Ca, Mg, K and Na, sum of exchangeable cations (S-value, per kg soil and clay), available P, organic carbon (OC) and exchangeable acidity (EA).

A2.1. *Sample tree characteristics:*
Total height, height to 5 cm top end diameter (crown base), over bark dbh of the actual *sample* tree and the associated *plot* mean dbh, under-bark (i.e. post bark stripping) stem volume (single tree), stocking per ha, basal area (sum of dbh cross-sectional area). Basal area was used as it is directly proportional to stem volume per unit area, and thus a useful measure of tree productivity. Tree volume of all trees per plot was not directly measured in the field, but all dbhs were recorded, thus necessitating the employment of basal area for statistical analyses.

A2.2. *Above-ground biomass component parameters:*
Water content ((fresh mass - dry mass)/fresh mass) and total oven-dry mass of leaves, branches, dead material, bole bark, bole wood, and total above-ground biomass per sample tree.

A2.3. *Sample tree density per disc sample height:*
Density per sample disc cut at 1.3 m, 25% and 75% of total tree bole height and at 5cm top end diameter (bole tip), together with their mass-weighted mean.

A3.1. *Nutrient concentration of selected foliar material*
Nutrient concentration (dry mass) of Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, and N per

sample tree; select material comprised that normally used in foliar sampling for diagnostic purposes.

A3.2. *Nutrient concentration of bulk foliar material*

Nutrient concentration (dry mass) of Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, and N per sample tree.

A3.3. *Nutrient concentration of branches*

Nutrient concentration (dry mass) of Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, and N per sample tree.

A3.4. *Nutrient concentration of on-tree dead matter*

Nutrient concentration (dry mass) of Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, and N per sample tree.

A3.5. *Nutrient concentration of bole bark*

Nutrient concentration (dry mass) of Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, and N per sample tree.

A3.6. *Nutrient concentration of bole wood*

Nutrient concentration (dry mass) of Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, and N per sample tree (bulked sample from four sample discs).

The data in Appendices A1 to A3.6 are summarised as means for each eucalypt species per site (3 samples), species across sites (15 samples) and sites (30 samples) in:

Table 3.1 (soil physical and chemical parameters)
Table 3.2 (sample tree and plot growth characteristics)
Table 3.3 (biomass component parameters)
Table 3.4 (bole wood density)
Table 3.5 (nutrient concentration of select foliar samples)
Tables 3.6.1 to 3.10.2 (elemental nutrient concentration and tree mass per biomass component)

These mean values were calculated following an analysis of variance of all data fields. Tables 3.1 to 3.10.2 also contain the probability level of the F-test, as well as the standard error (SE) of the difference between means (dbm). Statistical analyses and exposition of the data are presented in Chapter 4.

Table 3.1. Average soil physical and chemical parameters per trial, and species

Trial	Species	Soil texture (%)				Gravel	pH	Exchangeable cations (cmol(+)/kg soil)					S-value	P	OC	Exch. acidity
		Clay	*Silt*	*Sand*	*Class*	(%)	(KCl)	*Ca*	*Mg*	*K*	*Na*	*S-value*	(/kg Cl.)	(mg/kg)	(%)	(cmol(+)/kg)
10	*E. deanei*	44	5	52	SaCl	0	3.97	0.27	0.14	0.16	0.10	0.67	1.54	1.70	1.93	1.55
10	*E. dunnii*	45	5	50	SaCl	1	3.77	0.37	0.24	0.21	0.11	0.93	2.06	1.77	2.12	1.36
10	*E. elata*	44	5	51	SaCl	1	3.87	0.24	0.18	0.14	0.11	0.67	1.54	1.53	1.94	1.44
10	*E. fastigata*	42	5	52	SaCl	1	3.87	0.26	0.15	0.10	0.10	0.60	1.43	1.53	1.91	1.58
10	*E. grandis*	38	5	57	SaCl	1	3.93	0.27	0.16	0.13	0.10	0.66	1.76	1.50	1.52	1.33
10	*E. macarthurii*	41	5	53	SaCl	0	3.90	0.30	0.16	0.15	0.09	0.68	1.66	1.53	1.90	1.44
10	*E. nitens*	43	5	52	SaCl	0	3.90	0.34	0.19	0.14	0.10	0.51	1.24	1.70	1.94	1.51
10	*E. saligna*	44	5	50	SaCl	1	3.90	0.39	0.21	0.15	0.11	0.85	1.89	1.53	1.82	1.51
10	*E. smithii*	42	5	54	SaCl	1	3.90	0.25	0.13	0.19	0.11	0.69	1.65	1.80	1.87	1.52
10	*E. viminalis*	45	5	50	SaCl	1	3.90	0.31	0.18	0.14	0.10	0.73	1.63	1.47	1.96	1.53
10	**Mean**	**43**	**5**	**52**	SaCl	**1**	**3.89**	**0.30**	**0.17**	**0.15**	**0.10**	**0.70**	**1.64**	**1.61**	**1.89**	**1.48**
11	*E. deanei*	34	7	59	SaClLm	0	3.80	2.59	2.64	0.29	0.14	5.65	17.20	3.37	2.65	1.26
11	*E. dunnii*	31	10	59	SaClLm	0	4.07	3.05	2.46	0.26	0.21	5.98	19.45	3.87	2.56	0.65
11	*E. elata*	31	9	60	SaClLm	0	3.93	2.30	2.07	0.17	0.13	4.66	18.09	4.40	2.23	0.73
11	*E. fastigata*	33	10	57	SaClLm	0	4.03	3.02	2.75	0.17	0.16	6.11	18.67	3.00	2.65	0.55
11	*E. grandis*	35	9	56	SaClLm	0	4.00	2.46	2.77	0.17	0.17	5.57	15.83	2.93	2.29	1.02
11	*E. macarthurii*	31	10	60	SaClLm	0	3.83	2.63	2.41	0.18	0.16	5.38	17.92	3.73	2.48	0.90
11	*E. nitens*	38	7	55	SaCl	0	3.97	2.55	2.41	0.24	0.14	5.33	14.14	3.40	2.50	0.77
11	*E. saligna*	31	8	61	SaClLm	0	3.87	2.56	2.77	0.17	0.19	5.69	18.15	3.80	2.43	1.27
11	*E. smithii*	37	9	54	SaCl	0	4.07	2.49	2.51	0.21	0.16	5.37	15.74	2.67	2.14	1.05
11	*E. viminalis*	33	8	59	SaClLm	0	3.90	2.53	2.35	0.19	0.18	5.26	15.45	3.63	2.35	0.84
11	**Mean**	**33**	**9**	**58**	**SaClLm**	**0**	**3.95**	**2.62**	**2.52**	**0.21**	**0.16**	**5.50**	**17.07**	**3.48**	**2.43**	**0.90**
12	*E. deanei*	47	5	48	SaCl	0	4.03	0.22	0.23	0.15	0.10	0.70	1.50	3.40	2.17	2.03
12	*E. dunnii*	46	5	49	SaCl	0	4.03	0.30	0.28	0.15	0.11	0.83	1.79	4.07	2.09	1.79
12	*E. elata*	48	4	48	SaCl	0	4.07	0.23	0.19	0.11	0.11	0.64	1.36	4.07	2.14	1.92
12	*E. fastigata*	46	6	49	SaCl	0	4.00	0.28	0.26	0.10	0.10	0.74	1.61	3.87	2.22	1.82
12	*E. grandis*	46	6	48	SaCl	0	4.00	0.33	0.37	0.19	0.12	1.01	2.21	2.41	2.32	1.77
12	*E. macarthurii*	47	8	46	SaCl	0	4.03	0.21	0.19	0.12	0.12	0.67	1.44	3.43	2.22	1.91
12	*E. nitens*	49	5	47	SaCl	0	4.07	0.26	0.23	0.15	0.10	0.74	1.51	3.27	2.42	1.85
12	*E. saligna*	46	6	49	SaCl	0	4.13	0.27	0.25	0.17	0.12	0.81	1.75	3.23	2.01	1.85
12	*E. smithii*	46	6	48	SaCl	0	4.07	0.32	0.30	0.16	0.13	0.91	1.98	2.77	2.29	1.91
12	*E. viminalis*	46	6	48	SaCl	0	4.10	0.29	0.27	0.12	0.10	0.78	1.71	2.97	2.29	1.83
12	**Mean**	**47**	**6**	**48**	**SaCl**	**0**	**4.05**	**0.27**	**0.26**	**0.14**	**0.11**	**0.78**	**1.69**	**3.35**	**2.22**	**1.87**
F prob. (*Species*)		0.53	0.21	1.00			0.31	0.93	0.72	0.75	0.66	0.24	0.86	0.95	0.47	0.25
F prob. (*Spp. x Trial*)		0.92	0.75	0.49			0.32	0.99	0.92	0.84	0.64	0.94	0.99	1.00	0.54	0.99

Table 3.1. Average soil physical and chemical parameters per trial, and species

Trial	Species	Soil texture (%)				Gravel	pH	Exchangeable cations (cmol(+)/kg soil)					S-value	P	OC	Exch. acidity
		Clay	*Silt*	*Sand*	*Class*	(%)	(KCl)	*Ca*	*Mg*	*K*	*Na*	*S-value*	(/kg Cl.)	(mg/kg)	(%)	(cmol(+)/kg)
13	*E. deanei*	33	11	56	SaClLm	0	4.37	4.96	3.88	0.21	0.19	9.24	27.35	2.50	1.53	0.23
13	*E. dunnii*	32	10	58	SaClLm	0	4.47	4.82	3.35	0.23	0.18	8.57	26.41	1.40	1.36	0.14
13	*E. elata*	33	11	57	SaClLm	0	4.67	5.55	3.99	0.28	0.18	9.99	30.37	1.40	1.57	0.08
13	*E. fastigata*	32	11	57	SaClLm	0	4.43	5.74	3.85	0.33	0.17	10.10	31.81	1.57	1.55	0.11
13	*E. grandis*	35	12	53	SaClLm	0	4.50	6.37	3.32	0.46	0.17	10.33	29.43	1.70	1.66	0.12
13	*E. macarthurii*	33	11	56	SaClLm	0	4.50	5.32	3.64	0.22	0.17	9.36	28.45	2.83	1.57	0.13
13	*E. nitens*	32	10	58	SaClLm	0	4.60	4.90	3.39	0.35	0.25	8.89	27.24	2.57	1.58	0.09
13	*E. saligna*	37	12	52	SaCl	0	4.67	7.42	4.75	0.31	0.17	12.66	34.52	2.70	1.85	0.09
13	*E. smithii*	32	11	57	SaClLm	0	4.60	5.74	3.43	0.25	0.16	9.58	29.29	2.40	1.34	0.10
13	*E. viminalis*	36	12	53	SaCl	0	4.57	6.34	4.54	0.23	0.18	11.29	31.61	1.87	1.71	0.08
13	**Mean**	**33**	**11**	**56**	SaClLm	0	**4.54**	**5.72**	**3.81**	**0.29**	**0.18**	**10.00**	**29.65**	**2.09**	**1.57**	**0.12**
14	*E. deanei*	40	6	54	SaCl	0	3.67	0.27	0.11	0.66	0.49	1.53	3.62	6.00	2.78	2.05
14	*E. dunnii*	39	6	55	SaCl	0	3.73	0.25	0.08	0.13	0.09	0.56	1.46	5.20	2.21	1.64
14	*E. elata*	43	7	51	SaCl	0	3.73	0.26	0.12	0.16	0.09	0.63	1.47	5.47	2.84	1.87
14	*E. fastigata*	38	7	55	SaCl	0	3.70	0.21	0.09	0.10	0.05	0.45	1.18	5.17	2.63	1.87
14	*E. grandis*	38	6	57	SaCl	0	3.77	0.22	0.08	0.14	0.10	0.55	1.45	4.77	2.44	1.64
14	*E. macarthurii*	39	7	54	SaCl	0	3.67	0.26	0.10	0.07	0.08	0.50	1.28	6.27	2.88	1.98
14	*E. nitens*	40	7	53	SaCl	0	3.63	0.23	0.11	0.21	0.10	0.65	1.63	5.07	2.63	1.47
14	*E. saligna*	37	6	57	SaCl	0	3.73	0.22	0.10	0.14	0.11	0.56	1.51	5.50	2.58	1.90
14	*E. smithii*	39	6	55	SaCl	0	3.70	0.20	0.11	0.15	0.09	0.56	1.42	4.43	2.40	1.76
14	*E. viminalis*	35	5	59	SaCl	0	3.73	0.22	0.10	0.65	0.13	1.11	3.27	4.40	2.42	1.62
14	**Mean**	**39**	**6**	**55**	SaCl	**0**	**3.71**	**0.23**	**0.10**	**0.24**	**0.13**	**0.71**	**1.83**	**5.23**	**2.58**	**1.78**
10-14	*E. deanei*	40	7	54	SaCl	0	3.97	1.66	1.40	0.29	0.20	3.56	10.24	3.39	2.21	1.42
10-14	*E. dunnii*	39	7	54	SaCl	0	4.01	1.76	1.28	0.20	0.14	3.38	10.24	3.26	2.07	1.12
10-14	*E. elata*	40	7	53	SaCl	0	4.05	1.72	1.31	0.17	0.12	3.32	10.57	3.37	2.15	1.21
10-14	*E. fastigata*	38	8	54	SaCl	0	4.01	1.90	1.42	0.16	0.12	3.60	10.94	3.03	2.19	1.18
10-14	*E. grandis*	38	8	54	SaCl	0	4.04	1.93	1.34	0.22	0.13	3.62	10.14	2.66	2.04	1.17
10-14	*E. macarthurii*	38	8	54	SaCl	0	3.99	1.74	1.30	0.15	0.12	3.32	10.15	3.56	2.21	1.27
10-14	*E. nitens*	40	7	53	SaCl	0	4.03	1.66	1.26	0.22	0.14	3.22	9.15	3.20	2.21	1.14
10-14	*E. saligna*	39	7	54	SaCl	0	4.06	2.17	1.62	0.19	0.14	4.11	11.57	3.35	2.14	1.32
10-14	*E. smithii*	39	7	53	SaCl	0	4.07	1.80	1.30	0.19	0.13	3.42	10.02	2.81	2.01	1.27
10-14	*E. viminalis*	39	7	54	SaCl	0	4.04	1.94	1.49	0.27	0.14	3.84	10.73	2.87	2.15	1.18
SE (dbm): *w/i trial*		3.30	1.20	3.70			0.100	0.793	0.426	0.179	0.090	0.810	1.190	3.145	0.129	0.262
SE (dbm): *bet. trials*		1.50	0.50	1.60			0.042	0.354	0.190	0.080	0.040	0.360	0.532	1.407	0.107	0.117

Table 3.2. Average sample tree and plot growth characteristics per trial and species

Trial	Species	Height (m) Total	Height (m) 5cm top	OB Dbh (cm) Sample	OB Dbh (cm) Plot	Basal area (m²/ha)	Stocking (N/ha)	UB stem volume (dm³)	Form factor
10	*E. deanei*	19.97	16.47	16.97	16.02	27.39	1667	166.09	0.368
10	*E. dunnii*	21.37	17.73	16.23	15.96	27.35	1667	152.56	0.345
10	*E. elata*	20.00	16.57	16.10	15.58	17.90	1605	145.39	0.357
10	*E. fastigata*	19.37	15.73	16.93	16.39	24.39	1358	147.42	0.338
10	*E. grandis*	20.80	17.47	17.37	17.10	29.14	1358	170.50	0.346
10	*E. macarthurii*	19.90	16.47	18.23	17.66	32.45	1235	160.79	0.309
10	*E. nitens*	19.57	16.30	17.10	17.13	20.45	1420	174.08	0.387
10	*E. saligna*	19.90	16.40	15.87	15.69	27.43	1358	141.50	0.360
10	*E. smithii*	22.70	18.63	18.40	18.19	34.13	1667	217.57	0.360
10	*E. viminalis*	19.10	15.43	15.17	14.85	24.31	1543	111.78	0.324
10	**Mean**	**20.27**	**16.72**	**16.84**	**16.46**	**26.49**	**1488**	**158.77**	0.352
11	*E. deanei*	15.97	12.57	15.33	14.70	25.16	1667	110.32	0.374
11	*E. dunnii*	19.57	16.13	17.23	17.01	31.15	1543	150.12	0.329
11	*E. elata*	16.70	12.43	13.37	13.74	11.06	1296	84.87	0.362
11	*E. fastigata*	16.67	12.27	13.57	12.29	13.15	1173	82.59	0.343
11	*E. grandis*	19.77	16.53	16.27	15.12	28.63	1667	145.65	0.355
11	*E. macarthurii*	17.70	13.70	16.73	15.84	28.10	1667	131.68	0.338
11	*E. nitens*	19.03	15.87	17.40	17.10	29.12	1358	186.21	0.411
11	*E. saligna*	19.70	16.37	16.07	15.64	24.72	1543	144.52	0.362
11	*E. smithii*	19.20	15.13	16.73	15.40	29.90	1667	153.66	0.364
11	*E. viminalis*	18.93	15.30	16.03	15.59	25.95	1481	129.79	0.340
11	**Mean**	**18.32**	**14.63**	**15.87**	**15.24**	**24.69**	**1506**	**131.94**	0.364
12	*E. deanei*	21.00	17.33	18.07	17.26	32.30	1420	219.03	0.407
12	*E. dunnii*	26.50	23.40	23.53	20.48	36.80	1605	373.23	0.324
12	*E. elata*	26.33	22.07	21.80	21.40	24.20	1049	317.48	0.323
12	*E. fastigata*	24.13	20.13	19.60	17.99	30.90	1235	282.68	0.388
12	*E. grandis*	26.13	22.63	20.57	19.27	32.70	1667	298.24	0.344
12	*E. macarthurii*	20.93	16.90	17.47	18.73	28.20	1481	176.93	0.353
12	*E. nitens*	20.67	15.87	14.10	15.76	29.70	926	108.71	0.337
12	*E. saligna*	24.60	21.23	19.30	19.49	34.30	1481	269.59	0.375
12	*E. smithii*	27.90	23.33	21.43	18.82	30.80	1667	404.90	0.402
12	*E. viminalis*	23.60	19.70	19.63	19.66	30.70	1605	248.17	0.347
12	**Mean**	**24.18**	**20.26**	**19.55**	**18.89**	**31.06**	**1414**	**269.90**	0.372
F prob. (*Species*)		< 0.001	< 0.001	0.020	0.239		< 0.001	0.013	
F prob. (*Spp. x Trial*)		0.003	< 0.001	< 0.001	< 0.001		0.018	0.007	

Table 3.2. Average sample tree and plot growth characteristics per trial and species

Trial	Species	Height (m)		OB Dbh (cm)		Basal area (m²/ha)	Stocking (N/ha)	UB stem volume (dm³)	Form factor
		Total	*5cm top*	*Sample*	*Plot*				
13	*E. deanei*	13.67	9.27	11.80	11.74	14.35	1605	48.24	0.323
13	*E. dunnii*	15.70	11.83	13.83	13.54	19.45	1667	80.71	0.342
13	*E. elata*	13.10	8.83	11.10	11.87	11.57	1358	50.57	0.399
13	*E. fastigata*	13.70	9.00	10.73	11.56	8.71	1420	43.39	0.350
13	*E. grandis*	15.83	11.87	13.47	12.97	18.89	1605	87.78	0.389
13	*E. macarthurii*	15.67	11.37	14.00	12.78	16.04	1543	74.96	0.311
13	*E. nitens*	10.87	6.13	9.60	9.94	3.49	556	29.73	0.378
13	*E. saligna*	17.20	13.30	13.67	12.75	19.52	1667	107.52	0.426
13	*E. smithii*	16.20	11.57	12.40	11.91	15.79	1605	72.27	0.369
13	*E. viminalis*	14.33	9.80	12.07	12.04	17.39	1667	52.31	0.319
13	**Mean**	**14.63**	**10.30**	**12.27**	**12.11**	**14.52**	**1469**	**64.75**	0.375
14	*E. deanei*	17.20	12.87	12.53	12.69	22.40	1605	82.38	0.388
14	*E. dunnii*	20.43	16.67	15.57	14.58	28.14	1667	123.93	0.319
14	*E. elata*	17.93	12.90	12.47	14.60	27.96	1605	106.35	0.486
14	*E. fastigata*	20.33	16.07	17.80	18.65	33.98	1296	174.05	0.344
14	*E. grandis*	18.63	14.33	13.70	13.68	26.72	1605	105.07	0.383
14	*E. macarthurii*	18.07	13.57	14.57	14.49	25.31	1605	97.43	0.324
14	*E. nitens*	20.20	16.97	18.50	18.60	42.37	1605	207.54	0.382
14	*E. saligna*	18.00	13.90	14.77	14.92	27.51	1605	125.45	0.407
14	*E. smithii*	21.87	17.57	16.40	16.17	37.43	1667	163.01	0.353
14	*E. viminalis*	19.20	14.93	15.13	14.92	30.70	1667	113.26	0.328
14	**Mean**	**19.19**	**14.98**	**15.14**	**15.33**	**30.25**	**1593**	**129.85**	0.376
10-14	*E. deanei*	17.56	13.70	14.94	14.48	24.32	1593	125.21	0.407
10-14	*E. dunnii*	20.71	17.15	17.28	16.32	28.58	1630	176.11	0.363
10-14	*E. elata*	18.81	14.56	14.97	15.44	18.54	1383	140.93	0.426
10-14	*E. fastigata*	18.84	14.64	15.73	15.38	22.23	1296	146.03	0.399
10-14	*E. grandis*	20.23	16.57	16.27	15.63	27.22	1580	161.45	0.384
10-14	*E. macarthurii*	18.45	14.40	16.20	15.90	26.02	1506	128.36	0.337
10-14	*E. nitens*	18.07	14.23	15.34	15.71	25.03	1173	141.26	0.423
10-14	*E. saligna*	19.88	16.24	15.93	15.70	26.70	1531	157.72	0.398
10-14	*E. smithii*	21.57	17.25	17.07	16.10	29.61	1654	202.28	0.410
10-14	*E. viminalis*	19.03	15.03	15.61	15.41	25.81	1593	131.06	0.360
SE (dbm): *w/i trial*		1.378	1.495	1.521	1.373		190.5	48.207	
SE (dbm): *bet. trials*		0.616	0.669	0.680	0.614		85.2	21.559	

Table 3.3 Average above-ground tree biomass component parameters per trial and species

Trial	Species	Above ground water content (%)						Above ground dry mass (kg/tree)					
		Leaf	*Branch*	*Dead*	*Bark*	*Bole*	*Total*	*Leaf*	*Branch*	*Dead*	*Bark*	*Bole*	*Total*
10	*E. deanei*	54.6	50.8	13.3	67.4	50.0	51.5	6.206	12.044	6.072	10.535	92.171	127.029
10	*E. dunnii*	59.0	51.1	18.0	66.5	52.2	54.6	3.618	7.668	0.848	12.724	80.574	105.433
10	*E. elata*	55.2	49.1	16.4	61.6	53.1	53.4	5.082	11.963	2.370	11.017	73.945	104.377
10	*E. fastigata*	54.2	50.7	16.1	61.0	52.0	52.1	5.342	10.594	3.775	8.381	79.255	107.348
10	*E. grandis*	58.4	48.7	14.7	66.0	51.8	52.9	3.534	6.756	3.269	8.562	76.793	98.913
10	*E. macarthurii*	54.6	47.8	13.7	63.8	48.6	50.4	5.142	14.258	3.886	13.882	93.026	130.193
10	*E. nitens*	52.1	47.0	15.3	60.6	49.7	49.5	7.587	15.368	8.333	11.945	96.557	139.790
10	*E. saligna*	61.0	50.7	15.9	65.1	48.4	50.6	2.144	7.143	2.522	8.381	71.602	91.792
10	*E. smithii*	52.3	42.9	14.7	59.5	45.9	46.8	6.683	18.097	4.408	13.364	133.154	175.707
10	*E. viminalis*	58.7	50.2	15.2	67.1	49.0	52.1	2.618	5.647	0.989	9.043	63.110	81.407
10	**Mean**	**56.0**	**48.9**	**15.3**	**63.9**	**50.1**	**51.4**	**4.796**	**10.954**	**3.647**	**10.783**	**86.019**	**116.199**
11	*E. deanei*	61.7	56.5	23.1	69.4	52.2	54.7	5.745	11.952	4.871	7.297	57.564	87.429
11	*E. dunnii*	64.4	52.4	15.1	64.9	49.9	53.4	4.209	8.402	1.415	16.039	82.725	112.790
11	*E. elata*	60.4	52.8	30.8	61.3	54.2	54.6	2.440	8.576	2.307	5.995	40.185	59.502
11	*E. fastigata*	62.1	52.5	26.1	60.6	51.7	52.4	3.162	9.266	3.570	5.316	44.023	65.337
11	*E. grandis*	65.7	56.4	29.1	64.6	51.4	53.8	2.629	6.761	1.890	8.663	68.487	88.429
11	*E. macarthurii*	59.4	51.8	24.0	66.3	48.6	52.1	4.602	14.065	3.167	12.989	74.307	109.130
11	*E. nitens*	53.7	46.7	23.1	61.6	50.5	49.9	9.795	18.288	12.942	11.441	98.880	151.347
11	*E. saligna*	63.7	55.3	30.0	70.4	51.1	54.5	3.386	8.274	1.400	8.633	73.653	95.346
11	*E. smithii*	56.7	46.7	22.2	60.8	48.0	49.0	8.018	24.627	6.226	11.243	87.292	137.406
11	*E. viminalis*	61.6	50.4	24.4	67.3	47.5	51.0	4.224	10.416	4.159	11.156	76.368	106.323
11	**Mean**	**60.9**	**52.1**	**24.8**	**64.7**	**50.5**	**52.5**	**4.821**	**12.063**	**4.195**	**9.877**	**70.348**	**101.304**
12	*E. deanei*	53.8	53.8	25.1	70.8	54.4	55.8	8.000	13.936	3.621	11.181	110.418	147.156
12	*E. dunnii*	55.7	50.5	26.2	69.0	51.6	54.2	7.464	11.789	0.566	23.690	193.738	237.161
12	*E. elata*	61.3	51.2	18.1	64.0	52.9	54.1	8.570	23.089	3.961	19.757	163.040	218.418
12	*E. fastigata*	57.6	52.5	20.6	68.0	56.8	56.9	8.126	16.308	4.631	10.600	135.213	174.877
12	*E. grandis*	61.2	52.8	26.1	70.3	52.1	54.3	6.989	12.191	2.462	11.486	130.284	163.412
12	*E. macarthurii*	56.8	50.3	18.8	70.1	51.1	52.9	2.733	4.891	6.630	11.146	97.024	122.425
12	*E. nitens*	50.0	46.7	22.2	65.1	53.2	53.5	2.334	4.087	2.206	5.941	56.127	70.695
12	*E. saligna*	60.1	52.1	16.6	70.7	55.8	56.5	3.987	11.898	5.144	10.538	111.425	142.991
12	*E. smithii*	58.6	49.2	22.9	65.3	50.0	51.2	10.890	20.165	7.324	16.693	222.558	277.630
12	*E. viminalis*	57.2	50.2	22.5	68.8	52.0	54.7	5.780	7.718	1.551	18.951	133.723	167.722
12	**Mean**	**57.2**	**50.9**	**21.9**	**68.2**	**53.0**	**54.4**	**6.487**	**12.607**	**3.809**	**13.998**	**135.355**	**172.249**
F prob. (*Species*)		< 0.001	< 0.001	0.659	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
F prob. (*Spp. x Trial*)		0.003	0.079	0.259	0.027	0.108	0.046	0.018	< 0.001	< 0.001	< 0.001	0.002	< 0.001

Table 3.3 Average above-ground tree biomass component parameters per trial and species

Trial	Species	Above ground water content (%)						Above ground dry mass (kg/tree)					
		Leaf	*Branch*	*Dead*	*Bark*	*Bole*	*Total*	*Leaf*	*Branch*	*Dead*	*Bark*	*Bole*	*Total*
13	*E. deanei*	57.6	49.7	22.4	66.3	52.1	53.1	3.250	6.622	2.329	3.984	23.415	39.600
13	*E. dunnii*	58.5	54.4	26.8	67.8	53.4	54.9	4.292	7.594	0.366	6.494	41.258	59.877
13	*E. elata*	60.6	52.1	23.3	61.4	53.5	54.2	3.345	9.252	1.023	3.408	24.259	41.289
13	*E. fastigata*	58.7	49.2	20.4	59.5	49.9	50.8	2.204	5.501	1.195	2.833	22.040	33.773
13	*E. grandis*	61.3	56.4	23.2	66.9	50.5	52.7	3.353	6.904	0.768	5.076	37.132	53.233
13	*E. macarthurii*	58.1	49.4	22.8	67.1	53.5	54.3	3.767	7.342	3.862	6.742	37.605	59.318
13	*E. nitens*	55.1	52.3	25.4	63.0	52.5	52.0	3.819	8.420	3.604	2.592	15.513	33.947
13	*E. saligna*	61.7	54.8	25.3	68.5	50.0	53.1	3.954	7.455	1.743	5.520	51.151	69.823
13	*E. smithii*	51.9	48.1	20.2	61.4	45.3	47.4	4.489	8.470	1.464	4.370	41.930	60.723
13	*E. viminalis*	58.7	53.0	21.2	66.9	51.5	54.5	4.614	8.384	0.656	4.694	27.024	45.372
13	**Mean**	**58.2**	**52.0**	**23.1**	**64.9**	**51.2**	**52.7**	**3.709**	**7.594**	**1.701**	**4.571**	**32.133**	**49.696**
14	*E. deanei*	56.3	57.3	20.4	69.7	50.4	52.4	2.111	4.664	4.512	4.853	43.118	59.259
14	*E. dunnii*	55.1	54.2	19.1	65.9	48.6	52.0	2.497	5.388	1.887	12.121	70.569	92.462
14	*E. elata*	53.0	50.5	20.8	58.3	52.3	52.3	4.858	15.659	2.244	9.591	56.501	88.854
14	*E. fastigata*	52.4	51.1	17.8	63.2	51.4	51.4	6.669	12.966	7.258	8.765	94.288	129.947
14	*E. grandis*	56.3	54.2	19.0	66.4	52.6	53.9	2.915	7.029	2.836	6.384	47.264	66.429
14	*E. macarthurii*	58.3	53.5	26.3	67.0	49.0	52.1	3.269	9.759	2.211	7.427	55.128	77.794
14	*E. nitens*	48.6	49.7	19.6	65.9	55.8	54.4	8.265	13.903	10.715	11.254	102.246	146.383
14	*E. saligna*	58.5	52.3	18.5	67.1	50.5	51.4	2.972	9.248	6.519	6.080	53.410	78.229
14	*E. smithii*	47.2	48.5	19.6	62.1	48.3	48.9	5.461	11.583	4.689	9.031	92.548	123.312
14	*E. viminalis*	53.0	48.8	20.7	65.5	46.4	49.4	4.071	7.845	3.302	10.053	67.978	93.249
14	**Mean**	**53.9**	**52.0**	**20.2**	**65.1**	**50.5**	**51.8**	**4.309**	**9.804**	**4.617**	**8.556**	**68.305**	**95.592**
10-14	*E. deanei*	56.8	53.6	20.8	68.7	51.8	53.5	5.063	9.844	4.281	7.570	65.337	92.095
10-14	*E. dunnii*	58.5	52.5	21.0	66.8	51.1	53.8	4.416	8.168	1.016	14.214	93.773	121.544
10-14	*E. elata*	58.1	51.2	21.8	61.3	53.2	53.7	4.859	13.708	2.381	9.954	71.586	102.488
10-14	*E. fastigata*	57.0	51.2	20.2	62.5	52.4	52.7	5.100	10.927	4.086	7.179	74.964	102.256
10-14	*E. grandis*	60.6	53.7	22.4	66.8	51.7	53.5	3.884	7.928	2.245	8.034	71.992	94.083
10-14	*E. macarthurii*	57.5	50.6	21.1	66.9	50.2	52.4	3.903	10.063	3.951	10.437	71.418	99.772
10-14	*E. nitens*	51.9	48.5	21.1	63.2	52.3	51.9	6.360	12.013	7.560	8.635	73.865	108.433
10-14	*E. saligna*	61.0	53.1	21.3	68.4	51.1	53.2	3.289	8.804	3.466	7.830	72.248	95.636
10-14	*E. smithii*	53.3	47.1	19.9	61.8	47.5	48.7	7.108	16.588	4.822	10.940	115.496	154.955
10-14	*E. viminalis*	57.8	50.5	20.8	67.1	49.3	52.3	4.261	8.002	2.132	10.779	73.641	98.815
		57.3	**51.2**	**21.1**	**65.4**	**51.1**	**52.6**	**4.824**	**10.605**	**3.594**	**9.557**	**78.432**	**107.008**
SE (dbm): *w/i trial*		2.07	2.14	3.67	1.62	2.11	1.68	2.0280	3.6310	1.5813	2.2664	24.3747	30.8075
SE (dbm): *bet. trials*		0.93	0.96	1.64	0.73	0.94	0.75	0.9070	1.6238	0.7072	1.0136	10.9007	13.7775

Table 3.4. Average sample tree density per disc sample height

Trial	Species	Sample disc section				Weighted mean
		1.3m	*25% height*	*75% height*	*5cm top*	
10	*E. deanei*	0.558	0.560	0.548	0.534	0.557
10	*E. dunnii*	0.522	0.533	0.543	0.531	0.530
10	*E. elata*	0.502	0.518	0.508	0.492	0.507
10	*E. fastigata*	0.538	0.537	0.537	0.530	0.538
10	*E. grandis*	0.456	0.436	0.467	0.501	0.451
10	*E. macarthurii*	0.580	0.587	0.561	0.570	0.580
10	*E. nitens*	0.551	0.545	0.584	0.582	0.555
10	*E. saligna*	0.516	0.488	0.518	0.530	0.507
10	*E. smithii*	0.604	0.612	0.623	0.630	0.611
10	*E. viminalis*	0.578	0.573	0.548	0.558	0.571
10	**Mean**	**0.540**	**0.539**	**0.544**	**0.546**	**0.541**
11	*E. deanei*	0.516	0.522	0.504	0.507	0.516
11	*E. dunnii*	0.549	0.561	0.546	0.528	0.551
11	*E. elata*	0.479	0.482	0.459	0.449	0.475
11	*E. fastigata*	0.542	0.533	0.534	0.546	0.537
11	*E. grandis*	0.478	0.454	0.454	0.487	0.467
11	*E. macarthurii*	0.568	0.573	0.535	0.545	0.565
11	*E. nitens*	0.530	0.541	0.526	0.547	0.533
11	*E. saligna*	0.522	0.515	0.492	0.471	0.511
11	*E. smithii*	0.570	0.572	0.579	0.583	0.573
11	*E. viminalis*	0.592	0.577	0.595	0.600	0.588
11	**Mean**	**0.534**	**0.533**	**0.523**	**0.526**	**0.532**
12	*E. deanei*	0.513	0.511	0.517	0.491	0.510
12	*E. dunnii*	0.517	0.516	0.543	0.549	0.521
12	*E. elata*	0.510	0.525	0.503	0.503	0.515
12	*E. fastigata*	0.480	0.471	0.464	0.472	0.475
12	*E. grandis*	0.431	0.435	0.455	0.416	0.434
12	*E. macarthurii*	0.541	0.542	0.554	0.556	0.543
12	*E. nitens*	0.516	0.511	0.548	0.547	0.521
12	*E. saligna*	0.421	0.403	0.442	0.433	0.415
12	*E. smithii*	0.561	0.576	0.576	0.576	0.568
12	*E. viminalis*	0.544	0.548	0.561	0.545	0.547
12	**Mean**	**0.503**	**0.504**	**0.516**	**0.509**	**0.505**
F prob. (*Species*)		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
F prob. (*Spp. x Trial*)		0.013	0.013	0.013	0.013	0.051

Table 3.4. Average sample tree density per disc sample height

Trial	Species	Sample disc section				Weighted mean
		1.3m	*25% height*	*75% height*	*5cm top*	
13	*E. deanei*	0.493	0.480	0.484	0.482	0.487
13	*E. dunnii*	0.508	0.519	0.484	0.482	0.507
13	*E. elata*	0.478	0.487	0.468	0.458	0.479
13	*E. fastigata*	0.510	0.509	0.503	0.508	0.508
13	*E. grandis*	0.425	0.420	0.427	0.416	0.424
13	*E. macarthurii*	0.512	0.495	0.493	0.475	0.502
13	*E. nitens*	0.521	0.531	0.533	0.513	0.526
13	*E. saligna*	0.479	0.487	0.456	0.445	0.477
13	*E. smithii*	0.580	0.585	0.576	0.549	0.580
13	*E. viminalis*	0.523	0.528	0.499	0.495	0.519
13	**Mean**	**0.503**	**0.504**	**0.492**	**0.482**	**0.501**
14	*E. deanei*	0.529	0.529	0.550	0.536	0.532
14	*E. dunnii*	0.575	0.572	0.545	0.603	0.571
14	*E. elata*	0.535	0.539	0.542	0.551	0.539
14	*E. fastigata*	0.541	0.540	0.547	0.555	0.542
14	*E. grandis*	0.456	0.434	0.440	0.521	0.450
14	*E. macarthurii*	0.576	0.556	0.566	0.541	0.565
14	*E. nitens*	0.507	0.468	0.521	0.552	0.496
14	*E. saligna*	0.405	0.453	0.447	0.471	0.431
14	*E. smithii*	0.563	0.575	0.594	0.612	0.572
14	*E. viminalis*	0.602	0.595	0.601	0.597	0.600
14	**Mean**	**0.529**	**0.526**	**0.535**	**0.554**	**0.530**
10-14	*E. deanei*	0.522	0.520	0.521	0.510	0.520
10-14	*E. dunnii*	0.534	0.540	0.532	0.538	0.536
10-14	*E. elata*	0.501	0.510	0.496	0.491	0.503
10-14	*E. fastigata*	0.522	0.518	0.517	0.522	0.520
10-14	*E. grandis*	0.449	0.436	0.449	0.468	0.445
10-14	*E. macarthurii*	0.555	0.551	0.542	0.537	0.551
10-14	*E. nitens*	0.525	0.519	0.542	0.548	0.526
10-14	*E. saligna*	0.469	0.469	0.471	0.470	0.468
10-14	*E. smithii*	0.576	0.584	0.590	0.590	0.581
10-14	*E. viminalis*	0.568	0.564	0.561	0.559	0.565
SE (dbm): *w/i trial*		0.1251	0.1251	0.1251	0.1251	0.0280
SE (dbm): *bet. trials*		0.0071	0.0071	0.0071	0.0071	0.0109

Table 3.5. Average nutrient concentration of selected foliar material per trial and species

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	150	6	16	763	0.10	0.09	0.62	0.28	0.57	2.08
10	*E. dunnii*	78	8	23	747	0.13	0.06	0.53	0.32	1.13	2.26
10	*E. elata*	116	6	22	751	0.09	0.19	0.63	0.24	0.78	2.15
10	*E. fastigata*	82	8	11	390	0.08	0.02	0.36	0.23	0.57	1.82
10	*E. grandis*	69	8	20	721	0.13	0.08	0.65	0.36	0.74	2.28
10	*E. macarthurii*	88	9	21	769	0.15	0.05	0.50	0.20	0.86	2.66
10	*E. nitens*	65	5	14	468	0.09	0.00	0.39	0.15	0.69	1.71
10	*E. saligna*	92	7	14	749	0.12	0.09	0.73	0.41	0.70	1.97
10	*E. smithii*	126	8	17	618	0.08	0.03	0.44	0.13	0.87	1.78
10	*E. viminalis*	84	10	26	724	0.09	0.04	0.58	0.28	0.95	2.61
10	**Mean**	**95**	**7**	**18**	**670**	**0.11**	**0.07**	**0.54**	**0.26**	**0.79**	**2.13**
11	*E. deanei*	187	7	14	909	0.07	0.08	0.94	0.22	0.45	1.84
11	*E. dunnii*	169	7	14	782	0.08	0.06	0.92	0.26	0.52	1.80
11	*E. elata*	140	7	17	614	0.11	0.13	0.54	0.26	0.47	2.18
11	*E. fastigata*	110	6	8	438	0.07	0.01	0.48	0.25	0.40	1.56
11	*E. grandis*	172	6	12	700	0.10	0.06	0.81	0.36	0.45	1.81
11	*E. macarthurii*	129	10	21	810	0.12	0.06	0.59	0.19	0.68	2.41
11	*E. nitens*	98	5	12	506	0.09	0.01	0.56	0.18	0.49	1.61
11	*E. saligna*	121	9	20	613	0.13	0.07	0.74	0.43	0.57	2.17
11	*E. smithii*	146	6	15	427	0.09	0.06	0.46	0.13	0.46	1.96
11	*E. viminalis*	140	6	17	817	0.10	0.03	0.87	0.17	0.52	2.07
11	**Mean**	**141**	**7**	**15**	**661**	**0.10**	**0.06**	**0.69**	**0.25**	**0.50**	**1.94**
12	*E. deanei*	117	7	16	489	0.10	0.14	0.75	0.32	0.67	1.94
12	*E. dunnii*	101	7	18	658	0.11	0.09	0.62	0.29	0.75	1.79
12	*E. elata*	157	9	18	748	0.11	0.18	0.66	0.28	0.70	2.31
12	*E. fastigata*	104	6	12	434	0.09	0.07	0.38	0.23	0.62	2.02
12	*E. grandis*	113	9	18	687	0.11	0.09	0.61	0.29	0.82	1.91
12	*E. macarthurii*	96	7	16	639	0.10	0.05	0.47	0.18	0.72	2.46
12	*E. nitens*	80	5	20	476	0.08	0.01	0.38	0.17	0.66	1.63
12	*E. saligna*	96	8	18	529	0.10	0.08	0.58	0.31	0.73	2.07
12	*E. smithii*	118	10	16	388	0.10	0.07	0.41	0.14	0.96	2.06
12	*E. viminalis*	99	10	18	741	0.12	0.03	0.54	0.17	0.74	2.14
12	**Mean**	**108**	**8**	**17**	**579**	**0.10**	**0.08**	**0.54**	**0.24**	**0.74**	**2.03**
F prob. (*Species*)		< 0.001	< 0.001	< 0.001	< 0.001	0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
F prob. (*Spp. x Trial*)		0.037	0.178	0.384	0.583	0.090	0.224	0.334	0.257	0.015	0.674

Table 3.5. Average nutrient concentration of selected foliar material per trial and species

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. deanei*	103	7	18	873	0.11	0.29	1.25	0.27	0.51	1.79
13	*E. dunnii*	81	6	16	850	0.14	0.11	0.98	0.29	0.83	2.00
13	*E. elata*	108	5	23	551	0.13	0.15	0.64	0.30	0.57	1.85
13	*E. fastigata*	87	6	13	334	0.15	0.04	0.56	0.27	0.53	1.79
13	*E. grandis*	96	7	17	798	0.14	0.12	1.15	0.37	0.63	1.82
13	*E. macarthurii*	124	7	19	778	0.11	0.08	0.79	0.18	0.59	2.01
13	*E. nitens*	56	6	17	654	0.10	0.00	0.52	0.19	0.73	1.72
13	*E. saligna*	130	7	17	903	0.12	0.10	0.82	0.33	0.67	1.72
13	*E. smithii*	79	8	18	625	0.11	0.07	0.56	0.16	0.63	1.88
13	*E. viminalis*	74	8	21	588	0.13	0.06	0.68	0.43	0.81	2.14
13	**Mean**	**94**	7	**18**	**695**	**0.13**	**0.10**	**0.80**	**0.28**	**0.65**	**1.87**
14	*E. deanei*	162	9	20	705	0.11	0.09	0.56	0.27	0.59	2.03
14	*E. dunnii*	164	6	15	757	0.08	0.06	0.49	0.18	0.62	1.67
14	*E. elata*	183	8	14	640	0.10	0.15	0.32	0.18	0.43	1.95
14	*E. fastigata*	144	4	10	315	0.07	0.02	0.22	0.15	0.57	1.54
14	*E. grandis*	150	5	13	670	0.08	0.12	0.44	0.28	0.48	1.69
14	*E. macarthurii*	212	8	23	886	0.13	0.10	0.49	0.19	0.71	2.02
14	*E. nitens*	138	5	13	628	0.08	0.01	0.34	0.15	0.43	1.73
14	*E. saligna*	161	7	15	920	0.08	0.14	0.58	0.25	0.54	1.57
14	*E. smithii*	168	9	17	395	0.08	0.06	0.23	0.11	0.53	1.67
14	*E. viminalis*	130	12	12	557	0.08	0.03	0.39	0.16	0.46	1.64
14	**Mean**	**161**	7	**15**	**647**	**0.09**	**0.08**	**0.41**	**0.19**	**0.54**	**1.75**
10-14	*E. deanei*	144	7	17	748	0.10	0.14	0.83	0.27	0.56	1.94
10-14	*E. dunnii*	119	7	17	759	0.11	0.08	0.71	0.27	0.77	1.90
10-14	*E. elata*	141	7	19	661	0.11	0.16	0.56	0.25	0.59	2.09
10-14	*E. fastigata*	105	6	11	382	0.09	0.03	0.40	0.23	0.54	1.74
10-14	*E. grandis*	120	7	16	715	0.11	0.09	0.73	0.33	0.62	1.90
10-14	*E. macarthurii*	130	8	20	776	0.12	0.07	0.57	0.19	0.71	2.31
10-14	*E. nitens*	87	5	15	546	0.09	0.01	0.44	0.17	0.60	1.68
10-14	*E. saligna*	120	8	17	743	0.11	0.10	0.69	0.34	0.64	1.90
10-14	*E. smithii*	128	8	17	491	0.09	0.06	0.42	0.13	0.69	1.87
10-14	*E. viminalis*	106	9	19	685	0.11	0.04	0.61	0.24	0.70	2.12
		120	7	**17**	**651**	**0.104**	**0.077**	**0.595**	**0.243**	**0.642**	**1.946**
SE (dbm): *w/i trial*		22.4	1.7	4.0	153.4	0.020	0.040	0.138	0.061	0.104	0.262
SE (dbm): *bet. trials*		1.0	0.8	1.8	68.6	0.009	0.018	0.062	0.027	0.047	0.117

Table 3.6.1. Average nutrient concentration of bulk foliar material per trial and species

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	314	6	14	768	0.09	0.13	0.87	0.36	0.82	1.56
10	*E. dunnii*	164	8	20	799	0.15	0.09	0.56	0.26	0.92	1.94
10	*E. elata*	215	9	18	812	0.13	0.18	0.55	0.28	0.67	1.84
10	*E. fastigata*	248	8	11	429	0.10	0.04	0.38	0.23	0.58	1.55
10	*E. grandis*	140	10	17	777	0.11	0.11	0.74	0.37	0.78	1.70
10	*E. macarthurii*	347	7	22	880	0.12	0.08	0.75	0.24	0.84	1.79
10	*E. nitens*	394	8	19	559	0.10	0.04	0.51	0.19	0.75	1.49
10	*E. saligna*	346	7	21	778	0.12	0.11	0.65	0.34	0.80	1.66
10	*E. smithii*	258	11	18	607	0.11	0.06	0.40	0.12	0.77	1.72
10	*E. viminalis*	151	11	24	723	0.14	0.07	0.52	0.23	0.90	2.09
10	**Mean**	**258**	**8**	**19**	**713**	**0.12**	**0.09**	**0.59**	**0.26**	**0.78**	**1.73**
11	*E. deanei*	194	6	14	1263	0.10	0.15	2.05	0.45	0.68	1.84
11	*E. dunnii*	137	6	14	715	0.13	0.11	1.17	0.37	0.84	1.91
11	*E. elata*	142	6	16	513	0.15	0.18	0.84	0.37	0.67	2.15
11	*E. fastigata*	116	6	11	413	0.11	0.03	0.65	0.32	0.57	1.82
11	*E. grandis*	160	6	14	621	0.14	0.10	1.35	0.50	0.69	1.95
11	*E. macarthurii*	150	5	17	865	0.12	0.09	1.03	0.25	0.94	1.99
11	*E. nitens*	94	4	14	459	0.09	0.03	0.72	0.22	0.75	1.58
11	*E. saligna*	153	7	16	604	0.12	0.10	1.10	0.49	0.74	1.91
11	*E. smithii*	134	5	16	478	0.10	0.11	1.07	0.32	0.65	1.78
11	*E. viminalis*	138	6	16	755	0.13	0.07	1.19	0.27	0.77	2.21
11	**Mean**	**142**	**6**	**15**	**668**	**0.12**	**0.10**	**1.12**	**0.36**	**0.73**	**1.91**
12	*E. deanei*	206	12	16	735	0.11	0.13	1.00	0.33	0.74	1.72
12	*E. dunnii*	119	8	15	678	0.12	0.09	0.91	0.29	0.84	1.81
12	*E. elata*	170	9	16	844	0.13	0.14	0.65	0.27	0.74	2.11
12	*E. fastigata*	143	8	11	509	0.09	0.04	0.55	0.27	0.71	1.70
12	*E. grandis*	156	9	14	603	0.12	0.12	0.84	0.39	0.80	1.77
12	*E. macarthurii*	158	9	16	784	0.13	0.09	0.72	0.24	1.01	2.16
12	*E. nitens*	112	9	10	467	0.08	0.02	0.42	0.17	0.78	1.54
12	*E. saligna*	138	10	13	422	0.12	0.13	0.57	0.28	0.88	1.94
12	*E. smithii*	146	8	13	593	0.11	0.09	0.83	0.23	0.99	1.84
12	*E. viminalis*	129	9	14	798	0.14	0.03	0.70	0.25	0.92	2.03
12	**Mean**	**148**	**9**	**14**	**643**	**0.12**	**0.09**	**0.72**	**0.27**	**0.84**	**1.86**
F prob. (*Species*)		0.015	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
F prob. (*Spp. x Trial*)		< 0.001	0.044	0.325	< 0.001	0.279	0.002	0.016	0.792	0.003	0.229

Table 3.6.1. Average nutrient concentration of bulk foliar material per trial and species

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. deanei*	179	7	18	1240	0.14	0.14	1.57	0.35	0.60	1.71
13	*E. dunnii*	238	6	21	1097	0.18	0.07	1.43	0.31	0.72	1.73
13	*E. elata*	226	6	22	556	0.15	0.16	0.67	0.33	0.58	1.76
13	*E. fastigata*	123	7	19	325	0.17	0.06	0.49	0.29	0.64	1.85
13	*E. grandis*	202	6	16	816	0.18	0.13	1.21	0.39	0.75	1.59
13	*E. macarthurii*	166	6	25	937	0.13	0.08	1.02	0.27	0.71	1.84
13	*E. nitens*	154	6	19	661	0.13	0.03	0.50	0.20	0.83	1.65
13	*E. saligna*	152	8	20	864	0.14	0.06	0.57	0.30	0.74	1.72
13	*E. smithii*	151	7	20	703	0.16	0.07	0.82	0.23	0.61	1.56
13	*E. viminalis*	370	10	17	800	0.15	0.05	0.97	0.32	0.70	1.79
13	**Mean**	**196**	**7**	**20**	**800**	**0.15**	**0.09**	**0.92**	**0.30**	**0.69**	**1.72**
14	*E. deanei*	207	9	19	584	0.09	0.17	0.63	0.26	0.84	1.89
14	*E. dunnii*	176	7	17	753	0.12	0.11	0.55	0.20	1.05	1.88
14	*E. elata*	241	8	15	1039	0.12	0.13	0.68	0.26	0.59	1.90
14	*E. fastigata*	136	4	10	397	0.08	0.02	0.33	0.16	0.80	1.48
14	*E. grandis*	169	5	14	580	0.09	0.18	0.47	0.29	0.74	1.62
14	*E. macarthurii*	194	7	23	634	0.12	0.14	0.35	0.14	0.99	1.97
14	*E. nitens*	133	6	16	637	0.10	0.03	0.34	0.13	0.70	1.54
14	*E. saligna*	185	8	15	942	0.10	0.17	0.53	0.25	0.83	1.68
14	*E. smithii*	180	7	15	418	0.08	0.09	0.28	0.08	0.86	1.67
14	*E. viminalis*	141	11	15	550	0.10	0.05	0.39	0.16	0.77	1.77
14	**Mean**	**176**	**7**	**16**	**653**	**0.10**	**0.11**	**0.45**	**0.19**	**0.82**	**1.74**
10-14	*E. deanei*	220	8	16	918	0.11	0.14	1.23	0.35	0.74	1.74
10-14	*E. dunnii*	167	7	18	808	0.14	0.10	0.92	0.29	0.88	1.85
10-14	*E. elata*	199	8	17	753	0.14	0.16	0.68	0.30	0.65	1.95
10-14	*E. fastigata*	153	7	12	415	0.11	0.04	0.48	0.25	0.66	1.68
10-14	*E. grandis*	166	7	15	679	0.13	0.13	0.92	0.39	0.75	1.73
10-14	*E. macarthurii*	203	7	21	820	0.12	0.10	0.77	0.23	0.90	1.95
10-14	*E. nitens*	177	7	16	557	0.10	0.03	0.50	0.18	0.76	1.56
10-14	*E. saligna*	195	8	17	722	0.12	0.12	0.68	0.33	0.80	1.78
10-14	*E. smithii*	174	7	17	560	0.11	0.09	0.68	0.20	0.77	1.71
10-14	*E. viminalis*	186	9	17	725	0.13	0.06	0.76	0.25	0.81	1.98
	Mean	**184**	**8**	**17**	**696**	**0.12**	**0.09**	**0.76**	**0.28**	**0.77**	**1.79**
SE (dbm): *w/i trial*		41.1	1.4	2.8	146.1	0.017	0.021	0.199	0.055	0.078	0.144
SE (dbm): *bet. trials*		18.4	0.6	1.3	65.3	0.008	0.009	0.089	0.025	0.035	0.064

Table 3.6.2. Average nutrient mass of bulk foliar material per trial and species											
Trial	**Species**	**Micronutrient (g/tree)**				**Macronutrient (g/tree)**					
		Fe	***Cu***	***Zn***	***Mn***	***P***	***Na***	***Ca***	***Mg***	***K***	***N***
10	*E. deanei*	0.65	0.03	0.07	3.21	4.91	2.93	21.90	8.90	33.61	66.98
10	*E. dunnii*	0.40	0.03	0.06	1.91	3.66	1.75	13.57	6.00	24.00	54.85
10	*E. elata*	0.72	0.02	0.05	1.78	2.47	2.45	14.08	7.21	17.01	35.04
10	*E. fastigata*	1.63	0.07	0.11	4.15	6.99	4.28	27.34	7.85	50.98	110.85
10	*E. grandis*	0.49	0.03	0.06	2.68	3.92	3.84	27.79	13.68	27.84	60.50
10	*E. macarthurii*	1.67	0.04	0.11	4.44	5.97	4.10	37.78	12.00	43.84	93.37
10	*E. nitens*	2.94	0.06	0.14	4.18	7.97	3.23	39.29	14.55	57.50	114.05
10	*E. saligna*	1.09	0.04	0.09	4.13	6.65	8.84	26.87	14.02	34.16	94.70
10	*E. smithii*	1.36	0.04	0.06	2.16	5.25	2.08	19.76	12.13	31.10	81.96
10	*E. viminalis*	1.91	0.04	0.08	4.69	5.82	7.95	54.47	22.52	51.70	97.72
10	**Mean**	**1.28**	**0.04**	**0.08**	**3.33**	**5.36**	**4.14**	**28.33**	**11.89**	**37.17**	**81.00**
11	*E. deanei*	0.35	0.01	0.04	1.29	3.64	4.43	20.86	8.92	16.08	52.71
11	*E. dunnii*	0.60	0.02	0.06	3.11	5.35	4.92	52.40	16.30	35.44	78.77
11	*E. elata*	0.74	0.02	0.08	4.11	5.66	4.28	50.49	12.03	43.23	91.95
11	*E. fastigata*	0.43	0.01	0.03	1.56	3.62	2.74	37.78	13.39	17.75	48.98
11	*E. grandis*	0.52	0.02	0.06	2.05	4.07	3.41	37.06	16.76	25.15	65.11
11	*E. macarthurii*	0.36	0.02	0.04	1.29	3.31	1.04	21.08	10.26	17.99	57.28
11	*E. nitens*	1.10	0.03	0.08	7.65	5.66	8.90	119.43	26.28	38.45	104.35
11	*E. saligna*	0.58	0.03	0.07	3.19	5.50	3.09	50.18	11.23	32.65	93.43
11	*E. smithii*	1.06	0.04	0.13	3.78	7.98	8.78	85.99	25.79	51.69	143.32
11	*E. viminalis*	0.91	0.04	0.13	4.44	9.50	3.39	64.49	19.79	72.04	156.07
11	**Mean**	**0.66**	**0.03**	**0.07**	**3.25**	**5.43**	**4.50**	**53.98**	**16.08**	**35.05**	**89.20**
12	*E. deanei*	0.46	0.02	0.05	2.14	3.55	2.81	18.57	5.54	28.62	56.59
12	*E. dunnii*	0.26	0.02	0.02	1.09	1.89	0.47	9.99	4.10	18.05	35.92
12	*E. elata*	1.05	0.06	0.10	3.98	8.76	7.94	61.26	26.58	56.79	123.68
12	*E. fastigata*	0.56	0.04	0.05	1.73	4.72	5.02	22.76	11.10	34.64	77.39
12	*E. grandis*	1.78	0.08	0.12	5.32	8.41	10.72	74.33	23.24	55.62	136.41
12	*E. macarthurii*	0.80	0.05	0.08	4.92	7.73	2.29	41.61	13.36	53.09	117.31
12	*E. nitens*	1.46	0.07	0.14	7.33	11.07	12.06	56.29	23.08	63.78	180.89
12	*E. saligna*	0.89	0.06	0.11	5.12	8.95	6.98	69.06	21.98	62.67	135.24
12	*E. smithii*	1.19	0.07	0.08	4.24	7.62	3.22	48.01	22.64	56.64	137.34
12	*E. viminalis*	1.96	0.07	0.14	6.24	10.75	13.36	83.65	21.76	101.79	192.17
12	**Mean**	**1.04**	**0.06**	**0.09**	**4.21**	**7.35**	**6.49**	**48.55**	**17.34**	**53.17**	**119.29**
F prob. (*Species*)		0.005	0.016	< 0.001	0.011	0.046	< 0.001	< 0.001	0.011	0.009	0.010
F prob. (*Spp. x Trial*)		< 0.001	0.012	0.012	0.007	0.036	0.476	0.018	0.002	0.040	0.023

Table 3.6.2. Average nutrient mass of bulk foliar material per trial and species

Trial	Species	Micronutrient (g/tree)				Macronutrient (g/tree)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. deanei*	0.61	0.02	0.07	2.20	4.72	1.65	20.57	7.72	31.07	56.23
13	*E. dunnii*	0.56	0.02	0.06	4.52	4.26	3.86	53.90	12.00	19.50	54.65
13	*E. elata*	0.77	0.02	0.08	1.87	4.89	5.33	23.23	11.25	19.32	59.48
13	*E. fastigata*	0.68	0.02	0.05	2.73	6.09	4.43	41.77	12.95	25.18	53.67
13	*E. grandis*	0.97	0.02	0.09	4.60	8.18	3.04	61.26	14.07	31.39	71.97
13	*E. macarthurii*	0.63	0.02	0.09	3.51	5.03	2.93	39.02	10.24	26.67	69.18
13	*E. nitens*	0.67	0.03	0.09	3.47	7.47	2.88	39.09	10.46	27.48	70.37
13	*E. saligna*	1.75	0.05	0.08	3.66	7.01	2.56	44.31	14.50	33.11	82.61
13	*E. smithii*	0.60	0.03	0.08	3.41	5.67	2.29	21.72	12.01	28.88	67.35
13	*E. viminalis*	0.29	0.01	0.04	0.90	3.86	1.59	10.02	6.19	12.80	39.29
13	**Mean**	**0.75**	**0.03**	**0.07**	**3.09**	**5.72**	**3.06**	**35.49**	**11.14**	**25.54**	**62.48**
14	*E. deanei*	0.44	0.02	0.04	1.38	2.08	3.25	13.86	5.10	18.90	39.43
14	*E. dunnii*	0.44	0.02	0.04	1.88	2.87	2.77	13.66	5.17	25.89	46.69
14	*E. elata*	0.60	0.02	0.07	2.16	3.82	4.44	11.80	4.75	32.65	65.90
14	*E. fastigata*	0.57	0.05	0.06	2.26	4.26	2.32	15.97	6.39	31.47	72.62
14	*E. grandis*	0.50	0.02	0.04	1.74	2.55	4.96	14.01	8.63	21.04	47.14
14	*E. macarthurii*	0.54	0.02	0.04	2.78	2.92	4.89	16.25	7.71	24.48	49.50
14	*E. nitens*	1.18	0.04	0.07	5.05	5.65	6.47	32.40	12.26	28.61	92.33
14	*E. saligna*	0.90	0.03	0.06	2.60	5.64	1.34	21.80	10.67	53.57	98.19
14	*E. smithii*	0.98	0.04	0.08	2.23	4.42	5.27	14.89	4.70	46.41	91.78
14	*E. viminalis*	1.12	0.06	0.13	5.24	7.98	2.61	26.48	10.78	54.83	127.92
14	**Mean**	**0.73**	**0.03**	**0.07**	**2.73**	**4.22**	**3.83**	**18.11**	**7.62**	**33.79**	**73.15**
10-14	*E. deanei*	0.50	0.02	0.05	2.04	3.78	3.01	19.15	7.23	25.66	54.39
10-14	*E. dunnii*	0.45	0.02	0.05	2.50	3.61	2.75	28.70	8.71	24.58	54.18
10-14	*E. elata*	0.77	0.03	0.08	2.78	5.12	4.89	32.17	12.37	33.80	75.21
10-14	*E. fastigata*	0.77	0.04	0.06	2.49	5.13	3.76	29.22	10.34	32.00	72.70
10-14	*E. grandis*	0.85	0.04	0.07	3.28	5.43	5.19	42.89	15.28	32.21	76.22
10-14	*E. macarthurii*	0.80	0.03	0.07	3.39	4.99	3.05	31.15	10.71	33.21	77.33
10-14	*E. nitens*	1.47	0.05	0.11	5.54	7.56	6.71	57.30	17.33	43.17	112.40
10-14	*E. saligna*	1.04	0.04	0.08	3.74	6.75	4.56	42.44	14.48	43.23	100.83
10-14	*E. smithii*	1.04	0.05	0.09	3.17	6.19	4.33	38.07	15.46	42.94	104.35
10-14	*E. viminalis*	1.24	0.04	0.11	4.30	7.58	5.78	47.82	16.21	58.63	122.63
	Mean	**0.89**	**0.04**	**0.08**	**3.32**	**5.61**	**4.40**	**36.89**	**12.81**	**36.94**	**85.02**
SE (dbm): *w/i trial*		0.439	0.015	0.030	1.551	2.252	2.710	18.900	5.114	16.580	34.420
SE (dbm): *bet. trials*		0.196	0.007	0.013	0.693	1.007	1.212	8.450	2.287	7.410	15.390

Table 3.7.1. Average nutrient concentration of branches per trial and species

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	80	3	10	571	0.02	0.04	0.24	0.11	0.54	0.17
10	*E. dunnii*	108	4	7	394	0.02	0.03	0.32	0.15	0.43	0.22
10	*E. elata*	117	8	12	350	0.05	0.06	0.21	0.10	0.32	0.27
10	*E. fastigata*	66	4	4	353	0.02	0.04	0.15	0.12	0.34	0.23
10	*E. grandis*	70	5	8	370	0.01	0.06	0.27	0.13	0.44	0.22
10	*E. macarthurii*	83	4	7	297	0.02	0.03	0.31	0.16	0.38	0.26
10	*E. nitens*	95	5	8	409	0.03	0.04	0.34	0.11	0.42	0.27
10	*E. saligna*	75	5	7	353	0.02	0.05	0.38	0.13	0.46	0.24
10	*E. smithii*	108	3	7	285	0.03	0.04	0.29	0.09	0.40	0.27
10	*E. viminalis*	84	3	7	505	0.03	0.03	0.35	0.13	0.46	0.37
10	**Mean**	**89**	**5**	**8**	**389**	**0.02**	**0.04**	**0.28**	**0.12**	**0.42**	**0.25**
11	*E. deanei*	55	10	13	486	0.05	0.06	0.55	0.11	0.43	0.35
11	*E. dunnii*	39	9	7	238	0.03	0.04	0.62	0.18	0.44	0.28
11	*E. elata*	45	8	7	228	0.04	0.05	0.35	0.11	0.36	0.31
11	*E. fastigata*	53	7	6	321	0.04	0.02	0.33	0.15	0.32	0.30
11	*E. grandis*	62	9	8	346	0.05	0.05	0.57	0.19	0.46	0.35
11	*E. macarthurii*	79	9	11	309	0.04	0.02	0.45	0.12	0.46	0.25
11	*E. nitens*	57	7	6	190	0.02	0.03	0.50	0.10	0.37	0.27
11	*E. saligna*	50	10	9	293	0.04	0.04	0.65	0.24	0.47	0.33
11	*E. smithii*	42	6	8	234	0.03	0.04	0.52	0.10	0.30	0.27
11	*E. viminalis*	54	9	7	303	0.03	0.05	0.57	0.13	0.38	0.37
11	**Mean**	**54**	**8**	**8**	**295**	**0.04**	**0.04**	**0.51**	**0.14**	**0.40**	**0.31**
12	*E. deanei*	45	3	7	445	0.03	0.04	0.37	0.09	0.45	0.24
12	*E. dunnii*	37	4	6	236	0.02	0.02	0.44	0.12	0.48	0.30
12	*E. elata*	53	6	9	284	0.03	0.03	0.33	0.08	0.27	0.30
12	*E. fastigata*	61	2	5	421	0.02	0.02	0.26	0.08	0.37	0.26
12	*E. grandis*	45	7	7	288	0.03	0.04	0.37	0.11	0.48	0.29
12	*E. macarthurii*	72	5	7	327	0.03	0.02	0.37	0.09	0.49	0.34
12	*E. nitens*	65	4	7	311	0.04	0.04	0.38	0.10	0.52	0.36
12	*E. saligna*	57	6	5	294	0.03	0.04	0.38	0.10	0.50	0.29
12	*E. smithii*	50	3	8	367	0.05	0.03	0.43	0.09	0.45	0.29
12	*E. viminalis*	75	5	8	547	0.04	0.03	0.43	0.08	0.49	0.35
12	**Mean**	**57**	**5**	**7**	**352**	**0.03**	**0.03**	**0.38**	**0.09**	**0.45**	**0.30**
F prob. (*Species*)		0.124	< 0.001	0.003	< 0.001	0.451	0.013	< 0.001	< 0.001	< 0.001	0.001
F prob. (*Spp. x Trial*)		0.731	0.111	0.342	0.045	0.375	0.597	0.702	0.159	0.006	0.359

Table 3.7.1. Average nutrient concentration of branches per trial and species

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. deanei*	68	5	11	530	0.05	0.06	0.59	0.10	0.35	0.25
13	*E. dunnii*	49	6	8	414	0.06	0.05	0.47	0.13	0.52	0.36
13	*E. elata*	91	7	8	197	0.05	0.03	0.44	0.12	0.51	0.34
13	*E. fastigata*	60	5	12	292	0.06	0.03	0.45	0.14	0.39	0.30
13	*E. grandis*	73	5	8	403	0.04	0.04	0.52	0.09	0.43	0.32
13	*E. macarthurii*	94	6	12	473	0.06	0.05	0.60	0.18	0.40	0.38
13	*E. nitens*	60	6	10	362	0.06	0.05	0.42	0.13	0.38	0.38
13	*E. saligna*	69	7	12	517	0.07	0.04	0.54	0.16	0.54	0.30
13	*E. smithii*	72	3	8	406	0.06	0.05	0.50	0.09	0.35	0.33
13	*E. viminalis*	66	7	10	369	0.07	0.05	0.52	0.14	0.52	0.40
13	**Mean**	**70**	**6**	**10**	**396**	**0.06**	**0.04**	**0.51**	**0.13**	**0.44**	**0.34**
14	*E. deanei*	50	14	16	375	0.04	0.05	0.28	0.09	0.47	0.33
14	*E. dunnii*	48	10	10	320	0.03	0.04	0.30	0.13	0.64	0.36
14	*E. elata*	45	12	12	478	0.03	0.04	0.28	0.08	0.30	0.38
14	*E. fastigata*	47	9	8	493	0.02	0.02	0.23	0.13	0.47	0.31
14	*E. grandis*	57	13	11	338	0.02	0.06	0.24	0.14	0.44	0.29
14	*E. macarthurii*	86	10	12	414	0.03	0.05	0.20	0.07	0.46	0.39
14	*E. nitens*	56	11	12	363	0.03	0.04	0.28	0.08	0.39	0.32
14	*E. saligna*	62	11	11	468	0.02	0.04	0.30	0.12	0.51	0.32
14	*E. smithii*	44	7	11	400	0.04	0.06	0.25	0.07	0.43	0.44
14	*E. viminalis*	65	7	14	532	0.04	0.02	0.23	0.13	0.39	0.39
14	**Mean**	**56**	**10**	**12**	**418**	**0.03**	**0.04**	**0.26**	**0.11**	**0.45**	**0.35**
10-14	*E. deanei*	60	7	11	481	0.04	0.05	0.40	0.10	0.45	0.27
10-14	*E. dunnii*	56	7	8	321	0.03	0.04	0.43	0.14	0.50	0.30
10-14	*E. elata*	70	8	10	307	0.04	0.04	0.32	0.10	0.35	0.32
10-14	*E. fastigata*	57	5	7	376	0.03	0.02	0.29	0.13	0.38	0.28
10-14	*E. grandis*	61	8	8	349	0.03	0.05	0.39	0.13	0.45	0.29
10-14	*E. macarthurii*	83	7	10	364	0.04	0.04	0.39	0.13	0.44	0.32
10-14	*E. nitens*	67	6	9	327	0.04	0.04	0.38	0.10	0.42	0.32
10-14	*E. saligna*	63	8	9	385	0.04	0.04	0.45	0.15	0.50	0.30
10-14	*E. smithii*	65	5	8	338	0.04	0.05	0.40	0.09	0.39	0.32
10-14	*E. viminalis*	69	6	9	451	0.04	0.04	0.42	0.12	0.45	0.37
	Mean	**65**	**7**	**9**	**370**	**0.04**	**0.04**	**0.39**	**0.12**	**0.43**	**0.31**
SE (dbm): *w/i trial*		19.3	1.5	2.2	85.5	0.012	0.015	0.083	0.031	0.063	0.051
SE (dbm): *bet. trials*		8.6	0.7	1.0	38.2	0.005	0.007	0.037	0.014	0.028	0.023

Table 3.7.2. Average nutrient mass of branches per trial and species

Trial	Species	Micronutrient (g/tree)				Macronutrient (g/tree)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	0.95	0.04	0.12	6.88	2.41	4.92	28.50	13.58	66.18	20.51
10	*E. dunnii*	0.80	0.03	0.05	2.76	1.47	2.42	25.96	11.32	34.34	17.69
10	*E. elata*	1.41	0.09	0.14	4.31	5.93	7.42	25.02	11.53	38.53	31.99
10	*E. fastigata*	0.72	0.04	0.05	3.78	1.61	5.16	15.66	12.48	37.82	25.52
10	*E. grandis*	0.46	0.03	0.05	2.49	0.94	4.08	17.47	8.93	29.87	14.52
10	*E. macarthurii*	1.14	0.06	0.10	4.47	3.12	4.01	43.47	22.01	54.34	36.40
10	*E. nitens*	1.37	0.07	0.12	6.37	3.96	7.55	53.47	16.67	63.09	40.34
10	*E. saligna*	0.56	0.04	0.05	2.54	1.68	3.57	27.09	9.16	33.60	16.97
10	*E. smithii*	1.95	0.06	0.12	5.20	4.93	6.66	51.29	15.91	71.55	45.97
10	*E. viminalis*	0.47	0.02	0.04	2.90	1.49	1.79	19.32	7.43	25.74	20.79
10	**Mean**	**0.98**	**0.05**	**0.08**	**4.17**	**2.75**	**4.76**	**30.73**	**12.90**	**45.51**	**27.07**
11	*E. deanei*	0.55	0.11	0.14	5.64	5.08	6.76	66.09	13.07	49.32	39.03
11	*E. dunnii*	0.34	0.07	0.06	2.02	3.00	2.91	51.79	15.02	39.17	23.88
11	*E. elata*	0.38	0.07	0.06	1.95	3.29	4.42	29.81	9.23	30.23	26.01
11	*E. fastigata*	0.53	0.07	0.05	3.04	3.50	1.51	30.02	13.46	29.35	27.48
11	*E. grandis*	0.44	0.06	0.06	2.22	3.20	3.46	38.51	12.77	31.34	23.80
11	*E. macarthurii*	1.12	0.13	0.15	4.34	5.74	3.11	63.21	16.99	62.85	35.23
11	*E. nitens*	0.87	0.12	0.12	3.10	3.47	7.50	82.74	17.33	61.57	46.08
11	*E. saligna*	0.39	0.08	0.07	2.22	3.50	3.39	53.17	19.62	37.49	27.90
11	*E. smithii*	1.02	0.14	0.20	5.77	7.79	10.42	121.57	23.53	73.31	65.35
11	*E. viminalis*	0.53	0.09	0.07	3.01	3.04	4.72	57.06	13.63	39.98	38.17
11	**Mean**	**0.62**	**0.09**	**0.10**	**3.33**	**4.16**	**4.82**	**59.40**	**15.47**	**45.46**	**35.29**
12	*E. deanei*	0.67	0.05	0.12	5.90	4.09	5.32	51.64	12.21	59.17	35.93
12	*E. dunnii*	0.44	0.05	0.07	2.64	2.61	2.63	50.19	14.23	55.84	34.64
12	*E. elata*	1.21	0.14	0.20	6.59	7.76	6.74	76.10	17.82	61.28	69.98
12	*E. fastigata*	0.88	0.04	0.08	7.13	2.72	2.42	40.05	12.72	60.67	43.57
12	*E. grandis*	0.51	0.08	0.09	3.50	3.58	4.60	42.73	12.33	57.39	33.66
12	*E. macarthurii*	0.33	0.03	0.04	1.70	1.61	1.07	18.10	4.45	23.51	16.23
12	*E. nitens*	0.27	0.02	0.03	1.24	1.71	1.56	15.10	4.11	21.01	14.42
12	*E. saligna*	0.68	0.07	0.06	3.28	3.26	4.76	42.71	10.86	59.47	34.82
12	*E. smithii*	1.55	0.08	0.17	7.13	12.22	10.11	89.46	26.37	96.41	59.64
12	*E. viminalis*	0.66	0.04	0.06	4.40	3.39	2.86	35.12	6.86	38.63	27.85
12	**Mean**	**0.72**	**0.06**	**0.09**	**4.35**	**4.30**	**4.21**	**46.12**	**12.20**	**53.34**	**37.07**
F prob. (*Species*)		< 0.001	< 0.001	< 0.001	0.001	0.002	0.001	< 0.001	0.363	0.030	< 0.001
F prob. (*Spp. x Trial*)		0.104	0.001	0.013	0.003	0.813	0.844	< 0.001	0.229	0.038	0.024

Table 3.7.2. Average nutrient mass of branches per trial and species

Trial	Species	Micronutrient (g/tree)				Macronutrient (g/tree)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. deanei*	0.48	0.03	0.07	3.47	3.15	3.63	39.57	6.46	23.01	16.54
13	*E. dunnii*	0.37	0.05	0.06	3.40	4.52	3.95	36.96	10.53	39.99	27.53
13	*E. elata*	0.95	0.06	0.08	1.94	4.56	2.62	44.41	11.44	49.46	31.72
13	*E. fastigata*	0.35	0.02	0.05	1.30	3.43	2.30	19.71	6.26	19.76	15.90
13	*E. grandis*	0.45	0.03	0.05	2.84	2.59	2.45	33.38	5.89	29.39	23.39
13	*E. macarthurii*	0.69	0.04	0.09	3.49	4.15	3.90	44.12	13.38	29.14	28.05
13	*E. nitens*	0.48	0.04	0.07	3.07	4.55	2.61	33.18	9.98	36.08	31.10
13	*E. saligna*	0.52	0.05	0.09	3.69	4.88	2.71	40.02	11.88	40.08	21.79
13	*E. smithii*	0.60	0.03	0.06	3.54	4.98	4.50	42.37	7.68	29.01	26.59
13	*E. viminalis*	0.53	0.06	0.08	3.12	5.60	4.13	41.88	11.70	42.75	34.44
13	**Mean**	**0.54**	**0.04**	**0.07**	**2.99**	**4.24**	**3.28**	**37.56**	**9.52**	**33.87**	**25.71**
14	*E. deanei*	0.23	0.07	0.07	1.73	1.99	2.12	14.22	4.62	22.24	15.62
14	*E. dunnii*	0.25	0.05	0.06	1.74	1.63	2.12	16.16	6.83	34.44	19.32
14	*E. elata*	0.66	0.18	0.19	6.83	5.16	5.50	41.62	11.99	44.15	59.63
14	*E. fastigata*	0.63	0.11	0.10	6.76	2.96	1.98	31.24	17.30	62.68	39.08
14	*E. grandis*	0.41	0.09	0.07	2.38	1.41	4.49	17.63	10.37	30.05	21.10
14	*E. macarthurii*	0.84	0.10	0.11	3.92	3.25	4.85	19.95	7.23	45.50	36.73
14	*E. nitens*	0.76	0.15	0.16	5.05	4.15	5.61	38.42	12.05	52.71	44.95
14	*E. saligna*	0.57	0.11	0.10	4.20	2.43	4.04	28.85	11.98	47.14	29.50
14	*E. smithii*	0.54	0.08	0.14	4.67	4.12	7.40	27.49	8.62	49.19	50.94
14	*E. viminalis*	0.51	0.06	0.11	4.24	2.89	1.94	19.24	10.08	30.76	30.59
14	**Mean**	**0.54**	**0.10**	**0.11**	**4.15**	**3.00**	**4.00**	**25.48**	**10.10**	**41.89**	**34.75**
10-14	*E. deanei*	0.58	0.06	0.10	4.72	3.34	4.55	40.00	9.99	43.99	25.53
10-14	*E. dunnii*	0.44	0.05	0.06	2.51	2.65	2.80	36.21	11.58	40.76	24.61
10-14	*E. elata*	0.92	0.11	0.13	4.32	5.34	5.34	43.39	12.40	44.73	43.87
10-14	*E. fastigata*	0.62	0.06	0.07	4.40	2.85	2.67	27.34	12.44	42.06	30.31
10-14	*E. grandis*	0.46	0.06	0.06	2.69	2.35	3.82	29.94	10.06	35.61	23.29
10-14	*E. macarthurii*	0.82	0.07	0.10	3.58	3.58	3.39	37.77	12.81	43.07	30.53
10-14	*E. nitens*	0.75	0.08	0.10	3.77	3.57	4.97	44.58	12.03	46.89	35.38
10-14	*E. saligna*	0.54	0.07	0.08	3.18	3.15	3.69	38.37	12.70	43.55	26.19
10-14	*E. smithii*	1.13	0.08	0.14	5.26	6.81	7.82	66.44	16.42	63.89	49.70
10-14	*E. viminalis*	0.54	0.05	0.07	3.53	3.28	3.09	34.52	9.94	35.57	30.37
	Mean	**0.68**	**0.07**	**0.09**	**3.80**	**3.69**	**4.21**	**39.86**	**12.04**	**44.01**	**31.98**
SE (dbm): *w/i trial*		0.326	0.026	0.039	1.540	2.428	2.695	14.880	5.744	16.960	11.640
SE (dbm): *bet. trials*		0.146	0.012	0.017	0.689	1.086	1.205	6.650	2.582	7.590	5.200

Table 3.8.1. Average nutrient concentration of on-tree dead matter per trial and species

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	110	4	9	351	0.01	0.00	0.18	0.09	0.17	0.14
10	*E. dunnii*	144	3	6	271	0.00	0.01	0.27	0.15	0.25	0.15
10	*E. elata*	141	4	11	138	0.00	0.00	0.26	0.11	0.06	0.25
10	*E. fastigata*	148	2	5	219	0.00	0.00	0.15	0.06	0.05	0.19
10	*E. grandis*	87	3	5	292	0.00	0.01	0.24	0.07	0.08	0.14
10	*E. macarthurii*	86	3	8	279	0.00	0.00	0.23	0.11	0.23	0.17
10	*E. nitens*	159	3	8	196	0.00	0.00	0.34	0.09	0.09	0.19
10	*E. saligna*	84	3	9	285	0.00	0.01	0.30	0.12	0.19	0.17
10	*E. smithii*	172	3	7	234	0.00	0.00	0.19	0.04	0.05	0.16
10	*E. viminalis*	123	3	8	339	0.01	0.00	0.29	0.10	0.06	0.18
10	**Mean**	**125**	**3**	**8**	**260**	**0.00**	**0.00**	**0.25**	**0.09**	**0.12**	**0.17**
11	*E. deanei*	53	3	9	394	0.00	0.01	0.56	0.12	0.16	0.15
11	*E. dunnii*	121	3	12	235	0.01	0.00	0.57	0.13	0.08	0.17
11	*E. elata*	111	3	4	124	0.01	0.00	0.26	0.09	0.05	0.18
11	*E. fastigata*	46	2	5	173	0.01	0.01	0.25	0.11	0.21	0.16
11	*E. grandis*	60	3	5	137	0.01	0.01	0.37	0.08	0.15	0.16
11	*E. macarthurii*	56	3	9	341	0.01	0.03	0.35	0.14	0.33	0.19
11	*E. nitens*	66	2	6	145	0.00	0.02	0.46	0.09	0.10	0.15
11	*E. saligna*	60	2	4	119	0.01	0.02	0.27	0.14	0.06	0.12
11	*E. smithii*	66	2	5	186	0.00	0.02	0.35	0.07	0.12	0.12
11	*E. viminalis*	70	2	5	237	0.00	0.02	0.44	0.11	0.14	0.16
11	**Mean**	**71**	**3**	**6**	**209**	**0.01**	**0.01**	**0.39**	**0.11**	**0.14**	**0.16**
12	*E. deanei*	115	6	9	260	0.00	0.01	0.54	0.17	0.06	0.17
12	*E. dunnii*	229	7	13	124	0.01	0.02	0.40	0.23	0.12	0.29
12	*E. elata*	88	5	8	113	0.01	0.00	0.23	0.07	0.01	0.16
12	*E. fastigata*	92	3	11	224	0.00	0.00	0.16	0.06	0.02	0.19
12	*E. grandis*	87	4	6	128	0.00	0.01	0.27	0.12	0.07	0.17
12	*E. macarthurii*	86	7	9	157	0.01	0.01	0.32	0.10	0.21	0.20
12	*E. nitens*	106	6	12	270	0.01	0.01	0.35	0.14	0.13	0.29
12	*E. saligna*	133	5	8	106	0.00	0.00	0.28	0.08	0.04	0.13
12	*E. smithii*	74	5	8	178	0.00	0.00	0.14	0.02	0.13	0.17
12	*E. viminalis*	130	7	13	249	0.01	0.00	0.39	0.11	0.10	0.23
12	**Mean**	**114**	**6**	**10**	**181**	**0.01**	**0.01**	**0.31**	**0.11**	**0.09**	**0.20**
F prob. (*Species*)		0.153	0.552	0.287	< 0.001	0.813	0.021	< 0.001	< 0.001	< 0.001	< 0.001
F prob. (*Spp. x Trial*)		0.230	0.991	0.010	0.002	0.431	0.702	0.005	< 0.001	0.172	0.009

Table 3.8.1. Average nutrient concentration of on-tree dead matter per trial and species

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. deanei*	113	5	13	388	0.02	0.02	0.60	0.08	0.13	0.22
13	*E. dunnii*	89	4	7	184	0.01	0.03	0.42	0.12	0.19	0.20
13	*E. elata*	94	5	10	178	0.02	0.01	0.38	0.08	0.03	0.23
13	*E. fastigata*	88	3	12	291	0.02	0.01	0.39	0.11	0.06	0.21
13	*E. grandis*	90	4	15	165	0.03	0.03	0.44	0.16	0.09	0.16
13	*E. macarthurii*	170	6	10	546	0.02	0.02	0.57	0.16	0.07	0.24
13	*E. nitens*	130	4	14	224	0.02	0.01	0.56	0.10	0.07	0.31
13	*E. saligna*	108	5	13	206	0.01	0.02	0.49	0.12	0.12	0.22
13	*E. smithii*	86	3	7	293	0.02	0.02	0.42	0.06	0.10	0.22
13	*E. viminalis*	96	3	9	305	0.02	0.02	0.53	0.11	0.11	0.25
13	**Mean**	**106**	**4**	**11**	**278**	**0.02**	**0.02**	**0.48**	**0.11**	**0.10**	**0.23**
14	*E. deanei*	133	4	9	240	0.01	0.01	0.17	0.02	0.09	0.14
14	*E. dunnii*	93	6	6	196	0.01	0.03	0.22	0.04	0.21	0.17
14	*E. elata*	139	5	14	250	0.01	0.01	0.24	0.03	0.03	0.17
14	*E. fastigata*	91	3	6	264	0.01	0.00	0.13	0.02	0.06	0.14
14	*E. grandis*	79	8	10	233	0.01	0.02	0.12	0.05	0.07	0.12
14	*E. macarthurii*	75	4	7	228	0.01	0.02	0.14	0.04	0.11	0.15
14	*E. nitens*	94	4	9	242	0.00	0.02	0.20	0.04	0.05	0.14
14	*E. saligna*	68	5	8	201	0.01	0.03	0.12	0.04	0.12	0.14
14	*E. smithii*	64	4	7	328	0.01	0.02	0.22	0.03	0.11	0.14
14	*E. viminalis*	58	2	7	273	0.01	0.03	0.14	0.05	0.14	0.14
14	**Mean**	**89**	**5**	**8**	**246**	**0.01**	**0.02**	**0.17**	**0.04**	**0.10**	**0.15**
10-14	*E. deanei*	105	5	10	327	0.008	0.010	0.409	0.095	0.121	0.165
10-14	*E. dunnii*	135	5	9	202	0.009	0.019	0.375	0.137	0.170	0.195
10-14	*E. elata*	115	4	9	161	0.009	0.004	0.275	0.077	0.037	0.196
10-14	*E. fastigata*	93	3	8	234	0.009	0.005	0.217	0.071	0.077	0.177
10-14	*E. grandis*	81	4	8	191	0.009	0.015	0.288	0.097	0.093	0.151
10-14	*E. macarthurii*	94	5	9	310	0.010	0.015	0.325	0.109	0.192	0.193
10-14	*E. nitens*	111	4	10	215	0.007	0.011	0.380	0.091	0.088	0.213
10-14	*E. saligna*	91	4	8	183	0.007	0.014	0.292	0.099	0.107	0.158
10-14	*E. smithii*	92	4	7	244	0.007	0.012	0.265	0.044	0.100	0.161
10-14	*E. viminalis*	95	3	8	281	0.009	0.015	0.359	0.095	0.112	0.189
	Mean	**101**	**4**	**9**	**235**	**0.01**	**0.01**	**0.32**	**0.09**	**0.11**	**0.18**
SE (dbm): *w/i trial*		40.2	2.1	2.7	63.8	0.005	0.010	0.074	0.026	0.068	0.032
SE (dbm): *bet. trials*		18.0	1.0	1.2	28.6	0.002	0.004	0.033	0.012	0.030	0.014

Table 3.8.2. Average nutrient mass of on-tree dead matter per trial and species

Trial	Species	Micronutrient (g/tree)				Macronutrient (g/tree)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	0.75	0.02	0.06	2.16	0.28	0.14	11.28	5.31	8.68	8.77
10	*E. dunnii*	0.12	0.00	0.01	0.23	0.00	0.05	2.41	1.35	2.00	1.23
10	*E. elata*	0.34	0.01	0.03	0.31	0.07	0.00	5.66	2.25	1.31	6.30
10	*E. fastigata*	0.57	0.01	0.02	0.80	0.16	0.00	5.66	2.20	1.75	7.22
10	*E. grandis*	0.30	0.01	0.02	0.93	0.00	0.19	7.70	2.28	2.47	4.55
10	*E. macarthurii*	0.33	0.01	0.03	1.04	0.00	0.00	8.75	4.00	11.86	6.55
10	*E. nitens*	1.53	0.03	0.07	1.74	0.00	0.00	29.61	7.49	6.97	16.42
10	*E. saligna*	0.20	0.01	0.03	0.77	0.11	0.20	7.73	3.14	5.54	4.31
10	*E. smithii*	0.75	0.02	0.03	1.05	0.06	0.00	8.29	1.68	1.77	6.37
10	*E. viminalis*	0.11	0.00	0.01	0.34	0.07	0.00	2.83	0.95	0.62	1.71
10	**Mean**	**0.50**	**0.01**	**0.03**	**0.94**	**0.07**	**0.06**	**8.99**	**3.06**	**4.30**	**6.34**
11	*E. deanei*	0.25	0.02	0.04	1.90	0.20	0.81	26.45	5.85	8.28	7.31
11	*E. dunnii*	0.22	0.01	0.01	0.31	0.01	0.00	10.87	2.33	0.99	2.37
11	*E. elata*	0.23	0.01	0.01	0.27	0.24	0.08	5.93	2.04	1.06	4.08
11	*E. fastigata*	0.17	0.01	0.02	0.63	0.29	0.53	9.13	4.35	7.29	5.50
11	*E. grandis*	0.10	0.01	0.01	0.27	0.21	0.34	6.87	1.65	4.09	3.19
11	*E. macarthurii*	0.20	0.01	0.03	1.21	0.13	0.90	13.33	4.44	10.82	5.76
11	*E. nitens*	0.86	0.03	0.08	1.92	0.00	2.42	59.20	11.12	13.89	19.32
11	*E. saligna*	0.09	0.00	0.01	0.16	0.09	0.19	4.57	2.05	0.75	1.36
11	*E. smithii*	0.42	0.01	0.03	1.17	0.19	1.07	22.00	4.15	7.15	7.33
11	*E. viminalis*	0.28	0.01	0.02	0.98	0.11	0.72	18.93	4.71	5.63	6.40
11	**Mean**	**0.28**	**0.01**	**0.03**	**0.88**	**0.15**	**0.70**	**17.73**	**4.27**	**6.00**	**6.26**
12	*E. deanei*	0.44	0.03	0.03	0.99	0.09	0.18	19.75	5.60	2.38	6.24
12	*E. dunnii*	0.11	0.00	0.01	0.05	0.06	0.18	2.12	1.42	0.81	1.43
12	*E. elata*	0.34	0.02	0.03	0.45	0.21	0.00	9.38	2.89	0.58	6.39
12	*E. fastigata*	0.48	0.01	0.05	1.08	0.24	0.00	8.01	2.18	0.79	8.96
12	*E. grandis*	0.21	0.01	0.01	0.38	0.05	0.16	6.83	2.90	1.84	4.13
12	*E. macarthurii*	0.49	0.03	0.06	0.95	0.59	0.90	17.66	8.33	16.52	12.67
12	*E. nitens*	0.23	0.02	0.02	0.64	0.22	0.29	7.81	3.39	3.15	6.56
12	*E. saligna*	0.66	0.03	0.04	0.59	0.13	0.00	14.45	4.05	1.81	6.87
12	*E. smithii*	0.56	0.04	0.06	1.30	0.00	0.00	10.25	1.21	9.06	12.41
12	*E. viminalis*	0.20	0.01	0.02	0.36	0.11	0.03	6.08	1.77	1.30	3.74
12	**Mean**	**0.37**	**0.02**	**0.03**	**0.68**	**0.17**	**0.17**	**10.23**	**3.37**	**3.82**	**6.94**
F prob. (*Species*)		< 0.001	< 0.001	< 0.001	< 0.001	0.116	0.019	< 0.001	< 0.001	< 0.001	< 0.001
F prob. (*Spp. x Trial*)		0.337	0.810	0.631	0.072	0.640	0.348	< 0.001	0.285	0.275	0.184

Table 3.8.2. Average nutrient mass of on-tree dead matter per trial and species

Trial	Species	Micronutrient (g/tree)				Macronutrient (g/tree)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. deanei*	0.26	0.01	0.03	0.89	0.47	0.44	13.62	1.75	3.68	5.19
13	*E. dunnii*	0.03	0.00	0.00	0.07	0.05	0.18	1.71	0.50	0.81	0.77
13	*E. elata*	0.09	0.00	0.01	0.17	0.15	0.10	3.78	0.76	0.33	2.19
13	*E. fastigata*	0.11	0.00	0.02	0.42	0.26	0.12	5.03	1.40	0.73	2.71
13	*E. grandis*	0.06	0.00	0.01	0.13	0.23	0.18	3.67	1.25	0.66	1.48
13	*E. macarthurii*	0.38	0.02	0.04	2.05	0.77	0.70	22.61	6.34	2.59	8.52
13	*E. nitens*	0.49	0.01	0.05	0.87	0.72	0.36	20.36	3.24	2.20	11.94
13	*E. saligna*	0.22	0.01	0.02	0.34	0.20	0.25	8.51	1.92	1.20	4.01
13	*E. smithii*	0.11	0.00	0.01	0.52	0.29	0.32	5.80	0.83	1.35	2.87
13	*E. viminalis*	0.06	0.00	0.01	0.22	0.13	0.13	3.47	0.76	0.68	1.54
13	**Mean**	**0.18**	**0.01**	**0.02**	**0.57**	**0.33**	**0.28**	**8.86**	**1.88**	**1.42**	**4.12**
14	*E. deanei*	0.62	0.02	0.04	0.96	0.36	0.43	7.95	0.53	3.61	6.59
14	*E. dunnii*	0.19	0.01	0.01	0.34	0.19	0.55	4.32	0.79	3.66	3.41
14	*E. elata*	0.32	0.01	0.03	0.62	0.22	0.11	6.35	0.89	0.86	3.78
14	*E. fastigata*	0.69	0.02	0.05	2.04	0.73	0.22	9.66	1.90	4.14	9.26
14	*E. grandis*	0.19	0.02	0.02	0.61	0.09	0.57	2.28	1.30	2.32	3.07
14	*E. macarthurii*	0.15	0.01	0.02	0.44	0.22	0.42	2.62	0.48	2.86	3.35
14	*E. nitens*	1.00	0.04	0.10	2.57	0.34	1.75	20.91	3.82	5.29	15.05
14	*E. saligna*	0.44	0.03	0.04	1.33	0.45	1.56	8.03	2.68	8.05	8.72
14	*E. smithii*	0.32	0.02	0.04	1.72	0.47	0.75	11.35	1.41	5.35	6.61
14	*E. viminalis*	0.20	0.01	0.03	0.91	0.21	1.16	4.83	1.69	4.71	4.59
14	**Mean**	**0.41**	**0.02**	**0.04**	**1.15**	**0.33**	**0.75**	**7.83**	**1.55**	**4.09**	**6.44**
10-14	*E. deanei*	0.46	0.02	0.04	1.38	0.28	0.40	15.81	3.81	5.33	6.82
10-14	*E. dunnii*	0.13	0.01	0.01	0.20	0.06	0.19	4.29	1.28	1.65	1.84
10-14	*E. elata*	0.26	0.01	0.02	0.36	0.18	0.06	6.22	1.76	0.83	4.55
10-14	*E. fastigata*	0.40	0.01	0.03	0.99	0.34	0.17	7.50	2.41	2.94	6.73
10-14	*E. grandis*	0.17	0.01	0.01	0.46	0.12	0.29	5.47	1.88	2.28	3.28
10-14	*E. macarthurii*	0.31	0.01	0.04	1.14	0.34	0.58	13.00	4.72	8.93	7.37
10-14	*E. nitens*	0.82	0.03	0.06	1.55	0.26	0.96	27.58	5.81	6.30	13.86
10-14	*E. saligna*	0.32	0.02	0.03	0.64	0.20	0.44	8.66	2.77	3.47	5.05
10-14	*E. smithii*	0.43	0.02	0.03	1.15	0.20	0.43	11.54	1.86	4.94	7.12
10-14	*E. viminalis*	0.17	0.01	0.02	0.56	0.13	0.41	7.23	1.98	2.59	3.60
	Mean	**0.35**	**0.01**	**0.03**	**0.84**	**0.21**	**0.39**	**10.73**	**2.83**	**3.92**	**6.02**
SE (dbm): *w/i trial*		0.274	0.011	0.022	0.533	0.232	0.522	6.516	2.071	3.862	3.321
SE (dbm): *bet. trials*		0.123	0.005	0.010	0.238	0.104	0.234	2.914	0.926	1.727	1.485

Table 3.9.1. Average nutrient concentration of bole bark per trial and species

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	107	3	9	1428	0.04	0.04	0.79	0.42	0.40	0.24
10	*E. dunnii*	75	2	7	583	0.03	0.04	0.46	0.32	0.60	0.22
10	*E. elata*	68	3	9	673	0.03	0.06	0.36	0.24	0.40	0.31
10	*E. fastigata*	113	3	10	764	0.04	0.03	0.38	0.19	0.42	0.30
10	*E. grandis*	62	2	10	907	0.04	0.04	0.63	0.28	0.54	0.22
10	*E. macarthurii*	65	3	10	764	0.04	0.03	0.62	0.24	0.53	0.32
10	*E. nitens*	57	3	9	594	0.03	0.02	0.52	0.19	0.52	0.26
10	*E. saligna*	57	5	10	799	0.04	0.06	0.70	0.24	0.52	0.25
10	*E. smithii*	87	2	9	516	0.03	0.02	0.37	0.13	0.39	0.22
10	*E. viminalis*	61	3	9	798	0.03	0.02	0.58	0.31	0.47	0.35
10	**Mean**	**75**	**3**	**9**	**783**	**0.03**	**0.04**	**0.54**	**0.26**	**0.48**	**0.27**
11	*E. deanei*	34	3	5	1100	0.08	0.06	1.43	0.45	0.44	0.25
11	*E. dunnii*	33	2	4	415	0.02	0.07	1.03	0.35	0.46	0.22
11	*E. elata*	58	2	7	390	0.03	0.05	0.61	0.32	0.27	0.28
11	*E. fastigata*	33	3	5	651	0.04	0.04	0.63	0.33	0.36	0.29
11	*E. grandis*	42	3	6	524	0.04	0.08	1.40	0.25	0.51	0.24
11	*E. macarthurii*	57	3	11	600	0.04	0.04	1.32	0.30	0.56	0.35
11	*E. nitens*	38	3	9	336	0.03	0.04	1.11	0.23	0.45	0.27
11	*E. saligna*	52	3	6	622	0.06	0.06	1.38	0.36	0.59	0.30
11	*E. smithii*	45	2	6	304	0.03	0.03	0.75	0.16	0.31	0.23
11	*E. viminalis*	40	2	6	651	0.03	0.07	1.22	0.28	0.42	0.33
11	**Mean**	**43**	**3**	**7**	**559**	**0.04**	**0.06**	**1.09**	**0.30**	**0.44**	**0.28**
12	*E. deanei*	34	2	5	836	0.05	0.05	0.87	0.35	0.48	0.24
12	*E. dunnii*	66	2	6	432	0.03	0.06	0.68	0.22	0.48	0.23
12	*E. elata*	80	4	7	424	0.03	0.08	0.62	0.27	0.38	0.30
12	*E. fastigata*	54	2	5	671	0.03	0.04	0.35	0.11	0.47	0.30
12	*E. grandis*	50	3	6	797	0.03	0.06	1.02	0.31	0.52	0.23
12	*E. macarthurii*	172	3	12	672	0.04	0.05	0.94	0.27	0.64	0.37
12	*E. nitens*	92	3	9	554	0.03	0.02	0.80	0.25	0.40	0.29
12	*E. saligna*	100	3	7	790	0.03	0.05	1.01	0.26	0.62	0.20
12	*E. smithii*	34	1	6	579	0.02	0.03	0.46	0.18	0.48	0.23
12	*E. viminalis*	48	3	9	1033	0.05	0.05	0.80	0.22	0.42	0.34
12	**Mean**	**73**	**3**	**7**	**679**	**0.03**	**0.05**	**0.76**	**0.24**	**0.49**	**0.27**
F prob. (*Species*)		0.128	0.855	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
F prob. (*Spp. x Trial*)		0.304	0.998	0.270	0.348	< 0.001	0.449	0.716	0.083	0.457	0.259

Table 3.9.1. Average nutrient concentration of bole bark per trial and species

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. deanei*	119	3	10	1341	0.21	0.03	1.04	0.44	0.41	0.25
13	*E. dunnii*	39	2	4	729	0.07	0.05	0.84	0.39	0.56	0.24
13	*E. elata*	114	3	8	318	0.07	0.06	0.51	0.23	0.27	0.28
13	*E. fastigata*	62	4	10	655	0.06	0.03	0.46	0.32	0.35	0.25
13	*E. grandis*	48	4	10	588	0.16	0.05	1.09	0.37	0.45	0.24
13	*E. macarthurii*	138	4	10	692	0.05	0.05	0.80	0.24	0.49	0.33
13	*E. nitens*	108	4	12	472	0.09	0.02	0.93	0.21	0.46	0.32
13	*E. saligna*	25	3	7	808	0.11	0.04	1.02	0.37	0.50	0.24
13	*E. smithii*	138	4	9	555	0.06	0.03	0.47	0.10	0.29	0.26
13	*E. viminalis*	39	5	13	983	0.07	0.03	0.78	0.29	0.38	0.33
13	**Mean**	**83**	**4**	**9**	**714**	**0.10**	**0.04**	**0.80**	**0.30**	**0.41**	**0.27**
14	*E. deanei*	36	14	13	833	0.03	0.06	0.66	0.27	0.35	0.28
14	*E. dunnii*	43	12	10	278	0.02	0.07	0.70	0.31	0.54	0.28
14	*E. elata*	83	21	11	425	0.02	0.04	0.73	0.22	0.23	0.32
14	*E. fastigata*	76	23	11	448	0.02	0.02	0.59	0.20	0.33	0.35
14	*E. grandis*	78	19	12	405	0.02	0.05	0.64	0.30	0.29	0.26
14	*E. macarthurii*	59	8	13	348	0.03	0.07	0.54	0.19	0.38	0.37
14	*E. nitens*	75	19	12	575	0.03	0.04	1.01	0.19	0.48	0.31
14	*E. saligna*	61	15	14	427	0.02	0.05	0.75	0.27	0.39	0.28
14	*E. smithii*	53	14	12	385	0.02	0.02	0.44	0.11	0.24	0.26
14	*E. viminalis*	40	13	12	435	0.03	0.03	0.59	0.27	0.34	0.38
14	**Mean**	**60**	**16**	**12**	**456**	**0.02**	**0.05**	**0.67**	**0.23**	**0.36**	**0.31**
10-14	*E. deanei*	66	5	8	1107	0.08	0.05	0.96	0.38	0.42	0.25
10-14	*E. dunnii*	51	4	6	487	0.03	0.06	0.74	0.32	0.53	0.24
10-14	*E. elata*	81	7	8	446	0.04	0.06	0.57	0.26	0.31	0.30
10-14	*E. fastigata*	68	7	8	638	0.04	0.03	0.48	0.23	0.39	0.30
10-14	*E. grandis*	56	6	9	644	0.06	0.06	0.96	0.30	0.46	0.24
10-14	*E. macarthurii*	98	4	11	615	0.04	0.05	0.85	0.25	0.52	0.35
10-14	*E. nitens*	74	6	10	506	0.04	0.03	0.87	0.21	0.46	0.29
10-14	*E. saligna*	59	6	9	689	0.05	0.05	0.97	0.30	0.53	0.25
10-14	*E. smithii*	71	4	8	468	0.03	0.03	0.50	0.14	0.34	0.24
10-14	*E. viminalis*	46	5	10	780	0.04	0.04	0.80	0.27	0.41	0.35
	Mean	**67**	**6**	**9**	**638**	**0.05**	**0.05**	**0.77**	**0.27**	**0.44**	**0.28**
SE (dbm): *w/i trial*		38.4	4.5	1.9	173.5	0.014	0.016	0.211	0.057	0.076	0.025
SE (dbm): *bet. trials*		17.2	2.0	0.9	77.6	0.006	0.007	0.095	0.025	0.034	0.011

Table 3.9.2. Average nutrient mass of bole bark per trial and species

Trial	Species	Micronutrient (g/tree)				Macronutrient (g/tree)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	1.16	0.03	0.10	15.21	4.72	3.83	85.79	45.21	41.69	25.02
10	*E. dunnii*	0.98	0.03	0.09	7.66	3.49	5.35	60.74	40.81	75.34	28.24
10	*E. elata*	0.75	0.03	0.10	7.30	3.61	6.49	39.47	26.13	43.95	34.03
10	*E. fastigata*	0.96	0.03	0.08	6.41	3.06	2.76	32.20	15.68	35.38	25.16
10	*E. grandis*	0.53	0.02	0.08	7.76	3.17	3.45	54.71	24.17	45.86	18.96
10	*E. macarthurii*	0.86	0.04	0.14	10.26	5.36	4.70	85.54	32.96	71.28	43.31
10	*E. nitens*	0.68	0.04	0.11	7.02	3.19	2.64	61.90	22.19	62.49	30.95
10	*E. saligna*	0.48	0.04	0.08	6.78	3.03	4.70	58.93	20.09	43.90	20.83
10	*E. smithii*	1.37	0.03	0.13	6.45	3.18	3.31	46.51	16.03	49.78	29.45
10	*E. viminalis*	0.55	0.02	0.08	7.37	2.98	1.81	51.85	27.53	42.08	30.54
10	**Mean**	**0.83**	**0.03**	**0.10**	**8.22**	**3.58**	**3.90**	**57.76**	**27.08**	**51.18**	**28.65**
11	*E. deanei*	0.24	0.02	0.04	7.85	5.55	4.38	103.80	32.43	31.90	18.27
11	*E. dunnii*	0.53	0.03	0.07	6.87	3.63	10.91	172.95	56.78	69.26	35.43
11	*E. elata*	0.35	0.01	0.04	2.38	1.83	2.98	36.60	19.07	16.43	16.61
11	*E. fastigata*	0.17	0.02	0.03	3.45	2.13	2.29	33.55	17.52	19.09	15.23
11	*E. grandis*	0.36	0.03	0.05	4.41	3.15	7.22	121.37	21.53	43.92	20.57
11	*E. macarthurii*	0.72	0.04	0.14	7.72	4.90	4.86	167.43	37.01	74.51	44.86
11	*E. nitens*	0.44	0.03	0.10	3.93	3.43	4.88	130.38	25.16	53.22	31.00
11	*E. saligna*	0.46	0.03	0.05	5.33	5.09	5.40	121.97	31.27	52.29	26.05
11	*E. smithii*	0.50	0.02	0.06	3.42	3.00	3.68	84.49	18.48	34.46	26.30
11	*E. viminalis*	0.47	0.03	0.07	7.02	3.65	7.85	136.76	31.54	46.24	37.40
11	**Mean**	**0.42**	**0.03**	**0.07**	**5.24**	**3.64**	**5.44**	**110.93**	**29.08**	**44.13**	**27.17**
12	*E. deanei*	0.35	0.03	0.05	9.67	5.90	5.91	92.92	37.19	52.75	27.13
12	*E. dunnii*	1.53	0.05	0.15	10.25	6.28	13.38	158.41	51.31	113.83	54.33
12	*E. elata*	1.57	0.07	0.15	8.43	5.85	16.11	122.63	53.21	75.11	59.15
12	*E. fastigata*	0.57	0.02	0.06	7.27	3.56	3.86	36.41	11.85	49.28	31.84
12	*E. grandis*	0.56	0.03	0.06	9.23	3.06	7.50	116.76	34.76	59.91	27.04
12	*E. macarthurii*	1.48	0.04	0.12	7.66	4.15	6.88	118.68	30.39	74.33	41.24
12	*E. nitens*	0.52	0.02	0.05	3.45	1.78	1.36	49.16	14.78	23.78	17.56
12	*E. saligna*	1.05	0.03	0.07	8.35	3.16	5.56	106.77	27.67	65.86	20.76
12	*E. smithii*	0.63	0.02	0.13	8.66	3.34	5.90	77.05	42.90	83.92	40.23
12	*E. viminalis*	0.89	0.07	0.19	19.42	8.20	9.06	158.52	42.50	79.83	62.97
12	**Mean**	**0.91**	**0.04**	**0.10**	**9.24**	**4.53**	**7.55**	**103.73**	**34.66**	**67.86**	**38.23**
F prob. (*Species*)		0.100	0.883	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
F prob. (*Spp. x Trial*)		0.416	0.927	0.235	< 0.001	< 0.001	< 0.001	0.072	0.290	0.025	< 0.001

Table 3.9.2. Average nutrient mass of bole bark per trial and species											
Trial	**Species**	**Micronutrient (g/tree)**				**Macronutrient (g/tree)**					
		Fe	***Cu***	***Zn***	***Mn***	***P***	***Na***	***Ca***	***Mg***	***K***	***N***
13	*E. deanei*	0.47	0.01	0.04	5.49	8.48	1.17	41.12	17.30	16.39	10.03
13	*E. dunnii*	0.26	0.01	0.02	4.87	3.77	3.26	57.38	23.31	37.60	14.81
13	*E. elata*	0.43	0.01	0.02	1.13	2.57	2.11	17.39	8.56	10.46	9.74
13	*E. fastigata*	0.15	0.01	0.02	2.08	1.69	0.88	12.39	9.29	10.10	7.00
13	*E. grandis*	0.25	0.02	0.05	2.96	8.09	2.31	57.58	18.97	22.73	12.26
13	*E. macarthurii*	0.95	0.02	0.07	4.69	3.17	3.23	54.06	16.05	33.45	22.20
13	*E. nitens*	0.40	0.01	0.03	1.34	2.24	0.66	25.59	5.20	13.87	8.59
13	*E. saligna*	0.14	0.02	0.04	4.60	5.36	1.95	55.45	21.82	27.64	13.36
13	*E. smithii*	0.60	0.02	0.04	2.41	2.49	1.33	20.80	4.51	12.74	11.29
13	*E. viminalis*	0.19	0.02	0.06	4.16	3.21	1.35	35.39	13.51	17.59	15.21
13	**Mean**	**0.38**	**0.02**	**0.04**	**3.37**	**4.11**	**1.82**	**37.71**	**13.85**	**20.26**	**12.45**
14	*E. deanei*	0.17	0.08	0.06	4.07	1.61	2.65	37.38	13.23	17.62	13.80
14	*E. dunnii*	0.49	0.16	0.12	3.23	1.92	7.74	82.69	38.36	66.99	32.89
14	*E. elata*	0.83	0.20	0.10	4.10	1.78	4.41	72.54	21.12	22.38	30.94
14	*E. fastigata*	0.66	0.22	0.09	3.90	1.98	1.43	51.85	16.83	27.95	30.59
14	*E. grandis*	0.51	0.12	0.08	2.54	1.28	3.12	42.30	19.09	17.51	16.86
14	*E. macarthurii*	0.43	0.05	0.10	2.60	2.02	5.34	44.26	14.04	30.43	27.57
14	*E. nitens*	0.85	0.23	0.14	6.79	3.08	5.18	112.74	21.26	55.00	34.32
14	*E. saligna*	0.37	0.11	0.08	2.72	1.31	2.86	55.74	17.40	25.30	17.59
14	*E. smithii*	0.50	0.14	0.11	3.60	1.94	2.03	42.67	9.39	23.74	23.35
14	*E. viminalis*	0.40	0.14	0.12	4.36	3.20	2.65	61.74	27.51	34.44	38.01
14	**Mean**	**0.52**	**0.15**	**0.10**	**3.79**	**2.01**	**3.74**	**60.39**	**19.82**	**32.14**	**26.59**
10-14	*E. deanei*	0.48	0.03	0.06	8.46	5.25	3.59	72.20	29.07	32.07	18.85
10-14	*E. dunnii*	0.76	0.06	0.09	6.57	3.82	8.13	106.44	42.11	72.60	33.14
10-14	*E. elata*	0.78	0.06	0.08	4.67	3.13	6.42	57.73	25.62	33.67	30.09
10-14	*E. fastigata*	0.50	0.06	0.06	4.62	2.48	2.24	33.28	14.23	28.36	21.96
10-14	*E. grandis*	0.44	0.05	0.06	5.38	3.75	4.72	78.54	23.70	37.99	19.14
10-14	*E. macarthurii*	0.89	0.04	0.11	6.59	3.92	5.00	93.99	26.09	56.80	35.83
10-14	*E. nitens*	0.58	0.07	0.09	4.51	2.74	2.94	75.95	17.72	41.67	24.48
10-14	*E. saligna*	0.50	0.05	0.07	5.56	3.59	4.09	79.77	23.65	43.00	19.72
10-14	*E. smithii*	0.72	0.05	0.09	4.91	2.79	3.25	54.30	18.26	40.93	26.13
10-14	*E. viminalis*	0.50	0.06	0.11	8.46	4.25	4.54	88.85	28.52	44.03	36.83
	Mean	**0.62**	**0.05**	**0.08**	**5.97**	**3.57**	**4.49**	**74.11**	**24.90**	**43.11**	**26.62**
SE (dbm): *w/i trial*		0.383	0.050	0.035	2.023	1.103	1.811	31.390	10.320	13.980	6.901
SE (dbm): *bet. trials*		0.171	0.022	0.016	0.905	0.493	0.810	14.040	4.620	6.250	3.086

Table 3.10.1. Average nutrient concentration of bole wood per trial and species													
Trial	**Species**	**Micronutrient (mg/kg)**				**Macronutrient (%)**							
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*		
10	*E. deanei*	37.3	1.0	3.3	24.0	0.007	0.000	0.087	0.023	0.050	0.090		
10	*E. dunnii*	33.7	1.7	3.0	32.7	0.010	0.003	0.133	0.077	0.055	0.063		
10	*E. elata*	59.0	1.7	5.7	24.7	0.010	0.003	0.073	0.010	0.032	0.080		
10	*E. fastigata*	83.7	1.7	5.0	20.0	0.010	0.000	0.067	0.027	0.030	0.097		
10	*E. grandis*	33.0	1.7	3.7	35.7	0.003	0.007	0.180	0.023	0.047	0.063		
10	*E. macarthurii*	56.3	1.3	4.0	28.0	0.017	0.013	0.120	0.027	0.053	0.097		
10	*E. nitens*	174.3	1.7	4.0	26.7	0.010	0.013	0.100	0.023	0.052	0.087		
10	*E. saligna*	75.7	1.7	4.7	26.0	0.010	0.007	0.160	0.027	0.043	0.063		
10	*E. smithii*	118.3	1.3	6.0	37.7	0.010	0.000	0.120	0.030	0.032	0.060		
10	*E. viminalis*	128.0	1.7	3.3	28.0	0.027	0.000	0.100	0.030	0.060	0.107		
10	**Mean**	**79.9**	**1.5**	**4.3**	**28.3**	**0.011**	**0.005**	**0.114**	**0.030**	**0.045**	**0.081**		
11	*E. deanei*	26.0	1.7	4.0	8.3	0.017	0.010	0.180	0.017	0.062	0.117		
11	*E. dunnii*	21.0	1.3	4.3	20.0	0.017	0.003	0.220	0.067	0.055	0.070		
11	*E. elata*	61.0	1.3	5.7	4.7	0.010	0.003	0.127	0.027	0.038	0.087		
11	*E. fastigata*	43.0	1.7	5.7	12.7	0.013	0.007	0.187	0.027	0.042	0.100		
11	*E. grandis*	11.3	1.7	3.7	15.3	0.020	0.010	0.240	0.030	0.052	0.093		
11	*E. macarthurii*	45.3	1.0	7.0	16.7	0.030	0.010	0.140	0.023	0.060	0.093		
11	*E. nitens*	88.0	2.0	4.0	13.3	0.017	0.017	0.167	0.030	0.050	0.083		
11	*E. saligna*	36.0	1.7	3.7	5.3	0.010	0.007	0.193	0.023	0.043	0.080		
11	*E. smithii*	57.7	1.7	4.3	11.0	0.010	0.010	0.160	0.023	0.042	0.070		
11	*E. viminalis*	24.0	1.7	4.7	23.0	0.037	0.010	0.180	0.033	0.052	0.083		
11	**Mean**	**41.3**	**1.6**	**4.7**	**13.0**	**0.018**	**0.009**	**0.179**	**0.030**	**0.050**	**0.088**		
12	*E. deanei*	45.0	1.0	3.3	28.7	0.013	0.010	0.093	0.030	0.150	0.093		
12	*E. dunnii*	78.3	1.3	2.3	33.0	0.010	0.010	0.233	0.097	0.150	0.077		
12	*E. elata*	33.0	1.3	2.0	31.0	0.010	0.010	0.060	0.023	0.202	0.087		
12	*E. fastigata*	44.0	0.3	2.7	27.3	0.010	0.007	0.093	0.027	0.125	0.077		
12	*E. grandis*	18.7	1.0	3.3	22.0	0.010	0.007	0.133	0.017	0.130	0.070		
12	*E. macarthurii*	54.3	1.7	2.7	48.7	0.023	0.013	0.107	0.033	0.137	0.100		
12	*E. nitens*	52.7	1.0	2.0	22.7	0.010	0.013	0.080	0.017	0.153	0.087		
12	*E. saligna*	14.3	0.0	1.7	30.3	0.010	0.013	0.120	0.017	0.177	0.070		
12	*E. smithii*	65.0	1.3	3.0	39.7	0.007	0.010	0.100	0.020	0.137	0.067		
12	*E. viminalis*	80.0	1.3	3.0	51.3	0.013	0.023	0.107	0.027	0.165	0.080		
12	**Mean**	**48.5**	**1.0**	**2.6**	**33.5**	**0.012**	**0.012**	**0.113**	**0.031**	**0.153**	**0.081**		
F prob. (*Species*)		0.002	0.899	0.357	0.014	< 0.001	0.039	< 0.001	< 0.001	0.962	< 0.001		
F prob. (*Spp. x Trial*)		0.285	0.879	0.725	0.983	< 0.001	0.702	0.292	0.363	1.000	0.282		

Trial	Species	Micronutrient (mg/kg)				Macronutrient (%)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. deanei*	16.0	1.0	4.0	17.0	0.017	0.017	0.200	0.027	0.195	0.097
13	*E. dunnii*	9.3	0.7	2.7	25.3	0.023	0.003	0.267	0.080	0.180	0.067
13	*E. elata*	22.0	0.7	3.3	8.7	0.020	0.010	0.107	0.010	0.193	0.093
13	*E. fastigata*	21.3	1.0	4.0	4.3	0.020	0.003	0.100	0.033	0.197	0.120
13	*E. grandis*	14.3	1.0	5.0	16.7	0.023	0.017	0.260	0.023	0.217	0.083
13	*E. macarthurii*	19.3	1.0	7.3	43.7	0.073	0.010	0.140	0.027	0.223	0.133
13	*E. nitens*	85.7	0.7	7.7	17.7	0.043	0.010	0.120	0.027	0.213	0.090
13	*E. saligna*	11.0	0.7	3.7	0.7	0.020	0.000	0.180	0.013	0.188	0.070
13	*E. smithii*	48.0	0.7	4.7	36.3	0.023	0.010	0.140	0.037	0.183	0.060
13	*E. viminalis*	8.7	0.7	5.0	20.3	0.083	0.007	0.153	0.060	0.200	0.090
13	**Mean**	**25.6**	**0.8**	**4.7**	**19.1**	**0.035**	**0.009**	**0.167**	**0.034**	**0.199**	**0.090**
14	*E. deanei*	15.3	1.0	4.3	23.7	0.013	0.007	0.067	0.023	0.152	0.107
14	*E. dunnii*	17.7	1.0	3.0	45.0	0.010	0.007	0.113	0.063	0.110	0.083
14	*E. elata*	25.3	1.7	4.3	30.3	0.007	0.007	0.073	0.017	0.077	0.107
14	*E. fastigata*	24.0	1.0	4.0	12.7	0.013	0.003	0.047	0.037	0.118	0.103
14	*E. grandis*	61.7	1.3	4.3	30.0	0.003	0.017	0.073	0.013	0.107	0.090
14	*E. macarthurii*	28.7	1.0	5.0	29.0	0.010	0.017	0.060	0.017	0.143	0.090
14	*E. nitens*	26.3	1.0	4.0	29.7	0.010	0.013	0.073	0.040	0.138	0.090
14	*E. saligna*	21.3	1.0	5.7	29.0	0.007	0.017	0.080	0.043	0.138	0.080
14	*E. smithii*	20.7	1.0	4.0	35.0	0.003	0.003	0.073	0.037	0.127	0.070
14	*E. viminalis*	12.3	1.7	5.3	43.7	0.013	0.007	0.073	0.027	0.100	0.093
14	**Mean**	**25.3**	**1.2**	**4.4**	**30.8**	**0.009**	**0.010**	**0.073**	**0.032**	**0.121**	**0.091**
10-14	*E. deanei*	27.9	1.1	3.8	20.3	0.013	0.009	0.125	0.024	0.122	0.101
10-14	*E. dunnii*	32.0	1.2	3.1	31.2	0.014	0.005	0.193	0.077	0.110	0.072
10-14	*E. elata*	40.1	1.3	4.2	19.9	0.011	0.007	0.088	0.017	0.108	0.091
10-14	*E. fastigata*	43.2	1.1	4.3	15.4	0.013	0.004	0.099	0.030	0.102	0.099
10-14	*E. grandis*	27.8	1.3	4.0	23.9	0.012	0.011	0.177	0.021	0.110	0.080
10-14	*E. macarthurii*	40.8	1.2	5.2	33.2	0.031	0.013	0.113	0.025	0.123	0.103
10-14	*E. nitens*	85.4	1.3	4.3	22.0	0.018	0.013	0.108	0.027	0.121	0.087
10-14	*E. saligna*	31.7	1.0	3.9	18.3	0.011	0.009	0.147	0.025	0.118	0.073
10-14	*E. smithii*	61.9	1.2	4.4	31.9	0.011	0.007	0.119	0.029	0.104	0.065
10-14	*E. viminalis*	50.6	1.4	4.3	33.3	0.035	0.009	0.123	0.035	0.115	0.091
	Mean	**44.1**	**1.2**	**4.1**	**24.9**	**0.017**	**0.009**	**0.129**	**0.031**	**0.113**	**0.086**
SE (dbm): *w/i trial*		32.1	0.5	1.6	13.7	0.0060	0.0070	0.0180	0.0130	0.0830	0.0130
SE (dbm): *bet. trials*		14.4	0.2	0.7	6.1	0.0030	0.0030	0.0080	0.0060	0.0370	0.0060

Table 3.10.1. Average nutrient concentration of bole wood per trial and species

Table 3.10.2. Average nutrient mass of bole wood per trial and species

Trial	Species	Micronutrient (g/tree)				Macronutrient (g/tree)					
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	3.36	0.09	0.29	2.18	5.93	0.00	80.35	21.05	46.11	83.63
10	*E. dunnii*	2.62	0.14	0.26	2.68	8.06	2.90	109.91	63.93	44.27	51.24
10	*E. elata*	4.01	0.13	0.36	1.80	7.39	1.92	51.44	5.62	23.07	61.09
10	*E. fastigata*	6.57	0.13	0.41	1.58	7.93	0.00	53.10	20.69	23.60	76.83
10	*E. grandis*	2.54	0.13	0.28	2.73	2.58	5.07	137.96	17.78	35.68	48.57
10	*E. macarthurii*	4.97	0.12	0.37	2.59	15.11	12.30	111.63	24.91	49.57	91.71
10	*E. nitens*	17.02	0.16	0.39	2.56	9.66	12.61	97.53	22.46	49.94	83.94
10	*E. saligna*	5.15	0.12	0.34	1.89	7.16	4.48	116.35	19.19	31.18	46.04
10	*E. smithii*	15.12	0.17	0.78	5.12	13.32	0.00	160.75	40.58	42.14	80.53
10	*E. viminalis*	6.89	0.11	0.21	1.81	16.12	0.00	60.01	20.11	37.57	64.09
10	**Mean**	**6.82**	**0.13**	**0.37**	**2.49**	**9.32**	**3.93**	**97.90**	**25.63**	**38.31**	**68.77**
11	*E. deanei*	1.51	0.09	0.22	0.47	8.96	5.76	97.80	9.75	34.46	64.60
11	*E. dunnii*	1.76	0.11	0.38	1.64	14.10	2.62	182.00	53.77	45.00	58.08
11	*E. elata*	2.44	0.05	0.23	0.19	4.02	1.36	50.86	10.74	15.43	34.82
11	*E. fastigata*	1.95	0.08	0.26	0.54	5.99	2.88	80.49	11.69	18.26	44.19
11	*E. grandis*	0.80	0.12	0.25	0.91	13.70	6.85	160.78	20.55	36.45	66.05
11	*E. macarthurii*	3.27	0.07	0.49	1.09	22.29	6.31	101.11	16.74	44.75	69.09
11	*E. nitens*	9.21	0.20	0.38	1.27	17.47	15.90	163.19	29.66	51.71	81.59
11	*E. saligna*	2.63	0.13	0.27	0.43	7.37	5.08	142.00	16.88	32.07	58.92
11	*E. smithii*	5.03	0.15	0.37	0.96	8.73	8.73	141.18	20.47	35.62	61.86
11	*E. viminalis*	1.84	0.13	0.36	1.72	28.09	7.64	137.46	24.86	39.41	63.04
11	**Mean**	**3.04**	**0.11**	**0.32**	**0.92**	**13.07**	**6.31**	**125.69**	**21.51**	**35.32**	**60.22**
12	*E. deanei*	5.28	0.13	0.41	2.81	16.52	11.04	110.23	33.13	151.19	101.96
12	*E. dunnii*	15.01	0.25	0.45	6.50	19.37	19.37	435.27	187.07	298.60	147.30
12	*E. elata*	5.35	0.23	0.33	5.02	16.30	16.30	97.82	38.09	321.33	141.39
12	*E. fastigata*	5.80	0.05	0.37	3.38	13.52	8.28	129.39	35.45	160.19	99.01
12	*E. grandis*	2.51	0.15	0.45	2.59	13.03	7.56	180.07	20.87	154.97	91.20
12	*E. macarthurii*	5.84	0.19	0.27	5.72	24.48	15.25	112.24	31.18	147.98	97.02
12	*E. nitens*	2.92	0.05	0.11	1.26	5.61	6.44	44.90	9.80	81.01	47.04
12	*E. saligna*	1.59	0.00	0.18	3.36	11.14	14.77	137.66	19.52	196.93	78.24
12	*E. smithii*	10.48	0.27	0.57	8.29	8.56	41.07	221.42	25.13	384.02	151.79
12	*E. viminalis*	11.97	0.17	0.40	7.41	18.44	35.54	140.13	33.15	241.14	110.71
12	**Mean**	**6.67**	**0.15**	**0.35**	**4.63**	**14.70**	**17.56**	**160.91**	**43.34**	**213.74**	**106.57**
F prob. (*Species*)		0.001	0.353	0.021	0.005	< 0.001	0.605	< 0.001	< 0.001	0.606	0.358
F prob. (*Spp. x Trial*)		0.004	0.595	0.178	0.806	< 0.001	0.786	< 0.001	< 0.001	0.593	0.008

Table 3.10.2. Average nutrient mass of bole wood per trial and species										
Trial	Species	Micronutrient (g/tree)				Macronutrient (g/tree)				
		Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*
13	*E. deanei*	0.36	0.02	0.09	0.39	3.73	4.04	50.58	6.35	42.81
13	*E. dunnii*	0.43	0.03	0.11	1.13	9.49	0.81	93.80	32.58	79.77
13	*E. elata*	0.47	0.02	0.08	0.16	5.98	1.17	26.63	2.43	46.82
13	*E. fastigata*	0.55	0.02	0.08	0.08	4.59	0.41	23.61	8.36	42.10
13	*E. grandis*	0.54	0.04	0.19	0.64	8.60	6.27	96.28	8.44	79.76
13	*E. macarthurii*	0.73	0.04	0.27	1.65	27.65	3.81	52.78	10.13	83.92
13	*E. nitens*	1.06	0.01	0.10	0.46	4.58	3.07	18.62	4.51	35.49
13	*E. saligna*	0.60	0.04	0.19	0.03	10.23	0.00	91.72	7.74	94.97
13	*E. smithii*	1.93	0.03	0.20	1.58	9.47	4.19	58.70	15.95	76.49
13	*E. viminalis*	0.24	0.02	0.13	0.54	22.95	1.91	41.47	16.12	53.73
13	**Mean**	**0.69**	**0.03**	**0.14**	**0.67**	**10.73**	**2.57**	**55.42**	**11.26**	**63.59**
14	*E. deanei*	0.64	0.04	0.18	1.17	5.31	3.31	30.80	10.06	60.93
14	*E. dunnii*	1.24	0.07	0.21	3.23	7.06	4.89	82.92	44.51	75.40
14	*E. elata*	1.33	0.10	0.26	1.68	3.63	3.48	40.87	10.84	46.59
14	*E. fastigata*	2.32	0.09	0.37	1.35	12.11	3.64	45.00	32.57	105.33
14	*E. grandis*	2.83	0.06	0.20	1.43	1.56	7.89	34.69	6.33	50.10
14	*E. macarthurii*	1.51	0.06	0.28	1.60	5.51	8.86	33.08	9.80	81.16
14	*E. nitens*	2.86	0.10	0.42	2.88	10.22	15.29	72.27	42.93	148.62
14	*E. saligna*	1.40	0.05	0.31	1.82	2.66	8.35	48.11	19.83	63.08
14	*E. smithii*	1.87	0.09	0.36	3.52	2.73	3.68	70.23	30.51	110.54
14	*E. viminalis*	0.83	0.11	0.35	3.01	9.42	4.64	50.08	18.37	66.62
14	**Mean**	**1.68**	**0.08**	**0.29**	**2.17**	**6.02**	**6.40**	**50.80**	**22.57**	**80.84**
10-14	*E. deanei*	2.23	0.07	0.24	1.40	8.09	4.83	73.95	16.07	67.10
10-14	*E. dunnii*	4.21	0.12	0.28	3.04	11.62	6.12	180.78	76.37	108.61
10-14	*E. elata*	2.72	0.11	0.25	1.77	7.47	4.85	53.52	13.54	90.65
10-14	*E. fastigata*	3.44	0.07	0.30	1.39	8.83	3.04	66.32	21.75	69.89
10-14	*E. grandis*	1.84	0.10	0.27	1.66	7.89	6.73	121.96	14.79	71.39
10-14	*E. macarthurii*	3.26	0.10	0.34	2.53	19.01	9.30	82.17	18.55	81.48
10-14	*E. nitens*	6.61	0.11	0.28	1.69	9.51	10.66	79.30	21.87	73.35
10-14	*E. saligna*	2.27	0.07	0.26	1.51	7.71	6.54	107.17	16.63	83.65
10-14	*E. smithii*	6.89	0.14	0.45	3.89	8.56	11.53	130.46	26.53	129.76
10-14	*E. viminalis*	4.35	0.11	0.29	2.90	19.00	9.95	85.83	22.52	87.70
	Mean	**3.78**	**0.10**	**0.30**	**2.18**	**10.77**	**7.36**	**98.14**	**24.86**	**86.36**
SE (dbm): *w/i trial*		3.043	0.068	0.130	1.615	4.304	9.971	22.010	11.140	70.040
SE (dbm): *bet. trials*		1.361	0.031	0.058	0.722	1.925	4.459	9.840	4.980	31.320

4. DATA ANALYSIS

4.1. Analysis of variance

Analysis of variance was undertaken of all soil, tree growth and biomass (mass and nutrient content) data records to test differences between the means of species and the interactions between species and trial sites. Data were screened for the normal distribution of each parameter, and any skewed distributions checked for extreme values and non-normality. These analyses are presented in Appendices B1.1 to B11.2.10 in the following format:

Source of variation (trial, species, species x trial, residual, total)
Degrees of freedom (df)
Sum of squares (ss)
Mean squares (ms = ss/df)
Variance ratio (vr = ms term / ms residual)
F probability (F pr)

B1. *Analysis of variance of topsoil parameters (1.1 - 1.13):*
Clay, Silt, Sand, pH, Ca, Mg, K, Na, P, S-value (soil), S-value (clay), OC, EA

B2. *Analysis of variance of tree growth parameters (2.1 - 2.6):*
Total tree height, 5cm top diameter tree height, Dbh, Plot dbh, Stem volume, Stocking

B3. *Analysis of variance of dry mass of biomass components (3.1 - 3.6):*
Leaf, Branch, Dead matter, Bark, Bole wood, Total

B4. *Analysis of variance of water content of biomass components (4.1 - 4.6):*
Leaf, Branch, Dead matter, Bark, Bole wood, Total

B5. *Analysis of variance of bole wood density per disc*
Discs per section height - includes full table of means

B6. *Analysis of variance of select foliar nutrient concentrations (6.1 - 6.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

B7.1. *Analysis of variance of bulk foliar nutrient concentrations (7.1.1 - 7.1.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

B7.2. *Analysis of variance of bulk foliar nutrient mass per tree (7.2.1 - 7.2.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

B8.1. *Analysis of variance of branch nutrient concentrations (8.1.1 - 8.1.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

B8.2. *Analysis of variance of branch nutrient mass per tree (8.2.1 - 8.2.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

B9.1. *Analysis of variance of dead matter nutrient concentrations (9.1.1 - 9.1.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

B9.2. *Analysis of variance of dead matter nutrient mass per tree (9.2.1 - 9.2.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

B10.1. *Analysis of variance of bark nutrient concentrations (10.1.1 - 10.1.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

B10.2. *Analysis of variance of bark nutrient mass per tree (10.2.1 - 10.2.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

B11.1. *Analysis of variance of bole wood nutrient concentrations (11.1.1 - 11.1.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

B11.2. *Analysis of variance of bole wood nutrient mass per tree (11.2.1 - 11.2.10):*
Fe, Cu, Zn, Mn, P, Na, Ca, Mg, K, Na, N

The accompanying tables of means for Appendices B1.1 to B11.2.10 are presented in Tables 3.1. to 3.10.2.

4.1.1. Soils

Analysis of soil parameters (Appendices B1.1 - 1.13) shows that there are no significant ($p \leq 5\%$) differences between species treatments, with all F probabilities exceeding 20%. There is thus a high degree of uniformity of soil conditions within trial blocks and *within* sites (but not *between* sites), resulting in any differences in tree growth and biomass composition *per site* being able to be ascribed to treatments *per se*. This confirms the suitability of using these site-species trials for biomass studies. However, there are many significant differences between each of the five sites with regard to soil chemical and physical factors.

Based on site means, the sites with shallow lithic soils (GE.11 and GE.13) have sandy clay loam soil textures, as opposed to sandy clay textures on sites with deeply weathered soils (GE.10, GE.12 and GE.14). The shallower soils are also higher in exchangeable Ca and Mg by orders of magnitude of 10 to 20 (2.5 - 5.7 vs 0.1 - 0.3 cmol(+)/kg soil), while their Na, and K status is also marginally higher (0.2 - 0.3 vs 0.1- 0.2 cmol(+)/kg soil). However, K at GE.14 (derived from potassic granites) is of the same magnitude as the shallower lithic soils. The higher base status of the shallow soils reflects their lesser degree of leaching and higher primary mineral status. Accordingly, EA is lower by factors of 2 to 15 (0.1 - 0.9 vs 1.5 - 1.9 cmol(+)/kg soil). Available P is comparable between sites (1 - 3 mg/kg), but is somewhat higher at GE.14 (5 mg/kg). Topsoil OC (1.6 and 2.6%) shows no clear trends across sites.

4.1.2. Tree growth

Study of the tree growth parameters (Appendices B2.1 - 2.6) shows highly ($p \leq 1\%$) to very highly ($p \leq 0.1\%$) significant differences between species and for site-species interactions for total height, height to 5cm top, sample tree dbh, tree stem volume and stocking per ha. This indicates strong differences in tree growth form and size between species, and that these differences are also affected by site conditions.

The combined effects of tree height and dbh growth and vigour at approximately age seven (Schönau and Purnell, 1987) is summarised in Figure 4.1. Overall stem volume (combined expression of dbh and height) growth responds positively with increasing rooting depth, soil drainage status and MAT, i.e. in the ascending order of GE.13, GE.14/11. GE.10 and GE.12. Across species and all sites, *E. smithii* is best, but is also sensitive to poor drainage. The second best performers are *E. dunnii* and *E. grandis*, with the latter exceeding the former on the warmer sites (GE.12, 13). The poorest overall growers are *E. deanei*, *E. macarthurii* and *E. viminalis*. *E. nitens* and *E. fastigata* are generally off-site, except where MAT is below 15.5 °C (GE.14). *E. saligna* is superior to *E. grandis* on cool sites and/or with shallow soils, while *E. elata* shows average growth across all sites, except where drainage is poor.

In terms of general tree growth and vigour, basal area constitutes a combined expression of tree size and survival, and is directly proportional to stem volume per ha (see Figure 4.2). Under plantation conditions, *E. elata* has recorded the smallest yield per ha, despite having an 83% survival. *E. fastigata* is also a modest grower, but has also suffered from mortality (average of 22%), especially under poor drainage conditions (GE.11), resulting in below average yields. *E. nitens* has the lowest survival rate (30%), especially on the shallow soils and warm conditions of GE.13, but has yielded excellently (the best of any species on any site) under cool conditions with deep well-drained soils (GE.14). *E. smithii* has generally survived and grown very well, and thus is the top all-round yield performer across the five study sites.

One method of examining overall tree form in even-aged plantation conditions is by examining the dbh-height ratio [dbh (cm) / height (m)]. Low ratios indicate relatively tall and thin trees, while conversely high ratios are found on more heavily tapered trees. In general, within a genotype, lower ratios suggest (amongst other factors) relatively uninterrupted growing conditions (i.e. uniform, not strongly seasonal) (Kriedmann and Cromer, 1996) while an increase in the ratio is typically associated with site-related stress (drought, infertility, too low/high temperatures, damage).

Ratios are shown for species and study sites in Figure 4.3. From this it is evident that (on average) the cooler the site and deeper the soil, the lower the ratio. *E. smithii, E. elata, E. saligna* and *E. grandis* show similar general ratios (0.80), but this rises sharply for *E. macarthurii* (0.88). The other eucalypts show intermediate ratios of 0.82 - 0.85. Between sites, *E. saligna* (0.79 - 0.82) and *E. viminalis* (0.79 - 0.85) display the least variation, while the opposite applies to *E. deanei* (0.73 - 0.96) and *E. nitens* (0.68 and 0.92). The range in dbh-height ratios found between species and sites is indicative of strong differences in the above-ground morphology of species, and contrasting strategies in biomass allocations.

4.1.3. Dry mass of biomass components

Very highly significant to significant treatment differences exist between species and site-species interactions for all the dry mass components, *viz* bulk leaves, branches, dead material, bark and bole wood (see Appendix B3.1 - 3.6). This indicates very strong effects on biomass component sizes by species and site factor interactions.

Bulk leaf mass is generally depressed under the poor site conditions of GE.13 (average of 3.7 kg/tree), but conversely nearly doubled at 6.5 kg per tree on the best site (GE.10). Figure 4.4 shows that *E. saligna*, *E. grandis* and *E. macarthurii* have the smallest leaf masses on average (< 4.0 kg/tree), in strong contrast to *E. smithii* (7.1 kg) and *E. nitens* (6.4 kg). However, due mainly to *Mycosphaerella molleriana* leaf infection caused by high humidity and temperatures, *E. nitens* has the smallest leaf mass at GE.12. Similarly strong leaf mass - site interactions are also evident for *E. elata*, *E. deanei* and *E. fastigata*.

Individual branch masses are also least on the poor sites, but the gradient differences between sites are not as steep as for leaves (see Figure 4.5). *E. grandis*, *E. viminalis*, *E. dunnii* and *E. saligna* are on average the lightest branched species (< 9 kg/tree), but masses increase exponentially to 13.7 and 16.6 kg/tree for *E. elata* and *E. smithii* respectively. These latter species, together with *E. elata* and *E. nitens* also show the greatest branch mass variation between sites.

On-tree dead matter biomass is sharply lowered on poor sites, and appears greatest on the coolest site (GE.14). *E. dunnii* carries on average a distinctly low dead matter mass (1.0 kg/tree), in contrast to *E. nitens* (7.6 kg/tree) with many attached dead branches extending considerably below its live crown. Figure 4.6 shows two intermediate groups, *viz E. viminalis*, *E. grandis* and *E. elata* (< 2.5 kg/tree), and *E. saligna*, *E. macarthurii*, *E. fastigata* and *E. deanei* (3.5 - 4.5 kg/tree).

As could be expected, the biomass of bole bark increases strongly from poor to good sites, especially for *E. dunnii*, *E. viminalis* and *E. elata* (see Figure 4.7). Similarly, the bole wood to bark ratio increases from 7.0 (GE.13) to 9.7 (GE.12), indicating that the bark must also be thickening and/or becoming denser with bole size. *E. dunnii* also has an unusually high bark mass (average of 14.2 kg/tree) compared to the overall species mean of 9.6 kg/tree. Conversely, *E. fastigata*, *E. deanei* *E. saligna*, and *E. grandis* have average bark masses of 7.2 - 8.0 kg/tree. Individual masses range from 0.7 to 28.4

kg/tree across individual tree species. Bark mass does not appear to be affected by MAT.

The dry mass of bole wood varies widely for the study samples. *E. smithii* averages 115.5 kg/tree and *E. dunnii* 93.8 kg/tree, while all remaining species are between 65 and 75 kg/tree (see Figure 4.8). Again there are strong differences in averages between the poorest (GE.13: 32.1 kg/tree) and best (GE.12: 135.4 kg/tree) sites.

Total above-ground biomass is between 10.4 and 510.4 kg/tree, with a mean of 107.0 kg/tree across all sites and species. The lowest average species masses are between 92 and 96 kg/tree (*E. deanei, E. grandis* and *E. saligna*), while the largest are for *E. smithii* (155 kg/tree) and *E. dunnii* (122 kg/tree),with the remaining species between 99 and 108 kg/tree (see Figure 4.9 - arranged as increasing total biomass).

The average bole wood proportion comprises overall 73% of the biomass, with 10% for branches, 9% for bark, 5% for leaves and 3% for dead matter. However, these allocations vary considerably between species (see Figure 4.9). The average proportion of bole wood in the total biomass is highest in *E. dunnii, E. grandis* and *E. saligna* (77.2, 76.5 and 75.5% respectively), compared to the markedly lower proportions of 68.1 and 69.8% for *E. nitens* and *E. elata* respectively. Bark mass averages 12% of *E. dunnii* and 11% of *E. viminalis* biomass, while *E. fastigata* and *E. smithii* have only 7% of their biomass in bark.

In terms of mean branch biomass, *E. dunnii*, *E. grandis* and *E. viminalis* constitute only 7, 8 and 8% respectively of the total biomass, while that for *E. elata* is 13%. The proportion of leaf mass for *E. saligna* is 3%, as opposed to 6% for *E. nitens*. The average proportion of leaf plus branch mass is 14% over all species, but constitutes only 10 and 12% respectively for *E. dunnii* and *E. viminalis*. In contrast, it is 18% for *E. elata*, 17% for *E. nitens* and 16% each for *E. deanei* and *E. fastigata*. Extremes for average proportions of on-tree dead matter constitute 7% for *E. nitens* and 1% for *E. dunnii*.

Figures 4.10 to 4.15 show biomass components for species per site arranged in increasing proportions of bole wood. Figure 4.10 shows average biomass components across species for the five study sites. From this it is evident that as growing conditions improve and temperatures warm from GE.13 to GE.11, and from GE.14 to GE10 and GE.12, the proportion of bole wood also improves from 64.7% to 78.6%. These changes are reflected mostly in decreases in the proportion of branches (from 15%

to 7% of biomass) and to a lesser extent the leaves (from 7% to 4% of biomass).

While these general site associations in biomass proportions are followed by all species, there are some notable exceptions caused by site interactions. Once again, deviations from the "norm" are more extreme on poor sites. Low bole wood proportions of 69% and 71% are found for *E. nitens* and *E. elata* respectively at GE.10 (average of 74%), this increasing to the highest fraction of 78% for *E. saligna*, *E. grandis* and *E. viminalis*. At GE.11 (average of 69%), low bole wood proportions are found for *E. smithii* (64%) and *E. nitens* (65%), but percentages are high for *E. grandis* and *E. saligna* (77% each). The only unusually low bole wood proportion at GE.12 (warmest site with deep soils) is for *E. elata* (75%), compared to a relatively high site mean of 79%. The strongly off-site conditions for *E. nitens* at GE.13 result in this species only having 46% of its biomass represented in its bole wood, while *E. elata* (59%), *E. deanei* (59%) and *E. viminalis* (60%) also show proportions much lower than the trial's mean (65%). Conversely, *E. saligna* has a very high bole wood proportion (73%), as do *E. grandis* (70%) and *E. smithii* (69%). *E. elata* (64%) and *E. saligna* (68%) have low bole wood fractions on the cool site of GE.14 (72%), but *E. dunnii* (76%) is above average there.

4.1.4. Water content of biomass components

Although the water content of biomass may vary with season and climatic conditions, all the study sites were sampled at similar times, *viz* during the middle of the summer rainfall season. There are thus reasonable grounds for including these data in the biomass investigation and testing it statistically. Following analysis of variance (see Appendix B4.1 - B4.6), it is found that there are very highly significant differences in water content between species for all "live" biomass components (leaves, branches, bark, bole wood), but (understandably) no significant differences between the means of on-tree dead matter. Highly significant site interactions exist between species means for leaves, and significant differences for bark and total biomass water content. Trends ($p = 0.05 - 0.10$) also exist for branches and bole wood site-species interactions.

The lowest overall water content is found in dead matter (21%), followed by bole wood and branches (51% each), 57% for leaves and 65% for bole bark (see Figure 4.16). The effects of site conditions is less marked, averaging 55% for total live biomass at GE.10 and GE.14 and 57% at the other three sites. However, within individual components the effects are stronger. Leaf water content increases with

MAT from 54 to 57% on deep soils, but decreases from 61 to 58% on shallow soils. The pattern for bark water content is less clear, but is between 64% and 65% at GE.10, 11, 13 and 14, while significantly greater at GE.12 (68%).

The water content of total live biomass is lowest in *E. smithii* (52%) followed by *E. nitens* (54%) (Viminales group), and increases steadily to a maximum of 58% for *E. saligna*, *E. grandis* and *E. deanei* (Transversae group) - see Figure 4.17. This pattern is more marked in the leaf biomass, where across sites *E. nitens* (52%) and *E. smithii* (53%) have far lower values than *E. saligna* and *E. grandis* (61%), while the remaining species have between 57% and 59% water content (see Figure 4.18). Particularly low moisture levels are found at GE.14 for *E. smithii* (47%) and *E. nitens* (49%), while contrasting high levels are found at GE.11 for *E. grandis* (66%) and *E. saligna* and *E. dunnii* (64% each).

The branch biomass also reflects the higher water contents associated with the Transversae (54%), and the lower status of Viminales, particularly *E. smithii* and *E. nitens* (47 and 49%). The *Monocalyptus E. elata* and *E. fastigata* are intermediate in branch water content to these groups. Across sites, GE.10 is markedly lower than GE.11, GE.13 and GE.14, particularly for *E. smithii*, *E. macarthurii* and *E. grandis* (see Figure 4.19).

The species with the generally highest bark water content are *E. deanei* (69%) and *E. saligna* (68%), while *E. elata* (61%) and *E. smithii*, *E. fastigata* (62% each) and *E. nitens* (63%) have the lowest (see Figure 4.20). The remaining eucalypts all average 67% bark water content. Similarly to moisture values in branches, the variation in bark water contents for individual species across sites is relatively low, when compared to that in leaves and bole wood.

The bole wood water content averages highest for *E. elata* (53%). Lowest values are recorded for *E. smithii* (48%), *E. viminalis* (49%) and *E. macarthurii* (50%), with the remaining eucalypts at water contents of 51 - 52%. While on average GE.12 yields bole wood with the highest water content, large and inconsistent variation exists for the site effects on individual species (see Figure 4.21).

4.1.5. Density of bole wood

Cross sectional disc samples were cut at fixed intervals along the tree stem in order to examine variation in wood density and nutrient content. This yielded 4 disc *sections* per tree and a total of 600 samples for all ten *species* across the five *trial* sites. Analysis of variance for bole wood density per sample is given in Appendix B5, together with a full table of means. This shows that there are very highly significant differences between species, for disc sections within species, disc sections across sites, and sections within species across trials. There are also significant differences for species across sites.

From Figure 4.22 it can be seen that bole wood density follows a general trend of being lowest in the Transversae (0.45 kg/dm^3 for *E. grandis* and 0.47 kg/dm^3 for *E. saligna*) and highest in the Viminales (0.58 kg/dm^3 for *E. smithii* and 0.57 kg/dm^3 for *E. viminalis*). While overall there is no significant difference between the density of the different sections cut per stem, decreasing density up the stem is noted for *E. macarthurii* and *E. viminalis,* as well as *E. elata* to a lesser extent. Conversely, density increases for *E. nitens* and *E. smithii,* while *E. grandis* also increases, but somewhat erratically.

In general, mean bole wood density averaged across species is highest at GE.10 (0.54 kg/dm^3) and GE.11 and GE.14 (both 0.53 kg/dm^3) and lowest at GE.13 (0.50 kg/dm^3) and GE.12 (0.51 kg/dm^3). Figure 4.23 indicates clearly that within species, variation between sites can be very high, and that density is strongly influenced by both genotype and site conditions. Species with the least variation between sites are *E. smithii* (0.57 - 0.61 kg/dm^3) and *E. grandis* (0.42 - 0.47 kg/dm^3). Conversely, *E. saligna* is highly variable in density (0.41 - 0.51 kg/dm^3), as are *E. macarthurii* (0.50 - 0.58 kg/dm^3), *E. viminalis* (0.52 - 0.60 kg/dm^3) and *E. deanei* (0.49 - 0.56 kg/dm^3).

4.1.6. Select foliar nutrients

Analysis of variance of select foliar material (as per normal diagnostic sampling procedure) is presented in Appendices B6.1 - B6.10. There are very highly significant differences between species for all elements except P, the latter highly significant still. Significant site interactions are present for Fe and K only.

Separate samples of select foliar material were taken to allow nutritional comparisons with other sites and studies, but without having to undertake whole tree biomass sampling. These data can also be used to test relationships of select foliar nutrients with the nutrient status of single biomass components, as well as relationships to site nutrient status.

The differences between select and bulk foliar material for the different species is shown in Figure 4.24 for trace elements (sum of Fe, Cu, Zn and Mn), Na, P and Mg. The bulk leaf sample's nutrient contents are on average about 14 and 17% higher than the select foliar for these elements across species. However, differences vary amongst species, being largest for *E. smithii*, *E. deanei* and *E. grandis*, but very small for *E. saligna*. Differences for the other nutrients (N, K and Ca) are shown in Figure 4.25. On average, Ca is 28% higher in bulk foliar samples, with K also higher by 20%, but N is lower by 8%. Differences in Ca, K and N levels are greatest for *E. deanei, E. dunnii* and *E. smithii*, but again very slight for *E. saligna*.

Sections 4.1.7 to 4.1.11 present the nutrient profiles of each biomass component on (a) sites with deep and well-drained soils and (b) shallow skeletal soils. This is done for two reasons; soils on the poorer-growing site have higher levels of many soil nutrients (less weathered and leached soil and saprolite), which is also reflected in their biomass nutrient concentrations (see Figure 4.26). In addition, they have different nutrient proportions across biomass components, as presented below.

4.1.7. Bulked foliar nutrient content and mass

Analysis of variance of bulk leaf material is presented in Appendices B7.1.1 - B7.1.10. There are very highly significant differences between species for all elements except Fe (highly significant only). Highly significant site interactions are present for Fe, and Mn, with significant interactions for Cu, Na, Ca and K.

The elemental composition of leaves on the deep soils (see Figure 4.27) is dominated by N (1.78%), followed by K (0.81%) and Ca (0.59%). *E. macarthurii, E. dunnii* and *E. deanei* have the greatest total nutrient contents, while *E. nitens, E. fastigata* and *E. smithii* have the lowest amounts. The proportion of leaf N to total nutrients is lower in the Transversae than Viminales, while latter have higher K:Ca ratios than the former. However, Mg is higher in the Transversae than Viminales. *E. deanei* and *E. grandis* have higher than average Ca levels.

On the shallow sites, N increases to 1.82%, but K drops to 0.71% and Ca rises to 1.02% (see Figure 4.28). *E. deanei, E. dunnii* and *E. grandis* have the highest total nutrient concentrations, with *E. nitens, E. fastigata* and *E. smithii* containing the least leaf nutrients. The rise in Ca levels on the shallow soils applies particularly to *E. deanei, E. dunnii* and *E. grandis*. Discerning patterns between the Transversae and Viminales are not as clear as on the deep soils.

4.1.8. Branch nutrient content and mass

Analysis of variance of branch material is presented in Appendices B8.1.1 - B8.1.10. There are very highly significant differences between species for Cu, Mn, Ca, K and N, and significant differences for Zn, and Na. There are no significant differences for Fe and P. Site interactions are present for Mn (significant) and K (highly significant).

Branch nutrients on the deep soils (see Figure 4.29) are dominated by K (0.44%), followed by Ca (0.31%) and N (0.30%). *E. viminalis* and *E. dunnii* have the greatest total nutrient contents, while *E. fastigata* and *E. elata* have the lowest amounts. The proportion of branch N to total nutrients is lower in the Transversae than Viminales.

On the shallow sites, Ca increases on average to 0.51%, but K and N drop marginally to 0.42% and 0.32% respectively (see Figure 4.30). *E. saligna* has the highest total nutrient concentrations, with *E. fastigata, E. smithii, E. elata* and *E. nitens* containing the least branch nutrients. The rise in Ca levels on the shallow soils applies proportionally to all species. The *Monocalyptus E. elata* and *E. fastigata* have proportionally low Ca levels, while N is relatively low for the Transversae on the shallow soils.

4.1.9. Dead matter nutrient content and mass

Analysis of variance of dead material is presented in Appendices B9.1.1 - B9.1.10. There are very highly significant differences between species for Mn, Ca, Mg, K and N, and significant differences for Na. Highly significant site interactions are present for Zn, Mn, Ca, and N, with a very highly significant interaction for Mg.

Dead matter nutrients on the deep soils (see Figure 4.31) are dominated by Ca (0.24%), followed by N (0.17%) and K (0.10%), with generally very low levels of P. *E. dunnii* has a disproportionally high nutrient concentration, while *E. fastigata* and *E. smithii* have the lowest amounts. The proportion of dead matter N and P to total nutrients is higher but K lower in the *Monocalyptus* than other subgenera.

All dead matter nutrient levels increase markedly on the shallow sites. Notably Ca increases to 0.43%, N to 0.19% and K to 0.12% (see Figure 4.32). Interestingly, the average P content in dead matter is 0.013% compared to 0.005% on the sites with deep soils. *E. macarthurii* and *E. deanei* have the highest total nutrient concentrations, with *E. elata, E. fastigata, E. saligna* and *E. smithii* containing the least dead matter nutrients.

4.1.10. Bark nutrient content and mass

Analysis of variance of bole bark material is presented in Appendices B10.1.1 - B10.1.10. There are very highly significant differences between species for all elements except Fe and Cu. A very highly significant site interaction is present for P only.

Bark nutrients on the deep soils (see Figure 4.33) are dominated by Ca (0.65%), followed by K (0.44%) N (0.28) and Mg (0.24%). *E. saligna, E. deanei, E. macarthurii* and *E. grandis* have the greatest total nutrient contents, while *E. smithii* and *E. fastigata* and *E. elata* (the latter two *Monocalyptus*) have the lowest amounts. The total bark nutrient content of the Transversae is greater than the Viminales, while the former also tend to have a higher proportion of bark N present.

On the shallow sites, Ca and Mg increase markedly to 0.94% and 0.30% respectively, while K and N remain the same (see Figure 4.34). The Transversae group of *E. deanei, E. saligna* and *E. grandis* have the highest total nutrient concentrations, with *E. smithii* and the *Monocalyptus* group containing the least bark nutrients and lowest Ca levels. The strong overall rise in Ca levels on the shallow soils applies particularly to *E. deanei, E. saligna* and *E. grandis*. The Transversae also have lower bark N levels than the Viminales group.

4.1.11. Bole wood nutrient content and mass

Analysis of variance of bole wood material is presented in Appendices B11.1.1 - B11.1.10. There are very highly significant differences between species for P, Ca, Mg and N, highly significant differences for Fe and Mn, and significant differences for Na. A highly significant site interaction is present for P only.

Bole wood nutrients on the deep soils (see Figure 4.35) are dominated by K (0.11%) and Ca (0.10%), followed by N (0.08%) and Mg (0.03%). Wood P concentration averages 0.011% across species. While K is the dominant element in most species, it is exceeded by Ca for *E. dunnii, E. grandis* and *E. saligna*, with parity present in *E. smithii. E. dunnii* has an unusually high total nutrient content, while *E. elata, E. fastigata* and *E. smithii* have the lowest amounts by a considerable margin. The proportion of P is very low in *E. grandis* and *E. smithii*. There is no apparent pattern of bole wood nutrient allocation on the deep soil sites between the subgenera or species groups.

On the shallow sites, Ca increases dramatically to 0.17%, with only a slight improvement in K to 0.12% and N to 0.09% (see Figure 4.36). *E. grandis* and *E. dunnii* have the highest total nutrient concentrations, with *E. elata* and *E. smithii* containing the least bole wood nutrients. *E. dunnii, E. grandis and E. saligna* have particularly high Ca proportions, while P is proportionally much higher for *E. macarthurii* and *E. viminalis*. The Transversae tend to have lower Mg proportions than the Viminales.

4.2. Correlation and regression

From the findings presented in Chapter 3, it is evident that the mass of individual leaf, branch, dead matter, bole bark and bole wood biomass components is related to the overall size of the tree (such as can be determined from typical mensurational procedures) as well as the size of the other four biomass components. Site conditions between trial sites appear also to play a role, especially in terms of climate, soil rooting conditions and nutrient status.

While there are overall trends across species, there are also strong differences between them. At the same time, there are some similarities between species within the subgenera of Transversae and Viminales. Accordingly, these relationships were tested using correlation analysis for:

Individual *Eucalyptus* species (15 samples)
Transversae group: *E. deanei, E. grandis* and *E. saligna* (45 samples)
Viminales group: *E. dunnii, E. macarthurii, E. nitens, E. smithii* and *E. viminalis* (75 samples)
Combined *Eucalyptus* species (150 samples)

4.2.1. Dry mass of biomass components

Table 4.1 contains the simple correlation coefficients between the dry mass of individual biomass components and a range of mensurational parameters. The mensurational parameters include dbh (as well as transformations of square, log (natural), and inverse), total height (as well as transformations of log (natural) and inverse), height to 5cm top diameter, crown length (total height - 5cm top diameter length), tree bole volume (under bark) (and log (natural) volume), Dbh (cm) / Height (m) ratio and form factor (tree stem volume / dbh x total height cylindrical volume).

Across species, leaf and branch mass are highly significantly correlated, but this relationship is significant (only) for *E. saligna* and *E. viminalis*. Bark and bole mass are highly significantly correlated for all species. Both of these sets of correlations could be expected, as leaves and bark are both physically represented on branches and boles respectively. Correlations between leaf and bole mass are also highly significantly for *E. deanei, E. dunnii, E. elata, E. grandis* and *E. nitens*, and significant for *E. macarthurii*, but not significant for the remaining species. On-tree dead matter is significantly correlated to bark mass for *E. elata, E. fastigata and E. nitens*, as well as branch mass for *E. elata, E. nitens* and *E. viminalis*.

Following testing correlations with biomass components, it is evident that overall the most successful (i.e. significant) mensurational correlation variables are Dbh^2, Dbh, volume, log(volume), log(Dbh), 1/Dbh and height to 5cm top. All variables are positively correlated with biomass, excepting for 1/Dbh, 1/Height and crown length (negative). In general, highly significant correlations are formed with these mensurational variables and bole and bark mass, significant with leaves and branches, and non-significant with dead matter. However, relatively few significant correlations are formed with the leaf and branch mass of *E. macarthurii, E. saligna, E. smithii* and *E. viminalis.*

The large number of (highly) significant correlations between the dry mass of individual biomass components and many mensurational parameters, indicate that biomass component mass could be estimated from equations employing such variables. This would allow above-ground biomass to be estimated for application in other investigations on other sites. Similarly it may also be possible to construct estimating equations using biomass components as estimating variables to test the inter-dependance of biomass components.

Tables 4.2.1 to 4.2.13 present the results of multiple regression analysis for estimating the dry mass of individual biomass components. These are derived in two ways, *viz* using four biomass component estimating variables (Biomass model) and four mensurational parameters of *Dbh* (Dbh, Dbh^2, ln(Dbh, 1/Dbh) , *Height* (Height, ln(Height), 1/Height, Crown), *Dbh/Height* and *Form factor* as estimating variables (Mensurational model) for each of the ten species, the Transversae group, the Viminales group and all species combined. Only one of the four Dbh and Height parameters (with the largest correlation coefficient) was selected for inclusion in the biomass regressions for each model.

4.2.14. SUMMARY OF ALL REGRESSION EQUATION R^2 VALUES

Component	Biomass model			Mensurational model		
	Min.	*Max.*	*Mean*	*Min.*	*Max.*	*Mean*
Leaf [1]	67	93	79	27	88	62
Branch [2]	53	92	70	24	87	53
Dead material	0	79	20	0	76	16
Bole bark	66	95	82	69	98	82
Bole wood	64	96	83	92	99	95

1. Excluding *E. saligna* (both models), *E. grandis* (mensurational model) and *E. smithii* (biomass model).

2. Excluding *E. saligna* (biomass model) and *E. macarthurii* and *E. viminalis* (mensurational models).

Tables 4.2.1 to 4.2.13 also contain estimates of the percentage variance accounted for (R^2) when retaining only significant explaining variables in the regression analysis. Table 4.2.14 shows a summary of R^2 values for all regression equations. This indicates that the regression equations for both models are overall highly successful in accounting for variation in biomass component mass for individual species and subgenera groups. In general, the models work best for bole wood and bark, followed by leaf and branch biomass. However, analysis of the *E. saligna* leaf biomass data shows that both the models fail to explain any of the variation, as well as for *E. grandis* leaves in the mensurational model. This may be a result of most tree breeding work (for light branching) having taken place in these species. Problems of a lesser nature are also experienced with *E. smithii* ($R^2 = 0.42$). The mensurational model also fails to account for any of the variation in the branch biomass data for *E. macarthurii* and *E. viminalis* (and is also poor regarding their leaf mass estimates), while the biomass model explains only 21% and 42% of the variation in *E. saligna* and *E. smithii* data. The on-tree dead material is generally poorly accounted for by both forms of regression models.

Foliar analysis has been employed successfully in South Africa to investigate the nutritional status of eucalypts (Herbert and Schönau, 1989; Herbert, 1996). Accordingly, the select foliar data was examined to determine whether the mass of biomass components is related to tree nutrient status by using correlation analysis (see Table 4.3). Examination of the simple correlation coefficients for the ten individual eucalypt species in Table 4.3 show very few significant values (only 6%). Furthermore, there is no pattern of significant coefficients in terms of species, biomass component or nutritional element (i.e. very dispersed or random correlations). There is thus little purpose in trying to develop a meaningful regression model for individual species to estimate biomass component mass based on tree nutrient status as measured by foliar analysis.

A similar situation exists for correlations within the Transversae group (45 samples), i.e. only 8% of the simple coefficients are significant. However, within the Viminales group (75 samples) the number of significant correlations increases (22%), but more than half of these are for on-tree dead matter, and thus also of little practical use. Due to the large increase in sample size (from 15 to 150), there are more significant correlation coefficients in the combined analysis of all tree species (42%), but again 38% of these refer to relationships between select foliar nutrients and the dry mass of dead matter per tree. In addition, the remainder do not form a coherent trend across components of nutrients. Together, the correlation analyses indicate that statistically significant regression models will not be able to meaningfully explain variation in the biomass of above-ground components within the study data base.

4.2.2. Nutrient content of biomass components

From the data analysis in Chapter 3, it is clear that the nutrient content of biomass components varies with site conditions, especially soil chemical status. If site resources are to be sustainably managed, it is necessary to be able to predict the concentration of nutrients within biomass components. Investigation of the relationship between soil chemical status and the nutrient content of biomass components was thus undertaken, in order to develop suitable practical regression models. As the macro nutrients N, P K, Ca, Ma and Na constitute 97% of the average nutrient content across biomass components, it was decided in the interests of practical expediency to drop micro nutrients from this section of the study.

Table 4.4.1 contains the simple correlation coefficients between the macro nutrient concentrations of individual biomass components and nine soil chemical parameters. The soil parameters comprise pH, exchangeable (per soil mass) Ca, Mg, K and Na, S-value (per clay mass), OC and EA. The S-value is considered to be independent of exchangeable Ca, Mg, K and Na as it is derived across all four elements and further altered according to the clay fraction within the soil.

Based on the simple correlation coefficients in Table 4.4.13 it is evident that there are many (highly) significant relationships between soil variables and biomass nutrients. While these vary between species, biomass components and biomass nutrients, some general trends are evident. Significant correlations with biomass nutrient concentrations are most frequent with soil Mg, S-value and Ca, followed by EA, pH and Na. Relatively few correlations exist with OC and K, while soil P forms generally the least significant correlations.

Across all species, the biomass component with the greatest number of significant correlations is on-tree dead matter, followed by the leaf and branch components, while bole and bark nutrient concentrations of components have the fewest number of significant correlations. For biomass nutrients, P forms overall the most significant correlations, followed by Ca and Mg. Biomass N, K and Na have in general the fewest significant correlations with soil parameters.

The large number of (highly) significant correlations between the nutrient concentration of individual biomass components and soil chemical parameters, indicate that biomass component nutrient concentration could be estimated from equations employing such explaining variables. This would allow above-ground biomass nutrient content to be estimated per component following soil analysis on other sites. The on-tree dead matter nutrient concentrations are not included in this section of the study as they average only 3% of the total nutrient mass per tree. Tables 4.5.1 to 4.5.13 present the results of multiple linear regression analysis for estimating the nutrient concentration of leaf, branch, bole bark and bole wood biomass components. These are derived for each of the ten species, the Transversae group, the Viminales group and all species combined.

TABLE 4.5.14. SUMMARY OF REGRESSION EQUATIONS FROM TABLES 4.5.1-4.5.14

Biomass nutrient	*E.dea*	*E.dun*	*E.ela*	*E.fas*	*E.gra*	*E.mac*	*E.nit*	*E.sal*	*E.smi*	*E.vim*	Trans.	V'nales	All
	Percentage variance accounted for (R^2)												
						Leaf							
N	0.00	0.36	0.32	0.59	0.47	0.40	0.00	0.00	0.00	0.43	0.00	0.04	0.06
P	0.00	0.37	0.00	0.85	0.59	0.52	0.35	0.34	0.47	0.31	0.46	0.39	0.33
K	0.35	0.83	0.00	0.79	0.00	0.52	0.88	0.39	0.42	0.27	0.18	0.00	0.16
Ca	0.35	0.78	0.00	0.00	0.72	0.52	0.00	0.75	0.72	0.90	0.37	0.28	0.26
Mg	0.00	0.26	0.00	0.24	0.75	0.00	0.00	0.73	0.82	0.56	0.26	0.00	0.17
Na	0.45	0.71	0.72	0.70	0.37	0.25	0.00	0.85	0.00	0.93	0.19	0.04	0.00
						Branch							
N	0.21	0.25	0.00	0.98	0.66	0.00	0.00	0.36	0.00	0.44	0.31	0.00	0.12
P	0.71	0.79	0.00	0.87	0.69	0.76	0.63	0.67	0.00	0.54	0.50	0.50	0.30
K	0.20	0.30	0.55	0.00	0.00	0.46	0.25	0.00	0.29	0.31	0.00	0.31	0.00
Ca	0.75	0.39	0.92	0.68	0.60	0.86	0.00	0.88	0.51	0.65	0.68	0.21	0.45
Mg	0.71	0.27	0.85	0.62	0.65	0.21	0.41	0.77	0.00	0.47	0.33	0.00	0.16
Na	0.48	0.25	0.60	0.00	0.00	0.34	0.00	0.41	0.00	0.62	0.24	0.00	0.02
						Bark							
N	0.00	0.00	0.33	0.83	0.00	0.00	0.55	0.39	0.00	0.35	0.29	0.00	0.06
P	0.92	0.71	0.76	0.88	0.92	0.00	0.85	0.57	0.78	0.35	0.65	0.25	0.37
K	0.21	0.76	0.50	0.62	0.00	0.00	0.60	0.43	0.00	0.00	0.00	0.20	0.06
Ca	0.00	0.22	0.22	0.36	0.70	0.24	0.00	0.53	0.94	0.56	0.38	0.31	0.28
Mg	0.00	0.54	0.25	0.66	0.48	0.00	0.73	0.21	0.00	0.00	0.12	0.22	0.07
Na	0.57	0.00	0.00	0.59	0.56	0.00	0.50	0.29	0.64	0.75	0.32	0.00	0.13
						Bole							
N	0.00	0.00	0.00	0.59	0.88	0.43	0.00	0.70	0.25	0.31	0.17	0.16	0.03
P	0.00	0.79	0.73	0.87	0.83	0.94	0.74	0.81	0.62	0.88	0.44	0.35	0.32
K	0.53	0.41	0.59	0.58	0.51	0.44	0.63	0.79	0.41	0.31	0.37	0.08	0.38
Ca	0.88	0.37	0.88	0.81	0.78	0.65	0.70	0.63	0.84	0.86	0.53	0.51	0.26
Mg	0.48	0.44	0.32	0.73	0.00	0.67	0.32	0.64	0.24	0.34	0.00	0.13	0.00
Na	0.86	0.63	0.00	0.71	0.52	0.00	0.00	0.58	0.00	0.00	0.00	0.13	0.00

Overall it is evident that approximately 26% of the regression equations fail to supply a significant explaining variable (see Table 4.5.14), and that in these instances the "estimated" biomass nutrient concentration is thus a constant term. In addition, the percentage variance accounted for (R^2) decreases with the sample size, and the best results are obtained using individual species. *E. fastigata* and *E. grandis* have most variation explained by their regression variables, while *E. dunnii*, *E. macarthurii* and *E. viminalis* have the least. There is also a tendency for a better data fit on bole wood nutrients, with no difference between the other biomass components. P and Ca in biomass components are more easily accounted for than any other nutrient.

Fig. 4.1. Under-bark stem volume per trial and species

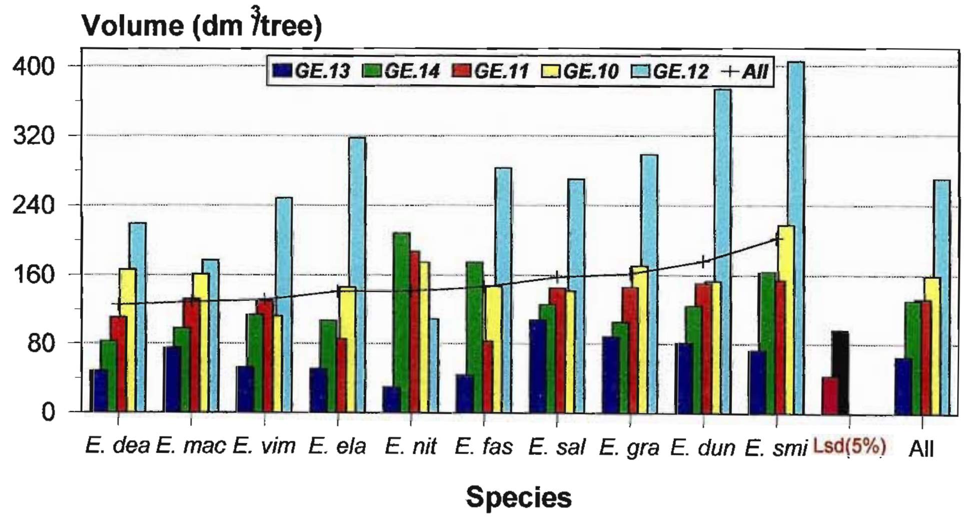


Fig. 4.2. Basal area per trial and species

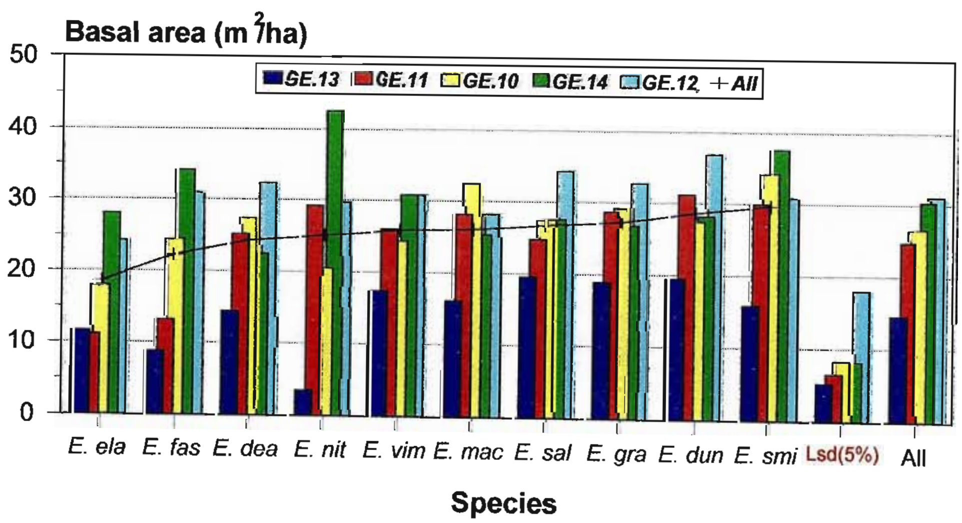


Fig. 4.3. Dbh-height ratio for species across sites

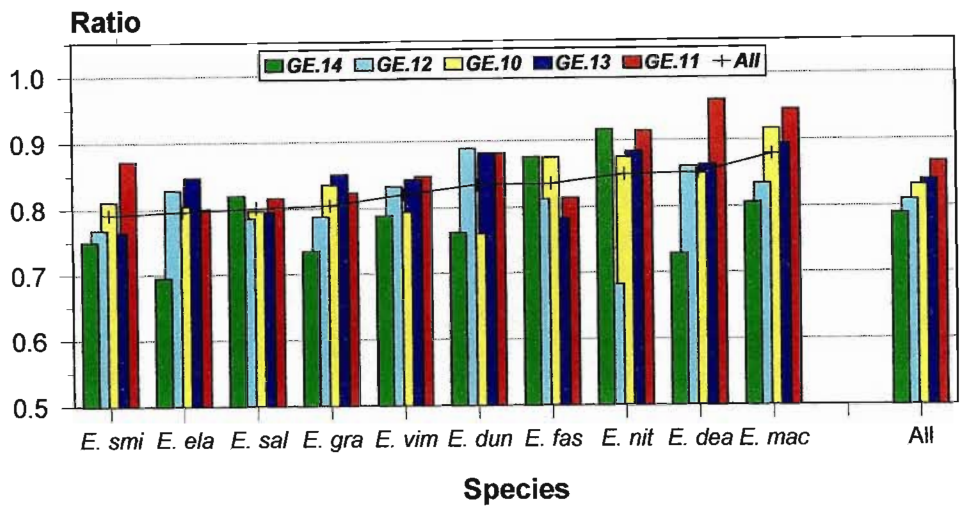


Fig. 4.4. Mean leaf dry mass per species and site

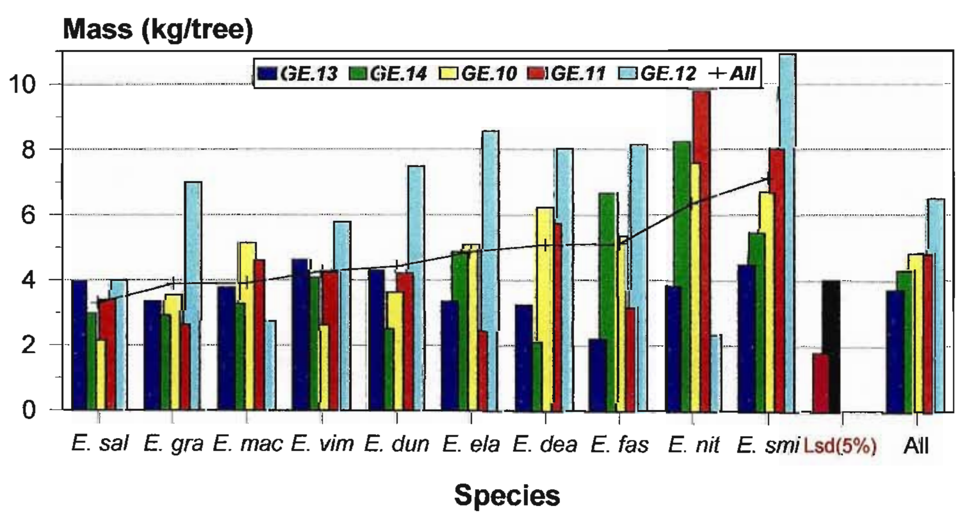


Fig. 4.5. Mean branch dry mass per species and site

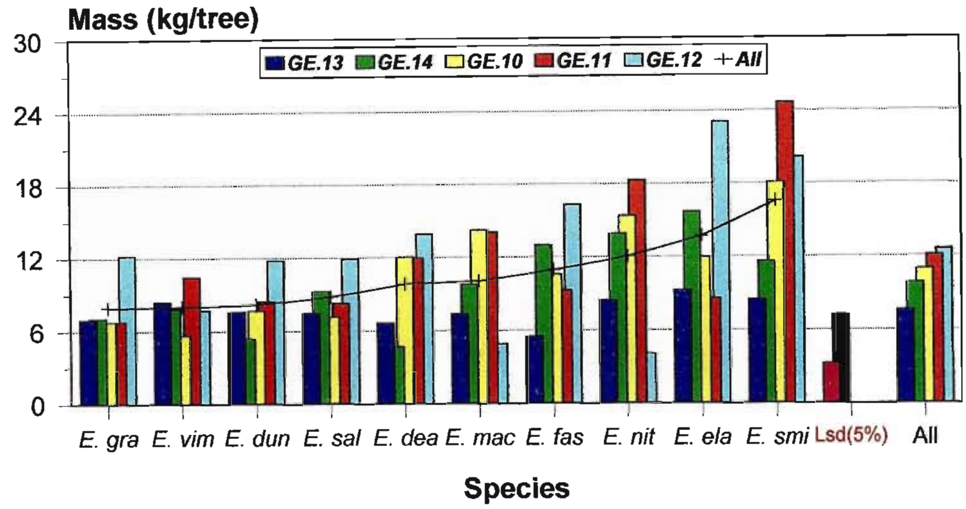


Fig. 4.6. Mean dead matter dry mass per species and site

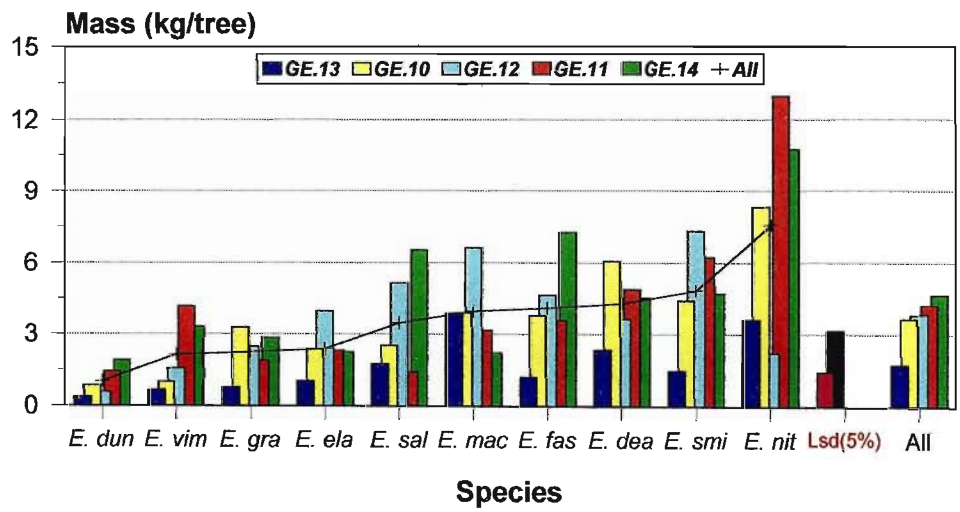


Fig. 4.7. Mean bole bark dry mass per species and site

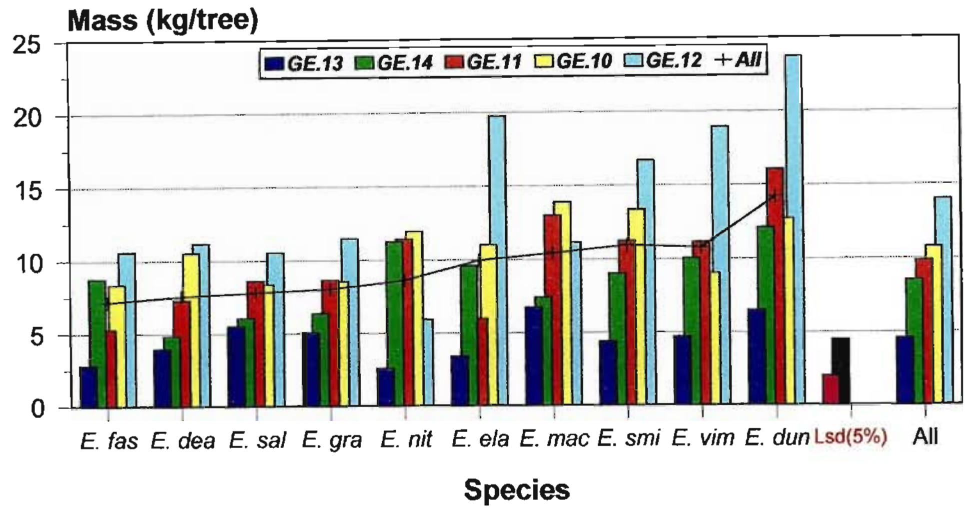


Fig. 4.8. Mean bole wood dry mass per species and site

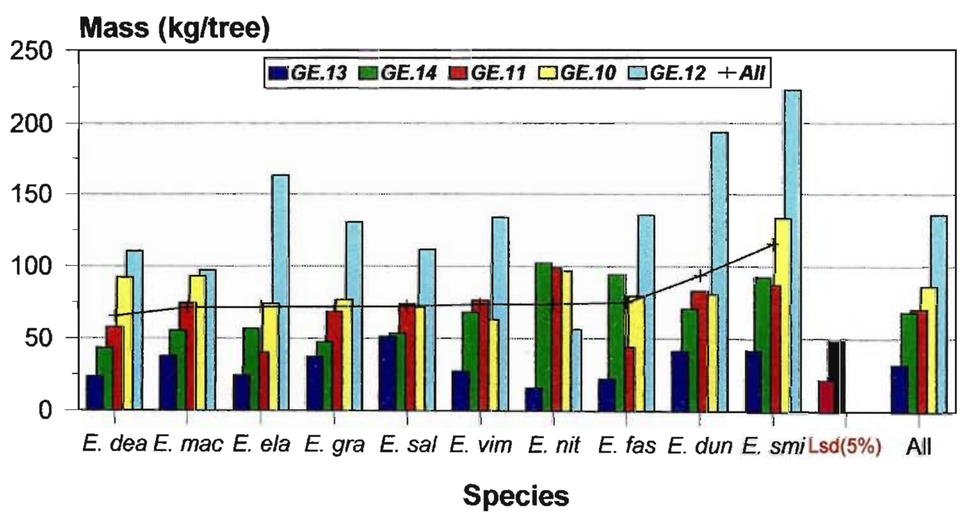


Fig. 4.9. Dry mass of components per species

Average above-ground tree profile: All sites

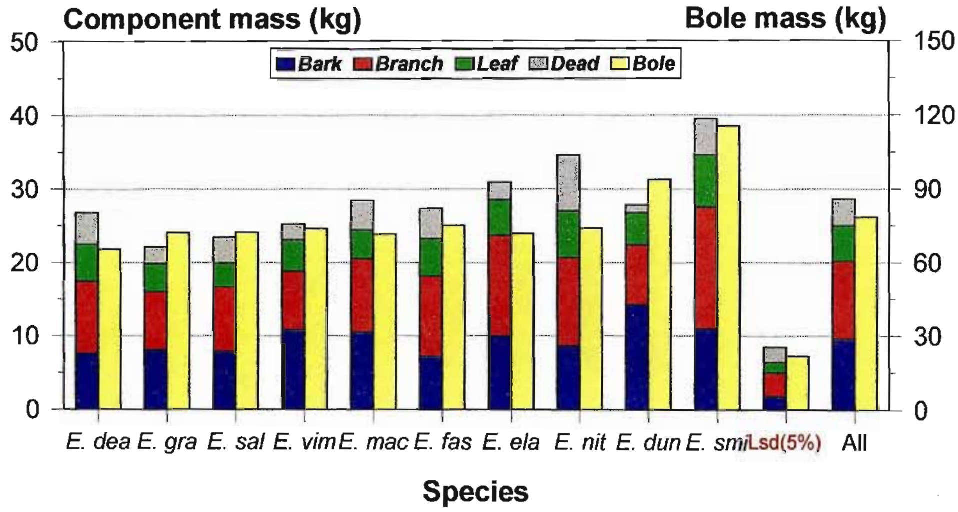


Fig. 4.10. Dry mass of components per site

Average above-ground tree profile: All species

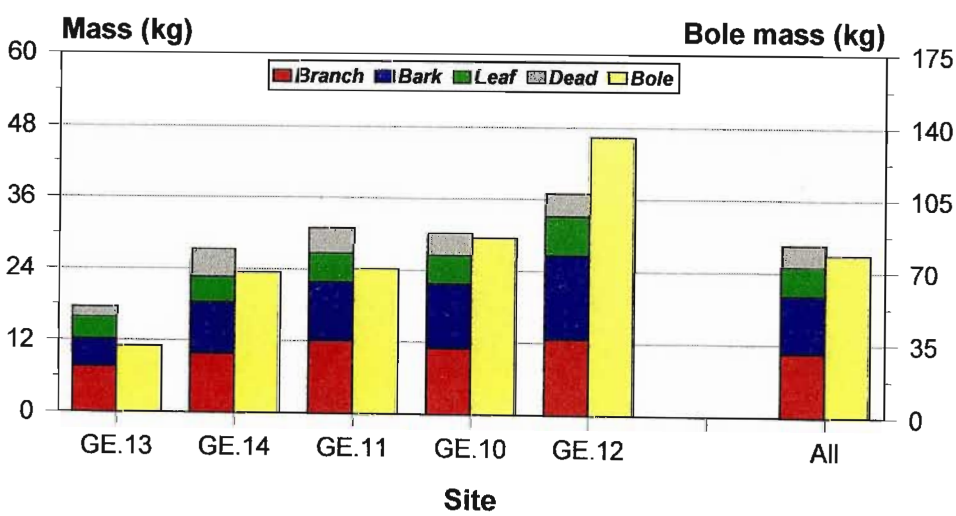


Fig. 4.11. Dry mass of components per species

Average above-ground tree profile: GE.10

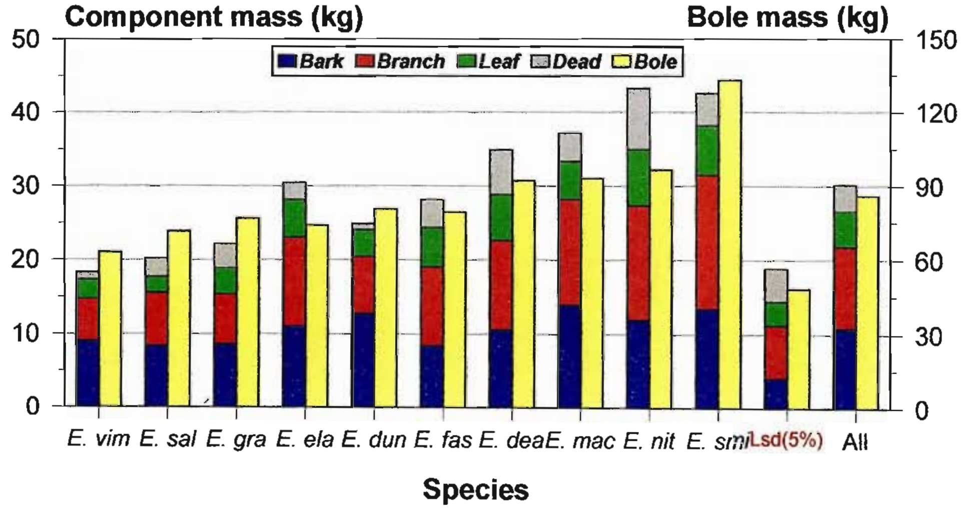
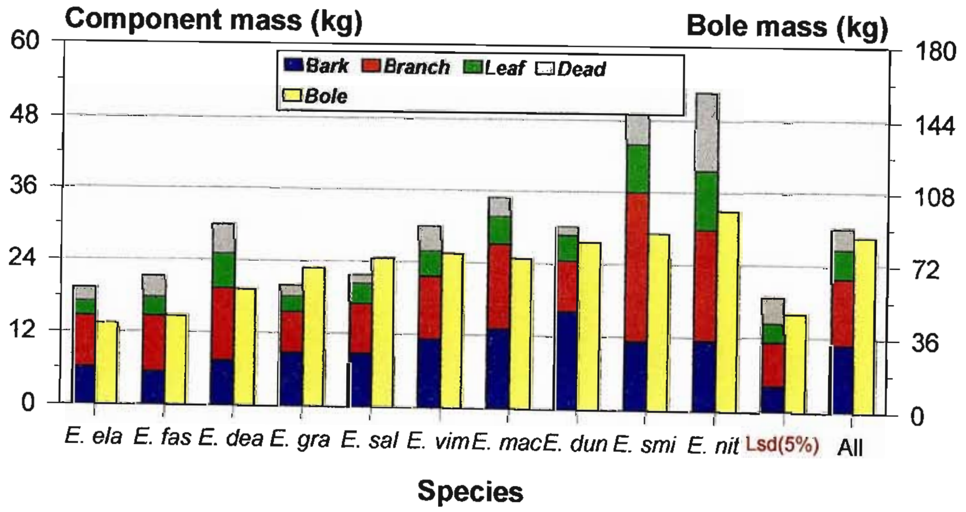


Fig. 4.12. Dry mass of components per species

Average above-ground tree profile: GE.11



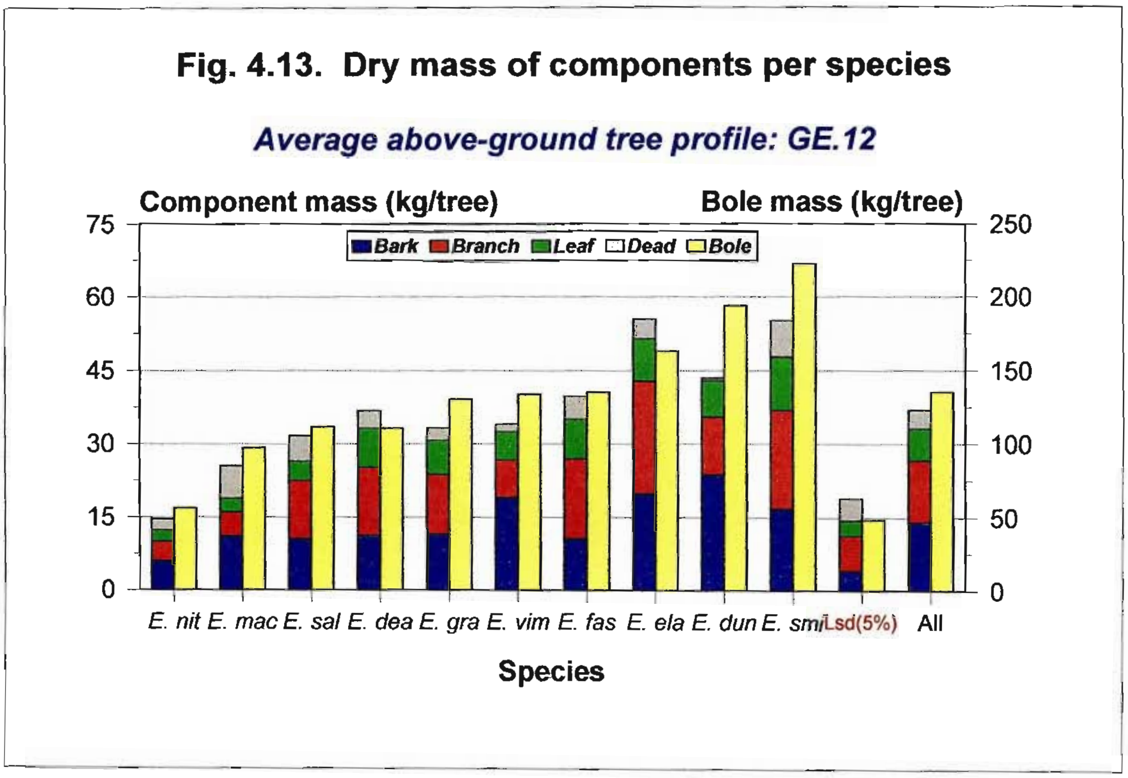


Fig. 4.13. Dry mass of components per species
Average above-ground tree profile: GE.12
Component mass (kg/tree)
Bole mass (kg/tree)
Bark Branch Leaf Dead Bole
75
60
45
30
15
0
250
200
150
100
50
0
E. nit E. mac E. sal E. dea E. gra E. vim E. fas E. ela E. dun E. smi Lsd(5%) All
Species

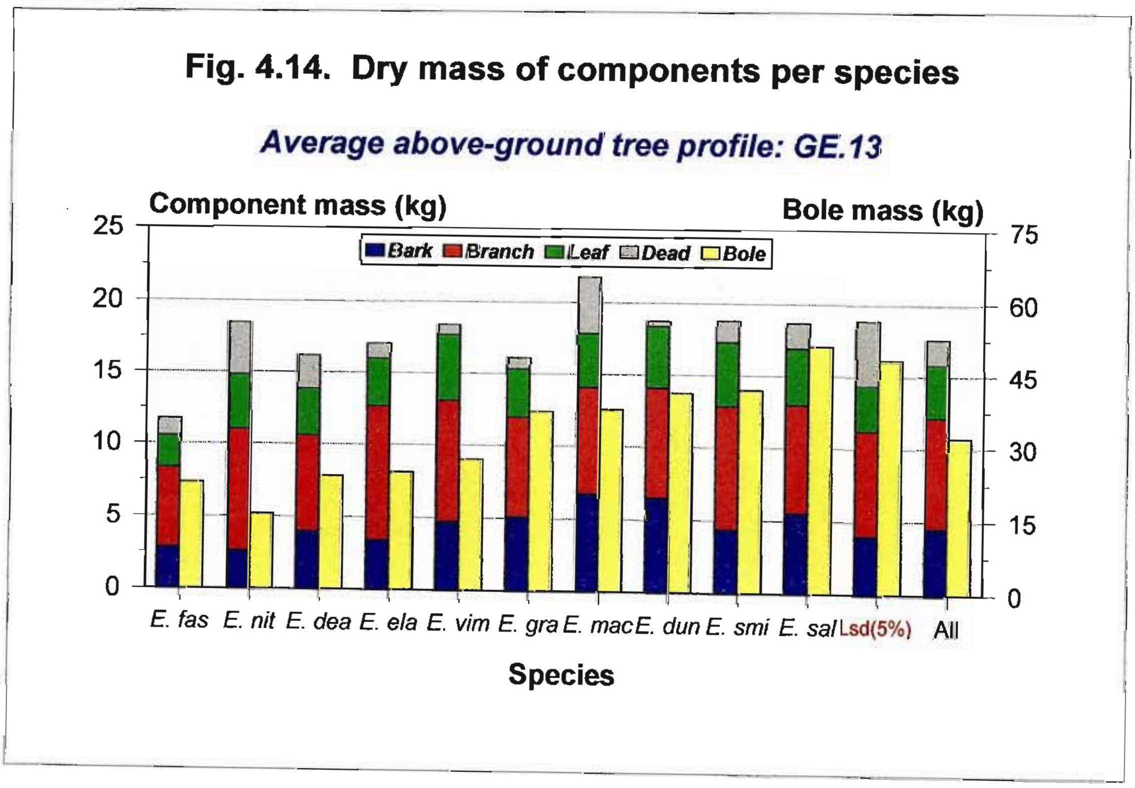


Fig. 4.14. Dry mass of components per species
Average above-ground tree profile: GE.13
Component mass (kg)
Bole mass (kg)
Bark Branch Leaf Dead Bole
25
20
15
10
5
0
75
60
45
30
15
0
E. fas E. nit E. dea E. ela E. vim E. gra E. mac E. dun E. smi E. sal Lsd(5%) All
Species

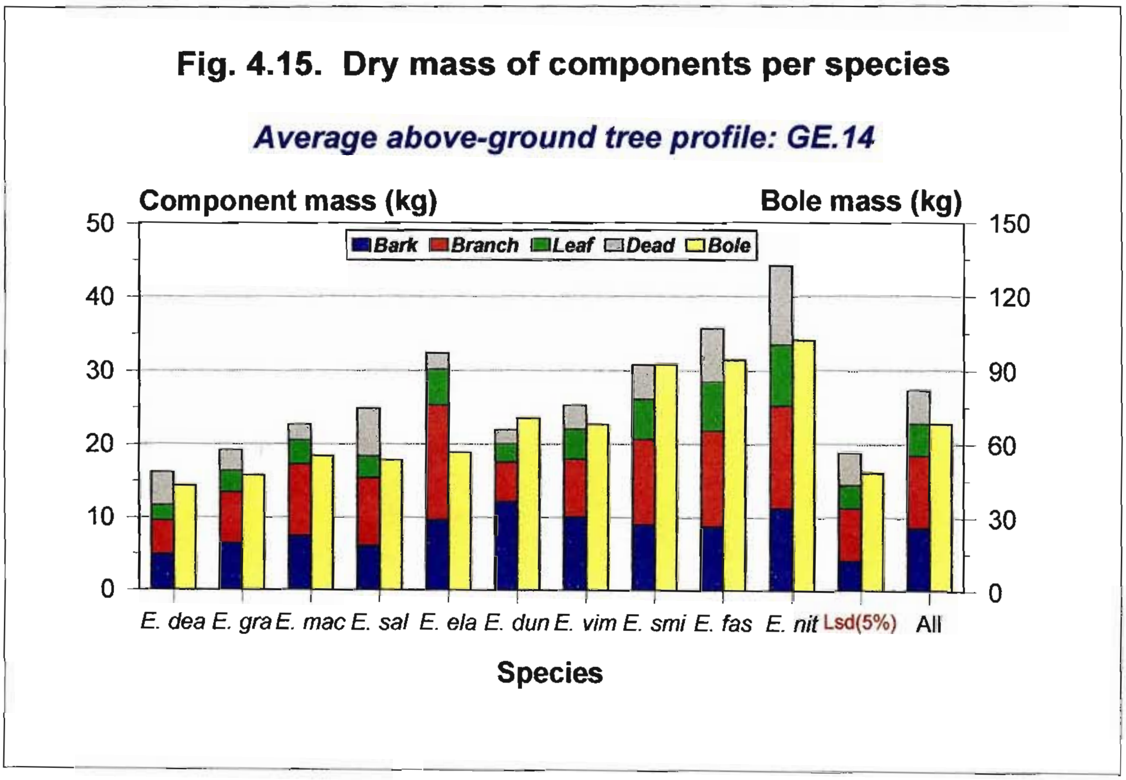


Fig. 4.15. Dry mass of components per species
Average above-ground tree profile: GE.14
Component mass (kg)
Bole mass (kg)
Bark Branch Leaf Dead Bole
0 10 20 30 40 50
0 30 60 90 120 150
E. dea E. gra E. mac E. sal E. ela E. dun E. vim E. smi E. fas E. nit Lsd(5%) All
Species

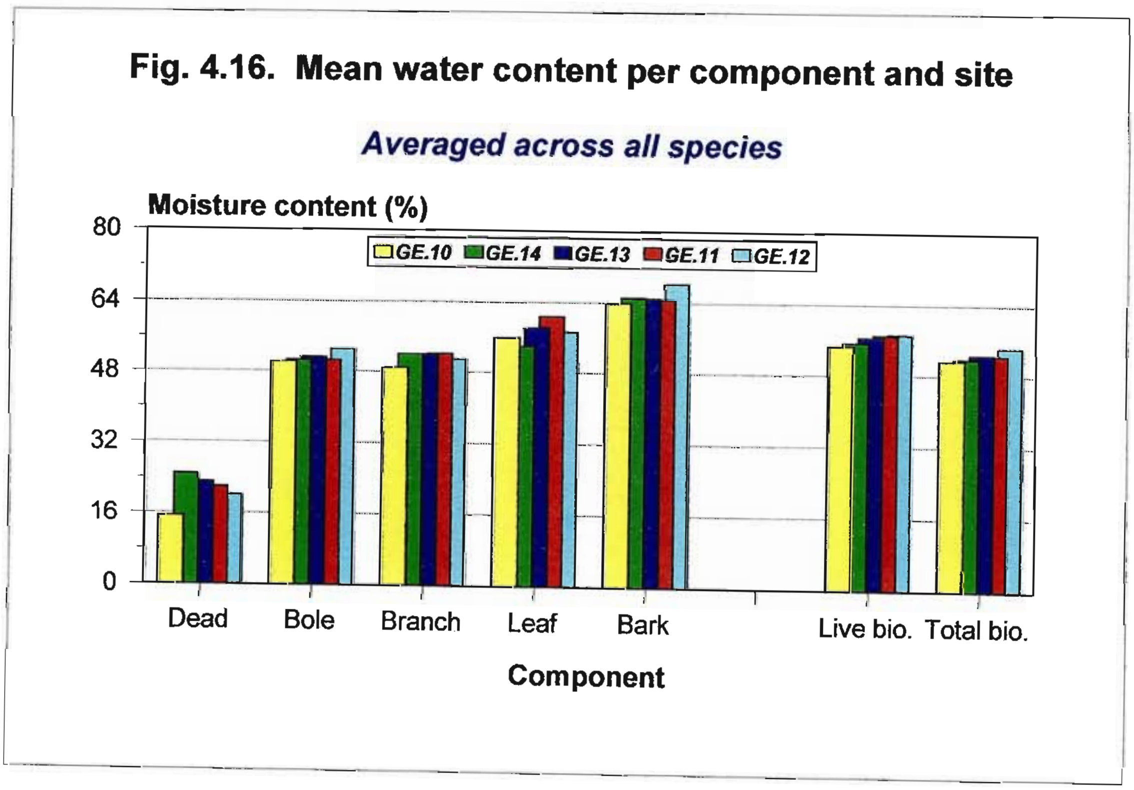


Fig. 4.16. Mean water content per component and site
Averaged across all species
Moisture content (%)
GE.10 GE.14 GE.13 GE.11 GE.12
0 16 32 48 64 80
Dead Bole Branch Leaf Bark Live bio. Total bio.
Component

Fig. 4.17. Mean water content per species and component

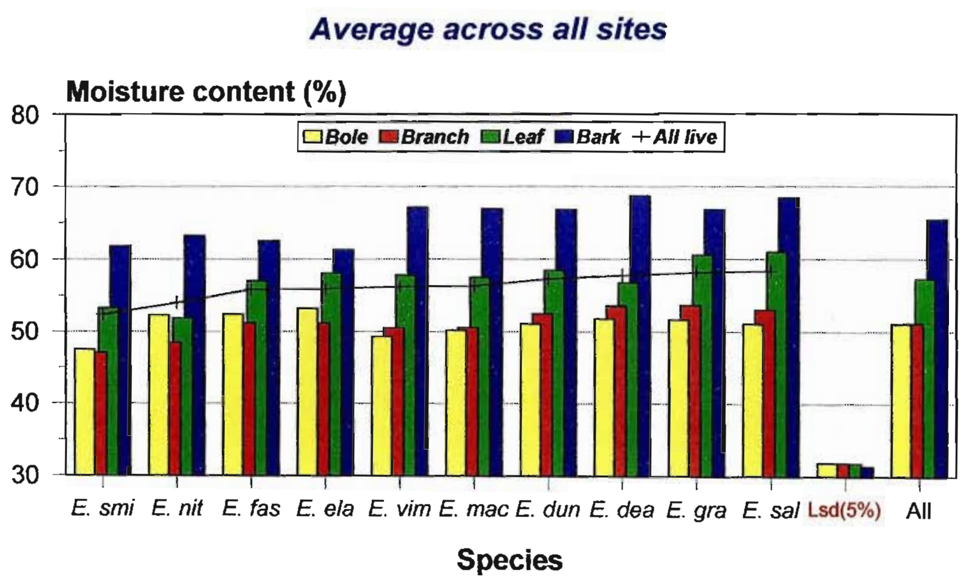


Fig. 4.18. Mean leaf water content per species and site

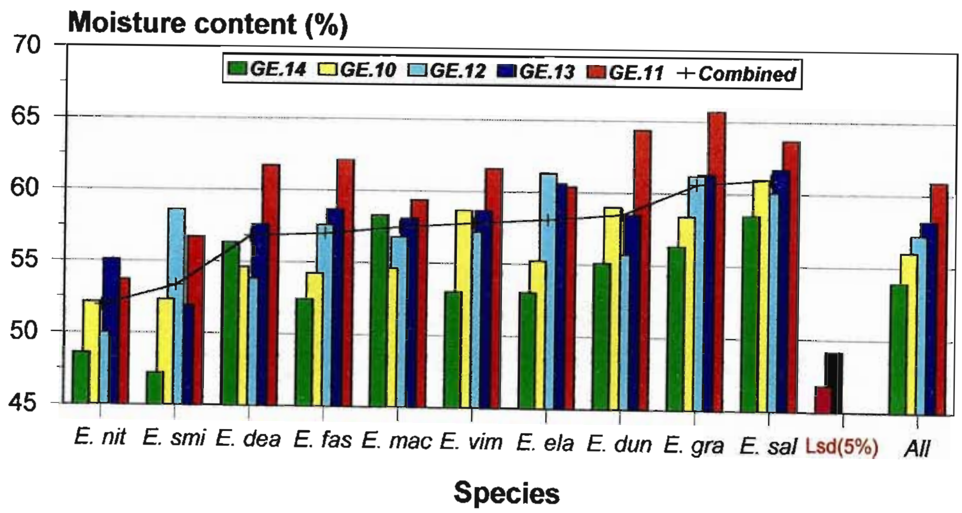


Fig 4.19. Mean branch water content per species and site

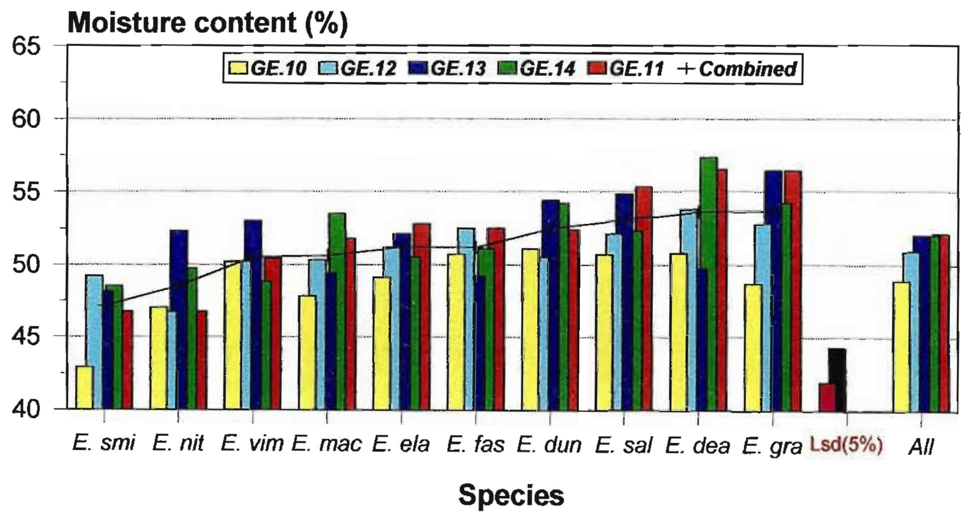


Fig. 4.20. Mean bark water content per species and site

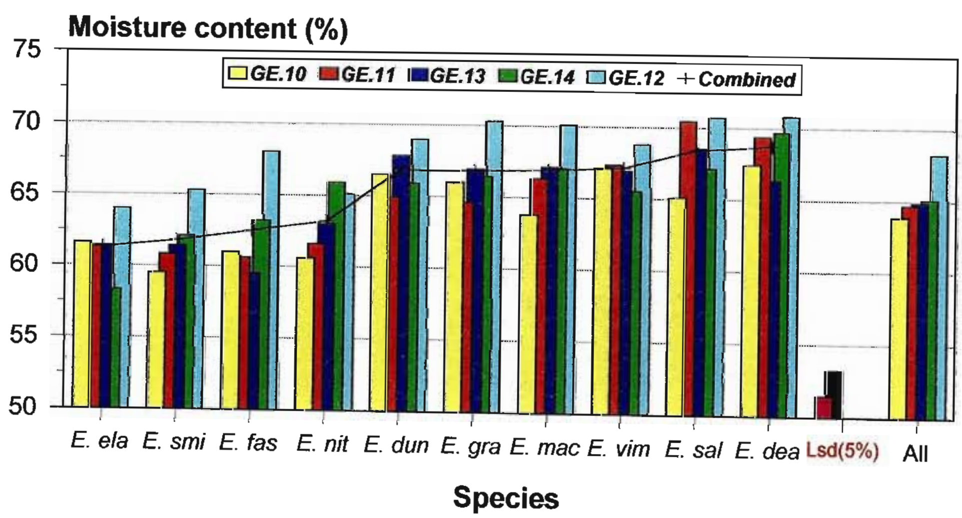


Fig. 4.21. Mean bole wood water content per species and site

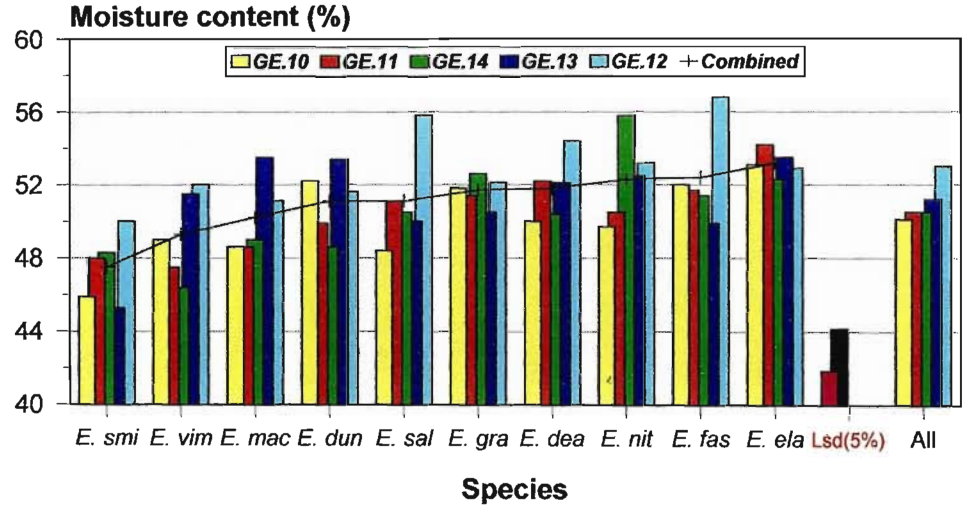


Fig. 4.22. Mean density of wood disc sections

Averaged per species across sites

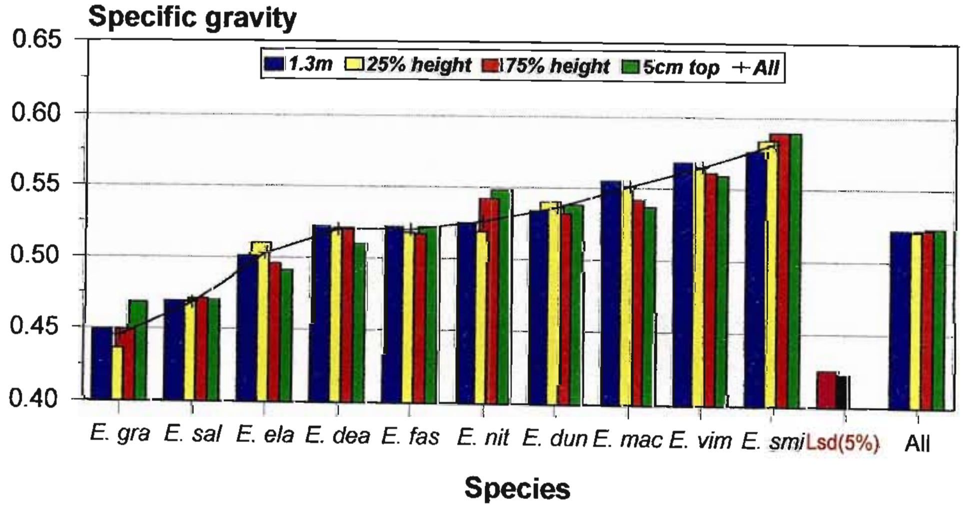


Fig. 4.23. Mean density of bole wood

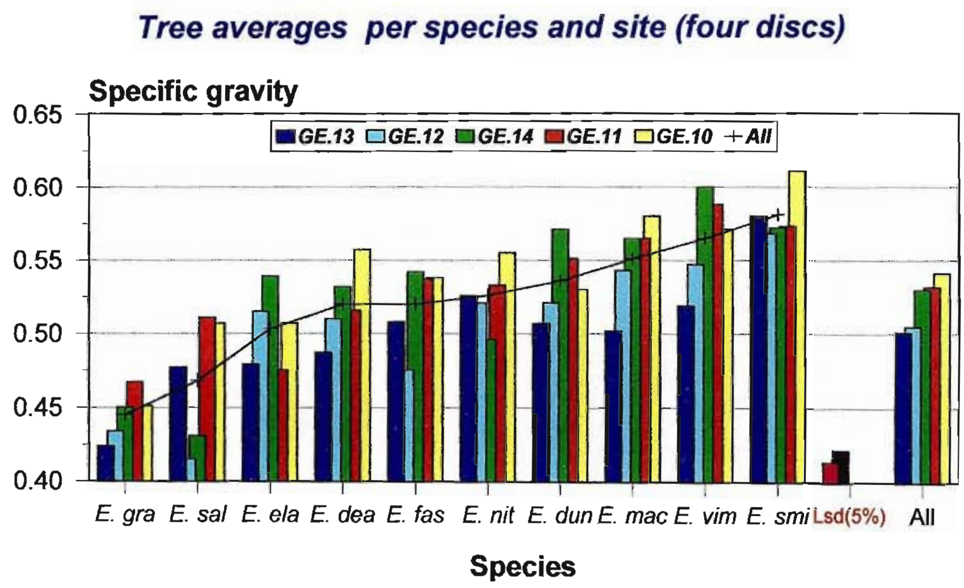


Fig. 4.24. Foliar nutrient concentrations per species

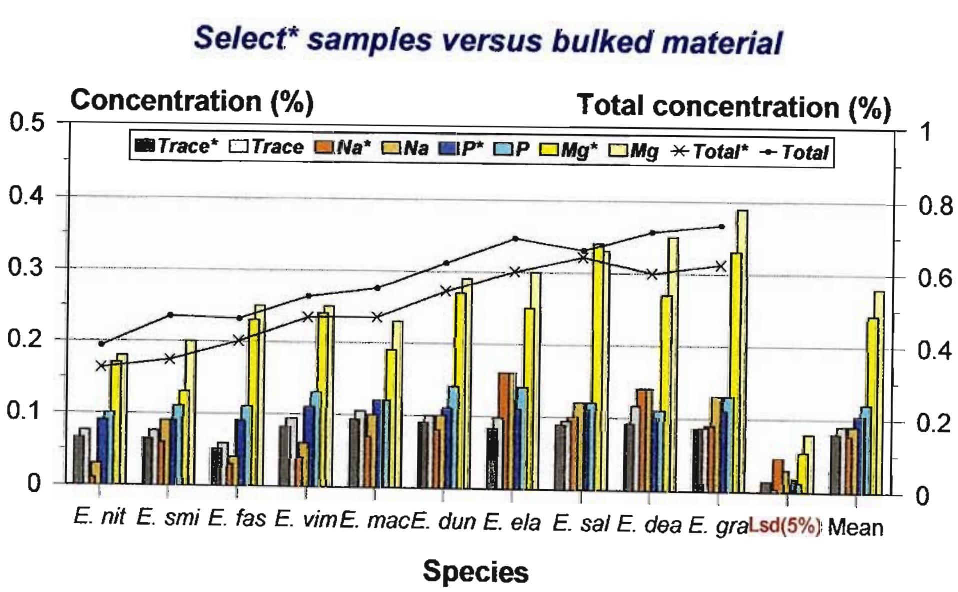


Fig. 4.25. Foliar N, K and Ca concentrations per species

Select samples versus bulked material*

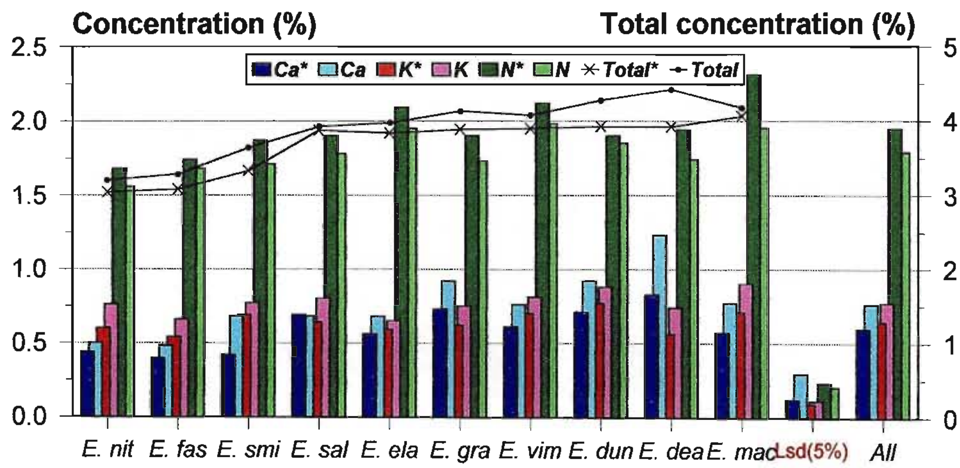


Fig. 4.26. Nutrient concentration of biomass components

Mean per site across species

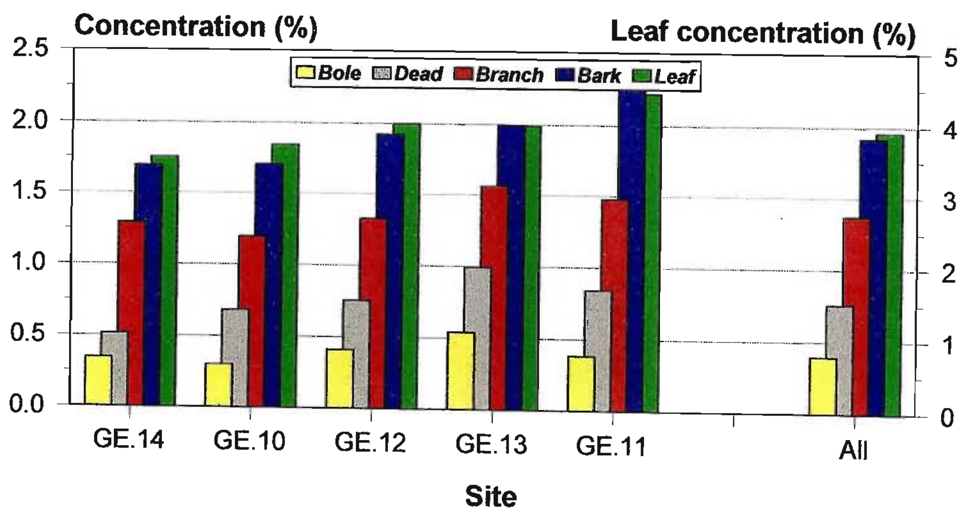


Fig. 4.27. Mean leaf nutrient concentration per element

Deep soils (GE.10 + GE.12 + GE.14)

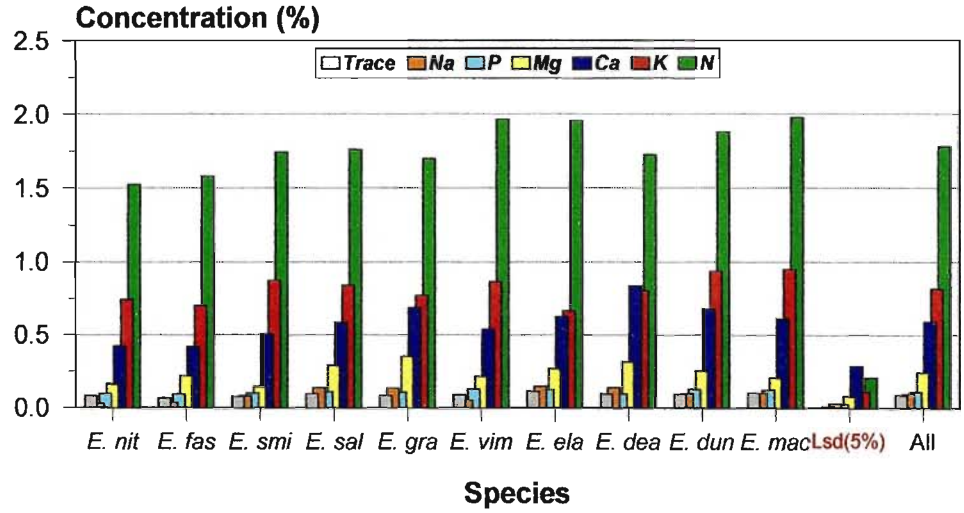
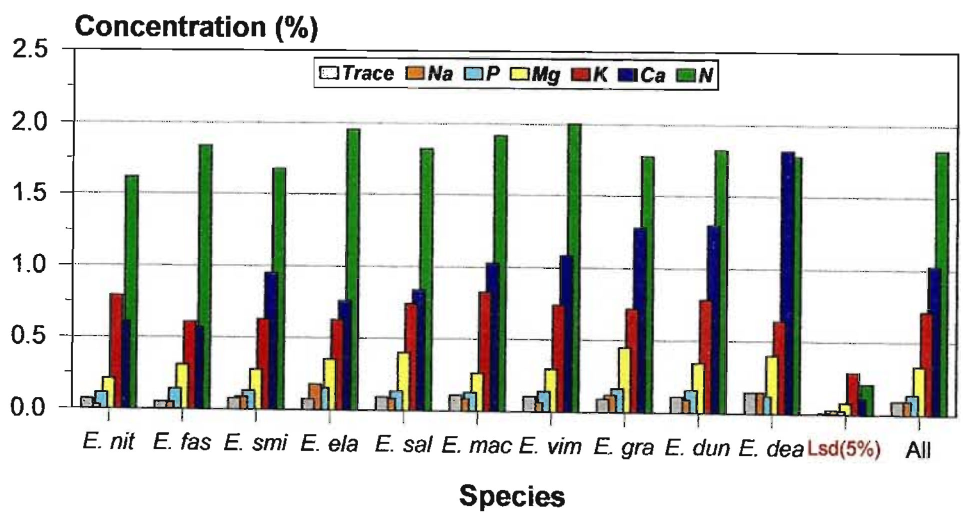


Fig. 4.28. Mean leaf nutrient concentration per element

Shallow soils (GE.11 + GE.13)



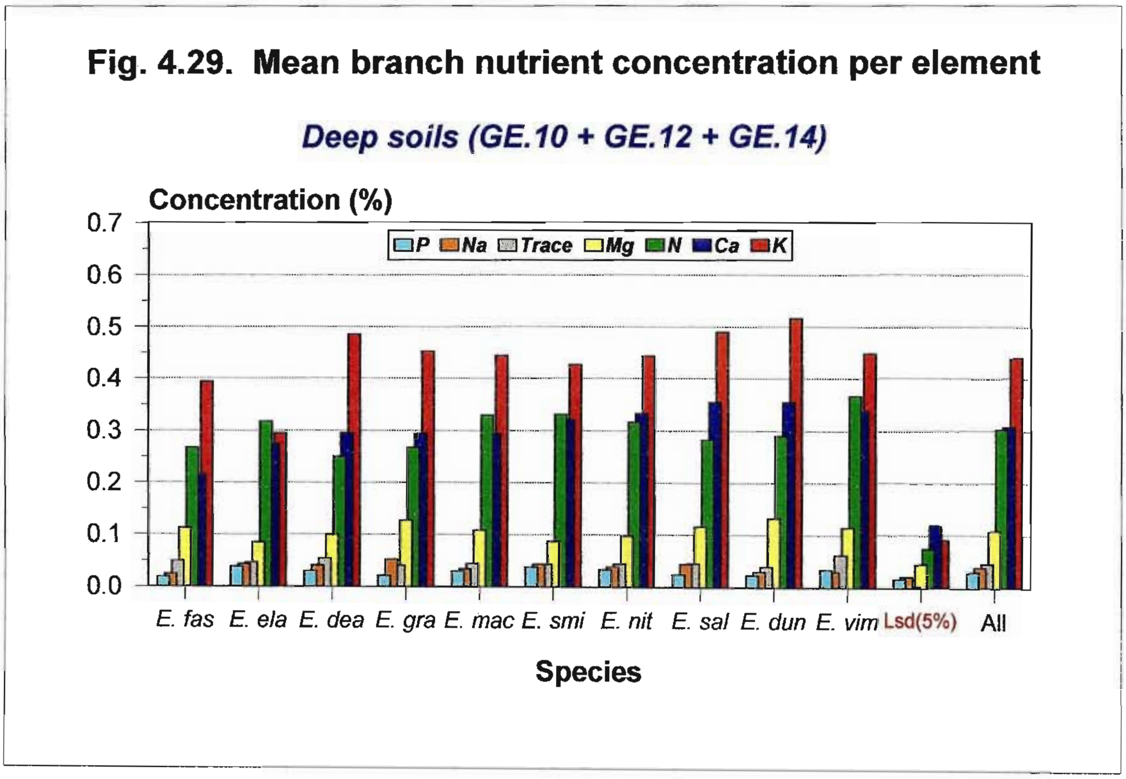


Fig. 4.29. Mean branch nutrient concentration per element
Deep soils (GE.10 + GE.12 + GE.14)
Concentration (%)
P Na Trace Mg N Ca K
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
E. fas E. ela E. dea E. gra E. mac E. smi E. nit E. sal E. dun E. vim Lsd(5%) All
Species

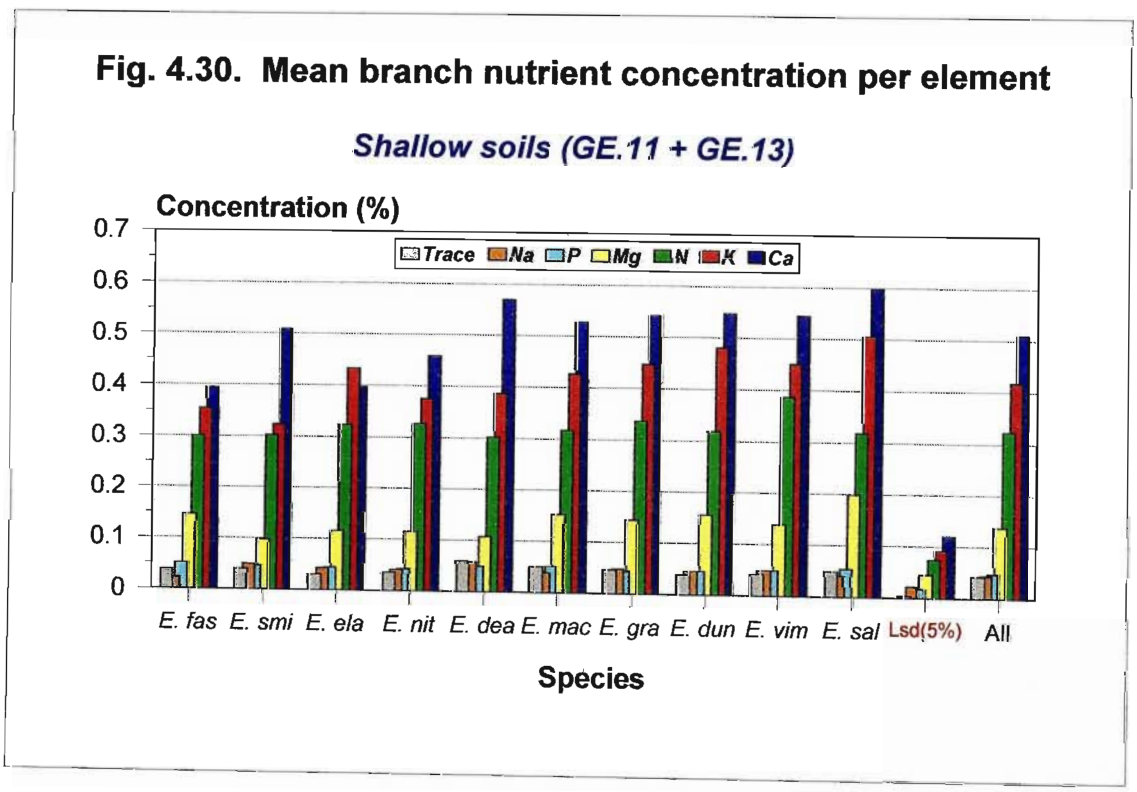


Fig. 4.30. Mean branch nutrient concentration per element
Shallow soils (GE.11 + GE.13)
Concentration (%)
Trace Na P Mg N K Ca
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
E. fas E. smi E. ela E. nit E. dea E. mac E. gra E. dun E. vim E. sal Lsd(5%) All
Species

Fig. 4.31. Mean dead matter nutrient concentration per element

Deep soils (GE.10 + GE.12 + GE.14)

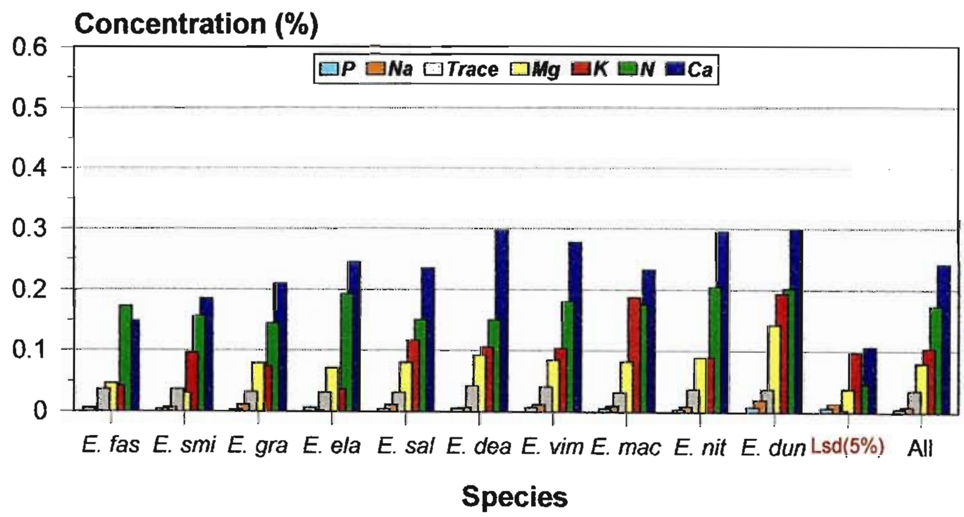


Fig. 4.32. Mean dead matter nutrient concentration per element

Shallow Soils (GE.11 + GE.13)

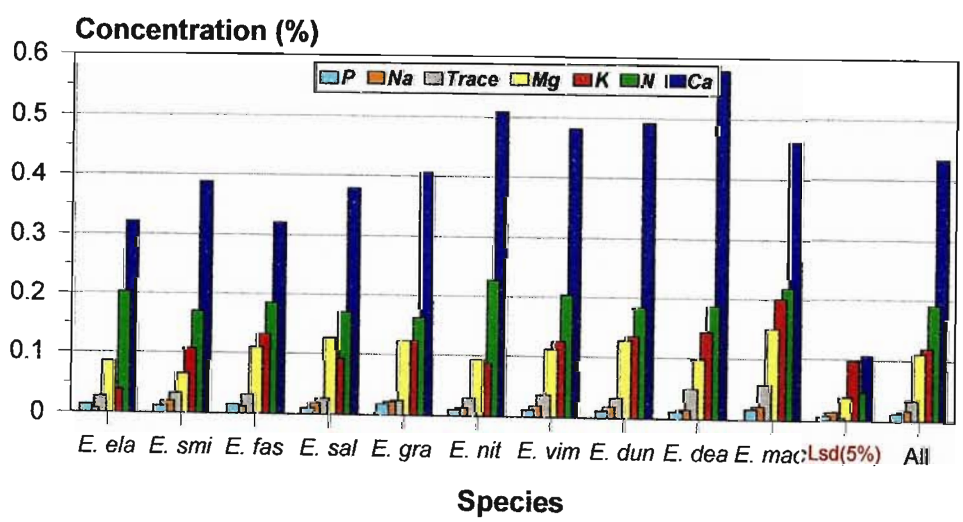


Fig. 4.33. Mean bark nutrient concentration per element

Deep soils (GE.10 + GE.12 + GE.14)

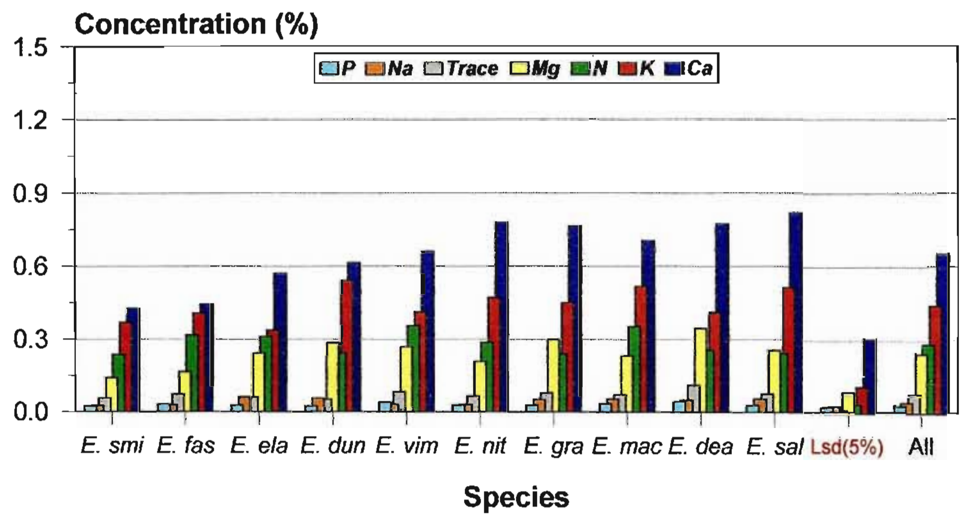
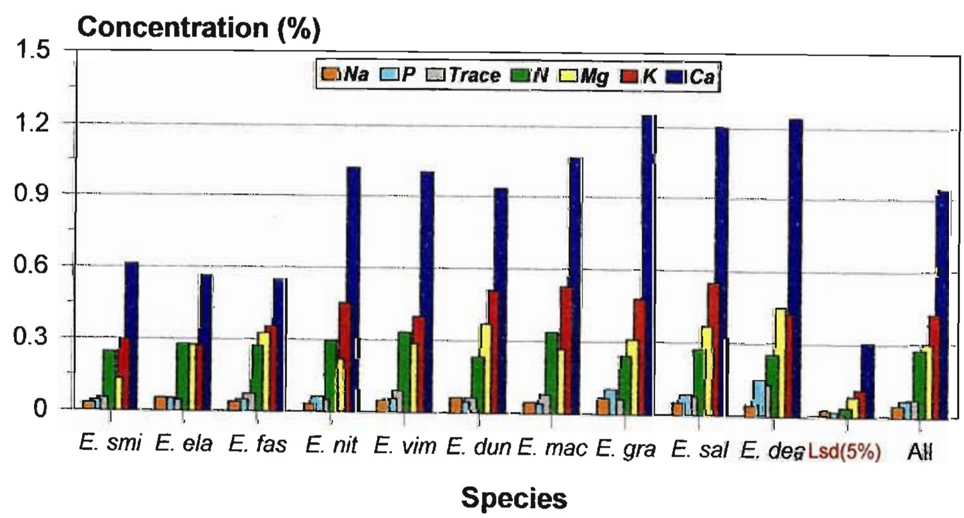


Fig. 4.34. Mean bark nutrient concentration per element

Shallow soils (GE.11 + GE.13)



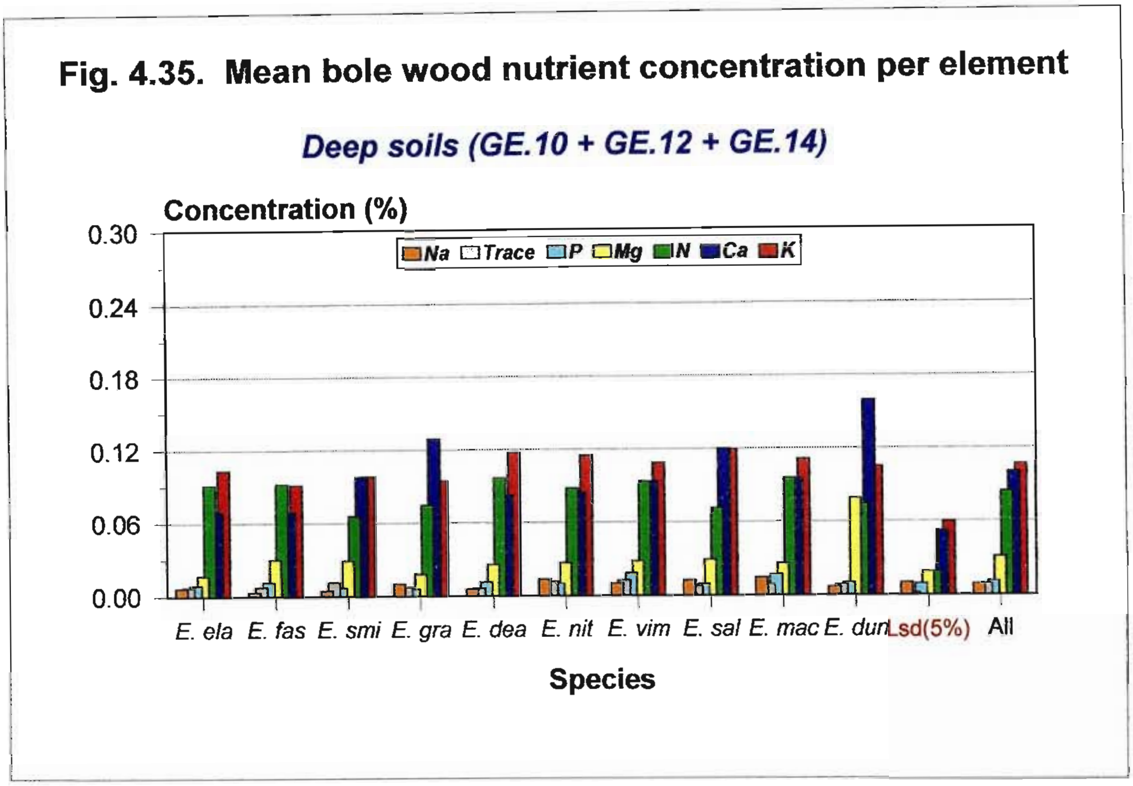


Fig. 4.35. Mean bole wood nutrient concentration per element
Deep soils (GE.10 + GE.12 + GE.14)
Concentration (%)
Na Trace P Mg N Ca K
0.30
0.24
0.18
0.12
0.06
0.00
E. ela E. fas E. smi E. gra E. dea E. nit E. vim E. sal E. mac E. dun Lsd(5%) All
Species

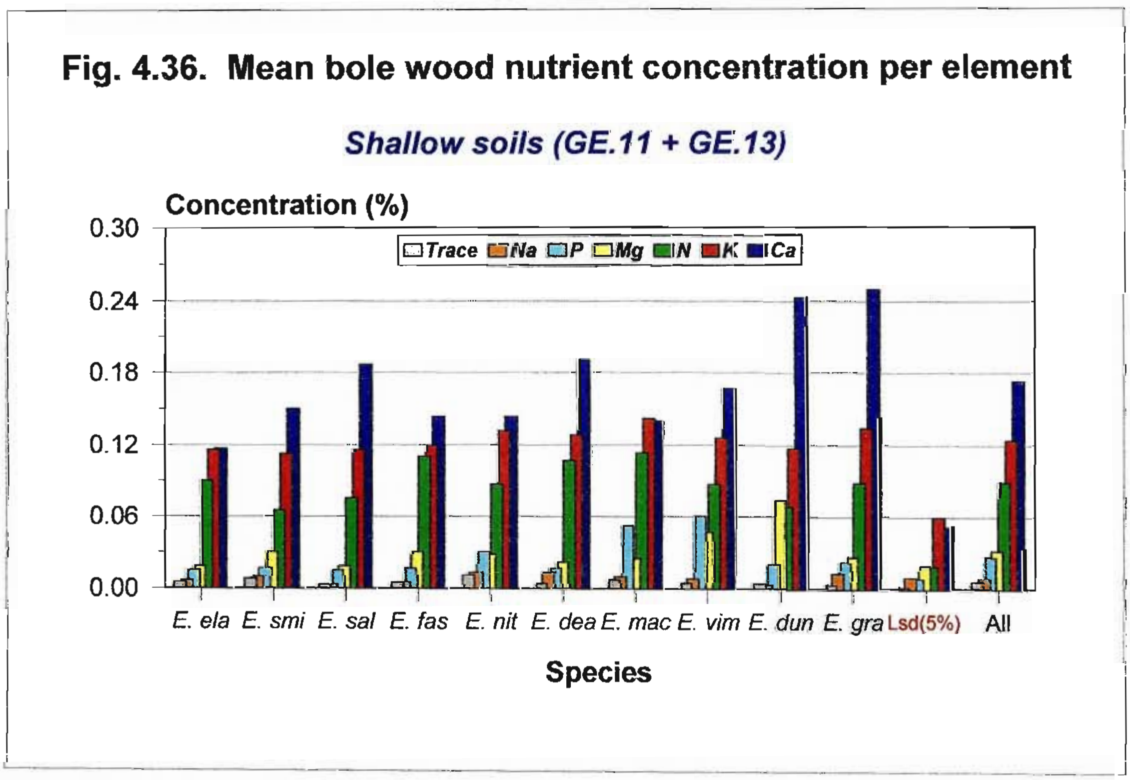


Fig. 4.36. Mean bole wood nutrient concentration per element
Shallow soils (GE.11 + GE.13)
Concentration (%)
Trace Na P Mg N K Ca
0.30
0.24
0.18
0.12
0.06
0.00
E. ela E. smi E. sal E. fas E. nit E. dea E. mac E. vim E. dun E. gra Lsd(5%) All
Species

Table 4.1. Simple correlation coefficients between dry mass of biomass components, remaining biomass components and meansuational parameters

E. deanei

	Leaf	Branch	Bark	Dead	Bole	Dbh	(Dbh)^2	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.963	0.870	0.319	0.845	0.884	0.905	0.855	-0.822	0.722	0.679	-0.637	0.748	-0.545	0.842	0.771	0.313	0.119
Branch	0.963	1.000	0.852	0.379	0.789	0.866	0.873	0.850	-0.827	0.660	0.626	-0.591	0.700	-0.599	0.769	0.741	0.398	0.059
Bark	0.870	0.852	1.000	0.399	0.942	0.956	0.953	0.947	-0.928	0.883	0.871	-0.852	0.919	-0.688	0.919	0.928	0.147	0.344
Dead	0.319	0.379	0.399	1.000	0.393	0.442	0.426	0.452	-0.456	0.348	0.364	-0.378	0.371	-0.329	0.306	0.390	0.188	-0.063
Bole	0.845	0.789	0.942	0.393	1.000	0.962	0.975	0.939	-0.908	0.938	0.915	-0.887	0.958	-0.610	0.993	0.956	0.066	0.452

E. dunnii

	Leaf	Branch	Bark	Dead	Bole	Dbh	(Dbh)^2	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.796	0.662	-0.126	0.784	0.812	0.820	0.794	-0.763	0.564	0.508	-0.443	0.609	-0.639	0.786	0.717	0.632	0.037
Branch	0.796	1.000	0.587	-0.130	0.634	0.676	0.685	0.657	-0.629	0.451	0.403	-0.347	0.456	-0.278	0.699	0.617	0.567	0.272
Bark	0.662	0.587	1.000	0.228	0.920	0.948	0.929	0.960	-0.961	0.875	0.861	-0.832	0.897	-0.635	0.912	0.944	0.299	0.003
Dead	-0.126	-0.130	0.228	1.000	-0.016	0.028	-0.010	0.068	-0.108	0.028	0.078	-0.128	0.075	-0.372	-0.061	0.076	-0.003	0.029
Bole	0.784	0.634	0.920	-0.016	1.000	0.988	0.991	0.976	-0.953	0.904	0.865	-0.810	0.925	-0.644	0.988	0.955	0.323	-0.006

E. elata

	Leaf	Branch	Bark	Dead	Bole	Dbh	(Dbh)^2	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.766	0.911	0.628	0.941	0.735	0.838	0.547	-0.329	0.876	0.787	-0.654	0.876	-0.010	0.932	0.859	-0.055	-0.058
Branch	0.766	1.000	0.813	0.520	0.778	0.418	0.585	0.161	0.100	0.731	0.685	-0.608	0.661	0.399	0.756	0.719	-0.374	0.381
Bark	0.911	0.813	1.000	0.776	0.974	0.828	0.912	0.648	-0.419	0.928	0.862	-0.751	0.936	-0.054	0.962	0.948	-0.001	-0.114
Dead	0.628	0.520	0.776	1.000	0.735	0.743	0.759	0.656	-0.512	0.753	0.709	-0.633	0.769	-0.100	0.722	0.755	0.120	-0.288
Bole	0.941	0.778	0.974	0.735	1.000	0.841	0.926	0.667	-0.452	0.936	0.849	-0.718	0.946	-0.070	0.994	0.933	0.016	-0.167

E. fastigata

	Leaf	Branch	Bark	Dead	Bole	Dbh	(Dbh)^2	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.879	0.842	0.384	0.933	0.890	0.898	0.872	-0.845	0.862	0.857	-0.844	0.872	-0.589	0.882	0.882	0.398	0.534
Branch	0.879	1.000	0.716	0.363	0.811	0.748	0.767	0.723	-0.695	0.714	0.700	-0.683	0.711	-0.399	0.730	0.710	0.361	0.273
Bark	0.842	0.716	1.000	0.573	0.914	0.982	0.980	0.971	-0.946	0.942	0.957	-0.960	0.949	-0.614	0.910	0.969	0.435	0.472
Dead	0.384	0.363	0.573	1.000	0.449	0.577	0.546	0.598	-0.607	0.461	0.508	-0.544	0.446	-0.147	0.398	0.566	0.454	0.192
Bole	0.933	0.811	0.914	0.449	1.000	0.937	0.961	0.901	-0.854	0.961	0.946	-0.921	0.963	-0.579	0.983	0.934	0.267	0.605

E. grandis

	Leaf	Branch	Bark	Dead	Bole	Dbh	(Dbh)^2	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.925	0.702	0.118	0.798	0.692	0.730	0.655	-0.617	0.599	0.560	-0.515	0.610	-0.327	0.801	0.684	0.136	-0.130
Branch	0.925	1.000	0.699	0.166	0.761	0.659	0.693	0.624	-0.591	0.541	0.497	-0.447	0.525	-0.146	0.725	0.608	0.215	-0.286
Bark	0.702	0.699	1.000	0.224	0.950	0.923	0.926	0.916	-0.907	0.880	0.876	-0.864	0.882	-0.402	0.913	0.924	-0.012	-0.553
Dead	0.118	0.166	0.224	1.000	0.171	0.229	0.210	0.248	-0.268	0.179	0.192	-0.207	0.128	0.214	0.150	0.187	0.085	-0.405
Bole	0.798	0.761	0.950	0.171	1.000	0.957	0.971	0.940	-0.921	0.929	0.913	-0.889	0.925	-0.387	0.982	0.962	-0.047	-0.521

$P<0.05$: $r = 0.514$ *$P<0.01$: $r = 0.641$* ** Height - Height 5cm tip*

Table 4.1. Simple correlation coefficients between dry mass of biomass components, remaining biomass components and meansuational parameters

E. macarthurii

	Leaf	Branch	Bark	Dead	Bole	Dbh	$(Dbh)^2$	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.778	0.600	0.077	0.515	0.622	0.634	0.607	-0.589	0.279	0.276	-0.269	0.304	-0.263	0.503	0.494	0.636	-0.177
Branch	0.778	1.000	0.310	-0.251	0.261	0.396	0.392	0.397	-0.394	0.051	0.081	-0.109	0.089	-0.228	0.232	0.298	0.570	-0.085
Bark	0.600	0.310	1.000	0.333	0.826	0.856	0.862	0.848	-0.837	0.708	0.706	-0.698	0.735	-0.472	0.799	0.815	0.424	-0.169
Dead	0.077	-0.251	0.333	1.000	0.491	0.284	0.298	0.270	-0.256	0.481	0.421	-0.358	0.531	-0.485	0.495	0.402	-0.172	0.227
Bole	0.515	0.261	0.826	0.491	1.000	0.921	0.927	0.912	-0.900	0.940	0.930	-0.913	0.946	-0.473	0.995	0.981	0.204	-0.029

E. nitens

	Leaf	Branch	Bark	Dead	Bole	Dbh	$(Dbh)^2$	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.923	0.703	0.878	0.777	0.793	0.817	0.749	-0.694	0.305	0.326	-0.344	0.444	-0.773	0.763	0.678	0.752	0.647
Branch	0.923	1.000	0.558	0.859	0.628	0.638	0.642	0.614	-0.576	0.149	0.184	-0.213	0.292	-0.713	0.583	0.545	0.731	0.629
Bark	0.703	0.558	1.000	0.722	0.940	0.895	0.899	0.866	-0.819	0.714	0.732	-0.739	0.823	-0.838	0.929	0.880	0.331	0.738
Dead	0.878	0.859	0.722	1.000	0.765	0.733	0.755	0.690	-0.635	0.314	0.347	-0.372	0.463	-0.822	0.734	0.651	0.599	0.704
Bole	0.777	0.628	0.940	0.765	1.000	0.953	0.967	0.914	-0.859	0.782	0.789	-0.786	0.862	-0.739	0.989	0.918	0.333	0.675

E. saligna

	Leaf	Branch	Bark	Dead	Bole	Dbh	$(Dbh)^2$	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.518	0.174	0.008	0.453	0.397	0.418	0.372	-0.347	0.325	0.304	-0.283	0.324	-0.218	0.466	0.438	0.168	0.215
Branch	0.518	1.000	0.459	0.187	0.517	0.621	0.632	0.605	-0.587	0.396	0.389	-0.380	0.393	-0.248	0.573	0.546	0.491	-0.099
Bark	0.174	0.459	1.000	0.143	0.836	0.863	0.827	0.890	-0.908	0.820	0.840	-0.856	0.852	-0.830	0.756	0.828	0.129	-0.412
Dead	0.008	0.187	0.143	1.000	0.260	0.322	0.326	0.313	-0.299	0.331	0.318	-0.303	0.285	0.159	0.404	0.370	-0.015	0.119
Bole	0.453	0.517	0.836	0.260	1.000	0.959	0.963	0.946	-0.925	0.948	0.944	-0.936	0.955	-0.715	0.972	0.969	0.018	-0.172

E. smithii

	Leaf	Branch	Bark	Dead	Bole	Dbh	$(Dbh)^2$	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.683	0.578	-0.100	0.244	0.453	0.450	0.455	-0.458	-0.081	-0.029	-0.024	0.003	-0.488	0.233	0.298	0.757	-0.031
Branch	0.683	1.000	0.542	0.239	0.240	0.458	0.444	0.471	-0.481	-0.045	0.004	-0.055	0.040	-0.490	0.231	0.319	0.733	-0.035
Bark	0.578	0.542	1.000	0.401	0.815	0.833	0.844	0.819	-0.801	0.604	0.627	-0.646	0.643	-0.109	0.783	0.775	0.218	-0.108
Dead	-0.100	0.239	0.401	1.000	0.494	0.553	0.529	0.571	-0.582	0.599	0.605	-0.608	0.575	0.251	0.539	0.577	-0.134	-0.213
Bole	0.244	0.240	0.815	0.494	1.000	0.918	0.922	0.909	-0.895	0.897	0.911	-0.920	0.924	0.017	0.989	0.965	-0.115	0.025

E. viminalis

	Leaf	Branch	Bark	Dead	Bole	Dbh	$(Dbh)^2$	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.578	0.621	0.095	0.553	0.570	0.636	0.494	-0.415	0.394	0.324	-0.255	0.376	-0.117	0.628	0.425	0.477	0.004
Branch	0.578	1.000	0.197	0.566	0.123	0.139	0.163	0.114	-0.087	0.008	-0.009	0.025	0.003	0.034	0.136	0.078	0.346	0.051
Bark	0.621	0.197	1.000	0.251	0.976	0.968	0.968	0.955	-0.930	0.930	0.904	-0.871	0.926	-0.542	0.976	0.936	0.114	0.200
Dead	0.095	0.566	0.251	1.000	0.215	0.226	0.163	0.289	-0.347	0.224	0.274	-0.320	0.248	-0.315	0.128	0.301	0.035	0.185
Bole	0.553	0.123	0.976	0.215	1.000	0.967	0.960	0.962	-0.943	0.968	0.945	-0.916	0.960	-0.544	0.986	0.972	0.016	0.336

P<0.05: r = 0.514 *P<0.01: r = 0.641* ** Height - Height 5cm tip*

Table 4.1. Simple correlation coefficients between dry mass of biomass components, remaining biomass components and meansuational parameters

Transversae: E. deanei + E. grandis + E. saligna [P, 0.05: r=0.294; P<0.01: r=0.381]

	Leaf	Branch	Bark	Dead	Bole	Dbh	(Dbh)²	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.862	0.659	0.221	0.688	0.607	0.627	0.583	-0.556	0.420	0.393	-0.363	0.433	-0.315	0.609	0.533	0.316	0.012
Branch	0.862	1.000	0.695	0.309	0.681	0.659	0.670	0.643	-0.624	0.430	0.409	-0.384	0.441	-0.303	0.618	0.564	0.397	-0.061
Bark	0.659	0.695	1.000	0.208	0.917	0.907	0.894	0.910	-0.903	0.819	0.821	-0.811	0.841	-0.584	0.855	0.880	0.076	-0.099
Dead	0.221	0.309	0.208	1.000	0.218	0.212	0.206	0.215	-0.214	0.118	0.118	-0.118	0.100	0.062	0.187	0.181	0.180	-0.030
Bole	0.688	0.681	0.917	0.218	1.000	0.951	0.960	0.932	-0.905	0.902	0.886	-0.859	0.909	-0.530	0.970	0.937	-0.010	0.003

Viminales: E. dunnii + E. macarthurii + E. nitens + E. smithii + E. viminalis [P, 0.05: r=0.235; P<0.01: r=0.305]

	Leaf	Branch	Bark	Dead	Bole	Dbh	(Dbh)²	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.772	0.412	0.520	0.538	0.576	0.573	0.555	-0.506	0.248	0.245	-0.236	0.317	-0.464	0.553	0.522	0.566	0.419
Branch	0.772	1.000	0.225	0.474	0.348	0.381	0.354	0.391	-0.375	0.110	0.126	-0.138	0.150	-0.260	0.327	0.368	0.475	0.387
Bark	0.412	0.225	1.000	0.074	0.860	0.884	0.896	0.834	-0.740	0.749	0.731	-0.689	0.801	-0.540	0.858	0.796	0.227	0.025
Dead	0.520	0.474	0.074	1.000	0.253	0.243	0.205	0.262	-0.255	0.123	0.133	-0.136	0.167	-0.288	0.244	0.302	0.242	0.500
Bole	0.538	0.348	0.860	0.253	1.000	0.929	0.944	0.875	-0.773	0.883	0.846	-0.783	0.908	-0.436	0.984	0.894	0.117	0.220

Combined: All species [P, 0.05: r=0.159; P<0.01: r=0.208]

	Leaf	Branch	Bark	Dead	Bole	Dbh	(Dbh)²	log(Dbh)	1/Dbh	Height	log(Ht.)	1/Ht.	Ht.(5cm)	Crown*	Volume	log(Vol)	Dbh/Ht.	F-factor
Leaf	1.000	0.786	0.529	0.430	0.666	0.624	0.646	0.558	-0.427	0.431	0.409	-0.372	0.460	-0.322	0.637	0.587	0.367	0.023
Branch	0.786	1.000	0.413	0.391	0.512	0.446	0.473	0.369	-0.225	0.317	0.308	-0.288	0.316	-0.104	0.470	0.458	0.245	0.205
Bark	0.529	0.413	1.000	0.153	0.855	0.825	0.853	0.741	-0.572	0.750	0.732	-0.685	0.773	-0.396	0.801	0.775	0.159	-0.045
Dead	0.430	0.391	0.153	1.000	0.284	0.289	0.259	0.297	-0.263	0.180	0.192	-0.195	0.201	-0.185	0.255	0.315	0.219	-0.021
Bole	0.666	0.512	0.855	0.284	1.000	0.913	0.944	0.822	-0.641	0.898	0.860	-0.787	0.909	-0.377	0.972	0.902	0.088	-0.053

* *Height - Height 5cm tip*

Table 4.2.1. Regression analysis of biomass components and mensurational parameters on single components: *E. deanei*

Leaf dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		E'mate	SE	t
Regression	1	131.50	167.41**	0.93	Constant	-1.055	0.525	-2.01
Residual	13	0.79			Branch	0.6215	0.0480	12.94**
Total	14	10.12						

Leaf dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		E'mate	SE	t
Regression	1	116.116	58.98**	0.81	Constant	-2.40	1.04	-2.32
Residual	13	1.969			$(Dbh)^2$	0.03235	0.00421	7.68
Total	14	10.122						

Branch dry mass (kg/tree) : Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		E'mate	SE	t
Regression	1	315.94	167.41**	0.92	Constant	2.285	0.683	3.34**
Residual	13	1.89			Leaf	1.493	0.115	12.94**
Total	14	24.32						

Branch dry mass (kg/tree) : Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		E'mate	SE	t
Regression	3	96.934	21.47**	0.81	Constant	-27.74	7.74	-3.58
Residual	11	4.515			Height	1.463	0.203	7.2**
Total	14	24.319			Dbh/Height	31.13	6.15	5.07**
					F-factor	-40.4	15.4	-2.62*

Dead matter dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		E'mate	SE	t
Regression	0	*		0.00	Constant	4.281	0.491	8.71**
Residual	14	3.62						
Total	14	3.62						

Dead matter dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		E'mate	SE	t
Regression	0	*	*	0.00	Constant	4.281	0.491	8.71**
Residual	14	3.621						
Total	14	3.621						

Bark dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		E'mate	SE	t
Regression	1	144.98	102.91**	0.88	Constant	2.226	0.610	3.65**
Residual	13	1.41			Bole	0.0818	0.00806	10.14**
Total	14	11.66						

Bark dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		E'mate	SE	t
Regression	1	148.181	127.5**	0.90	Constant	-0.863	0.797	-1.08
Residual	13	1.162			$(Dbh)^2$	0.03654	0.00324	11.29**
Total	14	11.664						

Bole dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		E'mate	SE	t
Regression	1	19235.6	102.91**	0.88	Constant	-16.83	8.84	-1.90
Residual	13	186.9			Bark	10.85	1.07	10.14**
Total	14	1547.5						

Bole dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		E'mate	SE	t
Regression	2	10722.57	583.8**	0.99	Constant	33.6	10.3	3.25
Residual	12	18.37			$(Dbh)^2$	0.4550	0.0133	34.09**
Total	14	1547.54			Dbh/Height	-85.7	12.5	-6.87**

Table 4.2.2. Regression analysis of biomass components and mensurational parameters on single components: *E. dunnii*

Leaf dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	22.722	19.44**	0.73	Constant	0.010	0.827	0.01
Residual	12	1.169			Branch	0.340	0.123	2.76*
Total	14	4.248			Bole	0.01733	0.00674	2.57*

Leaf dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	23.343	21.91**	0.75	Constant	-17.08	3.33	-5.12
Residual	12	1.065			Height	0.3426	0.0739	4.64**
Total	14	4.248			Dbh/Height	17.24	3.38	5.1**

Branch dry mass (kg/tree) : Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	81.615	22.55**	0.61	Constant	2.99	1.20	2.51*
Residual	13	3.619			Leaf	1.171	0.247	4.75**
Total	14	9.190						

Branch dry mass (kg/tree) : Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	36.858	8.05*	0.5	Constant	-19.11	6.91	-2.77
Residual	12	4.579			Height	0.407	0.153	2.66*
Total	14	9.190			Dbh/Height	22.55	7.00	3.22**

Dead matter dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	3.6865	3.77	0.28	Constant	-0.241	0.697	-0.35
Residual	12	0.9773			Bark	0.294	0.107	2.75*
Total	14	1.3643			Bole	-0.0312	0.0122	-2.56*

Dead matter dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	0	*	*	*	Constant	1.016	0.302	3.37**
Residual	14	1.364						
Total	14	1.364						

Bark dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	252.630	57.96**	0.89	Constant	3.01	1.20	2.51*
Residual	12	4.358			Dead	1.312	0.478	2.75*
Total	14	39.826			Bole	0.1053	0.0101	10.45**

Bark dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	501.460	116.2**	0.89	Constant	-14.40	2.71	-5.32
Residual	13	4.315			Dbh	1.656	0.154	10.78**
Total	14	39.826						

Bole dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	19378.1	54.77**	0.89	Constant	-32.3	13.1	-2.47*
Residual	12	353.8			Bark	6.28	1.06	5.91**
Total	14	3071.6			Leaf	8.34	3.26	2.56*

Bole dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	41994.2	541.89**	0.98	Constant	-168.0	11.5	-14.65
Residual	13	77.50			Dbh	15.152	0.651	23.28**
Total	14	3071.55						

Table 4.2.3. Regression analysis of biomass components and mensurational parameters on single components: *E. elata*

Leaf dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	66.8657	100.12**	0.88	Constant	1.875	0.365	5.13**
Residual	13	0.6679			Bole	0.04168	0.00417	10.01**
Total	14	5.3963						

Leaf dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	21.7330	23.1**	0.83	Constant	-10.96	3.11	-3.52
Residual	11	0.9408			Height	0.4938	0.0604	8.17**
Total	14	5.3963			Dbh/Height	6.96	2.56	2.72*
					F-factor	1.755	0.683	2.57*

Branch dry mass (kg/tree) : Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	370.59	25.26**	0.63	Constant	5.21	1.96	2.66*
Residual	13	14.67			Bark	0.854	0.170	5.03**
Total	14	40.09						

Branch dry mass (kg/tree) : Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	248.415	46.25**	0.87	Constant	-0.81	1.63	-0.50
Residual	12	5.371			$(Dbh)^2$	0.04301	******	8.79**
Total	14	40.092			F-factor	7.423	0.985	7.53**

Dead matter dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	13.5966	19.66**	0.57	Constant	0.753	0.425	1.77
Residual	13	0.6915			Bark	0.1636	0.0369	4.43**
Total	14	1.6133						

Dead matter dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	12.8219	17.07**	0.53	Constant	-1.242	0.905	-1.37
Residual	13	0.7511			Height	0.1926	0.0466	4.13**
Total	14	1.6133						

Bark dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	482.652	244.84**	0.95	Constant	1.938	0.628	3.09*
Residual	13	1.971			Bole	0.11198	0.00716	15.65**
Total	14	36.306						

Bark dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	166.456	205.55**	0.98	Constant	-34.89	2.89	-12.09
Residual	11	0.8098			Height	1.3666	0.0561	24.38**
Total	14	36.3056			Dbh/Height	20.68	2.38	8.7**
					F-factor	4.716	0.634	7.44**

Bole dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	18590.5	170.14**	0.96	Constant	-22.37	6.66	-3.36**
Residual	12	109.3			Bark	6.01	1.13	5.34**
Total	14	2749.4			Leaf	7.02	2.92	2.4*

Bole dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	12408.5	107.76**	0.96	Constant	-287.9	34.4	-8.37
Residual	11	115.2			Height	11.606	0.668	17.36**
Total	14	2749.4			Dbh/Height	154.8	28.3	5.46**
					F-factor	31.44	7.55	4.16**

Table 4.2.4. Regression analysis of biomass components and mensurational parameters on single components: *E. fastigata*

Leaf dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	50.2213	63.89**	0.90	Constant	0.136	0.504	0.27
Residual	12	0.7860			Branch	0.1719	0.0690	2.49*
Total	14	7.8482			Bole	0.04118	0.0092	4.44**

Leaf dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	88.699	54.45**	0.79	Constant	-1.188	0.914	-1.30
Residual	13	1.629			$(Dbh)^2$	0.02432	0.00330	7.38**
Total	14	7.848						

Branch dry mass (kg/tree) : Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	372.187	44.34**	0.76	Constant	1.54	1.60	0.96
Residual	13	8.394			Leaf	1.840	0.276	6.66**
Total	14	34.380						

Branch dry mass (kg/tree) : Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	283.26	18.59**	0.56	Constant	-0.31	2.79	-0.11
Residual	13	15.24			$(Dbh)^2$	0.0435	0.0101	4.31**
Total	14	34.38						

Dead matter dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	32.370	6.35*	0.28	Constant	0.45	1.56	0.29
Residual	13	5.100			Bark	0.506	0.201	2.52*
Total	14	7.048						

Dead matter dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	4.086	0.685	5.96
Residual	14	7.048						
Total	14	7.048						

Bark dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	105.377	65.66**	0.82	Constant	2.463	0.668	3.69**
Residual	13	1.605			Bole	0.06291	0.0077	8.1**
Total	14	9.017						

Bark dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	121.1441	309.06**	0.96	Constant	-0.170	0.448	-0.38
Residual	13	0.3920			$(Dbh)^2$	0.02842	0.00162	17.58**
Total	14	9.0171						

Bole dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	12334.3	75.57**	0.91	Constant	-15.59	8.89	-1.75
Residual	12	163.2			Bark	6.41	2.11	3.04*
Total	14	1901.9			Leaf	8.74	2.26	3.87**

Bole dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	12728.28	130.46**	0.95	Constant	60.0	31.0	1.94
Residual	12	97.56			$(Dbh)^2$	0.4427	0.0285	15.54**
Total	14	1901.95			Dbh/Heigh	-119.6	40.2	-2.97*

Table 4.2.5. Regression analysis of biomass components and mensurational parameters on single components: *E. grandis*

Leaf dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	6.6299	14.92**	0.52	Constant	0.712	0.708	1.00
Residual	12	0.4443			Branch	0.3668	0.0950	3.86**
Total	13	0.9201						

Leaf dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	3.360	0.256	13.11
Residual	13	0.9201						
Total	13	0.9201						

Branch dry mass (kg/tree) : Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	27.313	14.92**	0.52	Constant	2.14	1.36	1.57
Residual	12	1.830			Leaf	1.511	0.391	3.86**
Total	13	3.791						

Branch dry mass (kg/tree) : Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	14.889	5.2*	0.24	Constant	19.75	5.51	3.58
Residual	12	2.866			F-factor	-34.6	15.2	-2.28*
Total	13	3.791						

Dead matter dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*		0.00	Constant	2.222	0.421	5.28
Residual	13	2.478						
Total	13	2.478						

Dead matter dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	2.222	0.421	5.28
Residual	13							
Total	13							

Bark dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	48.0869	68.05**	0.84	Constant	3.028	0.601	5.04
Residual	12	0.7066			Bole	0.07031	0.00852	8.25**
Total	13	4.3512						

Bark dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	22.9463	23.65**	0.78	Constant	-12.57	4.64	-2.71
Residual	11	0.9703			Height	0.6035	0.0880	6.86**
Total	13	4.3512			Dbh/Height	10.23	4.53	2.26*

Bole dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	8268.6	68.05**	0.84	Constant	-26.8	11.6	-2.32
Residual	12	121.5			Bark	12.09	1.47	8.25**
Total	13	748.2						

Bole dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	4755.90	243.56**	0.97	Constant	43.0	15.4	2.79
Residual	11	19.53			$(Dbh)^2$	0.3292	0.0150	21.89**
Total	13	748.20			Dbh/Height	-77.5	18.7	-4.14**

Table 4.2.6. Regression analysis of biomass components and mensurational parameters on single components: *E. macarthurii*

Leaf dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	12.2871	17.75**	0.71	Constant	0.357	0.651	0.55
Residual	12	0.6924			Branch	0.2097	0.0489	4.29**
Total	14	2.3488			Bark	0.1376	0.0529	2.6*

Leaf dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	13.220	8.74*	0.36	Constant	0.69	1.13	0.61
Residual	13	1.512			$(Dbh)^2$	0.01201	0.00406	2.96
Total	14	2.349						

Branch dry mass (kg/tree) : Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	193.761	19.89**	0.57	Constant	0.59	2.27	0.26
Residual	13	9.741			Leaf	2.427	0.544	4.46**
Total	14	22.885						

Branch dry mass (kg/tree) : Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	0	*	*	0.00	Constant	10.06	1.24	8.15
Residual	14	22.89						
Total	14	22.89						

Dead matter dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	0	*	*	0.00	Constant	3.951	0.875	4.52**
Residual	14	11.47						
Total	14	11.47						

Dead matter dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	0	*	*	0.00	Constant	3.951	0.875	4.52
Residual	14	11.47						
Total	14	11.47						

Bark dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	187.108	28**	0.66	Constant	2.09	1.71	1.22
Residual	13	6.682			Bole	0.1169	0.0221	5.29**
Total	14	19.569						

Bark dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	203.551	37.58**	0.72	Constant	-2.18	2.14	-1.02
Residual	13	5.417			$(Dbh)^2$	0.04714	0.00769	6.13**
Total	14	19.569						

Bole dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	9356.1	28**	0.66	Constant	10.4	12.5	0.84
Residual	13	334.1			Bark	5.84	1.10	5.29**
Total	14	978.5						

Bole dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	3	4515.09	322.03**	0.99	Constant	-155.6	12.5	-12.45
Residual	11	14.02			$(Dbh)^2$	0.2468	0.0243	10.17**
Total	14	978.54			Height	5.745	0.800	7.18**
					F-factor	169.2	32.4	5.23**

Table 4.2.7. Regression analysis of biomass components and mensurational parameters on single components: *E. nitens*

Leaf dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	95.258	65.34**	0.90	Constant	-0.624	0.723	-0.86
Residual	12	1.458			Branch	0.3766	0.0564	6.67**
Total	14	14.858			Bole	0.0333	0.0110	3.04*

Leaf dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	62.945	36.11**	0.88	Constant	-23.89	4.44	-5.38
Residual	11	1.743			$(Dbh)^2$	0.03887	0.00511	7.61**
Total	14	14.858			1/Height	140.8	28.9	4.86**
					F-factor	33.69	9.31	3.62**

Branch dry mass (kg/tree) : Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	642.484	74.3**	0.84	Constant	0.84	1.50	0.56
Residual	13	8.647			Leaf	1.757	0.204	8.62**
Total	14	53.921						

Branch dry mass (kg/tree) : Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	278.97	17**	0.70	Constant	-36.49	8.84	-4.13
Residual	12	16.41			Dbh/Height	26.99	6.79	3.98**
Total	14	53.92			F-factor	70.0	22.8	3.07**

Dead matter dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	133.170	27.98**	0.79	Constant	-1.14	1.37	-0.83
Residual	12	4.760			Branch	0.4337	0.0957	4.53**
Total	14	23.104			Bark	0.404	0.168	2.41*

Dead matter dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	87.407	15.7**	0.76	Constant	-30.02	7.93	-3.78
Residual	11	5.567			$(Dbh)^2$	0.03877	0.00912	4.25*
Total	14	23.104			1/Height	146.0	51.7	2.82*
					F-factor	53.1	16.6	3.19**

Bark dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	217.297	98.07**	0.87	Constant	0.945	0.866	1.09
Residual	13	2.216			Bole	0.1041	0.0105	9.9**
Total	14	17.579						

Bark dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	107.646	41.93**	0.85	Constant	-8.34	3.36	-2.48
Residual	12	2.567			$(Dbh)^2$	0.02848	0.00506	5.63**
Total	14	17.579			F-factor	27.1	10.8	2.52*

Bole dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	17700.5	98.07**	0.87	Constant	0.63	8.17	0.08
Residual	13	180.5			Bark	8.481	0.856	9.9**
Total	14	1431.9						

Bole dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	9654.81	157.16**	0.96	Constant	16.5	11.0	1.50
Residual	12	61.43			$(Dbh)^2$	0.3846	0.0231	16.68**
Total	14	1431.92			Dbh/Height	-45.0	14.6	-3.08**

Table 4.2.8. Regression analysis of biomass components and mensurational parameters on single components: *E. saligna*

Leaf dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	3.289	0.273	12.05
Residual	14	1.116						
Total	14	1.116						

Leaf dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	3.289	0.273	12.05
Residual	14	1.116						
Total	14	1.116						

Branch dry mass (kg/tree) : Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	34.652	4.77*	0.21	Constant	3.91	2.35	1.66
Residual	13	7.265			Leaf	1.489	0.682	2.18
Total	14	9.221						

Branch dry mass (kg/tree) : Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	51.539	8.64*	0.35	Constant	2.52	2.23	1.13
Residual	13	5.966			$(Dbh)^2$	0.02425	0.00825	2.94*
Total	14	9.221						

Dead matter dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	3.466	0.607	5.71
Residual	14	5.530						
Total	14	5.530						

Dead matter dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	3.466	0.607	5.71
Residual	14	5.530						
Total	14	5.530						

Bark dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	51.051	30.07**	0.68	Constant	2.798	0.977	2.86
Residual	13	1.698			Bole	0.0697	0.0127	5.48
Total	14	5.223						

Bark dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	20.653	20.35**	0.81	Constant	-62.1	19.5	-3.18
Residual	11	1.015			$(Dbh)^2$	-0.0560	0.0237	-2.36*
Total	14	5.223			Height	2.186	0.639	3.42**
					Dbh/Height	51.0	16.4	3.12**

Bole dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	4188.6	23.43**	0.76	Constant	-28.2	15.7	-1.80
Residual	12	178.8			Bark	9.36	1.59	5.90
Total	14	751.6			Leaf	8.25	3.43	2.40

Bole dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	5050.72	143.91**	0.95	Constant	-58.6	15.0	-3.89
Residual	12	35.10			$(Dbh)^2$	0.2003	0.0466	4.3**
Total	14	751.61			Height	3.97	1.25	3.17**

Table 4.2.9. Regression analysis of biomass components and mensurational parameters on single components: *E. smithii*

Leaf dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	25.216	10.5**	0.42	Constant	2.89	1.01	2.87*
Residual	12	2.403			Branch	0.1976	0.0610	3.24**
Total	13	4.157						

Leaf dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	30.979	16.11**	0.54	Constant	-9.49	3.84	-2.47
Residual	12				Dbh/Height	19.67	4.90	4.01**
Total	13							

Branch dry mass (kg/tree) : Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	301.38	10.5**	0.42	Constant	1.19	4.51	0.26
Residual	12	28.72			Leaf	2.361	0.729	3.24**
Total	13	49.69						

Branch dry mass (kg/tree) : Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	347.15	13.94**	0.50	Constant	-36.3	13.8	-2.63
Residual	12				Dbh/Height	65.8	17.6	3.73**
Total	13							

Dead matter dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	0	*	*	0.00	Constant	4.570	0.682	6.7**
Residual	13	6.518						
Total	13	6.518						

Dead matter dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	31.318	7.04*	0.32	Constant	13.56	3.44	3.95
Residual	12				1/Height	-182.5	68.8	-2.65*
Total	13							

Bark dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	86.825	24.68**	0.79	Constant	-2.57	1.88	-1.37
Residual	11	3.519			Leaf	0.799	0.263	3.04*
Total	13	16.335			Bole	0.0803	0.0149	5.4**

Bark dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	151.287	29.73**	0.69	Constant	-3.05	2.41	-1.26
Residual	12				$(Dbh)^2$	0.04790	0.00878	5.45**
Total	13							

Bole dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	11242.9	23.8**	0.64	Constant	23.9	15.6	1.53
Residual	12	472.4			Bark	7.28	1.49	4.88**
Total	13	1300.9						

Bole dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	7981.12	92.45**	0.93	Constant	74.1	26.1	2.83
Residual	11				$(Dbh)^2$	0.4988	0.0369	13.5**
Total	13				Dbh/Height	-144.1	33.5	-4.3**

Table 4.2.10. Regression analysis of biomass components and mensurational parameters on single components: *E. viminalis*

Leaf dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	8.5081	10.57**	0.67	Constant	-0.383	0.921	-0.42
Residual	11	0.8049			Branch	0.474	0.122	3.88**
Total	14	2.4556			Dead	-0.468	0.190	-2.46*
					Bark	0.1711	0.0456	3.75**

Leaf dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	11.152	6.24*	0.27	Constant	-0.58	1.97	-0.29
Residual	13	1.787			Dbh	0.310	0.124	2.5*
Total	14	2.456						

Branch dry mass (kg/tree) : Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	23.848	8.91**	0.53	Constant	2.88	1.35	2.13
Residual	12	2.675			Leaf	0.806	0.280	2.88*
Total	14	5.700			Dead	0.793	0.283	2.81*

Branch dry mass (kg/tree) : Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	8.002	0.616	12.98
Residual	14	5.700						
Total	14	5.700						

Dead matter dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	10.817	6.13*	0.27	Constant	-0.81	1.24	-0.66
Residual	13	1.764			Branch	0.368	0.149	2.48*
Total	14	2.411						

Dead matter dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	2.132	0.401	5.32
Residual	14	2.411						
Total	14	2.411						

Bark dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	395.082	265.73**	0.95	Constant	0.786	0.689	1.14
Residual	13	1.487			Bole	0.13570	0.00832	16.3**
Total	14	29.601						

Bark dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	388.368	193.87**	0.69	Constant	-17.78	2.08	-8.53
Residual	13	2.003			Dbh	1.830	0.131	13.92**
Total	14	29.601						

Bole dry mass (kg/tree): Biomass model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	20453.10	265.73**	0.95	Constant	-2.09	5.17	-0.4
Residual	13	76.97			Bark	7.025	0.431	16.3**
Total	14	1532.41						

Bole dry mass (kg/tree): Mensurational model

Summary of analysis					Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	10397.08	189.17**	0.93	Constant	-260.3	35.6	-7.31
Residual	12	54.96			Height	11.541	0.593	19.45**
Total	14	1532.41			Dbh/Height	139.1	38.8	3.59**

Table 4.2.11. Regression analysis of biomass components and mensurational parameters on single components: *Transversae: E. deani + E. grandis + E. saligna*

Leaf dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	186.598	123.88**	0.74	Constant	-0.662	0.464	-1.43
Residual	43	1.506			Branch	0.5351	0.0481	11.13**
Total	44	5.713						

Leaf dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	60.937	19.76**	0.46	Constant	4.52	1.93	2.35
Residual	42	3.083			$(Dbh)^2$	0.03297	0.00657	5.02**
Total	44	5.713			Height	-0.459	0.168	-2.73*

Branch dry mass (kg/tree) : Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	251.077	70.54**	0.76	Constant	1.711	0.862	1.98
Residual	42	3.559			Leaf	1.150	0.158	7.26**
Total	44	14.810			Bark	0.315	0.138	2.27*

Branch dry mass (kg/tree) : Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	188.495	28.82**	0.56	Constant	10.60	2.81	3.78
Residual	42	6.539			$(Dbh)^2$	0.05993	0.00957	6.26**
Total	44	14.810			Height	-0.882	0.245	-3.6**

Dead matter dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	3.331	0.311	10.7**
Residual	44	4.363						
Total	44	4.363						

Dead matter dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	0	*	*	0.00	Constant	3.331	0.311	10.70
Residual	44	4.363						
Total	44	4.363						

Bark dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	276.747	227.02**	0.84	Constant	2.687	0.378	7.11**
Residual	43	1.219			Bole	0.07335	0.00487	15.07**
Total	44	7.481						

Bark dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	132.788	87.7**	0.80	Constant	-18.53	2.75	-6.74
Residual	42	1.514			Height	0.7545	0.0572	13.2**
Total	44	7.481			Dbh/Height	14.40	2.65	5.44**

Bole dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	43245.1	227.02**	0.84	Constant	-19.68	6.29	-3.13**
Residual	43	190.5			Bark	11.462	0.761	15.07**
Total	44	1169.0						

Bole dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	24074.24	307.55**	0.93	Constant	19.9	15.0	1.33
Residual	42	78.28			$(Dbh)^2$	0.3783	0.0153	24.8**
Total	44	1169.00			Dbh/Height	-56.1	18.1	-3.11**

Table 4.2.12. Regression analysis of biomass components and mensurational parameters on single components: *Viminales: E. dunnii + E. macarthurii + E. nitens + E. smithii + E. viminalis*

Leaf dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	155.366	74.86**	0.67	Constant	0.367	0.427	0.86
Residual	71	2.075			BRd	0.2888	0.0312	9.26**
Total	73	6.275			BOd	0.01871	0.00438	4.27**

Leaf dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	98.958	42.97**	0.63	Constant	-9.57	1.83	-5.24
Residual	70	2.303			Dbh	0.9273	0.0990	9.37**
Total	73	6.275			Height	-0.5343	0.0872	-6.13**
					F-factor	29.18	4.93	5.92**

Branch dry mass (kg/tree) : Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	1447.03	106.07**	0.59	Constant	1.803	0.956	1.89
Residual	72	13.64			LEd	1.777	0.173	10.3**
Total	73	33.28						

Branch dry mass (kg/tree) : Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	347.86	17.57**	0.41	Constant	-36.77	6.72	-5.47
Residual	70	19.80			Dbh	0.338	0.183	1.85
Total	73	33.28			Dbh/Height	24.82	5.53	4.49**
					F-factor	62.2	14.4	4.33**

Dead matter dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	270.55	26.7**	0.26	Constant	0.033	0.824	0.04
Residual	72	10.13			LEd	0.769	0.149	5.17**
Total	73	13.70						

Dead matter dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	488.09	23.85**	0.39	Constant	-35.77	6.81	-5.25
Residual	71	20.47			Dbh/Height	28.58	5.23	5.47**
Total	73	33.28			F-factor	66.1	14.5	4.57**

Bark dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	1	1456.305	204.71**	0.74	Constant	1.927	0.691	2.79
Residual	72	7.114			BOd	0.1088	0.0076	14.31**
Total	73	26.966						

Bark dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	527.621	95.77**	0.80	Constant	7.80	8.22	0.95
Residual	70	5.509			Dbh	2.724	0.529	5.15**
Total	73	26.966			Height	-0.995	0.443	-2.25*
					Dbh/Height	-25.91	9.63	-2.69*

Bole dry mass (kg/tree): Biomass model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	2	48003.0	126.14**	0.77	Constant	-2.13	5.95	-0.36
Residual	71	380.6			BAd	6.079	0.483	12.6**
Total	73	1685.3			LEd	3.62	1.00	3.62**

Bole dry mass (kg/tree): Mensurational model

	Summary of analysis				Regression coefficients			
	df	MS	VR	R^2		Estimate	SE	t
Regression	3	37951.1	289.61**	0.92	Constant	-90.3	17.3	-5.22
Residual	70	131.0			Dbh	13.403	0.472	28.41**
Total	73	1685.3			Dbh/Height	-95.5	14.2	-6.71**
					F-factor	103.4	37.0	2.79*

Table 4.2.13. Regression analysis of biomass components and mensurational parameters on single biomass components: All species

Leaf dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	327.181	180.1**	0.71	Constant	0.148	0.265	0.56
Residual	146	1.817			Branch	0.2755	0.0236	11.65**
Total	148	6.214			Bole	0.02196	0.00318	6.91**

Leaf dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	3	157.574	51.13**	0.5	Constant	-6.60	1.45	-4.57
Residual	145	3.082			$(Dbh)^2$	0.01491	0.00150	9.97**
Total	148	6.214			Dbh/Height	7.53	1.62	4.66**
					F-factor	3.166	0.715	4.43**

Branch dry mass (kg/tree) : Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	2716.88	237.07**	0.62	Constant	2.354	0.593	3.97**
Residual	147	11.46			Leaf	1.719	0.112	15.4**
Total	148	29.74						

Branch dry mass (kg/tree) : Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	3	565.38	30.3**	0.37	Constant	-13.22	3.56	-3.72
Residual	145	18.66			$(Dbh)^2$	0.02510	0.00368	6.82**
Total	148	29.74			Dbh/Height	15.96	3.97	4.02**
					F-factor	10.50	1.76	5.97**

Dead matter dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	248.762	33.31**	0.18	Constant	1.122	0.478	2.34*
Residual	147	7.467			Leaf	0.5201	0.0901	5.77**
Total	148	9.098						

Dead matter dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	67.718	8.16**	0.09	Constant	-6.56	2.53	-2.60
Residual	146	8.295			Height	0.1928	0.0661	2.92**
Total	148	9.098			Dbh/Height	7.75	2.33	3.33**

Bark dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	2386.008	400.27**	0.73	Constant	1.89	0.427	4.43**
Residual	147	5.961			Bole	0.09897	0.00495	20.01**
Total	148	22.042						

Bark dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	1	2371.849	391.56**	0.73	Constant	-0.857	0.558	-1.54
Residual	147	6.057			$(Dbh)^2$	0.03940	0.00199	19.79**
Total	148	22.042						

Bole dry mass (kg/tree): Biomass model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	2	96786.7	282.37**	0.79	Constant	-3.35	3.72	-0.90
Residual	146	342.8			Bark	6.036	0.382	15.8**
Total	148	1646.1			Leaf	4.821	0.719	6.7**

Bole dry mass (kg/tree): Mensurational model

Summary of analysis	df	MS	VR	R^2	Regression coefficients	Estimate	SE	t
Regression	3	76284.7	749.27**	0.94	Constant	29.57	8.31	3.56
Residual	145	101.8			$(Dbh)^2$	0.40585	0.00860	47.21**
Total	148	1646.1			Dbh/Height	-76.56	9.28	-8.25**
					F-factor	10.84	4.11	2.64*

Table 4.3. Simple correlation coefficients between dry mass of biomass components and selected foliar nutrient concentrations

E. deanei [P<0.05: r = 0.514   P<0.01: r = 0.641]

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	0.009	-0.350	-0.323	-0.304	-0.195	0.045	-0.087	-0.068	-0.048	0.096
Branch	0.127	-0.374	-0.341	-0.269	-0.215	-0.074	-0.076	-0.108	-0.104	0.155
Dead	0.200	0.295	0.263	-0.273	0.307	-0.252	-0.547	0.213	0.148	0.610
Bark	0.008	-0.261	-0.224	-0.339	-0.103	-0.206	-0.356	0.126	0.217	0.257
Bole	-0.100	-0.162	-0.117	-0.504	-0.033	-0.202	-0.467	0.258	0.358	0.213

E. dunnii [P<0.05: r = 0.514   P<0.01: r = 0.641]

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	-0.153	-0.038	-0.168	0.119	0.132	0.223	0.205	0.143	-0.194	-0.282
Branch	-0.072	0.112	-0.115	-0.059	0.195	0.001	0.090	0.117	-0.060	-0.129
Dead	0.509	0.015	-0.106	0.089	-0.227	-0.255	-0.044	-0.259	-0.205	-0.076
Bark	0.186	0.289	0.019	-0.252	-0.314	-0.201	-0.256	-0.041	-0.193	-0.151
Bole	-0.017	0.261	0.075	-0.162	-0.178	0.027	-0.248	0.053	-0.099	-0.200

E. elata [P<0.05: r = 0.514   P<0.01: r = 0.641]

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	0.303	0.484	-0.087	0.264	-0.191	0.466	0.144	0.121	0.548	0.364
Branch	0.323	0.384	-0.241	0.161	0.020	0.171	-0.137	0.152	0.354	0.399
Dead	0.344	0.299	-0.389	-0.075	-0.411	0.249	0.280	-0.143	0.324	0.463
Bark	0.332	0.522	-0.152	0.309	-0.336	0.427	0.104	-0.004	0.548	0.506
Bole	0.265	0.528	-0.090	0.289	-0.270	0.421	0.145	0.123	0.565	0.473

E. fastigata [P<0.05: r = 0.514   P<0.01: r = 0.641]

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	0.146	-0.345	-0.406	0.063	-0.561	-0.154	-0.473	-0.388	0.108	-0.053
Branch	0.110	-0.369	-0.527	0.171	-0.559	-0.244	-0.377	-0.346	-0.067	-0.213
Dead	0.702	-0.176	-0.114	0.305	-0.434	0.186	-0.284	-0.586	0.250	-0.177
Bark	0.284	-0.108	-0.167	0.261	-0.650	0.130	-0.474	-0.409	0.349	0.140
Bole	0.170	-0.200	-0.234	0.067	-0.565	0.037	-0.478	-0.444	0.297	0.166

E. grandis [P<0.05: r = 0.514   P<0.01: r = 0.641]

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	-0.253	0.314	0.140	-0.386	0.131	-0.030	-0.179	-0.137	0.415	-0.079
Branch	-0.063	0.274	0.077	-0.411	0.043	-0.147	-0.203	-0.246	0.225	0.018
Dead	-0.089	-0.051	0.140	0.024	-0.181	-0.335	-0.465	0.131	-0.087	0.341
Bark	-0.033	0.456	0.090	-0.336	-0.079	-0.391	-0.376	-0.102	0.365	0.163
Bole	-0.118	0.477	0.099	-0.332	-0.044	-0.297	-0.332	-0.207	0.483	0.057

E. macarthurii [P<0.05: r = 0.514   P<0.01: r = 0.641]

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	-0.186	0.013	0.149	0.028	0.336	-0.212	-0.035	-0.108	0.098	0.341
Branch	0.019	0.042	0.054	-0.028	0.156	-0.141	-0.196	-0.234	0.202	0.221
Dead	-0.341	-0.023	0.009	-0.315	-0.097	-0.261	0.207	0.286	-0.037	0.106
Bark	-0.394	0.135	0.051	-0.019	0.438	-0.465	-0.276	0.196	0.263	0.649
Bole	-0.393	-0.028	-0.103	-0.140	0.093	-0.401	-0.376	0.068	0.336	0.524

E. nitens [P<0.05: r = 0.514   P<0.01: r = 0.641]

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	0.334	-0.229	-0.503	0.041	-0.271	0.459	-0.163	-0.274	-0.397	-0.160
Branch	0.152	-0.134	-0.384	0.047	-0.241	0.240	-0.099	-0.296	-0.297	-0.179
Dead	0.455	-0.318	-0.435	0.052	-0.173	0.212	-0.041	-0.282	-0.670	-0.068
Bark	0.478	-0.525	-0.376	-0.277	-0.303	0.203	-0.222	-0.453	-0.534	-0.046
Bole	0.560	-0.544	-0.438	-0.193	-0.427	0.381	-0.346	-0.432	-0.579	-0.115

Table 4.3. Simple correlation coefficients between dry mass of biomass components and selected foliar nutrient concentrations

E. saligna [P<0.05: r = 0.514   P<0.01: r = 0.641]

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	0.348	0.276	0.170	0.011	-0.045	-0.530	0.206	-0.062	-0.156	-0.163
Branch	0.196	-0.034	-0.142	-0.251	-0.484	-0.581	-0.094	-0.341	-0.364	-0.288
Dead	0.094	-0.090	-0.121	0.171	-0.273	0.384	-0.098	-0.186	0.098	-0.044
Bark	-0.210	0.257	0.153	-0.369	0.070	-0.550	0.253	0.333	0.050	0.280
Bole	-0.267	0.372	0.204	-0.425	0.075	-0.536	0.050	0.192	0.233	0.335

E. smithii [P<0.05: r = 0.514   P<0.01: r = 0.641]

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	0.560	0.009	-0.119	0.159	-0.563	-0.216	0.074	-0.383	-0.453	-0.235
Branch	0.391	-0.221	-0.325	-0.101	-0.443	-0.171	0.040	-0.351	-0.312	-0.228
Dead	0.160	-0.241	-0.327	-0.508	0.021	-0.180	-0.198	-0.177	0.204	0.266
Bark	0.373	0.210	-0.154	0.040	-0.376	-0.478	0.054	-0.347	-0.092	-0.049
Bole	0.262	0.175	-0.294	0.023	-0.319	-0.512	-0.124	-0.275	0.375	0.027

E. viminalis [P<0.05: r = 0.514   P<0.01: r = 0.641]

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	-0.009	-0.039	-0.148	0.093	0.393	-0.033	0.040	-0.217	-0.080	-0.221
Branch	0.052	-0.408	-0.238	-0.034	0.186	0.001	0.392	-0.293	-0.337	-0.250
Dead	0.661	-0.131	-0.463	0.145	-0.317	-0.224	0.214	-0.384	-0.586	-0.371
Bark	0.194	0.100	-0.152	0.385	0.061	-0.390	-0.024	-0.371	-0.088	-0.079
Bole	0.168	0.181	-0.065	0.285	0.067	-0.387	-0.091	-0.423	0.015	0.007

***Transversae: E. deanei + E. grandis + E. saligna** [P< 0.05: r=0.294; P<0.01: r=0.381]*

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	0.055	-0.040	-0.081	-0.238	-0.134	0.058	-0.007	-0.174	0.033	0.006
Branch	0.128	-0.070	-0.154	-0.276	-0.255	-0.095	-0.081	-0.254	-0.083	0.001
Dead	0.152	0.064	0.109	0.007	-0.108	0.008	-0.272	-0.124	-0.029	0.255
Bark	-0.082	0.108	-0.040	-0.346	-0.031	-0.271	-0.231	0.142	0.224	0.227
Bole	-0.170	0.214	0.030	-0.424	0.015	-0.254	-0.319	0.101	0.379	0.184

***Viminales: E. dunnii + E. mac. + E. nitens + E. smithii + E. vim.** [P< 0.05: r=0.235; P<0.01: r=0.305]*

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	0.014	-0.165	-0.315	-0.144	-0.157	-0.173	-0.140	-0.202	-0.268	-0.262
Branch	0.108	-0.132	-0.242	-0.233	-0.170	-0.118	-0.204	-0.302	-0.210	-0.163
Dead	-0.008	-0.260	-0.298	-0.314	-0.233	-0.409	-0.253	-0.318	-0.294	-0.164
Bark	0.156	0.131	-0.071	0.128	0.022	0.013	0.045	-0.005	-0.030	0.081
Bole	0.097	0.067	-0.154	-0.062	-0.128	-0.031	-0.171	-0.148	0.041	-0.033

***Combined: All species** [P< 0.05: r=0.159; P<0.01: r=0.208]*

	Fe	Cu	Zn	Mn	P	Na	Ca	Mg	K	N
Leaf	0.033	-0.104	-0.221	-0.150	-0.214	-0.071	-0.149	-0.232	-0.085	-0.112
Branch	0.132	-0.101	-0.196	-0.180	-0.212	-0.041	-0.217	-0.273	-0.113	-0.045
Dead	0.043	-0.171	-0.213	-0.192	-0.233	-0.203	-0.223	-0.277	-0.171	-0.066
Bark	0.100	0.175	0.014	0.076	-0.067	-0.085	-0.083	-0.119	0.158	0.189
Bole	0.023	0.126	-0.088	-0.104	-0.160	-0.118	-0.209	-0.122	0.197	0.090

Table 4.4.1. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *E. deanei**

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) *Ca*	*Mg*	*K*	*Na*	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acid. (cmol(+)/kg)
Leaf									
N	-0.174	-0.013	-0.024	0.210	-0.053	0.562	0.077	0.438	0.047
P	0.629	0.427	0.527	0.344	0.606	-0.423	0.537	-0.517	-0.559
K	-0.303	-0.503	-0.632	-0.353	-0.618	0.133	-0.521	0.197	0.471
Ca	0.243	0.660	0.788	0.495	0.664	-0.143	0.721	-0.027	-0.571
Mg	0.104	0.305	0.375	0.054	0.298	-0.143	0.218	-0.036	-0.243
Na	-0.299	-0.243	-0.061	-0.221	-0.027	0.173	-0.169	0.261	0.086
Branch									
N	-0.371	0.079	0.185	0.427	-0.005	0.515	0.246	0.484	0.015
P	-0.049	0.398	0.457	0.624	0.338	0.428	0.535	0.262	-0.306
K	-0.314	-0.473	-0.513	-0.185	-0.509	0.047	-0.485	0.119	0.403
Ca	0.459	0.742	0.792	0.499	0.721	-0.047	0.875	-0.109	-0.664
Mg	0.012	-0.003	0.031	0.556	0.140	-0.299	0.191	-0.009	-0.158
Na	0.013	0.280	0.521	0.117	0.365	0.023	0.415	-0.094	-0.423
Dead									
N	0.653	0.793	0.664	0.172	0.577	-0.002	0.686	-0.400	-0.620
P	0.552	0.520	0.486	-0.079	0.452	-0.167	0.450	-0.626	-0.682
K	0.096	-0.011	0.024	0.349	0.273	-0.455	0.034	-0.046	-0.186
Ca	0.512	0.554	0.666	0.463	0.695	-0.109	0.609	-0.204	-0.483
Mg	0.265	-0.006	0.043	0.241	0.172	-0.198	-0.034	-0.142	0.062
Na	0.201	0.230	0.266	-0.040	0.263	-0.222	0.218	-0.213	-0.325
Bark									
N	-0.410	-0.104	-0.018	0.049	-0.245	0.460	0.037	0.231	0.126
P	0.788	0.822	0.853	0.300	0.879	-0.246	0.861	-0.587	-0.915
K	0.150	0.107	0.069	0.516	0.244	0.051	0.163	0.129	0.028
Ca	0.093	0.335	0.497	0.225	0.404	-0.248	0.443	0.029	-0.286
Mg	0.294	0.325	0.489	0.204	0.434	-0.441	0.360	-0.429	-0.454
Na	-0.537	-0.338	-0.258	0.019	-0.200	0.561	-0.297	0.724	0.465
Bole									
N	-0.245	0.047	0.163	0.330	0.025	0.095	0.121	0.242	-0.036
P	0.076	0.203	0.375	0.399	0.389	-0.123	0.315	-0.026	-0.265
K	0.377	0.060	0.123	-0.090	0.220	0.159	0.114	-0.371	-0.235
Ca	0.402	0.862	0.769	0.541	0.623	-0.025	0.838	-0.110	-0.651
Mg	-0.060	-0.094	0.047	-0.238	-0.011	0.001	-0.143	-0.178	0.131
Na	0.408	0.707	0.752	0.093	0.632	0.126	0.721	-0.106	-0.488
	* $P<0.05$: $r = 0.514$			* $P<0.01$: $r = 0.641$					

Table 4.4.2. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *E. dunnii**									
Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg)				P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
		Ca	*Mg*	*K*	*Na*				
Leaf									
N	-0.640	-0.302	-0.267	0.311	0.051	0.150	-0.296	0.339	0.285
P	0.272	0.538	0.505	0.363	0.446	-0.501	0.510	-0.442	-0.509
K	-0.642	-0.356	-0.453	0.108	-0.228	0.585	-0.450	0.495	0.487
Ca	0.830	0.655	0.733	0.166	0.552	-0.268	0.745	-0.191	-0.695
Mg	0.340	0.525	0.557	0.152	0.500	-0.261	0.564	0.187	-0.474
Na	-0.405	-0.306	-0.232	-0.276	-0.172	0.464	-0.212	0.469	0.192
Branch									
N	0.408	0.309	0.275	-0.262	0.224	0.226	0.297	-0.263	-0.193
P	0.719	0.539	0.575	-0.141	0.392	-0.196	0.617	-0.474	-0.625
K	0.007	0.001	-0.057	-0.199	0.044	0.592	-0.009	0.051	0.049
Ca	0.543	0.355	0.463	0.306	0.510	0.007	0.465	0.030	-0.411
Mg	0.061	0.019	0.103	-0.108	0.156	-0.139	0.140	0.190	-0.217
Na	0.283	0.345	0.393	0.359	0.302	-0.086	0.391	-0.380	-0.551
Dead									
N	0.088	-0.073	-0.063	-0.057	-0.141	0.104	-0.111	-0.008	0.233
P	0.280	0.223	0.241	0.196	0.118	0.019	0.198	-0.325	-0.150
K	-0.280	-0.109	-0.192	-0.123	-0.121	-0.185	-0.154	-0.070	0.249
Ca	0.508	0.550	0.627	0.459	0.528	-0.109	0.609	0.277	-0.487
Mg	0.193	-0.047	-0.035	0.042	0.037	-0.178	-0.049	0.079	0.194
Na	0.232	0.223	0.101	-0.131	-0.041	0.035	0.137	-0.210	0.077
Bark									
N	-0.136	-0.253	-0.241	-0.337	-0.006	0.350	-0.216	-0.030	0.307
P	0.589	0.241	0.330	-0.029	0.349	-0.338	0.345	-0.658	-0.471
K	-0.176	0.086	-0.013	0.343	-0.015	-0.131	-0.033	-0.188	-0.078
Ca	0.361	0.460	0.521	0.486	0.488	0.094	0.503	0.387	-0.288
Mg	0.250	0.289	0.347	0.115	0.409	-0.170	0.395	-0.150	-0.468
Na	-0.155	0.008	0.009	-0.007	0.295	0.406	0.014	0.144	0.108
Bole									
N	-0.155	0.014	-0.032	-0.030	0.030	0.233	-0.057	0.341	0.271
P	0.744	0.854	0.899	0.539	0.634	-0.400	0.882	-0.235	-0.856
K	0.449	0.361	0.280	-0.142	-0.158	-0.161	0.265	-0.432	-0.201
Ca	0.533	0.198	0.326	0.239	0.393	-0.101	0.300	-0.379	-0.353
Mg	0.281	-0.192	-0.189	-0.297	-0.199	-0.167	-0.208	-0.430	0.142
Na	-0.003	-0.390	-0.362	-0.259	0.108	0.577	-0.350	0.040	0.367
	* *P<0.05: r = 0.514*			* *P<0.01: r = 0.641*					

Table 4.4.3. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *E. elata**

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) *Ca*	*Mg*	*K*	*Na*	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
Leaf									
N	-0.344	-0.215	-0.208	-0.292	-0.284	0.604	-0.179	0.360	0.334
P	0.319	0.407	0.425	0.378	0.354	-0.069	0.398	-0.105	-0.441
K	-0.135	-0.400	-0.387	-0.319	-0.021	0.102	-0.404	0.046	0.334
Ca	-0.002	0.147	0.188	0.380	0.169	0.254	0.172	0.151	-0.136
Mg	0.145	0.361	0.407	0.450	0.180	-0.033	0.395	-0.138	-0.393
Na	0.055	0.122	0.194	0.062	0.599	-0.359	0.167	-0.226	-0.401
Branch									
N	0.005	0.035	0.090	0.224	0.131	0.315	0.050	0.309	0.055
P	0.200	0.204	0.237	0.222	0.137	-0.336	0.226	-0.488	-0.283
K	0.655	0.729	0.762	0.588	0.614	-0.429	0.734	-0.577	-0.735
Ca	0.657	0.795	0.739	0.578	0.384	-0.195	0.752	-0.400	-0.561
Mg	0.670	0.726	0.772	0.522	0.521	-0.580	0.787	-0.657	-0.881
Na	-0.412	-0.274	-0.236	-0.136	0.068	-0.176	-0.229	0.020	0.017
Dead									
N	0.158	0.127	0.161	-0.030	0.420	-0.638	0.130	-0.358	-0.309
P	0.341	0.371	0.436	-0.085	0.090	-0.129	0.492	-0.288	-0.415
K	-0.187	-0.104	-0.035	-0.096	-0.147	-0.277	0.011	-0.162	-0.167
Ca	0.570	0.586	0.485	0.648	0.365	-0.377	0.474	-0.348	-0.498
Mg	0.203	0.094	0.104	0.059	0.108	-0.423	0.124	-0.512	-0.290
Na	0.360	0.540	0.571	0.186	0.217	-0.043	0.591	-0.219	-0.494
Bark									
N	-0.477	-0.459	-0.562	-0.180	-0.616	0.373	-0.572	0.526	0.685
P	0.883	0.746	0.775	0.585	0.754	-0.668	0.726	-0.754	-0.760
K	-0.019	-0.193	-0.253	-0.096	-0.282	-0.332	-0.257	-0.344	0.283
Ca	-0.059	-0.079	-0.095	-0.059	0.062	0.529	-0.084	0.391	0.143
Mg	-0.004	0.104	0.123	-0.072	-0.072	0.268	0.170	-0.092	-0.100
Na	0.185	-0.025	-0.069	0.129	0.283	-0.166	-0.123	-0.077	0.141
Bole									
N	0.020	0.112	0.078	0.283	-0.293	0.169	0.107	0.275	0.062
P	0.521	0.523	0.561	0.526	0.364	-0.364	0.516	-0.550	-0.457
K	0.506	0.316	0.286	0.056	0.438	-0.084	0.236	-0.318	-0.124
Ca	0.337	0.605	0.697	0.567	0.357	-0.073	0.720	-0.276	-0.763
Mg	-0.237	-0.133	-0.100	-0.406	0.152	0.287	-0.062	0.050	0.059
Na	0.170	-0.118	-0.027	-0.115	0.378	0.033	-0.095	0.098	0.030
	* *P<0.05: r = 0.514*			* *P<0.01: r = 0.641*					

Table 4.4.4. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *E. fastigata**

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) *Ca*	*Mg*	*K*	*Na*	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
Leaf									
N	0.738	0.745	0.784	0.577	0.740	-0.309	0.730	-0.168	-0.660
P	0.894	0.857	0.824	0.627	0.709	-0.585	0.816	-0.630	-0.797
K	-0.317	-0.300	-0.383	-0.079	-0.619	0.730	-0.351	0.143	0.402
Ca	0.193	0.296	0.299	0.060	0.290	-0.221	0.279	0.204	-0.191
Mg	0.499	0.543	0.561	0.307	0.570	-0.482	0.529	-0.100	-0.517
Na	0.700	0.495	0.489	0.545	0.611	-0.546	0.558	-0.729	-0.532
Branch									
N	0.158	0.353	0.322	0.437	0.039	0.158	0.405	0.296	-0.331
P	0.807	0.920	0.899	0.646	0.716	-0.416	0.891	-0.317	-0.788
K	-0.258	-0.103	-0.227	0.134	-0.484	0.426	-0.130	0.185	0.199
Ca	0.595	0.781	0.695	0.836	0.509	-0.141	0.754	-0.120	-0.630
Mg	0.003	0.432	0.371	0.356	0.178	0.044	0.357	0.234	-0.216
Na	0.163	-0.056	-0.038	-0.164	0.045	-0.344	0.011	-0.376	-0.111
Dead									
N	0.399	0.211	0.196	0.222	0.301	-0.400	0.256	-0.588	-0.156
P	0.445	0.581	0.548	0.364	0.321	0.023	0.530	-0.384	-0.486
K	-0.023	0.226	0.328	0.058	0.285	0.027	0.277	0.242	-0.397
Ca	0.824	0.881	0.875	0.577	0.772	-0.486	0.865	-0.440	-0.784
Mg	0.680	0.700	0.745	0.406	0.868	-0.603	0.727	-0.207	-0.724
Na	0.549	0.727	0.784	0.479	0.628	-0.269	0.775	0.036	-0.798
Bark									
N	-0.822	-0.729	-0.741	-0.498	-0.846	0.638	-0.735	0.421	0.614
P	0.814	0.769	0.762	0.442	0.721	-0.677	0.738	-0.590	-0.714
K	-0.002	-0.381	-0.354	-0.334	-0.036	-0.015	-0.364	-0.406	0.210
Ca	-0.074	0.221	0.270	0.241	0.168	0.297	0.276	0.450	-0.279
Mg	0.525	0.697	0.794	0.509	0.708	-0.350	0.745	-0.123	-0.825
Na	0.269	0.135	0.222	0.323	0.472	-0.306	0.251	-0.058	-0.308
Bole									
N	0.273	0.281	0.302	0.121	0.131	-0.063	0.352	-0.428	-0.355
P	0.535	0.660	0.609	0.307	0.431	-0.186	0.599	-0.083	-0.386
K	0.498	0.439	0.332	0.484	0.139	0.175	0.405	-0.409	-0.237
Ca	0.388	0.405	0.591	0.163	0.624	-0.256	0.449	0.250	-0.560
Mg	0.146	0.119	0.124	-0.275	-0.099	0.106	0.049	-0.027	0.021
Na	0.185	0.139	0.181	0.279	0.309	0.220	0.165	0.265	-0.175
	* $P<0.05$: $r = 0.514$			* $P<0.01$: $r = 0.641$					

Table 4.4.5. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *E. grandis**

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) *Ca*	*Mg*	*K*	*Na*	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
Leaf									
N	-0.291	-0.184	-0.010	-0.219	-0.346	0.018	-0.129	0.159	0.143
P	0.624	0.788	0.740	0.427	0.419	-0.549	0.774	-0.424	-0.585
K	0.036	-0.168	-0.342	0.241	-0.452	-0.080	-0.227	-0.113	-0.041
Ca	0.437	0.531	0.705	0.386	0.660	-0.417	0.656	-0.068	-0.341
Mg	0.392	0.289	0.531	0.140	0.520	-0.239	0.363	0.140	-0.323
Na	-0.050	-0.056	-0.224	0.078	-0.314	0.647	-0.122	0.158	0.107
Branch									
N	0.368	0.386	0.518	0.407	0.528	0.266	0.484	0.330	-0.244
P	0.355	0.566	0.750	0.057	0.612	-0.168	0.621	0.036	-0.345
K	-0.057	-0.229	-0.154	-0.023	-0.228	0.076	-0.223	0.318	0.276
Ca	0.557	0.621	0.769	0.287	0.790	-0.266	0.665	-0.111	-0.543
Mg	-0.222	-0.096	0.214	-0.528	0.475	0.010	-0.016	0.235	-0.001
Na	-0.234	-0.223	-0.178	-0.289	0.000	0.048	-0.252	0.110	0.028
Dead									
N	0.331	0.188	0.144	0.278	-0.080	-0.152	0.132	-0.061	-0.152
P	0.739	0.834	0.620	0.691	0.182	-0.128	0.760	-0.278	-0.739
K	0.025	0.107	0.168	0.040	-0.217	0.053	0.103	0.092	-0.203
Ca	0.679	0.744	0.809	0.384	0.748	-0.626	0.756	-0.306	-0.727
Mg	0.789	0.690	0.571	0.532	0.508	-0.526	0.646	-0.323	-0.554
Na	0.145	0.456	0.356	-0.042	-0.015	-0.021	0.385	-0.186	-0.294
Bark									
N	-0.232	0.019	0.006	-0.005	-0.206	0.220	0.054	0.321	0.019
P	0.806	0.922	0.749	0.576	0.425	-0.494	0.863	-0.461	-0.837
K	0.174	0.013	0.112	-0.006	-0.030	-0.443	0.043	-0.323	-0.010
Ca	0.415	0.382	0.546	0.497	0.466	-0.076	0.492	0.223	-0.292
Mg	0.430	0.368	0.101	0.460	-0.136	-0.088	0.314	-0.374	-0.154
Na	-0.146	0.040	0.388	-0.201	0.492	-0.024	0.193	0.466	-0.008
Bole									
N	-0.122	0.255	0.421	-0.053	0.260	0.422	0.354	0.337	-0.001
P	0.700	0.788	0.829	0.612	0.535	-0.156	0.809	-0.064	-0.601
K	0.629	0.576	0.332	0.644	0.069	0.032	0.519	-0.123	-0.346
Ca	0.698	0.749	0.828	0.500	0.604	-0.622	0.803	-0.361	-0.793
Mg	0.324	0.186	0.237	0.310	0.244	-0.038	0.210	-0.058	-0.132
Na	0.098	0.314	0.279	0.063	0.136	0.081	0.346	0.064	-0.152
	* *P<0.05: r = 0.514*			* *P<0.01: r = 0.641*					

Table 4.4.6. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: E. *macarthurii**

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) *Ca*	*Mg*	*K*	*Na*	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
Leaf									
N	-0.116	-0.262	-0.209	-0.281	-0.156	0.260	-0.211	0.376	0.325
P	0.516	0.297	0.361	0.036	0.340	-0.126	0.301	-0.306	-0.294
K	-0.643	-0.644	-0.574	-0.603	-0.368	0.371	-0.607	0.598	0.684
Ca	0.569	0.744	0.679	0.597	0.535	-0.217	0.718	-0.416	-0.663
Mg	0.553	0.528	0.397	0.376	0.280	-0.199	0.463	-0.363	-0.425
Na	-0.553	-0.282	-0.333	-0.497	-0.175	0.484	-0.341	0.596	0.479
Branch									
N	0.294	0.211	0.096	-0.122	-0.151	0.371	0.156	0.034	0.006
P	0.563	0.653	0.698	0.423	0.694	0.009	0.653	-0.255	-0.642
K	-0.232	-0.239	-0.223	-0.540	-0.083	0.359	-0.275	0.483	0.339
Ca	0.675	0.542	0.720	0.785	0.649	-0.390	0.677	-0.590	-0.742
Mg	0.441	0.216	0.361	0.651	0.313	-0.580	0.337	-0.626	-0.520
Na	0.282	0.438	0.234	-0.056	-0.003	0.369	0.305	0.042	-0.179
Dead									
N	0.567	0.399	0.572	0.484	0.513	-0.480	0.492	-0.482	-0.549
P	0.352	0.598	0.651	0.501	0.429	0.286	0.697	-0.021	-0.455
K	-0.253	-0.177	-0.093	-0.056	-0.098	-0.008	-0.111	0.094	0.075
Ca	0.824	0.720	0.772	0.630	0.733	-0.392	0.738	-0.637	-0.778
Mg	0.507	0.543	0.606	0.673	0.708	-0.423	0.597	-0.531	-0.586
Na	0.017	0.354	0.420	0.116	0.148	0.493	0.420	0.267	-0.252
Bark									
N	-0.339	-0.459	-0.264	-0.262	-0.170	0.017	-0.357	0.314	0.349
P	0.520	0.375	0.493	0.516	0.242	-0.591	0.417	-0.651	-0.605
K	0.060	-0.074	0.017	0.211	0.018	-0.250	-0.016	-0.114	0.001
Ca	0.011	0.234	0.353	0.388	0.542	-0.047	0.320	0.086	-0.222
Mg	0.121	-0.019	0.183	0.258	0.344	-0.327	0.097	-0.270	-0.243
Na	-0.282	-0.319	-0.214	-0.281	0.087	0.081	-0.286	0.252	0.320
Bole									
N	0.709	0.685	0.582	0.495	0.476	-0.125	0.597	-0.574	-0.633
P	0.912	0.913	0.872	0.758	0.714	-0.146	0.900	-0.645	-0.858
K	0.486	0.355	0.370	0.173	0.116	0.200	0.348	-0.222	-0.315
Ca	0.574	0.589	0.621	0.821	0.725	-0.494	0.620	-0.636	-0.699
Mg	0.237	-0.114	-0.033	0.252	-0.036	-0.306	-0.048	-0.216	-0.035
Na	-0.197	-0.391	-0.281	-0.259	-0.151	-0.114	-0.353	-0.072	0.222
	* *P<0.05: r = 0.514*			* *P<0.01: r = 0.641*					

Table 4.4.7. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *E. nitens**

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) Ca	Mg	K	Na	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
Leaf									
N	0.361	0.452	0.513	0.282	0.178	-0.080	0.457	0.020	-0.314
P	0.582	0.633	0.532	0.430	0.687	-0.366	0.628	-0.615	-0.576
K	0.673	0.476	0.433	0.655	0.512	-0.122	0.473	-0.382	-0.604
Ca	0.335	0.403	0.494	0.242	0.129	-0.137	0.408	0.086	-0.479
Mg	0.550	0.499	0.533	0.174	0.261	-0.391	0.483	-0.033	-0.394
Na	-0.199	-0.155	-0.215	-0.342	-0.105	-0.154	-0.170	-0.102	0.144
Branch									
N	0.462	0.266	0.229	0.291	0.367	0.089	0.334	-0.392	-0.247
P	0.600	0.407	0.340	0.351	0.463	-0.100	0.468	-0.636	-0.383
K	0.067	-0.283	-0.355	0.120	-0.160	0.048	-0.276	-0.156	0.138
Ca	0.358	0.352	0.511	0.115	0.146	-0.193	0.442	-0.213	-0.445
Mg	0.675	0.592	0.529	0.486	0.624	-0.281	0.541	-0.303	-0.435
Na	-0.013	0.061	0.072	-0.297	0.120	-0.135	0.051	-0.178	0.116
Dead									
N	0.579	0.195	0.173	-0.126	0.400	-0.410	0.275	-0.534	-0.147
P	0.808	0.575	0.488	0.486	0.682	-0.106	0.622	-0.511	-0.556
K	0.087	-0.053	-0.072	0.136	-0.009	-0.040	-0.111	-0.032	0.093
Ca	0.804	0.749	0.776	0.436	0.742	-0.489	0.790	-0.554	-0.747
Mg	0.429	0.137	0.162	0.207	0.144	-0.247	0.135	-0.191	-0.157
Na	-0.197	-0.030	-0.003	0.248	0.114	0.357	-0.009	0.037	-0.123
Bark									
N	0.281	0.184	0.111	0.308	0.483	0.196	0.228	-0.119	-0.293
P	0.862	0.867	0.778	0.562	0.819	-0.199	0.871	-0.533	-0.728
K	-0.124	-0.173	-0.283	0.257	0.146	-0.044	-0.178	-0.295	-0.150
Ca	-0.036	0.237	0.280	0.250	0.269	0.484	0.281	0.155	-0.312
Mg	0.113	-0.052	0.132	-0.422	-0.099	-0.091	0.051	0.175	0.102
Na	-0.460	-0.229	-0.204	-0.217	-0.232	0.269	-0.254	0.548	0.236
Bole									
N	0.124	0.175	0.121	0.256	0.175	0.115	0.118	0.065	-0.046
P	0.634	0.665	0.725	0.278	0.521	-0.300	0.761	-0.613	-0.625
K	0.356	0.316	0.199	0.076	0.483	0.281	0.333	-0.260	-0.172
Ca	0.343	0.527	0.658	0.326	0.354	-0.229	0.551	-0.058	-0.633
Mg	-0.341	0.043	0.011	-0.195	-0.046	0.436	0.026	0.277	0.072
Na	-0.248	-0.167	-0.160	-0.198	-0.125	0.281	-0.144	0.162	0.031
	* $P<0.05$: $r = 0.514$			* $P<0.01$: $r = 0.641$					

Table 4.4.8. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *E. saligna**									
Biomass nutrient	**pH (KCl)**	**Exch. cations (cmol(+)/kg)**				**P (mg/kg)**	**S-value (clay)**	**Organic C (%)**	**Exch. acidity (cmol(+)/kg)**
		Ca	***Mg***	***K***	***Na***				
Leaf									
N	0.028	0.020	0.127	-0.070	0.399	0.033	0.100	0.244	-0.082
P	0.598	0.624	0.620	0.426	0.506	-0.394	0.615	-0.496	-0.554
K	-0.123	-0.383	-0.434	-0.201	-0.279	0.060	-0.412	0.277	0.293
Ca	-0.268	-0.050	0.113	0.189	0.337	0.082	0.094	0.027	0.134
Mg	-0.163	0.161	0.372	-0.014	0.576	-0.089	0.320	0.236	-0.225
Na	-0.663	-0.661	-0.668	-0.621	-0.395	0.417	-0.657	0.523	0.597
Branch									
N	-0.116	0.026	0.074	0.110	0.157	0.380	0.076	0.035	0.213
P	0.622	0.713	0.681	0.644	0.369	-0.085	0.707	-0.341	-0.506
K	0.329	0.316	0.255	0.082	0.242	-0.128	0.281	-0.132	-0.270
Ca	0.322	0.559	0.707	0.355	0.816	-0.267	0.675	-0.011	-0.555
Mg	-0.058	0.338	0.512	0.065	0.653	-0.086	0.478	0.194	-0.281
Na	-0.326	-0.255	-0.216	-0.463	0.160	-0.527	-0.217	0.107	0.039
Dead									
N	0.525	0.496	0.354	0.244	-0.085	-0.346	0.409	-0.316	-0.419
P	0.432	0.518	0.468	0.709	0.161	0.156	0.502	-0.128	-0.372
K	-0.042	-0.001	-0.086	0.347	-0.248	0.025	-0.044	-0.246	-0.070
Ca	0.852	0.817	0.775	0.459	0.511	-0.577	0.773	-0.588	-0.841
Mg	0.279	0.392	0.492	0.355	0.472	-0.490	0.459	-0.425	-0.461
Na	-0.093	0.178	0.153	0.268	-0.045	0.604	0.187	0.236	0.036
Bark									
N	-0.375	0.001	0.114	-0.041	0.136	0.208	0.087	0.427	-0.016
P	0.650	0.763	0.738	0.588	0.625	-0.360	0.777	-0.383	-0.712
K	0.033	-0.037	0.065	-0.092	0.410	-0.400	0.018	-0.379	-0.019
Ca	0.078	0.193	0.314	0.343	0.494	0.011	0.282	-0.077	-0.202
Mg	0.358	0.474	0.518	0.388	0.244	0.044	0.497	0.084	-0.377
Na	-0.360	-0.268	-0.188	-0.585	0.097	-0.154	-0.214	0.361	0.266
Bole									
N	-0.213	-0.008	0.071	-0.322	0.100	0.534	0.025	0.249	0.094
P	0.827	0.844	0.765	0.453	0.372	-0.272	0.790	-0.435	-0.737
K	0.544	0.328	0.184	0.223	-0.068	0.203	0.229	-0.126	-0.176
Ca	0.299	0.443	0.519	0.321	0.508	-0.489	0.509	-0.450	-0.445
Mg	-0.562	-0.378	-0.363	-0.632	-0.333	0.491	-0.392	0.509	0.397
Na	-0.487	-0.555	-0.539	-0.592	-0.437	0.250	-0.556	0.644	0.586
	** P<0.05: r = 0.514*			** P<0.01: r = 0.641*					

Table 4.4.9. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *E. smithii**

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) *Ca*	*Mg*	*K*	*Na*	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
Leaf									
N	-0.320	-0.412	-0.247	-0.378	-0.037	-0.086	-0.338	0.372	0.328
P	0.611	0.712	0.511	0.284	0.343	-0.389	0.587	-0.578	-0.459
K	-0.464	-0.644	-0.677	-0.306	-0.535	0.300	-0.672	0.555	0.677
Ca	0.416	0.485	0.451	0.191	0.733	-0.336	0.399	-0.115	-0.074
Mg	0.469	0.507	0.639	0.113	0.521	-0.347	0.537	-0.105	-0.419
Na	-0.162	-0.194	-0.093	-0.090	0.062	0.316	-0.177	0.259	0.226
Branch									
N	-0.184	-0.140	-0.135	-0.356	-0.153	0.495	-0.102	0.345	0.107
P	0.418	0.353	0.187	0.054	0.247	0.090	0.259	-0.262	-0.152
K	-0.306	-0.451	-0.585	-0.239	-0.316	0.325	-0.520	0.397	0.485
Ca	0.626	0.552	0.740	0.177	0.637	-0.342	0.674	-0.198	-0.509
Mg	0.157	0.025	0.140	-0.050	0.294	-0.111	0.115	-0.030	-0.120
Na	0.008	0.250	0.168	-0.221	-0.053	0.305	0.209	-0.095	-0.237
Dead									
N	0.586	0.381	0.309	0.535	0.159	-0.206	0.415	-0.591	-0.379
P	0.529	0.639	0.488	0.486	0.115	0.218	0.596	-0.572	-0.674
K	0.074	-0.146	0.034	0.081	-0.148	0.252	-0.021	0.147	-0.038
Ca	0.558	0.768	0.699	0.564	0.602	-0.179	0.717	-0.452	-0.390
Mg	0.434	0.635	0.691	0.509	0.574	-0.309	0.661	-0.473	-0.525
Na	0.326	0.385	0.534	0.139	-0.009	0.179	0.532	-0.320	-0.600
Bark									
N	0.134	0.190	0.250	-0.042	0.022	0.246	0.287	-0.162	-0.228
P	0.715	0.887	0.741	0.448	0.514	-0.269	0.823	-0.570	-0.653
K	-0.051	-0.225	-0.224	0.017	0.200	-0.117	-0.237	0.276	0.384
Ca	0.100	0.212	0.429	0.262	0.408	0.145	0.306	0.336	-0.149
Mg	-0.033	-0.051	-0.001	-0.132	0.157	-0.025	-0.037	0.109	0.093
Na	0.200	-0.099	-0.062	0.227	0.639	-0.035	-0.079	0.002	0.226
Bole									
N	-0.178	-0.231	-0.083	-0.561	-0.018	0.135	-0.157	0.550	0.233
P	0.775	0.803	0.682	0.330	0.494	-0.470	0.747	-0.674	-0.766
K	0.461	0.292	0.175	0.135	0.024	0.265	0.272	-0.346	-0.329
Ca	0.565	0.570	0.717	0.479	0.635	-0.572	0.646	-0.332	-0.534
Mg	-0.057	0.302	0.129	-0.176	-0.138	-0.019	0.185	-0.246	-0.209
Na	0.370	0.281	0.314	0.213	0.514	0.131	0.295	0.010	-0.100
	* *P<0.05: r = 0.514*			* *P<0.01: r = 0.641*					

Table 4.4.10. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *E. viminalis**

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) *Ca*	*Mg*	*K*	*Na*	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
Leaf									
N	-0.325	-0.321	-0.237	0.059	-0.261	0.219	-0.304	0.086	0.258
P	0.342	0.179	0.178	0.151	-0.070	-0.190	0.163	-0.602	-0.173
K	-0.307	-0.472	-0.475	-0.193	-0.389	0.194	-0.521	0.335	0.571
Ca	0.488	0.654	0.729	0.614	0.616	-0.177	0.666	-0.022	-0.694
Mg	0.625	0.610	0.634	0.526	0.168	-0.434	0.586	-0.272	-0.513
Na	-0.097	0.150	0.172	0.323	0.676	-0.136	0.205	0.006	-0.334
Branch									
N	0.217	0.293	0.257	-0.065	0.363	0.039	0.262	-0.286	-0.401
P	0.756	0.623	0.578	0.231	0.314	-0.377	0.576	-0.483	-0.607
K	0.600	0.317	0.281	0.223	-0.086	-0.580	0.236	-0.327	-0.214
Ca	0.498	0.568	0.627	0.821	0.447	-0.245	0.586	-0.118	-0.571
Mg	0.123	0.418	0.417	0.522	0.487	-0.317	0.444	-0.035	-0.451
Na	0.492	0.586	0.610	0.603	0.630	-0.297	0.569	-0.071	-0.586
Dead									
N	0.717	0.492	0.448	0.316	0.263	-0.277	0.449	-0.500	-0.375
P	0.740	0.706	0.644	0.219	0.321	-0.371	0.669	-0.412	-0.605
K	-0.127	-0.002	0.026	-0.089	0.124	0.202	0.075	0.203	-0.066
Ca	0.620	0.628	0.655	0.728	0.297	-0.264	0.611	-0.447	-0.567
Mg	0.522	0.400	0.447	0.511	0.138	-0.292	0.384	-0.406	-0.362
Na	-0.128	0.179	0.175	-0.071	0.467	0.449	0.282	0.152	-0.224
Bark									
N	-0.273	-0.278	-0.299	-0.633	-0.326	0.143	-0.320	0.091	0.251
P	0.630	0.422	0.392	0.112	-0.059	-0.443	0.384	-0.460	-0.373
K	-0.192	-0.287	-0.255	0.105	-0.285	-0.244	-0.262	-0.285	0.289
Ca	0.007	0.177	0.273	0.355	0.270	0.375	0.220	0.051	-0.252
Mg	-0.058	0.185	0.177	0.234	0.141	-0.179	0.175	-0.374	-0.254
Na	-0.090	0.077	0.188	0.272	0.299	0.274	0.134	0.466	-0.107
Bole									
N	-0.073	-0.115	-0.151	-0.125	-0.023	-0.397	-0.102	-0.490	-0.043
P	0.820	0.905	0.892	0.684	0.456	-0.412	0.892	-0.646	-0.897
K	0.601	0.400	0.344	0.188	-0.025	-0.132	0.343	-0.393	-0.246
Ca	0.425	0.595	0.673	0.519	0.505	-0.110	0.635	-0.289	-0.681
Mg	0.623	0.623	0.596	0.311	0.286	-0.242	0.611	-0.390	-0.625
Na	0.107	-0.111	-0.089	0.029	0.033	0.224	-0.102	0.101	0.148
	* $P<0.05$: $r = 0.514$			* $P<0.01$: $r = 0.641$					

Table 4.4.11. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *Transversae: *E.deanei* + *E.grandis* + *E.saligna***

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) Ca	Mg	K	Na	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
Leaf									
N	-0.124	-0.055	0.047	-0.077	-0.015	0.206	0.019	0.274	0.042
P	0.582	0.593	0.565	0.421	0.495	-0.463	0.595	-0.477	-0.561
K	-0.114	-0.323	-0.449	-0.107	-0.402	0.078	-0.367	0.133	0.265
Ca	0.077	0.317	0.470	0.315	0.428	-0.132	0.431	0.008	-0.252
Mg	0.083	0.229	0.383	0.098	0.431	-0.191	0.274	0.055	-0.277
Na	-0.398	-0.368	-0.365	-0.192	-0.293	0.379	-0.355	0.305	0.294
Branch									
N	-0.042	0.155	0.227	0.330	0.230	0.379	0.247	0.293	-0.011
P	0.333	0.561	0.618	0.354	0.399	0.124	0.620	0.033	-0.358
K	-0.003	-0.109	-0.154	-0.074	-0.170	0.027	-0.142	0.088	0.155
Ca	0.435	0.627	0.745	0.343	0.767	-0.152	0.727	-0.076	-0.566
Mg	-0.042	0.140	0.300	-0.128	0.485	-0.096	0.232	0.098	-0.161
Na	-0.182	-0.089	0.026	-0.176	0.131	-0.126	-0.044	0.013	-0.123
Dead									
N	0.485	0.481	0.398	0.195	0.110	-0.144	0.414	-0.247	-0.380
P	0.548	0.612	0.486	0.487	0.244	-0.088	0.556	-0.371	-0.608
K	0.007	0.020	0.017	0.197	-0.061	-0.139	0.022	-0.048	-0.128
Ca	0.538	0.584	0.654	0.343	0.545	-0.283	0.617	-0.247	-0.545
Mg	0.413	0.330	0.323	0.370	0.358	-0.354	0.318	-0.257	-0.273
Na	0.082	0.295	0.245	0.055	0.077	0.101	0.261	-0.094	-0.203
Bark									
N	-0.339	-0.015	0.065	-0.033	-0.059	0.289	0.070	0.321	0.049
P	0.642	0.743	0.714	0.423	0.567	-0.301	0.762	-0.456	-0.752
K	0.140	0.040	0.094	0.080	0.247	-0.245	0.071	-0.194	-0.021
Ca	0.179	0.290	0.435	0.349	0.447	-0.104	0.392	0.054	-0.253
Mg	0.256	0.322	0.373	0.241	0.132	-0.130	0.354	-0.181	-0.270
Na	-0.309	-0.171	-0.040	-0.201	0.167	0.096	-0.105	0.479	0.202
Bole									
N	-0.235	0.020	0.133	-0.028	-0.003	0.286	0.100	0.273	0.069
P	0.516	0.604	0.622	0.513	0.418	-0.154	0.624	-0.109	-0.500
K	0.505	0.327	0.208	0.299	0.071	0.145	0.287	-0.209	-0.240
Ca	0.459	0.647	0.649	0.489	0.579	-0.362	0.670	-0.296	-0.644
Mg	-0.152	-0.118	-0.058	-0.118	-0.030	0.182	-0.129	0.073	0.156
Na	-0.066	0.051	0.059	-0.078	0.081	0.115	0.070	0.151	0.010
	* $P<0.05$: $r = 0.294$			* $P<0.01$: $r = 0.381$					

Table 4.4.12. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: *Viminales: *E. dunnii* + *E. macarthurii* + *E. nitens* + *E. smithii* + *E. viminalis***

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) *Ca*	*Mg*	*K*	*Na*	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
Leaf									
N	-0.199	-0.146	-0.082	-0.141	-0.062	0.125	-0.113	0.188	0.169
P	0.358	0.425	0.357	0.134	0.284	-0.253	0.397	-0.434	-0.354
K	-0.338	-0.380	-0.387	-0.061	-0.194	0.332	-0.396	0.352	0.415
Ca	0.472	0.551	0.566	0.184	0.434	-0.191	0.557	-0.167	-0.449
Mg	0.415	0.477	0.491	0.129	0.297	-0.241	0.479	-0.113	-0.405
Na	-0.215	-0.098	-0.092	-0.201	-0.022	0.200	-0.079	0.127	0.137
Branch									
N	0.203	0.153	0.124	-0.086	0.129	0.215	0.154	-0.046	-0.091
P	0.598	0.499	0.454	0.155	0.379	-0.128	0.490	-0.403	-0.434
K	0.023	-0.093	-0.138	-0.053	-0.068	0.186	-0.124	0.068	0.106
Ca	0.530	0.482	0.609	0.322	0.440	-0.231	0.573	-0.231	-0.538
Mg	0.232	0.207	0.275	0.205	0.313	-0.277	0.279	-0.175	-0.334
Na	0.195	0.320	0.277	-0.017	0.191	0.025	0.279	-0.142	-0.229
Dead									
N	0.402	0.198	0.195	0.101	0.145	-0.185	0.217	-0.362	-0.199
P	0.474	0.528	0.485	0.358	0.384	0.093	0.554	-0.317	-0.485
K	-0.145	-0.088	-0.072	-0.053	-0.064	0.001	-0.065	0.008	0.072
Ca	0.655	0.666	0.678	0.468	0.553	-0.282	0.670	-0.320	-0.606
Mg	0.254	0.239	0.268	0.206	0.258	-0.206	0.256	-0.151	-0.240
Na	0.077	0.243	0.241	0.058	0.087	0.235	0.262	-0.051	-0.217
Bark									
N	-0.076	-0.078	-0.044	-0.229	-0.012	0.139	-0.052	0.127	0.074
P	0.630	0.503	0.496	0.273	0.404	-0.305	0.515	-0.482	-0.512
K	-0.111	-0.116	-0.126	0.132	0.026	-0.034	-0.113	-0.025	0.053
Ca	0.055	0.231	0.323	0.238	0.353	0.194	0.288	0.244	-0.232
Mg	0.022	0.063	0.123	-0.078	0.177	-0.056	0.116	-0.023	-0.150
Na	-0.191	-0.103	-0.049	-0.099	0.115	0.230	-0.078	0.248	0.131
Bole									
N	0.059	0.114	0.092	-0.054	0.080	0.041	0.092	0.042	-0.061
P	0.604	0.690	0.693	0.240	0.416	-0.215	0.687	-0.397	-0.627
K	0.457	0.342	0.273	0.066	0.114	0.093	0.310	-0.297	-0.252
Ca	0.365	0.327	0.404	0.275	0.380	-0.168	0.383	-0.305	-0.424
Mg	0.089	0.120	0.090	0.010	0.030	-0.045	0.102	-0.192	-0.146
Na	-0.022	-0.130	-0.093	-0.107	0.009	0.184	-0.112	0.102	0.103
	* $P<0.05$: $r = 0.235$			* $P<0.01$: $r = 0.305$					

Table 4.4.13. Simple correlation coefficients between macro nutrient concentration per biomass components and soil chemical parameters: All species*

Biomass nutrient	pH (KCl)	Exch. cations (cmol(+)/kg) *Ca*	*Mg*	*K*	*Na*	P (mg/kg)	S-value (clay)	Organic C (%)	Exch. acidity (cmol(+)/kg)
Leaf									
N	-0.112	-0.060	0.006	-0.073	0.005	0.168	-0.016	0.183	0.067
P	0.470	0.512	0.469	0.300	0.393	-0.325	0.492	-0.439	-0.472
K	-0.232	-0.314	-0.356	-0.055	-0.195	0.233	-0.347	0.208	0.316
Ca	0.253	0.388	0.454	0.259	0.395	-0.126	0.425	-0.063	-0.284
Mg	0.237	0.332	0.393	0.157	0.283	-0.180	0.347	-0.049	-0.269
Na	-0.128	-0.097	-0.083	-0.065	-0.018	0.141	-0.070	0.063	0.106
Branch									
N	0.109	0.141	0.150	0.115	0.163	0.265	0.175	0.103	-0.080
P	0.501	0.532	0.528	0.279	0.405	-0.093	0.548	-0.271	-0.439
K	0.072	0.005	-0.031	0.052	-0.024	0.065	-0.020	-0.009	0.035
Ca	0.488	0.556	0.643	0.398	0.548	-0.185	0.619	-0.183	-0.520
Mg	0.134	0.224	0.310	0.102	0.352	-0.200	0.281	-0.065	-0.270
Na	0.041	0.110	0.122	-0.054	0.165	-0.062	0.112	-0.119	-0.136
Dead									
N	0.408	0.258	0.240	0.092	0.216	-0.221	0.260	-0.317	-0.257
P	0.503	0.559	0.497	0.346	0.281	-0.017	0.551	-0.342	-0.521
K	-0.088	-0.026	-0.003	0.057	-0.013	-0.032	-0.006	0.022	-0.042
Ca	0.577	0.609	0.637	0.426	0.559	-0.276	0.611	-0.293	-0.550
Mg	0.324	0.275	0.290	0.267	0.312	-0.277	0.278	-0.221	-0.268
Na	0.089	0.262	0.249	0.084	0.149	0.151	0.272	-0.070	-0.220
Bark									
N	-0.179	-0.125	-0.099	-0.196	-0.105	0.201	-0.094	0.195	0.098
P	0.544	0.576	0.559	0.365	0.431	-0.293	0.567	-0.409	-0.531
K	-0.026	-0.074	-0.067	0.089	0.094	-0.126	-0.083	-0.127	0.064
Ca	0.074	0.214	0.306	0.283	0.345	0.085	0.267	0.152	-0.162
Mg	0.125	0.212	0.268	0.131	0.187	-0.079	0.247	-0.085	-0.205
Na	-0.132	-0.091	-0.023	-0.061	0.162	0.108	-0.056	0.230	0.127
Bole									
N	-0.006	0.102	0.126	-0.022	0.013	0.107	0.133	0.071	-0.055
P	0.507	0.555	0.558	0.248	0.382	-0.183	0.552	-0.302	-0.512
K	0.491	0.342	0.259	0.189	0.138	0.094	0.308	-0.287	-0.229
Ca	0.364	0.441	0.496	0.370	0.461	-0.232	0.468	-0.236	-0.479
Mg	0.015	0.038	0.033	-0.065	0.033	0.029	0.017	-0.098	-0.066
Na	-0.002	-0.058	-0.026	-0.053	0.092	0.145	-0.037	0.112	0.056
	P<0.05: r = 0.159			*P<0.01: r = 0.2.08*					

Table 4.5.1. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. deanei*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	0	*		0.00	Constant	1.7440	0.0472	36.96
Residual	14	0.0334						
Total	14	0.0334						
P								
Regression	1	0.0040	8.53*	0.00	Constant	-0.1581	0.0904	-1.75
Residual	13	0.0005			pH	0.0664	0.0227	2.92*
Total	14	0.0007						
K								
Regression	1	0.1163	8.65*	0.35	Constant	0.8124	0.0396	20.50
Residual	13	0.0134			Mg	-0.0545	0.0185	-2.94*
Total	14	0.0208						
Ca								
Regression	1	2.9496	21.33**	0.35	Constant	0.841	0.127	6.62
Residual	13	0.1383			Mg	0.2744	0.0594	4.62**
Total	14	0.3391						
Mg								
Regression	0	*		0.00	Constant	0.3487	0.0279	12.49
Residual	14	0.0117						
Total	14	0.0117						
Na								
Regression	4	0.0023	3.88*	0.45	Constant	0.2101	0.0392	5.36
Residual	10	0.0006			Ca	-0.02255	0.00681	-3.31**
Total	14	0.0011			K	-0.1859	0.0710	-2.62*
					OC	0.0649	0.0194	3.36**
					EA	-0.0983	0.0281	-3.5**

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	1	0.0274	4.69*	0.21	Constant	0.1889	0.0423	4.46
Residual	13	0.0058			P	0.0239	0.0110	2.17*
Total	14	0.0074						
P								
Regression	3	0.0013	12.5**	0.71	Constant	-0.00569	0.00775	-0.73
Residual	11	0.0001			Mg	0.00442	0.00179	2.48*
Total	14	0.0004			K	0.0930	0.0257	3.61**
					P	0.00599	0.00152	3.94**
K								
Regression	1	0.0394	4.54	0.20	Constant	0.5796	0.0671	8.63
Residual	13	0.0087			Na	-1.113	0.522	-2.13*
Total	14	0.0109						
Ca								
Regression	1	0.3112	42.6**	0.75	Constant	0.2691	0.0303	8.88
Residual	13	0.0073			SVcl	0.01324	0.00203	6.53**
Total	14	0.0290						
Mg								
Regression	4	0.0014	9.66**	0.71	Constant	0.3943	0.0761	5.18
Residual	10	0.0001			pH	-0.0665	0.0185	-3.6**
Total	14	0.0005			Mg	-0.03686	0.00690	-5.34**
					SVcl	0.00621	0.00108	5.75**
					P	-0.01191	0.00235	-5.06**
Na								
Regression	2	0.0008	7.43**	0.48	Constant	0.04068	0.00355	11.46
Residual	12	0.0001			Ca	-0.00914	0.00332	-2.75*
Total	14	0.0002			Mg	0.01557	0.00436	3.57**

Table 4.5.1. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. deanei*

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
					N			
Regression	0	*		0.00	Constant	0.25400	0.00616	41.26
Residual	14	0.0006						
Total	14	0.0006						
					P			
Regression	3	0.0212	54**	0.92	Constant	0.0183	0.0330	0.56
Residual	11	0.0004			Na	1.244	0.126	9.87**
Total	14	0.0048			P	0.01668	0.00382	4.37**
					OC	-0.0634	0.0128	-4.97**
					K			
Regression	1	0.0257	4.72*	0.21	Constant	0.3486	0.0361	9.65
Residual	13	0.0054			K	0.376	0.173	2.17*
Total	14	0.0069						
					Ca			
Regression	0	*		0.00	Constant	0.959	0.106	9.07
Residual	14	0.1680						
Total	14	0.1680						
					Mg			
Regression	0	*		0.00	Constant	0.3847	0.0281	13.70
Residual	14	0.0118						
Total	14	0.0118						
					Na			
Regression	4	0.0011	10.64**	0.57	Constant	-0.0539	0.0192	2.82
Residual	10	0.0001			Na	0.460	0.126	3.66**
Total	14	0.0004			SVcl	-0.001755	0.000489	-3.59**
					P	0.00629	0.00224	2.8*
					OC	0.01929	0.00657	2.93*

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
					N			
Regression	0	*		0.00	Constant	0.10067	0.00463	21.76
Residual	14	0.0003						
Total	14	0.0003						
					P			
Regression	0	*		0.00	Constant	0.01333	0.00159	8.37
Residual	14	0.0000						
Total	14	0.0000						
					K			
Regression	4	0.0513	4.87	0.53	Constant	1.44	0.181	1.44
Residual	10	0.0105			Ca	-2.55	0.0217	-2.55*
Total	14	0.0222			Na	2.63	1.07	2.63*
					P	3.81	0.0224	3.81**
					OC	-3.62	0.0689	-3.62**
					Ca			
Regression	3	0.0065	34.35	0.88	Constant	-0.0737	0.0220	-1.68
Residual	11	0.0002			Ca	0.042	0.00317	6.63**
Total	14	0.0015			K	0.2785	0.0353	3.95**
					EA	0.0561	0.0102	2.74*
					Mg			
Regression	5	0.0004	3.61	0.48	Constant	0.328	0.111	2.96
Residual	9	0.0001			pH	-0.0827	0.0267	-3.09*
Total	14	0.0002			Na	0.595	0.166	3.59**
					P	0.00643	0.00232	2.77*
					OC	-0.0532	0.0131	-4.07**
					EA	0.03392	0.00995	3.41**
					Na			
Regression	6	0.0001	14.83	0.86	Constant	-0.02487	0.00613	-4.06
Residual	8	0.0000			K	-0.01927	0.00709	-2.72*
Total	14	0.0000			Na	0.1424	0.0332	4.29**
					SVcl	0.00788	0.000188	4.2**
					P	0.001418	0.000544	2.6*
					OC	-0.00678	0.00243	-2.79*
					EA	0.01544	0.00364	4.24**

Table 4.5.2. Regression analysis of soil parameters on the macro nutrient content of single biomass components: E. dunnii

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	1	0.2304	9.02**	0.36	Constant	3.533	0.560	6.30
Residual	13	0.0256			pH	-0.418	0.139	-3.00*
Total	14	0.0402						
P								
Regression	2	0.0038	5.04**	0.37	Constant	0.1701	0.0334	5.09
Residual	12	0.0007			Na	0.299	0.125	2.40*
Total	14	0.0012			OC	-0.0348	0.0146	-2.38*
K								
Regression	4	0.0668	17.68**	0.83	Constant	0.5626	0.0648	8.68
Residual	10	0.0038			Ca	0.1809	0.0378	4.79**
Total	14	0.0218			Mg	-0.3183	0.0566	-5.63**
					K	1.292	0.285	4.54**
					P	0.0461	0.0107	4.3**
Ca								
Regression	3	0.6990	17.24**	0.78	Constant	-2.38	1.06	-2.26
Residual	11	0.0405			pH	0.786	0.277	2.83*
Total	14	0.1816			Ca	-0.326	0.125	-2.61*
					SVcl	0.0709	0.0247	2.88*
Mg								
Regression	1	0.0304	5.84*	0.26	Constant	0.2485	0.0250	9.95
Residual	13	0.0052			Mg	0.0313	0.0130	2.42*
Total	14	0.0070						
Na								
Regression	5	0.0010	7.76*	0.71	Constant	0.3151	0.0649	4.86
Residual	9	0.0001			pH	-0.0560	0.0163	-3.43**
Total	14	0.0005			Ca	-0.03498	0.00796	-4.39**
					Na	-0.3379	0.0980	-3.45**
					SVcl	0.00883	0.00178	4.97**
					P	0.00697	0.00223	3.13*

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	2	0.0133	3.27	0.25	Constant	0.3857	0.0517	7.46
Residual	12	0.0041			Ca	0.02127	0.00928	2.29*
Total	14	0.0054			K	-0.624	0.286	-2.18*
P								
Regression	4	0.0011	13.74**	0.79	Constant	0.0537	0.0107	5.04
Residual	10	0.0001			Ca	-0.01265	0.00552	-2.29*
Total	14	0.0004			Mg	-0.0694	0.0192	-3.61**
					SVcl	0.01200	0.00249	4.82**
					OC	-0.01605	0.00477	-3.37**
K								
Regression	1	0.0674	7.01*	0.30	Constant	0.3677	0.0567	6.49
Residual	13	0.0096			P	0.0412	0.0156	2.65*
Total	14	0.0137						
Ca								
Regression	2	0.0823	5.45*	0.39	Constant	0.3470	0.0437	7.94
Residual	12	0.0151			Ca	-0.1848	0.0758	-2.44*
Total	14	0.0247			SVcl	0.0401	0.0142	2.83*
Mg								
Regression	2	0.0044	3.55	0.27	Constant	0.1299	0.0125	10.36
Residual	12	0.0012			Ca	-0.0564	0.0218	-2.59*
Total	14	0.0017			SVcl	0.01081	0.00406	2.66*
Na								
Regression	1	0.0010	5.67*	0.25	Constant	0.05003	0.00684	7.32
Residual	13	0.0002			EA	-0.01257	0.00528	-2.38*
Total	14	0.0002						

Table 4.5.2. Regression analysis of soil parameters on the macro nutrient content of single biomass components: E. dunnii

Bark nutrient concentration (%)

Element	df	MS	VR	R^2		Estimate	SE	t
				N				
Regression	0	*	*	0.00	Constant	0.23733	0.00949	25.02
Residual	14	0.0013						
Total	14	0.0013						
				P				
Regression	3	0.0030	12.46**	0.71	Constant	0.1006	0.0186	5.40
Residual	11	0.0002			Ca	-0.03564	0.00954	-3.74**
Total	14	0.0008			SVcl	0.00707	0.00178	3.98**
					OC	-0.03752	0.00833	-4.5**
				K				
Regression	4	0.0265	11.81**	0.76	Constant	0.8339	0.0850	9.81
Residual	10	0.0022			Ca	0.2347	0.0357	6.57**
Total	14	0.0092			Na	1.246	0.373	3.34**
					SVcl	-0.06076	0.00894	-6.8**
					EA	-0.2414	0.0509	-4.74**
				Ca				
Regression	1	0.4185	4.84*	0.22	Constant	0.592	0.102	5.82
Residual	13	0.0864			Mg	0.1162	0.0528	2.2*
Total	14	0.1101						
				Mg				
Regression	3	0.0250	6.48*	0.54	Constant	0.2705	0.0221	12.23
Residual	11	0.0039			Ca	-0.0877	0.0388	-2.26*
Total	14	0.0084			Mg	-0.363	0.135	-2.68*
					SVcl	0.0652	0.0175	3.72**
				Na				
Regression	0	*	*	0.00	Constant	0.05800	0.00490	11.84
Residual	14	0.0004						
Total	14	0.0004						

Bole wood nutrient concentration (%)

Element	df	MS	VR	R^2		Estimate	SE	t
				N				
Regression	0	*	*	0.00	Constant	0.07200	0.00480	15.00
Residual	14	0.0003						
Total	14	0.0003						
				P				
Regression	1	0.0005	54.79*	0.79	Constant	0.009098	0.000995	9.15
Residual	13	0			Mg	0.003821	0.000516	7.4**
Total	14	0						
				K				
Regression	3	0.0491	4.2*	0.41	Constant	-0.517	0.567	-1.82
Residual	11	0.0117			pH	0.163	0.149	2.19*
Total	14	0.0197			Ca	0.0917	0.0672	2.73*
					SVcl	-0.0185	0.0133	-2.79*
				Ca				
Regression	2	0.0081	5.18*	0.37	Constant	0.1541	0.0139	5.56
Residual	12	0.0016			Ca	-0.1360	0.0240	-2.83*
Total	14	0.0025			Mg	0.2170	0.0352	3.08**
				Mg				
Regression	2	0.0013	6.58*	0.44	Constant	-0.1730	0.0730	-2.37
Residual	12	0.0002			pH	0.0665	0.0191	3.48**
Total	14	0.0004			SVcl	-0.001679	0.000502	-3.34**
				Na				
Regression	3	0.0001	8.9**	0.63	Constant	-0.0535	0.0171	-3.14
Residual	11	0.0000			pH	0.01362	0.00435	3.13**
Total	14	0.0000			Na	0.0868	0.0220	3.94**
					SVcl	-0.000763	0.000149	-5.11**

Table 4.5.3. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. elata*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	1	0.2165	7.47*	0.32	Constant	1.7176	0.0970	17.71
Residual	13	0.0290			P	0.0701	0.0256	2.73*
Total	14	0.0424						
P								
Regression	0	*	*	0.00	Constant	0.13533	0.00601	22.54
Residual	14	0.0005						
Total	14	0.0005						
K								
Regression	0	*	*	0.00	Constant	0.6480	0.0212	30.62
Residual	14	0.0067						
Total	14	0.0067						
Ca								
Regression	0	*	*	0.00	Constant	0.6780	0.0549	12.36
Residual	14	0.0452						
Total	14	0.0452						
Mg								
Regression	0	*	*	0.00	Constant	0.3013	0.0210	14.35
Residual	14	0.0066						
Total	14	0.0066						
Na								
Regression	3	0.0043	12.96	0.72	Constant	0.4801	0.0861	5.58
Residual	11	0.0003			pH	-0.1025	0.0226	-4.54**
Total	14	0.0012			Na	0.977	0.177	5.52**
					P	-0.00824	0.00343	-2.4*

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	0	*	*	0.00	Constant	0.3193	0.0173	18.42
Residual	14	0.0045						
Total	14	0.0045						
P								
Regression	0	*	*	0.00	Constant	0.04000	0.00402	9.94
Residual	14	0.0002						
Total	14	0.0002						
K								
Regression	1	0.1059	18.03**	0.55	Constant	0.2792	0.0259	10.79
Residual	13	0.0059			Mg	0.0541	0.0127	4.25**
Total	14	0.0130						
Ca								
Regression	6	0.0251	26.93**	0.92	Constant	-0.612	0.131	-4.67
Residual	8	0.0009			Mg	-0.4320	0.0889	-4.86**
Total	14	0.0113			K	1.066	0.199	5.35**
					Na	2.929	0.564	5.2**
					SVcl	0.0679	0.0108	6.28**
					OC	-0.0834	0.0236	-3.53**
					EA	0.3444	0.0454	7.58**
Mg								
Regression	4	0.0014	21.42**	0.85	Constant	0.0758	0.0452	1.68
Residual	10	0.0001			pH	0.0329	0.0134	2.45*
Total	14	0.0005			Mg	-0.01441	0.00512	-2.82*
					Na	-0.2410	0.0904	-2.67*
					EA	-0.05266	0.00988	-5.33**
Na								
Regression	3	0.0011	8.06**	0.60	Constant	0.3068	0.0557	5.51
Residual	11	0.0001			pH	-0.0701	0.0146	-4.8**
Total	14	0.0003			Na	0.333	0.114	2.91*
					P	-0.00636	0.00222	-2.86*

Table 4.5.3. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. elata*

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
				N				
Regression	1	0.0029	7.94*	0.33	Constant	0.3421	0.0167	20.54
Residual	13	0.0004			Na	-0.359	0.128	-2.82*
Total	14	0.0005						
				P				
Regression	1	0.0054	46.07**	0.76	Constant	-0.1949	0.0342	-5.69
Residual	13	0.0001			pH	0.05712	0.00842	6.79**
Total	14	0.0005						
				K				
Regression	2	0.0289	7.92**	0.50	Constant	0.5310	0.0769	6.90
Residual	12	0.0036			OC	-0.1604	0.0435	-3.69**
Total	14	0.0073			EA	0.1019	0.0288	3.54**
				Ca				
Regression	1	0.1590	5.04*	0.22	Constant	0.364	0.101	3.60
Residual	13	0.0315			P	0.0601	0.0267	2.25*
Total	14	0.0406						
				Mg				
Regression	2	0.0094	3.3ns	0.25	Constant	0.3830	0.0756	5.07
Residual	12	0.0028			P	0.0350	0.0138	2.54*
Total	14	0.0038			OC	-0.1146	0.0499	-2.3*
				Na				
Regression	0	*	*	0.00	Constant	0.05800	0.00656	8.84
Residual	14	0.0006						
Total	14	0.0006						

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
				N				
Regression	0	*	*	0.00	Constant	0.09067	0.00384	23.62
Residual	14	0.0002						
Total	14	0.0002						
				P				
Regression	5	0.0002	8.37**	0.73	Constant	0.1581	0.0428	3.69
Residual	9	0.0000			pH	-0.0367	0.0103	-3.57**
Total	14	0.0001			Mg	0.04145	0.00902	4.6**
					SVcl	-0.003391	0.000910	-3.73**
					OC	-0.01945	0.00440	-4.42**
					EA	0.02098	0.00578	3.63**
				K				
Regression	3	0.0977	7.64**	0.59	Constant	-1.438	0.671	-4.29
Residual	11	0.0128			pH	0.378	0.163	4.59**
Total	14	0.0310			SVcl	-0.00497	0.00391	-2.54*
					P	0.0247	0.0214	2.31*
				Ca				
Regression	5	0.0005	20.55**	0.88	Constant	0.3652	0.0349	5.23
Residual	9	0.0000			pH	-0.05670	0.00731	-3.88**
Total	14	0.0002			K	0.1592	0.0233	3.41**
					P	0.01052	0.00135	3.89**
					OC	-0.02930	0.00616	-2.38*
					EA	-0.03886	0.00306	-6.35**
				Mg				
Regression	3	0.0004	3.22ns	0.32	Constant	-0.0232	0.0150	-1.55
Residual	11	0.0001			Mg	-0.0576	0.0199	-2.9*
Total	14	0.0002			Na	0.381	0.135	2.82*
					SVcl	0.00648	0.00235	2.76*
				Na				
Regression	0	*	*	0.00	Constant	0.00667	0.00211	3.16
Residual	14	0.0001						
Total	14	0.0001						

Table 4.5.4. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. fastigata*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	1	0.2683	20.71**	0.59	Constant	1.5646	0.0390	40.12
Residual	13	0.0130			Mg	0.0822	0.0181	4.55**
Total	14	0.0312						
P								
Regression	2	0.0084	41.26**	0.85	Constant	0.1602	0.0181	8.84
Residual	12	0.0002			Mg	0.01564	0.00233	6.71**
Total	14	0.0014			OC	-0.03239	0.00758	-4.28**
K								
Regression	4	0.0331	14.01**	0.79	Constant	-0.192	0.319	-0.60
Residual	10	0.0024			pH	0.2277	0.0881	2.58*
Total	14	0.0111			K	0.414	0.161	2.57*
					Na	-2.142	0.511	-4.19**
					P	0.0402	0.0102	3.95**
Ca								
Regression	0	*	*	0.00	Constant	0.4787	0.0534	8.96
Residual	14	0.0428						
Total	14	0.0428						
Mg								
Regression	1	0.0220	5.45*	0.24	Constant	0.2222	0.0213	10.42
Residual	13	0.0040			Ca	0.01672	0.00716	2.33*
Total	14	0.0053						
Na								
Regression	4	0.0009	9.12**	0.70	Constant	0.0803	0.0137	5.86
Residual	10	0.0001			Ca	-0.01543	0.00648	-2.38*
Total	14	0.0003			Mg	0.01856	0.00756	2.45*
					K	0.1204	0.0493	2.44*
					OC	-0.02617	0.00566	-4.62**

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	7	0.0045	79.6**	0.98	Constant	-0.3905	0.0889	-4.39
Residual	7	0.0001			pH	0.1722	0.0216	7.96**
Total	14	0.0023			Ca	-0.02021	0.00612	-3.3*
					Mg	-0.06153	0.00971	-6.34**
					Na	-1.313	0.109	-12.04**
					SVcl	0.01156	0.00101	11.49**
					OC	0.09467	0.00744	12.72**
					EA	-0.06457	0.00916	-7.05**
P								
Regression	2	0.0027	49.54**	0.87	Constant	0.02280	0.00386	5.91
Residual	12	0.0001			Ca	0.01080	0.00149	7.26**
Total	14	0.0004			K	-0.0743	0.0330	-2.25*
K								
Regression	0	*	*	0.00	Constant	0.3773	0.0185	20.42
Residual	14	0.0051						
Total	14	0.0051						
Ca								
Regression	1	0.1836	30.07**	0.68	Constant	0.1133	0.0374	3.03
Residual	13	0.0061			K	1.071	0.195	5.48**
Total	14	0.0188						
Mg								
Regression	2	0.0075	12.55**	0.62	Constant	0.856	0.175	4.90
Residual	12	0.0006			pH	-0.1950	0.0457	-4.26**
Total	14	0.0016			Ca	0.02645	0.00528	5.01**
Na								
Regression	0	*	*	0.00	Constant	0.02333	0.00523	4.47
Residual	14	0.0004						
Total	14	0.0004						

Table 4.5.4. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. fastigata*

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	4	0.0042	18.43**	0.83	Constant	0.4007	0.0319	12.55
Residual	10	0.0002			Mg	-0.02152	0.00845	-2.55*
Total	14	0.0014			Na	-0.611	0.181	-3.38**
					OC	0.02782	0.00930	2.99*
					EA	-0.0530	0.0159	-3.34**
P								
Regression	5	0.0004	20.61**	0.88	Constant	0.04751	0.00862	5.51
Residual	9	0.0000			Mg	0.01216	0.00234	5.2**
Total	14	0.0002			K	-0.0500	0.0178	-2.81*
					P	-0.00241	0.00101	-2.38*
					OC	-0.01242	0.00307	-4.04**
					EA	0.01337	0.00498	2.69*
K								
Regression	3	0.0222	8.72**	0.62	Constant	0.4746	0.0812	5.85
Residual	11	0.0026			Na	1.722	0.543	3.17**
Total	14	0.0068			SVcl	-0.00894	0.00205	-4.36**
					OC	-0.0867	0.0275	-3.16**
Ca								
Regression	2	0.0615	4.97*	0.36	Constant	0.204	0.129	1.58
Residual	12	0.0124			OC	0.1795	0.0626	2.87*
Total	14	0.0194			EA	-0.0961	0.0410	-2.35*
Mg								
Regression	1	0.0904	27.61**	0.66	Constant	0.3495	0.0272	12.84
Residual	13	0.0033			EA	-0.1015	0.0193	-5.25**
Total	14	0.0095						
Na								
Regression	3	0.0008	7.75**	0.59	Constant	-0.0170	0.0107	-1.59
Residual	11	0.0001			Ca	-0.01163	0.00294	-3.95**
Total	14	0.0003			K	0.1393	0.0474	2.94*
					Na	0.427	0.102	4.21**

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	5	0.0013	5.01	0.59	Constant	0.2186	0.0322	6.79
Residual	9	0.0003			Ca	-0.0408	0.0116	-3.52**
Total	14	0.0006			Mg	0.0344	0.0155	2.22*
					Na	-0.753	0.216	-3.48**
					SVcl	0.00568	0.00203	2.79*
					OC	-0.02998	0.00970	-3.09*
P								
Regression	3	0.0002	32.64	0.87	Constant	-0.00143	0.00307	-0.47
Residual	11	0.0000			Ca	0.006462	0.000716	9.03**
Total	14	0.0000			K	-0.0526	0.0100	-5.24**
					EA	0.00927	0.00169	5.47**
K								
Regression	3	0.0170	7.41	0.58	Constant	0.131	0.133	1.96
Residual	11	0.0023			K	0.407	0.261	3.12*
Total	14	0.0054			P	0.0334	0.0195	3.44**
					OC	-0.0889	0.0584	-3.05*
Ca								
Regression	2	0.0206	30.65	0.81	Constant	0.06630	0.00444	7.46
Residual	12	0.0007			Ca	-0.07230	0.00605	-5.97**
Total	14	0.0035			Mg	0.11950	0.00852	7.02**
Mg								
Regression	5	0.0006	8.39	0.73	Constant	0.0558	0.0186	2.99
Residual	9	0.0001			Mg	0.02968	0.00507	5.85**
Total	14	0.0003			K	-0.1490	0.0324	-4.59**
					Na	-0.399	0.101	-3.93**
					OC	-0.01405	0.00523	-2.69*
					EA	0.02777	0.00881	3.15*
Na								
Regression	7	0.0000	5.80	0.71	Constant	-0.1093	0.0332	-3.30
Residual	7	0.0000			pH	0.02268	0.00801	2.83*
Total	14	0.0000			Mg	-0.00939	0.00207	-4.53**
					K	0.0313	0.0108	2.91*
					Na	0.1247	0.0387	3.22*
					P	0.002140	0.000670	3.19*
					OC	0.00914	0.00266	3.44*
					EA	-0.00860	0.00307	-2.8*

Table 4.5.5. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. grandis*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R²**		**Estimate**	**SE**	**t**
N								
Regression	3	0.1512	5.08*	0.47	Constant	2.195	0.152	14.47
Residual	11	0.0298			Mg	0.407	0.120	3.39**
Total	14	0.0558			Na	-4.68	1.42	-3.3**
					SVcl	-0.0384	0.0137	-2.8*
P								
Regression	1	0.0123	21.23**	0.59	Constant	0.10577	0.00795	13.30
Residual	13	0.0006			Ca	0.01185	0.00257	4.61**
Total	14	0.0014						
K								
Regression	0	*	*	0.00	Constant	0.7487	0.0199	37.53
Residual	14	0.0060						
Total	14	0.0060						
Ca								
Regression	2	0.9381	19.2**	0.72	Constant	0.5913	0.0798	7.41
Residual	12	0.0489			Ca	-0.497	0.122	-4.09**
Total	14	0.1759			SVcl	0.1272	0.0259	4.92**
Mg								
Regression	3	0.0299	15.11**	0.75	Constant	-1.196	0.363	-3.29
Residual	11	0.0020			pH	0.3979	0.0936	4.25**
Total	14	0.0080			Ca	-0.0943	0.0174	-5.43**
					Mg	0.1196	0.0199	6.00**
Na								
Regression	1	0.0091	9.36**	0.37	Constant	0.0796	0.0178	4.48
Residual	13	0.0010			P	0.01819	0.00594	3.06**
Total	14	0.0016						

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R²**		**Estimate**	**SE**	**t**
N								
Regression	4	0.0111	7.8**	0.66	Constant	-0.513	0.314	-1.63
Residual	10	0.0014			pH	0.1782	0.0793	2.25*
Total	14	0.0042			Ca	-0.0880	0.0251	-3.5**
					SVcl	0.01864	0.00465	4.01**
					P	0.02565	0.00792	3.24**
P								
Regression	2	0.0012	16.82**	0.69	Constant	-0.00437	0.00912	-0.48
Residual	12	0.0001			Mg	0.01296	0.00244	5.31**
Total	14	0.0002			EA	0.01448	0.00513	2.82*
K								
Regression	0	*	*	0.00	Constant	0.4500	0.0103	43.57
Residual	14	0.0016						
Total	14	0.0016						
Ca								
Regression	1	0.2383	21.64**	0.60	Constant	0.0617	0.0763	0.81
Residual	13	0.0110			Na	2.487	0.535	4.65**
Total	14	0.0273						
Mg								
Regression	2	0.0143	14.25**	0.65	Constant	0.0915	0.0236	3.87
Residual	12	0.0010			K	-0.2348	0.0534	-4.4**
Total	14	0.0029			Na	0.699	0.168	4.15**
Na								
Regression	0	*	*	0.00	Constant	0.05000	0.00478	10.46
Residual	14	0.0003						
Total	14	0.0003						

Table 4.5.5. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. grandis*

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
N								
Regression	0	*	*	0.00	Constant	0.23933	0.00727	32.93
Residual	14	0.0008						
Total	14	0.0008						
P								
Regression	3	0.0153	55.54**	0.92	Constant	0.03922	0.00879	4.46
Residual	11	0.0003			Ca	0.04370	0.00583	7.5**
Total	14	0.0035			Mg	-0.02960	0.00788	-3.76**
					K	-0.1219	0.0426	-2.87*
K								
Regression	0	*	*	0.00	Constant	0.4613	0.0285	16.20
Residual	14	0.0122						
Total	14	0.0122						
Ca								
Regression	3	0.5096	11.79**	0.70	Constant	0.414	0.110	3.76
Residual	11	0.0432			Ca	-0.3119	0.0730	-4.27**
Total	14	0.1432			Mg	0.4816	0.0987	4.88**
					K	2.285	0.533	4.29**
Mg								
Regression	2	0.0151	7.36**	0.48	Constant	0.2939	0.0159	18.54
Residual	12	0.0020			Mg	-0.0939	0.0270	-3.48**
Total	14	0.0039			SVcl	0.01327	0.00349	3.8**
Na								
Regression	2	0.0019	9.97**	0.56	Constant	0.04705	0.00501	9.40
Residual	12	0.0002			Ca	-0.03299	0.00762	-4.33**
Total	14	0.0004			SVcl	0.00724	0.00162	4.46**

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
N								
Regression	4	0.0007	26.15**	0.88	Constant	0.2405	0.0390	6.17
Residual	10	0.0000			pH	-0.05108	0.00934	-5.47**
Total	14	0.0002			SVcl	0.002175	0.000248	8.77**
					P	0.00439	0.00109	4.01**
					EA	0.01034	0.00388	2.66*
P								
Regression	5	0.0002	15.03**	0.83	Constant	-0.01430	0.00590	-2.42
Residual	9	0.0000			Ca	0.00688	0.00295	2.33*
Total	14	0.0001			Mg	0.01538	0.00379	4.06**
					K	0.0415	0.0117	3.55**
					SVcl	-0.002631	0.000953	-2.76*
					EA	0.00851	0.00315	2.7*
K								
Regression	2	0.0944	8.22	0.51	Constant	0.0844	0.0376	4.49
Residual	12	0.0115			Mg	-0.0948	0.0640	-2.96*
Total	14	0.0233			SVcl	0.01509	0.00827	3.65**
Ca								
Regression	2	0.0085	26.13	0.78	Constant	0.1855	0.0130	7.15
Residual	12	0.0003			Mg	0.03556	0.00339	5.24**
Total	14	0.0015			P	-0.02097	0.00366	-2.86*
Mg								
Regression	0	*	*	0.00	Constant	0.02133	0.00350	6.09
Residual	14	0.0002						
Total	14	0.0002						
Na								
Regression	4	0.0002	4.82*	0.52	Constant	-0.00850	0.00872	-0.97
Residual	10	0.0000			Mg	-0.02124	0.00580	-3.66**
Total	14	0.0001			K	-0.0697	0.0193	-3.61**
					SVcl	0.003653	0.000899	4.06**
					OC	0.01296	0.00445	2.91*

Table 4.5.6. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. macarthurii*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	3	0.1103	4.13*	0.40	Constant	-3.41	1.73	-1.97
Residual	11	0.0267			pH	1.092	0.369	2.96*
Total	14	0.0446			Ca	-0.0831	0.0319	-2.6*
					OC	0.521	0.162	3.23**
P								
Regression	4	0.0003	4.86*	0.52	Constant	-0.0140	0.0414	-0.34
Residual	10	0.0001			pH	0.0416	0.0115	3.62**
Total	14	0.0001			Ca	-0.00912	0.00386	-2.36*
					K	-0.2199	0.0669	-3.29**
					SVcl	0.002123	0.000819	2.59*
K								
Regression	2	0.0853	8.43**	0.52	Constant	0.8643	0.0567	15.25
Residual	12	0.0101			Ca	-0.0413	0.0115	-3.59**
Total	14	0.0208			P	0.0295	0.0133	2.21*
Ca								
Regression	1	0.8678	16.14**	0.52	Constant	0.5891	0.0756	7.79
Residual	13	0.0538			Ca	0.1064	0.0265	4.02**
Total	14	0.1119						
Mg								
Regression	0	*	*	0.00	Constant	0.2267	0.0216	10.51
Residual	14	0.0070						
Total	14	0.0070						
Na								
Regression	1	0.0040	5.72*	0.25	Constant	0.3163	0.0923	3.43
Residual	13	0.0007			pH	-0.0553	0.0231	-2.39*
Total	14	0.0009						

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	0	*	*	0.00	Constant	0.3240	0.0208	15.55
Residual	14	0.0065						
Total	14	0.0065						
P								
Regression	5	0.0005	10**	0.76	Constant	-0.2778	0.0795	-3.49
Residual	9	0.0001			pH	0.0668	0.0176	3.79**
Total	14	0.0002			Na	0.2011	0.0648	3.1*
					SVcl	-0.002507	0.000746	-3.36**
					OC	0.0484	0.0116	4.18**
					EA	-0.0446	0.0117	-3.82**
K								
Regression	4	0.0099	4.03*	0.46	Constant	-1.322	0.543	-2.43
Residual	10	0.0025			pH	0.376	0.122	3.09*
Total	14	0.0046			SVcl	-0.01324	0.00482	-2.75*
					OC	0.2841	0.0789	3.6**
					EA	-0.1820	0.0794	-2.29*
Ca								
Regression	6	0.0590	15.52**	0.86	Constant	-2.952	0.773	-3.82
Residual	8	0.0038			pH	0.692	0.163	4.25**
Total	14	0.0274			Ca	-0.1141	0.0237	-4.82**
					K	1.486	0.487	3.05*
					Na	1.315	0.545	2.41*
					OC	0.3350	0.0905	3.7**
					EA	-0.2696	0.0673	-4.0**
Mg								
Regression	1	0.0147	4.81**	0.21	Constant	0.1819	0.0295	6.17
Residual	13	0.0031			EA	-0.0445	0.0203	-2.19*
Total	14	0.0039						
Na								
Regression	2	0.0014	4.6**	0.34	Constant	0.0570	0.0137	4.18
Residual	12	0.0003			Ca	0.00837	0.00277	3.02*
Total	14	0.0005			K	-0.239	0.105	-2.27*

Table 4.5.6. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. macarthurii*

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	0	*	*	0.00	Constant	0.34533	0.00956	36.14
Residual	14	0.0014						
Total	14	0.0014						
P								
Regression	0	*	*	0.00	Constant	0.03733	0.00248	15.04
Residual	14	0.0001						
Total	14	0.0001						
K								
Regression	0	*	*	0.00	Constant	0.5207	0.0322	16.19
Residual	14	0.0155						
Total	14	0.0155						
Ca								
Regression	1	0.5113	5.4*	0.24	Constant	0.304	0.247	1.23
Residual	13	0.0948			Na	4.43	1.91	2.32*
Total	14	0.1245						
Mg								
Regression	0	*	*	0.00	Constant	0.2467	0.0131	18.86
Residual	14	0.0026						
Total	14	0.0026						
Na								
Regression	0	*	*	0.00	Constant	0.05000	0.00640	7.81
Residual	14	0.0006						
Total	14	0.0006						

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	1	0.0031	11.5**	0.43	Constant	0.09150	0.00539	16.98
Residual	13	0.0003			Ca	0.00640	0.00189	3.39**
Total	14	0.0005						
P								
Regression	2	0.0038	116.36**	0.94	Constant	-0.1644	0.0260	-6.32
Residual	12	0.0000			pH	0.04652	0.00680	6.84**
Total	14	0.0006			Mg	0.00741	0.00137	5.42**
K								
Regression	4	0.0496	3.76*	0.44	Constant	-0.095	0.672	-2.83
Residual	10	0.0132			pH	0.247	0.165	2.99*
Total	14	0.0236			Mg	0.134	0.112	2.4*
					SVcl	-0.0187	0.0154	-2.44*
					P	0.0294	0.0203	2.89*
Ca								
Regression	1	0.0028	26.94**	0.65	Constant	0.04490	0.00710	3.16
Residual	13	0.0001			K	0.4583	0.0441	5.19**
Total	14	0.0003						
Mg								
Regression	5	0.0002	6.60	0.67	Constant	-0.3952	0.0857	-4.61
Residual	9	0.0000			pH	0.0841	0.0174	4.82**
Total	14	0.0001			K	0.3063	0.0617	4.96**
					SVcl	0.003848	0.000784	-4.91**
					OC	0.0572	0.0128	4.46**
					EA	-0.0376	0.0104	-3.6**
Na								
Regression	0	*	*	0.00	Constant	0.01267	0.00228	5.55
Residual	14	0.0001						
Total	14	0.0001						

Table 4.5.7. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. nitens*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
N								
Regression	0	*	*	0.00	Constant	1.5587	0.0326	47.83
Residual	14	0.0159						
Total	14	0.0159						
P								
Regression	1	0.0020	8.48*	0.35	Constant	0.09158	0.00516	17.74
Residual	13	0.0002			SVcl	0.001065	0.000366	2.91*
Total	14	0.0004						
K								
Regression	6	0.0159	17.54**	0.88	Constant	-0.638	0.218	-2.92
Residual	8	0.0009			pH	0.4452	0.0581	7.66**
Total	14	0.0073			Mg	0.2001	0.0438	4.57**
					SVcl	-0.04257	0.00729	-5.84**
					P	0.0634	0.0130	4.87**
					OC	-0.1572	0.0371	-4.23**
					EA	-0.1009	0.0259	-3.9**
Ca								
Regression	0	*	*	0.00	Constant	0.4967	0.0466	10.67
Residual	14	0.0325						
Total	14	0.0325						
Mg								
Regression	0	*	*	0.00	Constant	0.1807	0.0125	14.48
Residual	14	0.0023						
Total	14	0.0023						
Na								
Regression	0	*	*	0.00	Constant	0.02867	0.00506	5.67
Residual	14	0.0004						
Total	14	0.0004						

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
N								
Regression	0	*	*	0.00	Constant	0.3200	0.0169	18.93
Residual	14	0.0043						
Total	14	0.0043						
P								
Regression	3	0.0011	8.83**	0.63	Constant	-0.0203	0.0480	-0.42
Residual	11	0.0001			pH	0.02322	0.00972	2.39*
Total	14	0.0003			P	0.00779	0.00294	2.65*
					OC	-0.02787	0.00797	-3.5**
K								
Regression	2	0.0259	3.27ns	0.25	Constant	-0.591	0.455	-1.30
Residual	12	0.0079			pH	0.272	0.120	2.27*
Total	14	0.0105			SVcl	-0.00970	0.00381	-2.54*
Ca								
Regression	0	*	*	0.00	Constant	0.3827	0.0288	13.31
Residual	14	0.0124						
Total	14	0.0124						
Mg								
Regression	1	0.0050	10.9**	0.41	Constant	-0.1108	0.0655	-1.69
Residual	13	0.0005			pH	0.0534	0.0162	3.3**
Total	14	0.0008						
Na								
Regression	0	*	*	0.00	Constant	0.03933	0.00658	5.98
Residual	14	0.0006						
Total	14	0.0006						

Table 4.5.7. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. nitens*

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	4	0.0024	5.26*	0.55	Constant	0.1152	0.0493	2.34
Residual	10	0.0005			Ca	-0.0512	0.0156	-3.28**
Total	14	0.0010			Na	0.783	0.182	4.31**
					SVcl	0.00680	0.00263	2.58*
					OC	0.0399	0.0155	2.56*
P								
Regression	2	0.0044	40.55**	0.85	Constant	0.02239	0.00355	6.31
Residual	12	0.0001			Mg	-0.02707	0.00838	-3.23**
Total	14	0.0007			SVcl	0.00573	0.00115	4.98**
K								
Regression	2	0.0511	11.69**	0.60	Constant	0.8397	0.0808	10.39
Residual	12	0.0044			Mg	-0.1067	0.0225	-4.75**
Total	14	0.0110			EA	-0.2123	0.0468	-4.53**
Ca								
Regression	0	*	*	0.00	Constant	0.8747	0.0633	13.81
Residual	14	0.0602						
Total	14	0.0602						
Mg								
Regression	6	0.0027	7.28**	0.73	Constant	-0.379	0.141	-2.69
Residual	8	0.0004			pH	0.1057	0.0322	3.29*
Total	14	0.0014			Ca	-0.0772	0.0139	-5.56**
					Mg	0.0952	0.0157	6.08**
					Na	0.473	0.177	2.68*
					P	0.01342	0.00503	2.67*
					EA	0.0560	0.0150	3.73**
Na								
Regression	5	0.0008	3.81	0.50	Constant	0.287	0.107	2.68
Residual	9	0.0002			pH	-0.0888	0.0287	-3.09*
Total	14	0.0004			Mg	-0.0543	0.0216	-2.52*
					SVcl	0.00992	0.00358	2.77*
					P	-0.01689	0.00627	-2.7*
					OC	0.0602	0.0177	3.4**

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	0	*	*	0.00	Constant	0.08733	0.00267	32.75
Residual	14	0.0001						
Total	14	0.0001						
P								
Regression	3	0.0010	14.36**	0.74	Constant	0.0580	0.0150	3.88
Residual	11	0.0001			Na	-0.1283	0.0581	-2.21*
Total	14	0.0003			SVcl	0.001510	0.000344	4.39**
					OC	-0.01626	0.00504	-3.23**
K								
Regression	4	0.0639	6.98	0.63	Constant	-0.570	0.487	-2.35
Residual	10	0.0091			pH	0.189	0.108	3.49**
Total	14	0.0248			K	-0.325	0.221	-2.94*
					P	0.0675	0.0287	4.71**
					OC	-0.0977	0.0682	-2.87*
Ca								
Regression	3	0.0013	11.72**	0.70	Constant	0.1634	0.0145	5.63
Residual	11	0.0001			Mg	0.06860	0.00842	4.08**
Total	14	0.0004			SVcl	-0.00996	0.00132	-3.79**
					EA	-0.04480	0.00843	-2.65*
Mg								
Regression	2	0.0004	4.34*	0.32	Constant	0.1709	0.0490	3.49
Residual	12	0.0001			pH	-0.0379	0.0129	-2.94*
Total	14	0.0001			SVcl	0.001027	0.000410	2.5*
Na								
Regression	0	*	*	0.00	Constant	0.01333	0.00287	4.64
Residual	14	0.0001						
Total	14	0.0001						

Table 4.5.8. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. saligna*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
N								
Regression	0	*	*	0.00	Constant	1.7820	0.0568	31.37
Residual	14	0.0484						
Total	14	0.0484						
P								
Regression	1	0.0023	8.28*	0.34	Constant	0.10903	0.00547	19.93
Residual	13	0.0003			Ca	0.00443	0.00154	2.88*
Total	14	0.0004						
K								
Regression	3	0.0207	3.94*	0.39	Constant	-0.459	0.480	-0.96
Residual	11	0.0053			pH	0.253	0.101	2.5*
Total	14	0.0086			Mg	-0.0505	0.0159	-3.17**
					OC	0.1462	0.0621	2.35*
Ca								
Regression	5	0.1721	9.49**	0.75	Constant	3.181	0.867	3.67
Residual	9	0.0181			pH	-0.925	0.204	-4.54**
Total	14	0.0731			Mg	0.2465	0.0476	5.18**
					K	2.562	0.565	4.54**
					P	-0.0967	0.0276	-3.51**
					EA	0.534	0.139	3.86**
Mg								
Regression	2	0.0472	20.05**	0.73	Constant	0.2902	0.0166	17.46
Residual	12	0.0024			Ca	-0.1020	0.0178	-5.73**
Total	14	0.0088			Mg	0.1634	0.0263	6.23**
Na								
Regression	4	0.0060	20.23**	0.85	Constant	0.1622	0.0148	10.98
Residual	10	0.0003			Mg	-0.1200	0.0268	-4.48**
Total	14	0.0019			K	-0.4600	0.0816	-5.64**
					SVcl	0.01694	0.00404	4.2**
					P	0.01106	0.00284	3.89**

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
N								
Regression	2	0.0165	4.96*	0.36	Constant	-0.042	0.109	-0.39
Residual	12	0.0033			Ca	0.0449	0.0150	2.99*
Total	14	0.0052			EA	0.1823	0.0579	3.15**
P								
Regression	2	0.0023	15.27**	0.67	Constant	-0.0431	0.0231	-1.87
Residual	12	0.0001			Ca	0.01412	0.00318	4.43**
Total	14	0.0005			EA	0.0366	0.0123	2.98*
K								
Regression	0	*	*	0.00	Constant	0.4960	0.0151	32.89
Residual	14	0.0034						
Total	14	0.0034						
Ca								
Regression	4	0.0698	27.42**	0.88	Constant	0.3242	0.0408	7.94
Residual	10	0.0025			Ca	-0.1520	0.0221	-6.88**
Total	14	0.0217			Mg	0.2467	0.0298	8.28**
					K	0.807	0.202	3.99**
					P	-0.02718	0.00853	-3.19**
Mg								
Regression	4	0.0091	12.9**	0.77	Constant	0.676	0.156	4.33
Residual	10	0.0007			pH	-0.1671	0.0346	-4.83**
Total	14	0.0031			SVcl	0.00869	0.00150	5.79**
					P	-0.01483	0.00511	-2.9*
					EA	0.0757	0.0289	2.62*
Na								
Regression	2	0.0004	5.78*	0.41	Constant	0.0281	0.0123	2.28
Residual	12	0.0001			P	-0.00504	0.00150	-3.36**
Total	14	0.0001			OC	0.01473	0.00657	2.24*

Table 4.5.8. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. saligna*

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	2	0.0085	5.45*	0.39	Constant	0.810	0.173	4.68
Residual	12	0.0016			pH	-0.1460	0.0448	-3.26**
Total	14	0.0025			Mg	0.02197	0.00793	2.77*
P								
Regression	1	0.0126	19.87**	0.57	Constant	0.02485	0.00860	2.89
Residual	13	0.0006			SVcl	0.002174	0.000488	4.46**
Total	14	0.0015						
K								
Regression	3	0.0519	4.54*	0.43	Constant	0.657	0.183	3.60
Residual	11	0.0114			Ca	-0.0315	0.0130	-2.43*
Total	14	0.0201			Na	2.517	0.807	3.12**
					OC	-0.1923	0.0773	-2.49*
Ca								
Regression	4	0.4513	4.94*	0.53	Constant	-0.608	0.436	-1.40
Residual	10	0.0914			Mg	1.162	0.489	2.38*
Total	14	0.1942			K	4.97	1.44	3.45**
					Na	7.19	2.97	2.42*
					SVcl	-0.1921	0.0715	-2.69*
Mg								
Regression	1	0.0383	4.77*	0.21	Constant	0.2584	0.0303	8.51
Residual	13	0.0080			Mg	0.0266	0.0122	2.19*
Total	14	0.0102						
Na								
Regression	1	0.0023	6.76*	0.29	Constant	0.0782	0.0109	7.17
Residual	13	0.0003			K	-0.1366	0.0525	-2.6*
Total	14	0.0005						

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	4	0.0006	8.96**	0.70	Constant	0.1171	0.0181	6.46
Residual	10	0.0001			K	-0.1706	0.0363	-4.7**
Total	14	0.0002			SVcl	0.000791	0.000215	3.67**
					P	0.00961	0.00183	5.25**
					OC	-0.02522	0.00842	-3.0*
P								
Regression	4	0.0001	15.44**	0.81	Constant	0.02961	0.00546	5.42
Residual	10	0.0000			K	-0.02169	0.00960	-2.26*
Total	14	0.0000			Na	-0.0593	0.0216	-2.75*
					SVcl	0.000500	0.0000866	5.78**
					OC	-0.00552	0.00173	-3.19**
K								
Regression	5	0.0490	11.74**	0.79	Constant	-1.058	0.375	-5.65
Residual	9	0.0042			pH	0.3012	0.0962	6.26**
Total	14	0.0202			Mg	-0.158	0.101	-3.15*
					K	-0.699	0.333	-4.19**
					SVcl	0.0211	0.0153	2.77*
					P	0.2865	0.0121	4.74**
Ca								
Regression	3	0.0022	8.83**	0.63	Constant	0.3115	0.0272	5.73
Residual	11	0.0003			Ca	-0.05900	0.00884	-3.34**
Total	14	0.0007			SVcl	0.01382	0.00184	3.76**
					OC	-0.0918	0.0126	-3.64**
Mg								
Regression	2	0.0011	13.54**	0.64	Constant	0.02858	0.00694	4.12
Residual	12	0.0001			K	-0.1084	0.0258	-4.2**
Total	14	0.0002			P	0.00487	0.00144	3.39**
Na								
Regression	2	0.0003	10.7**	0.58	Constant	-0.01569	0.00840	-1.87
Residual	12	0.0000			Mg	-0.002023	0.000737	-2.75*
Total	14	0.0001			OC	0.01292	0.00378	3.42**

Table 4.5.9. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. smithii*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
					N			
Regression	0	*	*	0.00	Constant	1.7147	0.0387	44.36
Residual	14	0.0224						
Total	14	0.0224						
					P			
Regression	1	0.0094	13.38**	0.47	Constant	0.09257	0.00865	10.70
Residual	13	0.0007			Ca	0.01079	0.00295	3.66**
Total	14	0.0013						
					K			
Regression	1	0.1693	10.99**	0.42	Constant	0.5964	0.0626	9.53
Residual	13	0.0154			EA	0.1407	0.0424	3.32**
Total	14	0.0264						
					Ca			
Regression	4	0.4675	9.96**	0.72	Constant	-2.44	1.30	-1.87
Residual	10	0.0470			pH	0.772	0.337	2.29*
Total	14	0.1671			Ca	0.513	0.108	4.74**
					Mg	1.259	0.255	4.93**
					SVcl	-0.2577	0.0487	-5.29**
					Mg			
Regression	4	0.0285	16.5**	0.82	Constant	-0.533	0.250	-2.13
Residual	10	0.0017			pH	0.1761	0.0645	2.73*
Total	14	0.0094			Ca	0.0648	0.0208	3.12*
					Mg	0.3232	0.0489	6.6**
					SVcl	-0.05220	0.00933	-5.59**
					Na			
Regression	0	*	*	0.00	Constant	0.08533	0.00696	12.26
Residual	14	0.0007						
Total	14	0.0007						

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
					N			
Regression	0	*	*	0.00	Constant	0.3193	0.0248	12.86
Residual	14	0.0092						
Total	14	0.0092						
					P			
Regression	0	*	*	0.00	Constant	0.04067	0.00565	7.20
Residual	14	0.0005						
Total	14	0.0005						
					K			
Regression	1	0.0303	6.75*	0.29	Constant	0.4240	0.0228	18.59
Residual	13	0.0045			Mg	-0.0298	0.0115	-2.6*
Total	14	0.0063						
					Ca			
Regression	1	0.1495	15.77**	0.51	Constant	0.3094	0.0332	9.33
Residual	13	0.0095			Mg	0.0661	0.0167	3.97**
Total	14	0.0195						
					Mg			
Regression	0	*	*	0.00	Constant	0.0907	0.0102	8.92
Residual	14	0.0015						
Total	14	0.0015						
					Na			
Regression	0	*	*	0.00	Constant	0.04533	0.00496	9.13
Residual	14	0.0004						
Total	14	0.0004						

Table 4.5.9. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. smithii*

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
					N			
Regression	0	*	*	0.00	Constant	0.24	0.00743	32.29
Residual	14	0.0008						
Total	14	0.0008						
					P			
Regression	2	0.0015	25.7**	0.78	Constant	0.01978	0.00264	7.50
Residual	12	0.0001			Mg	-0.02101	0.00720	-2.92*
Total	14	0.0003			SVcl	0.003744	0.000920	4.07**
					K			
Regression	0	*	*	0.00	Constant	0.34	0.0322	10.55
Residual	14	0.0156						
Total	14	0.0156						
					Ca			
Regression	4	0.1085	59.97**	0.94	Constant	-0.765	0.126	-6.06
Residual	10	0.0018			Mg	0.243	0.0480	5.07**
Total	14	0.0323			K	2.058	0.250	8.22**
					SVcl	-0.02148	0.00659	-3.26**
					OC	0.3825	0.0442	8.66**
					Mg			
Regression	0	*	*	0.00	Constant	0.1373	0.0219	6.28
Residual	14	0.0072						
Total	14	0.0072						
					Na			
Regression	2	0.0014	13.69**	0.64	Constant	-0.0263	0.0112	-2.35
Residual	12	0.0001			Ca	-0.00454	0.00135	-3.36**
Total	14	0.0003			Na	0.4854	0.0934	5.2*

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
					N			
Regression	1	0.0005	5.62*	0.25	Constant	0.0395	0.0112	3.54
Residual	13	0.0001			OC	0.01287	0.00543	2.37*
Total	14	0.0001						
					P			
Regression	1	0.0006	23.6**	0.62	Constant	0.00584	0.00162	3.62
Residual	13	0.0000			Ca	0.002678	0.000551	4.86**
Total	14	0.0001						
					K			
Regression	2	0.0792	5.86*	0.41	Constant	-0.729	0.499	-2.92
Residual	12	0.0135			pH	0.175	0.110	3.17**
Total	14	0.0229			P	0.0430	0.0332	2.58*
					Ca			
Regression	4	0.0009	19.08*	0.84	Constant	-0.0159	0.0181	-0.44
Residual	10	0.0000			Mg	0.01449	0.00142	5.09**
Total	14	0.0003			K	0.3544	0.0430	4.12**
					P	-0.02127	0.00217	-4.9**
					OC	0.05340	0.00664	4.02**
					Mg			
Regression	2	0.0011	3.21ns	0.24	Constant	0.248	0.103	2.41
Residual	12	0.0003			pH	-0.0576	0.0265	-2.18*
Total	14	0.0004			Ca	0.00879	0.00349	2.52*
					Na			
Regression	0	*	*	0.00	Constant	0.00667	0.00211	3.16
Residual	14	0.0001						
Total	14	0.0001						

Table 4.5.10. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. viminalis*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	2	0.1820	6.38*	0.43	Constant	1.9873	0.0574	34.65
Residual	12	0.0285			Ca	-0.471	0.140	-3.37**
Total	14	0.0505			Mg	0.608	0.190	3.19**
P								
Regression	1	0.0035	7.39*	0.31	Constant	0.2300	0.0365	6.30
Residual	13	0.0005			OC	-0.0456	0.0168	-2.72*
Total	14	0.0007						
K								
Regression	1	0.0765	6.28*	0.27	Constant	0.6887	0.0573	12.02
Residual	13	0.0122			EA	0.1057	0.0422	2.51*
Total	14	0.0168						
Ca								
Regression	4	0.3789	31.34**	0.90	Constant	0.2905	0.0970	3.00
Residual	10	0.0121			Ca	-0.355	0.109	-3.27**
Total	14	0.1169			Mg	1.061	0.140	7.6**
					Na	2.814	0.927	3.04*
					SVcl	-0.0759	0.0216	-3.52**
Mg								
Regression	3	0.0162	6.87**	0.56	Constant	0.020	0.107	0.19
Residual	11	0.0024			Mg	0.0746	0.0237	3.14**
Total	14	0.0053			P	-0.0224	0.0100	-2.23*
					EA	0.1520	0.0652	2.33*
Na								
Regression	6	0.0014	32.24**	0.93	Constant	0.2905	0.0610	4.76
Residual	8	0.0000			pH	-0.0660	0.0137	-4.8**
Total	14	0.0006			Ca	0.03016	0.00699	4.32**
					K	0.2633	0.0406	6.48**
					Na	0.7101	0.0615	11.55**
					SVcl	-0.00799	0.00142	-5.63**
					OC	-0.03672	0.00678	-5.41**

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	5	0.0043	3.16ns	0.44	Constant	0.4428	0.0745	5.94
Residual	9	0.0014			Ca	0.0938	0.0325	2.88*
Total	14	0.0024			Na	1.050	0.339	3.09*
					SVcl	-0.02162	0.00725	-2.98*
					P	0.02144	0.00926	2.31*
					OC	-0.1048	0.0404	-2.59*
P								
Regression	1	0.0030	17.32**	0.54	Constant	-0.1505	0.0459	-3.28
Residual	13	0.0002			pH	0.0472	0.0113	4.16**
Total	14	0.0004						
K								
Regression	1	0.0411	7.31*	0.31	Constant	-0.259	0.263	-0.99
Residual	13	0.0056			pH	0.1754	0.0649	2.7*
Total	14	0.0082						
Ca								
Regression	1	0.2400	26.97**	0.65	Constant	0.1260	0.0618	2.04
Residual	13	0.0089			K	1.939	0.373	5.19**
Total	14	0.0254						
Mg								
Regression	3	0.0041	5.2*	0.47	Constant	0.796	0.213	3.74
Residual	11	0.0008			pH	-0.1644	0.0523	-3.14**
Total	14	0.0015			Ca	0.02030	0.00566	3.59**
					P	-0.01661	0.00656	-2.53*
Na								
Regression	4	0.0009	6.72**	0.62	Constant	-0.0201	0.0142	-1.41
Residual	10	0.0001			Ca	0.02495	0.00959	2.6*
Total	14	0.0004			K	0.1589	0.0707	2.25*
					Na	0.342	0.101	3.38**
					SVcl	-0.00583	0.00218	-2.68*

Table 4.5.10. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *E. viminalis*

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	1	0.0087	8.68*	0.35	Constant	0.4021	0.0207	19.39
Residual	13	0.0010			K	-0.369	0.125	-2.95
Total	14	0.0016						
P								
Regression	1	0.0035	8.55*	0.35	Constant	-0.1616	0.0707	-2.28
Residual	13	0.0004			pH	0.0510	0.0175	2.92*
Total	14	0.0006						
K								
Regression	0	*	*	0.00	Constant	0.4060	0.0170	23.87
Residual	14	0.0043						
Total	14	0.0043						
Ca								
Regression	2	0.3731	9.89**	0.56	Constant	0.6855	0.0659	10.40
Residual	12	0.0377			Ca	-0.671	0.161	-4.17**
Total	14	0.0856			Mg	0.949	0.219	4.33**
Mg								
Regression	0	*	*	0.00	Constant	0.2747	0.0110	24.89
Residual	14	0.0018						
Total	14	0.0018						
Na								
Regression	2	0.0022	21.79**	0.75	Constant	0.03123	0.00342	9.13
Residual	12	0.0001			Ca	-0.05379	0.00834	-6.45**
Total	14	0.0004			Mg	0.0747	0.0114	6.58**

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	2	0.0008	4.2*	0.31	Constant	0.1795	0.0312	5.76
Residual	12	0.0002			Mg	-0.01950	0.00675	-2.89*
Total	14	0.0003			EA	-0.0508	0.0180	-2.82*
P								
Regression	2	0.0050	52.51**	0.88	Constant	0.1267	0.0158	8.04
Residual	12	0.0001			Na	-0.2408	0.0729	-3.3**
Total	14	0.0008			EA	-0.04977	0.00554	-8.98**
K								
Regression	1	0.1201	7.33*	0.31	Constant	-0.490	0.449	-2.19
Residual	13	0.0164			pH	0.1499	0.111	2.71*
Total	14	0.0238						
Ca								
Regression	3	0.0019	28.74**	0.86	Constant	0.2046	0.0171	6.00
Residual	11	0.0001			Ca	-0.09760	0.00752	-6.48**
Total	14	0.0005			Mg	0.14370	0.01000	7.18**
					OC	-0.04960	0.00758	-3.27**
Mg								
Regression	1	0.0019	8.31*	0.34	Constant	0.05518	0.00793	6.96
Residual	13	0.0002			EA	-0.01684	0.00584	-2.88*
Total	14	0.0004						
Na								
Regression	0	*	*	0.00	Constant	0.00933	0.00300	3.11
Residual	14	0.0001						
Total	14	0.0001						

Table 4.5.11. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *Transversae: E. deanei + E. grandis + E. saligna*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	0	*	*	0	Constant	1.7509	0.0314	55.79
Residual	44	0.0443						
Total	44	0.0443						
P								
Regression	2	0.0097	19.73**	0.46	Constant	0.12446	0.00828	15.04
Residual	42	0.0005			SVcl	0.001324	0.000282	4.69**
Total	44	0.0009			P	-0.00670	0.00206	-3.26**
K								
Regression	1	0.1068	10.89**	0.18	Constant	0.8036	0.0195	41.12
Residual	43	0.0098			Mg	-0.02909	0.00882	-3.3**
Total	44	0.0120						
Ca								
Regression	3	1.4233	9.45**	0.37	Constant	4.47	1.11	4.02
Residual	41	0.1505			pH	-1.021	0.297	-3.44**
Total	44	0.2373			Mg	0.2088	0.0462	4.52**
					K	1.410	0.565	2.5*
Mg								
Regression	2	0.0622	8.72**	0.26	Constant	0.3329	0.0169	19.71
Residual	42	0.0071			Mg	0.1072	0.0297	3.6**
Total	44	0.0096			SVcl	-0.01235	0.00418	-2.95**
Na								
Regression	2	0.0080	6.18*	0.19	Constant	0.1153	0.0136	8.51
Residual	42	0.0013			Mg	-0.00699	0.00327	-2.14*
Total	44	0.0016			P	0.00758	0.00335	2.26*

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	3	0.0289	7.63**	0.31	Constant	0.1207	0.0390	3.10
Residual	41	0.0038			K	0.1647	0.0774	2.13*
Total	44	0.0055			Na	0.479	0.214	2.24*
					P	0.02290	0.00595	3.85**
P								
Regression	2	0.0040	23.02**	0.50	Constant	-0.0120	0.0107	-1.12
Residual	42	0.0002			SVcl	0.001970	0.000334	5.89**
Total	44	0.0003			EA	0.01951	0.00560	3.49**
K								
Regression	0	*	*	0.00	Constant	0.4640	0.0111	41.67
Residual	44	0.0056						
Total	44	0.0056						
Ca								
Regression	3	0.2621	32.08**	0.68	Constant	0.1679	0.0455	3.69
Residual	41	0.0082			Ca	-0.0627	0.0236	-2.66*
Total	44	0.0255			Na	1.326	0.432	3.07**
					SVcl	0.01840	0.00539	3.41**
Mg								
Regression	2	0.0193	11.61**	0.33	Constant	0.3118	0.0905	3.45
Residual	42	0.0017			pH	-0.0691	0.0246	-2.81**
Total	44	0.0025			Na	0.719	0.150	4.81**
Na								
Regression	3	0.0009	5.55*	0.24	Constant	0.1916	0.0475	4.03
Residual	41	0.0002			pH	-0.0269	0.0113	-2.39*
Total	44	0.0002			Ca	-0.00375	0.00176	-2.13*
					EA	-0.02254	0.00597	-3.78**

Table 4.5.11. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *Transversae: E. deanei + E. grandis + E. saligna*

Bark nutrient concentration (%)

Element	df	MS	VR	R^2		Estimate	SE	t
				N				
Regression	2	0.0092	10.06**	0.29	Constant	0.6306	0.0865	7.29
Residual	42	0.0009			pH	-0.1001	0.0225	-4.45**
Total	44	0.0013			SVcl	0.001971	0.000547	3.6**
				P				
Regression	2	0.0492	42.43**	0.65	Constant	0.1099	0.0263	4.18
Residual	42	0.0012			SVcl	0.003340	0.000437	7.65**
Total	44	0.0033			OC	-0.0383	0.0114	-3.35**
				K				
Regression	0	*	*	0.00	Constant	0.4678	0.0180	25.97
Residual	44	0.0146						
Total	44	0.0146						
				Ca				
Regression	3	1.0016	10.08**	0.38	Constant	0.5857	0.0942	6.22
Residual	41	0.0993			Ca	-0.2222	0.0587	-3.78**
Total	44	0.1608			Mg	0.3658	0.0808	4.52**
					K	1.404	0.459	3.06**
				Mg				
Regression	1	0.0601	6.97*	0.12	Constant	0.2979	0.0183	16.25
Residual	43	0.0086			Mg	0.02182	0.00827	2.64*
Total	44	0.0098						
				Na				
Regression	3	0.0023	7.9**	0.32	Constant	-0.0179	0.0155	-1.15
Residual	41	0.0003			Na	0.2309	0.0776	2.98**
Total	44	0.0004			SVcl	0.000669	0.000313	-2.14*
					OC	0.02206	0.00572	3.85**

(Columns Element–R^2: Summary of analysis; remaining columns: Regression coefficients)

Bole wood nutrient concentration (%)

Element	df	MS	VR	R^2		Estimate	SE	t
				N				
Regression	2	0.0017	5.41**	0.17	Constant	0.2313	0.0476	4.86
Residual	42	0.0003			pH	-0.0387	0.0123	-3.14**
Total	44	0.0004			Mg	0.00598	0.00213	2.81**
				P				
Regression	2	0.0005	18.32**	0.44	Constant	0.00590	0.00146	4.03
Residual	42	0.0000			Mg	0.002052	0.000514	3.99**
Total	44	0.0000			K	0.01722	0.00689	2.5*
				K				
Regression	2	0.1837	13.86**	0.37	Constant	-0.605	0.277	-4.38
Residual	42	0.0132			pH	0.1655	0.0646	5.12**
Total	44	0.0210			P	0.0180	0.0114	3.15**
				Ca				
Regression	4	0.0082	13.59**	0.53	Constant	0.6140	0.0937	3.27
Residual	40	0.0006			pH	-0.1226	0.0237	-2.58*
Total	44	0.0013			Ca	0.02303	0.00248	4.64**
					K	0.1803	0.0366	2.16*
					P	-0.01599	0.00252	-3.17**
				Mg				
Regression	0	*	*	0.00	Constant	0.02333	0.00208	11.20
Residual	44	0.0002						
Total	44	0.0002						
				Na				
Regression	0	*	*	0.00	Constant	0.00956	0.00114	8.35
Residual	44	0.0001						
Total	44	0.0001						

(Columns Element–R^2: Summary of analysis; remaining columns: Regression coefficients)

Table 4.5.12: Regression analysis of soil parameters on the macro nutrient content of single biomass components: *Viminales: E. dunnii + E. macarthurii + E. nitens + E. smithii + E. viminalis*

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	0	*	*	0.00	Constant	1.8113	0.0277	65.34
Residual	74	0.0576						
Total	74	0.0576						
P								
Regression	2	0.0087	13.12**	0.25	Constant	0.1581	0.0163	9.68
Residual	72	0.0007			Ca	0.00400	0.00144	2.79**
Total	74	0.0009			OC	-0.02037	0.00700	-2.91**
K								
Regression	2	0.1675	10.17**	0.20	Constant	0.6723	0.0382	17.62
Residual	72	0.0165			P	0.0217	0.0103	2.11*
Total	74	0.0206			EA	0.0702	0.0221	3.18**
Ca								
Regression	1	3.1984	34.35**	0.31	Constant	0.5496	0.0464	11.85
Residual	73	0.0931			Mg	0.1334	0.0228	5.86**
Total	74	0.1351						
Mg								
Regression	1	0.1236	21.53**	0.22	Constant	0.1955	0.0112	17.51
Residual	73	0.0057			Ca	0.01810	0.00390	4.64**
Total	74	0.0073						
Na								
Regression	0	*	*	0.00	Constant	0.07227	0.00415	17.42
Residual	74	0.0013						
Total	74	0.0013						

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	3	0.0287	5.82**	0.16	Constant	-0.157	0.130	-1.20
Residual	71	0.0049			pH	0.1158	0.0321	3.61**
Total	74	0.0059			K	-0.2186	0.0986	-2.22*
					P	0.01856	0.00585	3.17**
P								
Regression	1	0.0091	40.64**	0.35	Constant	-0.1059	0.0226	-4.70
Residual	73	0.0002			pH	0.0356	0.00558	6.37
Total	74	0.0003						
K								
Regression	3	0.0272	3.03*	0.08	Constant	-0.159	0.241	-0.66
Residual	71	0.0090			pH	0.1431	0.0600	2.39*
Total	74	0.0097			P	0.01782	0.00796	2.24*
					SVcl	-0.00355	0.00152	-2.34*
Ca								
Regression	3	0.2747	26.48**	0.51	Constant	-0.385	0.237	-1.63
Residual	71	0.0104			pH	0.1853	0.0616	3.01**
Total	74	0.0211			Ca	-0.0840	0.0181	-4.65**
					Mg	0.1448	0.0243	5.96**
Mg								
Regression	2	0.0117	6.4**	0.13	Constant	0.10321	0.00666	15.49
Residual	72	0.0018			Ca	-0.02333	0.00936	-2.49**
Total	74	0.0021			SVcl	0.00552	0.00182	3.03**
Na								
Regression	2	0.0023	6.32**	0.13	Constant	0.04153	0.00480	8.64
Residual	72	0.0004			Ca	0.00405	0.00114	3.55**
Total	74	0.0004			K	-0.0547	0.0274	-2.00*

Table 4.5.12. Regression analysis of soil parameters on the macro nutrient content of single biomass components: *Viminales: E. dunnii + E. macarthurii + E. nitens + E. smithii + E. viminalis*

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
N								
Regression	1	0.0135	4.04*	0.04	Constant	0.3178	0.0146	21.78
Residual	73	0.0033			K	-0.1436	0.0714	-2.01*
Total	74	0.0035						
P								
Regression	1	0.0149	48.15**	0.39	Constant	-0.1467	0.0266	-5.52
Residual	73	0.0003			pH	0.04562	0.00657	6.94**
Total	74	0.0005						
K								
Regression	0	*	*	0.00	Constant	0.4515	0.0144	31.27
Residual	74	0.0156						
Total	74	0.0156						
Ca								
Regression	4	0.5668	8.17**	0.28	Constant	-0.041	0.183	-0.23
Residual	70	0.0694			Ca	-0.0911	0.0447	-2.04*
Total	74	0.0963			Mg	0.1772	0.0637	2.78**
					Na	1.631	0.788	2.07*
					OC	0.2361	0.0718	3.29**
Mg								
Regression	0	*	*	0.00	Constant	0.2379	0.0102	23.32
Residual	74	0.0078						
Total	74	0.0078						
Na								
Regression	1	0.0021	4.08*	0.04	Constant	0.02979	0.00604	4.93
Residual	73	0.0005			P	0.00351	0.00174	2.02*
Total	74	0.0005						

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
N								
Regression	0	*	*	0.00	Constant	0.08360	0.00241	34.75
Residual	74	0.0004						
Total	74	0.0004						
P								
Regression	2	0.0080	37.49**	0.50	Constant	0.02775	0.00908	3.06
Residual	72	0.0002			Mg	0.00832	0.00116	7.2**
Total	74	0.0004			OC	-0.00807	0.00389	-2.08*
K								
Regression	3	0.0459	12.16**	0.31	Constant	-0.596	0.118	-5.05
Residual	71	0.0038			pH	0.1759	0.0302	5.82**
Total	74	0.0055			Na	-0.374	0.167	-2.24*
					P	0.01668	0.00513	3.25**
Ca								
Regression	3	0.0240	7.69**	0.21	Constant	0.1818	0.0354	5.14
Residual	71	0.0031			Ca	-0.02035	0.00939	-2.17*
Total	74	0.0040			Mg	0.0411	0.0134	3.07**
					OC	-0.0323	0.0152	-2.12*
Mg								
Regression	0	*	*	0.00	Constant	0.03880	0.00292	13.31
Residual	74	0.0006						
Total	74	0.0006						
Na								
Regression	0	*	*	0.00	Constant	0.00947	0.00111	8.57
Residual	74	0.0001						
Total	74	0.0001						

Table 4.5.13. Regression analysis of soil parameters on the macro nutrient content of single biomass components: Combined species

Bulk leaf nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	3	0.2044	4.08**	0.06	Constant	1.6895	0.0490	34.47
Residual	146	0.0501			Ca	-0.0670	0.0248	-2.7**
Total	149	0.0532			Mg	0.1007	0.0363	2.78**
					P	0.0283	0.0121	2.35*
P								
Regression	2	0.0231	37.41**	0.33	Constant	0.1520	0.0109	13.90
Residual	147	0.0006			Ca	0.005315	0.000938	5.66**
Total	149	0.0009			OC	-0.01909	0.00468	-4.08**
K								
Regression	3	0.1682	10.16**	0.16	Constant	0.7279	0.0322	22.62
Residual	146	0.0166			K	0.270	0.121	2.24*
Total	149	0.0196			SVcl	-0.00493	0.00108	-4.57**
					P	0.01433	0.00687	2.08*
Ca								
Regression	2	3.2737	26.72**	0.26	Constant	0.087	0.154	0.56
Residual	147	0.1225			Mg	0.2304	0.0377	6.11**
Total	149	0.1648			EA	0.2924	0.0842	3.47**
Mg								
Regression	2	0.1463	16.18**	0.17	Constant	0.1539	0.0418	3.68
Residual	147	0.0090			Mg	0.0451	0.0103	4.4**
Total	149	0.0109			EA	0.0494	0.0229	2.16*
Na								
Regression	0	*	*	0.00	Constant	0.09460	0.00415	22.81
Residual	149	0.0026						
Total	149	0.0026						

Branch nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	df	MS	VR	R^2		Estimate	SE	t
N								
Regression	2	0.0548	11.1**	0.12	Constant	0.2449	0.0151	16.23
Residual	147	0.0049			SVcl	0.001593	0.000497	3.21**
Total	149	0.0056			P	0.01547	0.00375	4.12**
P								
Regression	1	0.0153	63.65**	0.30	Constant	0.02750	0.00167	16.47
Residual	148	0.0002			SVcl	0.000847	0.000106	7.98**
Total	149	0.0003						
K								
Regression	0	*	*	0.00	Constant	0.43093	0.00795	54.21
Residual	149	0.0095						
Total	149	0.0095						
Ca								
Regression	3	0.5225	42.14**	0.45	Constant	0.2663	0.0191	13.95
Residual	146	0.0124			Ca	-0.0445	0.0130	-3.41**
Total	149	0.0227			Mg	0.1131	0.0180	6.27**
					K	0.261	0.106	2.46*
Mg								
Regression	4	0.0141	8.27**	0.16	Constant	0.2901	0.0708	4.10
Residual	145	0.0017			pH	-0.0496	0.0176	-2.81**
Total	149	0.0020			Mg	0.00852	0.00363	2.35*
					Na	0.2590	0.0977	2.65**
					P	-0.00521	0.00237	-2.2*
Na								
Regression	1	0.0015	4.12*	0.02	Constant	0.03161	0.00443	7.14
Residual	148	0.0004			Na	0.0646	0.0318	2.03*
Total	149	0.0004						

Table 4.5.13. Regression analysis of soil parameters on the macro nutrient content of single biomass components: Combined species

Bark nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
				N				
Regression	2	0.0139	5.41**	0.06	Constant	0.2772	0.0126	22.04
Residual	147	0.0026			K	-0.0843	0.0400	-2.11*
Total	149	0.0027			P	0.00578	0.00265	2.18*
				P				
Regression	2	0.0410	44.91**	0.37	Constant	0.0711	0.0133	5.35
Residual	147	0.0009			Ca	0.00808	0.00114	7.08**
Total	149	0.0015			OC	-0.01905	0.00569	-3.35**
				K				
Regression	3	0.0617	4.19**	0.06	Constant	0.4772	0.0601	7.95
Residual	146	0.0147			Na	0.746	0.279	2.67**
Total	149	0.0157			SVcl	-0.00367	0.00120	-3.06**
					OC	-0.0472	0.0227	-2.08*
				Ca				
Regression	6	0.9409	10.4**	0.28	Constant	-0.137	0.168	-0.82
Residual	143	0.0905			Ca	-0.1365	0.0358	-3.81**
Total	149	0.1247			Mg	0.2807	0.0564	4.98**
					K	1.051	0.299	3.52**
					Na	1.585	0.722	2.19*
					P	0.0340	0.0172	1.98*
					EA	0.2174	0.0794	2.74**
				Mg				
Regression	1	0.1043	11.42**	0.07	Constant	0.2436	0.0103	23.67
Residual	148	0.0091			Mg	0.01652	0.00489	3.38**
Total	149	0.0098						
				Na				
Regression	4	0.0030	6.5**	0.13	Constant	0.0016	0.0113	0.14
Residual	145	0.0005			Ca	-0.00508	0.00244	-2.08*
Total	149	0.0005			Mg	0.00860	0.00392	2.19*
					Na	0.1757	0.0508	3.46**
					EA	0.01477	0.00531	2.78**

Bole wood nutrient concentration (%)

Summary of analysis					Regression coefficients			
Element	**df**	**MS**	**VR**	**R^2**		**Estimate**	**SE**	**t**
				N				
Regression	2	0.0015	3.48*	0.03	Constant	0.1510	0.0328	4.61
Residual	147	0.0004			pH	-0.01758	0.00855	-2.06*
Total	149	0.0004			SVcl	0.000571	0.000217	2.64**
				P				
Regression	2	0.0063	36.46**	0.32	Constant	-0.0333	0.0202	-1.65
Residual	147	0.0002			pH	0.01111	0.00526	2.11*
Total	149	0.0003			Mg	0.004030	0.000995	4.05**
				K				
Regression	3	0.1078	31.29**	0.38	Constant	-0.4025	0.0978	-4.11
Residual	146	0.0034			pH	0.1334	0.0197	6.76**
Total	149	0.0055			S_P	0.02306	0.00385	5.98**
					OC	-0.0428	0.0146	-2.93**
				Ca				
Regression	2	0.0217	27.2**	0.26	Constant	0.07260	0.00724	5.01
Residual	147	0.0008			Mg	0.01397	0.00205	3.41**
Total	149	0.0011			Na	0.2890	0.0660	2.19*
				Mg				
Regression	0	*	*	0.00	Constant	0.03113	0.00180	17.33
Residual	149	0.0005						
Total	149	0.0005						
				Na				
Regression	0	*	*	0.00	Constant	0.008667	0.000706	12.28
Residual	149	0.0001						
Total	149	0.0001						

5. NUTRIENT BUDGETS

5.1. Nutrient mass per tree

Appendix A2.2 contains details of the mass of biomass components per individual tree, and the nutrient composition of these is presented in Appendices A3.2 to A3.6 per respective component. The product of these records yields the total sample tree mass of individual nutrients per component and per species. These are presented per biomass component in sections 5.1.1 to 5.1.5 of Chapter 5.

As Fe, Cu, Zn and Mn are present only in trace quantities, these four elements are combined as "Trace"for computing nutrient budgets. Figure 5.1 shows the average total nutrient mass of above-ground biomass per species. Total nutrient mass (an average of 834 g per tree) is dominated by Ca (31%), N and K (26% each). Mg is present in intermediate quantities (9%), while P, trace elements and Na are at about 3% each. The proportion of total nutrient mass per biomass component is greatest for bole wood (36%), followed by leaf and bark (22% each), branches (17%) and on-tree dead matter (3%).

It is clear that there are large differences between species, with a steady increase in nutrient mass from 650 g/tree for *E. fastigata* (the smallest) to about 1010 g/tree for *E. smithii*. While all species display similar nutrient profiles, there is a tendency for increasing nutrient mass to be accompanied by increases in Ca and Mg. As nutrient mass is a function of both nutrient concentration and biomass size, the linear trend of increasing nutrient mass in Figure 5.1 may partly reflect an increase in total biomass *per se*. This holds true for individual biomass components as well, and will be investigated further in this chapter (also see Figure 5.20).

Analysis of variance of the tree nutrient mass of bulk leaf material is presented in Appendices B7.2.1 - B7.2.10. There are very highly significant differences between species for Zn, Na and Ca, highly significant for Fe, Mn, Mg, K and N, and significant for P. Significant to very highly significant site interactions are present for Fe, and Mn, with significant interactions for all nutrients except Na.

As could be expected, foliar nutrient mass across species is dominated by N (46%), followed by K and Ca (20% each). Overall, Mg comprise 7%, with 3% for P and 2% for Na and trace elements each (see Figure 5.2). Total foliar nutrient mass ranges across sites from an average of 116 g/tree (*E. deanei*) to over 260 g/tree (*E. viminalis*).

Analysis of variance of the tree nutrient mass of branch material is presented in Appendices B8.2.1 - B8.2.10. There are very highly significant differences between species for Fe, Cu, Zn, Mn, Na, Ca and N, and highly significant differences for P and K. There are no significant differences for Mg. Significant to very highly significant site interactions are present for Cu, Zn, Mn, Ca, K and N.

The average total branch nutrient mass (see Figure 5.3) is relatively more uniform across species than for leaves. The lowest is for *E. grandis* (108 g/tree), and this increases gradually across ranked species to about 155 g/tree for *E. nitens* and *E. elata*, but is markedly higher at 218 g/tree for *E. smithii*. These latter three species have large leaf biomasses, especially compared to *E. grandis*. Individual nutrient mass is greatest for K (31%), Ca (28%) and N (23%), again followed by Mg (9%) and trace elements, Na and P (3% each).

Analysis of variance of the tree nutrient mass of dead material is presented in Appendices B9.2.1 - B9.2.10. There are very highly significant differences between species for all nutrients except P (not significant) and Na (significant). There are significant site interactions present except for Ca (very highly significant).

The relatively high on-tree dead matter biomass of *E. smithii, E. macarthurii* and *E. deanei* also causes their total nutrient mass to be high at 57, 36 and 34 g/tree respectively. In contrast and for opposite reasons, the nutrient masses of *E. dunnii* (10 g/tree) and *E. grandis* and *E. elata* (14 g/tree each) are low. On average, Ca dominates the proportion of dead matter nutrient mass (42%), followed by N (24%) and K (15%). Mg is at 9%, with low fractions for trace elements (5%), Na (2%) and P (1%).

Analysis of variance of the tree nutrient mass of bole bark material is presented in Appendices B10.2.1 - B10.2.10. There are very highly significant differences between species for all elements except Fe and Cu (not significant). Very highly significant site interactions are present for Mn, P, Na and N, while K is significant only.

As could be expected, the bark nutrient mass across species is dominated by Ca (40% of total content), followed by K (23%) and N (15%). Mg comprise 14%, with 4% for trace elements, and 2% for Na and P each (see Figure 5.5). The total bark nutrient mass average across sites is about 180 g/tree, but ranges from a low of 108g/tree (*E. fastigata*) to over 270 g/tree (*E. dunnii*).

Analysis of variance of the tree nutrient mass of bole wood material is presented in Appendices B11.2.1 - B11.2.10. There are very highly significant differences between species for Fe, P, Ca and Mg, a highly significant and significant difference for Mn and Zn respectively. Very highly significant site interactions are present for P, Ca and Mg, and highly significant for N.

Total nutrient mass for bole wood (see Figure 5.6) ranges between about 240 and 300 g/tree for most species, but is dramatically higher for *E. smithii* (395 g/tree) and *E. dunnii* (460 g/tree). These latter two species also possess the greatest round wood yields. Overall, Ca (33%), K (29%) and N (22%) comprise the largest nutrient mass fractions, followed by Mg (8%), P (4%) and Na and trace elements (2% each).

While species and biomass size are important factors in determining nutrient mass per biomass component, the site also plays a role. The site influences nutrient mass in terms of the availability of soil nutrients for uptake and other factors linked to production capacity (climate, plant available water, soil depth and drainage etc). Figure 5.7 illustrates differences in the average biomass nutrient mass across species per site. Overall, GE.12 has the greatest mass of nutrients per tree (see Table 5.1), as this site has generally the highest tree growth rates, i.e. a large biomass (see Figure 4.10). While GE.11 (shallow lithosol with relatively high levels of soil nutrients) supports only a modest biomass production capacity, it also has a higher concentration of biomass nutrients compared to GE.10 and GE.14, and thus a greater total nutrient mass per tree.

In order to obviate confusion caused by differences in nutrient concentration and the confounding multiplier effect of biomass size, it is useful to examine the mass of nutrients per unit biomass in determining nutrient budgets. A comparison between sites (see Figure 5.8) shows that the average nutrient profile across species is dominated by Ca, K and N, but that these increase absolutely and proportionately on shallower rocky soils with a higher nutrient content (especially Ca and K) from more weathering primary minerals. Thus trees on these sites have a greater nutrient mass per unit of biomass - an increase of up to 69% compared to deep well-weathered soils with high growth rates. It is thus apparent that nutrient mass per unit biomass is increased by the level of soil nutrition, and may be decreased on well-watered but highly weathered soils supporting high growth rates.

Steenbjerg and Jakobsen (1963 - in Grove et al., 1996) proposed the "Utilization Quotient" (UQ) as the reciprocal of nutrient concentration, *viz* total biomass produced per unit of nutrient:

Utilization Quotient = Total biomass / Total nutrient mass (kg/g)

This is useful as a tool for examining the benefits derived from utilising natural resources, especially if in short supply. Values for the study sites are given in Table 5.1. Figure 5.9 shows UQs for all nutrients as a curvilinear trend and the inverse of Figure 5.8. Figure 5.9 indicates that P yields appreciably more biomass on deep than shallow soils, as does Mg (and to a lesser extent Na and trace elements). Similarly, the UQ for Ca increases markedly (see Figure 5.10), as well as (erratically) for K and N. Overall, UQ is lowest at GE.13, and improves by 70% for GE.10 (deep soil with high tree growth rates).

As one of the aims of this study is directed at managing timber production more sustainably, a practical adaptation of the UQ is the Efficiency Quotient (EQ), defined as:

Efficiency Quotient = Bole wood biomass / Total biomass nutrient mass (kg/g)

By definition, EQs have relatively smaller values than UQs (see Table 5.1). However, Figure 5.11 shows that it is more sensitive to site conditions, increasing by 95% from GE.13 to GE.10. Interestingly, EQ values differ somewhat less between sites with deep soils, and also indicate that GE.14 (cool site) is slightly less effective for most species than GE.12 (warm site) in terms of bole wood yield per unit nutrient mass.

Table 5.2 presents the average nutrient mass of total biomass for eucalypt species across sites, as well as their UQs and EQs. The total nutrient mass per kilogram of above-ground biomass is lowest for *E. fastigata* and *E. smithii* (6.4 - 6.5 g/kg), and rises slowly across ranked species to a maximum of 9.3 g/kg for *E. viminalis* (see Figure 5.13). The *Monocalyptus* are generally thriftier than the other subgenera, but there appears to be no clear distinguishing pattern between the Transversae and Viminales groups. The proportion of Mg and Ca in *E. dunnii* is markedly higher than other species, although *E. grandis* and *E. saligna* also have high contents of Ca per unit total biomass.

The UQs (see Figures 5.14 and 5.15) show that differences between species are most marked for P, Na and trace elements, but more uniform for Ca, K and N. In particular, *E. smithii* uses P, Na and Mg very sparingly, as does *E. fastigata* (especially for Na), and both these species have the largest UQ values for the macro nutrients. Conversely, *E. grandis* and *E. dunnii* utilise Ca more poorly, but the latter species is the most efficient with N.

The EQ values indicate a similar range to UQ values in total nutrient quotients, i.e. an increase of 44% from the least (*E. viminalis*) to the most efficient (*E. smithii*). However, there are a differences in intermediate species, with a tendency for the Transversae to be more efficient than the Viminales (excluding *E. smithii* and *E. dunnii*). This pattern is clearest for P, N and K. The *Monocalyptus E. fastigata* and *E. elata* appear particularly effective at utilising Ca.

The trends presented above are based on actual field data across a broad range of site conditions. The generally good growth of *E. smithii* and *E. dunnii* reflect their adaptation to the generally cool climate in the region, and hence the modest (more off-sites) growth of *E. grandis* and *E. deanei*. Conversely, *E. nitens* has only grown vigorously at the high altitude (cold) site of GE.14. As tree growth rate and yield *per se* strongly influence nutrient mass per unit biomass (see Table 5.3 and Figure 5.18), it is therefore more meaningful to compare contents and quotients on a biomass-equivalence basis.

TABLE 5.3. AVERAGE GROWTH PARAMETERS AND BIOMASS NUTRIENT CONTENT PER SITE

Site	Dbh	Height	Stocking	Merchantable timber		Total tree content	
	(cm)	(m)	(N/ha)	(m^3/tree)	(t/tree)	*Biomass (kg)*	*Nutrients (g)*
GE.10	16.84	20.27	1488	0.159	0.086	116.20	761.0
GE.11	15.87	18.32	1506	0.132	0.070	101.30	906.0
GE.12	19.55	24.18	1414	0.270	0.136	172.25	1281.3
GE.13	12.27	14.63	1469	0.065	0.032	49.70	550.4
GE.14	15.14	19.19	1593	0.130	0.069	95.59	672.1
Mean	**15.93**	**19.32**	**1494**	**0.151**	**0.079**	**107.01**	**834.1**

From the data in Table 5.3, average tree timber yield across the five trial study sites is as follows:

Merchantable (ub) yield at 7 years: 153.0 t/ha (6 weeks air-dry) or 225.6 m^3/ha
Mean annual increment: 21.9 t/ha/an or 32.2 m^3/ha/an

The average yields shown in Table 5.3 are approximately equivalent to eucalypt pulpwood yields in the southeastern Mpumalanga on an eight year cycle (discounting the above-average standard of silviculture applied in experimental areas), where silviculture of a reasonable standard has been applied, including correct site-species matching. It would therefore be justified to use the "average" tree growth size from this study to examine "average" nutrient budgeting across the region's granite-derived soils. From the mensurational parameters recorded at GE.10 to GE.14, the "average" tree has the following characteristics:

Height:	19.32 m
Dbh:	15.93 cm
Form factor:	0.391
Dbh/Height:	0.8245
Total dry biomass:	107.008 kg
Stand density:	1494 trees per ha

Complete mass equivalence at the individual biomass component levels is impossible to achieve, as species differ in their allocations of biomass to different above-ground components. However, by using the mensurational biomass models (see Tables 4.2.1 to 4.2.10) and the "average" tree parameters, it is possible to estimate the mass of biomass components per species for trees with nominally the same dbh, height, Dbh/Height ratio and form factor (see Table 5.4). These values can in turn be adjusted for equivalence on a total biomass weighted basis. The final adjusted biomass values thus represent each species "normal" on-site growth rate and above-ground component allocations. In addition, they allow comparisons on nutrient distribution and budgets to be made without the bias of different growth rates. and biomass yields.

Figure 5.18 shows adjusted modelled biomass component mass per species. It is evident that *E. nitens* (67%), *E. smithii* and *E. elata* have relatively low proportions of bole wood to other biomass components, while *E. grandis* (76%), *E. macarthurii* and *E. dunnii* have the greatest bole wood biomass allocations. Conversely, these species show reverse trends in terms of bark mass, with 15% for *E. smithii* and only 8% for *E. grandis*. Leaf mass may vary by a factor of 2, with 6% for *E. nitens* and 3% for *E. macarthurii*.

5.2. Harvesting effects

Table 5.5 contains the estimated average nutrient mass per above-ground component for eucalypt species at harvesting (age 8 years, pulpwood rotation). These are derived from the modelled biomass component masses (see Table 5.4) and average nutrient concentrations per species across sites (see Tables 3.6.1, 3.7.1, 3.8.1, 3.9.1 and 3.10.1).

In general, *E. dunnii* and *E. deanei* have the highest total nutrient mass per tree, while those for *E. fastigata, E. elata* and *E. smithii* are much lower (see Figure 5.20). *E. dunnii* (936 g/tree) has a high nutrient mass due mainly to its bole wood and bark nutrients. The nutrient mass of *E. fastigata* is low for all components (706 g/tree), but particularly regarding its branches and bark. Differences in total nutrient mass between the other remaining species are not as great. However, the distribution of nutrient mass between biomass components varies widely across species from the "norm" of 36% for bole wood, 22% each for leaves and bark, 17% for branches and 3% for on-tree dead matter.

Using the equivalent biomass data, it is evident that the nutrient composition of total biomass across species is dominated by Ca (31%), N and K (22% each), with a medium content of 9% for Mg and small amounts of P, trace elements and Na (3%, 3% and 2% respectively) - see Figure 5.21. *E. dunnii, E. deanei, E. grandis* and *E. saligna* (to a lesser extent) all show elevated masses of Ca. *E. dunnii* also shows an unusually strong affinity for K and Mg. *E. grandis* and *E. saligna* are weak accumulators of N. *E. fastigata* and *E. elata* contain relatively large proportions (but normal mass) of N, but are low in Ca and K nutrient mass.

The varying amounts of nutrients contained within biomass components across species will result in differing quantities being removed from the site or returned to the soil as slash and litter. Table 5.5 contains single tree nutrient estimates per species for debarked and un-debarked bole wood, and slash (leaf + branch + dead matter + bark). These values are based on each tree having the same total dry biomass (103.6 kg) distributed between biomass components according to each species's own inherent characteristics.

The mass of nutrients removed in bole wood varies greatly between species, from a frugal 243 g/tree for *E. elata* and *E. smithii* to 373 g/tree for *E. dunnii* - an increase of 53%. On a per hectare basis (1494 N/ha), these translate into 363 and 557 kg/ha respectively. The other species reflect a gradient of nutrient masses per tree between these extremes (see Figure 5.22). *E. dunnii, E. grandis* and (to a lesser extent) *E. saligna* all contain large amounts of Ca in their bole wood, while *E. dunnii* also has unusually large amounts of Mg. Nutrient differences between the other species are less marked, excepting that *E. smithii* has relatively low quantities of N, and *E. viminalis* and *E. macarthurii* have relatively large amounts of P in their bole wood. Harvested K is remarkably uniform across species.

The average export of nutrients from the site increases by 61% from 297 g/tree to 477 g/tree if bark is retained on logs. On a per hectare basis (1494 N/ha), this translates into 444 and 713 kg/ha respectively. However, the increase differs across species, and is greatest for *E. dunnii* (72%) and least for *E. smithii* (41%). In addition, the gradient of differences between species becomes steeper with than without bark retained on the bole (see Figure 5.23). The greatest proportion of these increases are in Mg (107%), Ca (74%) and Na (64%), although the quantities of nutrients removed is most for Ca (73 g/tree) and K (41 g/tree).

TABLE 5.6. ESTIMATED EXPORT QUOTIENTS FOR BOLE WOOD WITH AND WITHOUT BARK

Species	Bole wood mass *(kg/tree)*	Nutrient mass *(g/tree)*		Export Quotient	
		Bole	***Bole + bark***	***Bole***	***Bole + bark***
E. deanei	75.677	301.94	494.90	0.251	0.153
E. dunnii	77.964	372.73	639.62	0.209	0.122
E. elata	73.703	242.39	406.02	0.304	0.182
E. fastigata	75.927	268.83	383.25	0.282	0.198
E. grandis	79.148	330.87	542.95	0.239	0.146
E. macarthurii	78.041	324.68	530.91	0.240	0.147
E. nitens	69.837	270.01	434.04	0.259	0.161
E. saligna	77.319	299.59	495.07	0.258	0.156
E. smithii	70.794	243.97	343.97	0.290	0.206
E. viminalis	77.617	323.63	524.61	0.240	0.148
Model mean	**75.603**	**297.10**	**477.37**	**0.254**	**0.158**

As there are some differences in the adjusted bole wood mass between species, it is also important to calculate the effect this has on the efficiency with which nutrient budgets are able to provide utilizable timber. An adaptation of the EQ is the Export Quotient, which is the quantity of bole wood produced per unit of nutrient mass exported from the site during harvesting:

Export Quotient = Bole wood biomass / Total roundwood nutrient mass

Export Quotients for "average" sized trees per species (i.e. across sites) are presented in Table 5.6 for both the harvesting of bole wood and bole wood with bark retained. It is clear that *E. elata* has the best (i.e. most efficient) bole wood quotient, while *E. dunnii* shows the poorest (a decrease of 45%). *E. grandis, E. macarthurii* and *E. viminalis* show a marginal improvement over *E. dunnii*, but *E. smithii* and *E. fastigata* are markedly better and similar to that of *E. elata* (see Figure 5.24). If bark is retained on the timber during harvesting, the average Export Quotient drops by 61%, but the decrease is greatest for *E. dunnii* (71%) and least for *E. smithii* (41%).

In order to attempt managing the conservation of soil nutrients, it is necessary to quantify how much nutrient is lost in harvesting (export) as debarked or un-debarked logs, volatilisation and particulate convection during burning, and by erosion and leaching of soil components. However, due to a generally negative water balance, soil leaching losses over the rotation are likely to be small under commercial eucalypts. Estimates of atmospheric losses have been calculated by Harwood and Jackson (1975), Ellis and Graley (1983), Raison *et al.* (1985), Attiwill and Leeper (1987) and Stewart and Flinn (1995). Nutrient inputs are mainly in the form of on-site biological nitrogen fixation and dissolved elements in rainfall (Parker, 1983; Attiwill and Leeper (1987).

TABLE 5.7. ESTIMATED SITE NUTRIENT BALANCE FOR BOLE WOOD WITH AND WITHOUT BARK

Species	Element (kg/ha/8 yrs)					
	N	*P*	*K*	*Ca*	*Mg*	*Total*
Inputs (rainfall)	40.0	0.16	40.0	64.0	32.0	176.2
Burning losses	156.7	10.5	113.3	143.9	48.6	473.0
Debarked export	97.3	19.1	128.2	145.9	35.2	425.7
Un-debarked export	136.7	25.5	189.5	254.2	72.6	678.5

Using the data in Table 5.6 with the study's average stocking of 1494 trees per hectare, Table 5.7. shows the "average" nutrient balance for short rotation (8 years) pulpwood production in the eastern Mpumalanga. From Table 5.7 it is clear that, except for Mg, the rate on nutrient consumption exceeds inputs considerably, even without the burning of felling debris and debarking in-field. However, it is possible that N inputs are under-estimated, given the high incidence of electrical storms in the region. The inputs in Table 5.7 also exclude "root-mined" nutrients introduced into the soil from the decomposition and uptake of primary minerals in the substrate rock and saprolite. The relatively large amounts of Ca, Mg and K lost to the system is confirmed by Musto (1994), who found a significant decrease in soil Ca following afforestation of grasslands in the KwaZulu/Natal Midlands.

Fig. 5.1. Nutrient mass of total biomass per species

Recorded average tree profiles across sites

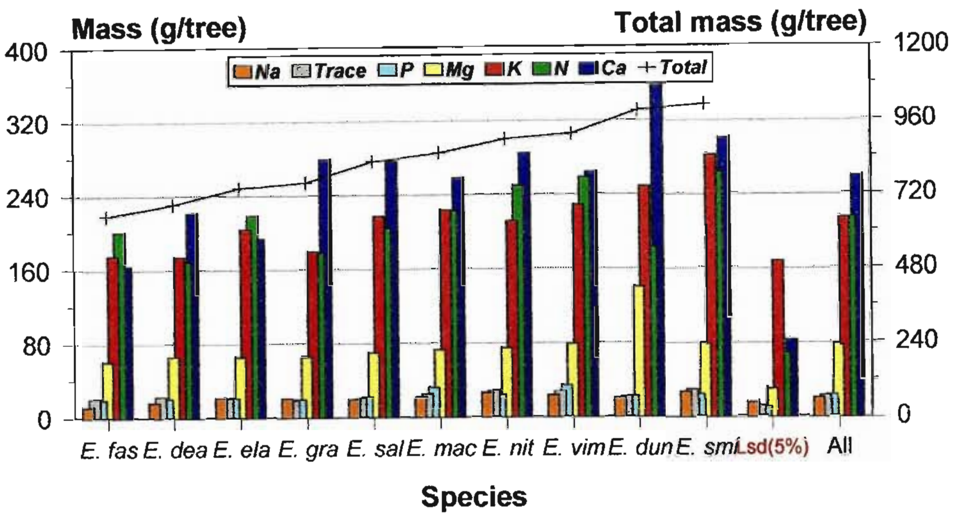


Fig. 5.2. Nutrient mass of leaf biomass per species

Recorded average tree profiles across sites

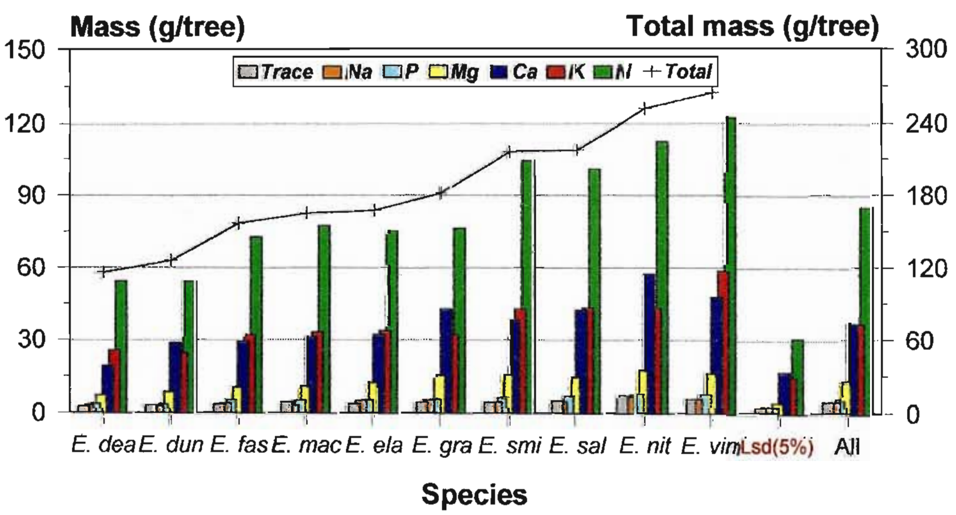


Fig. 5.3. Nutrient mass of branch biomass per species

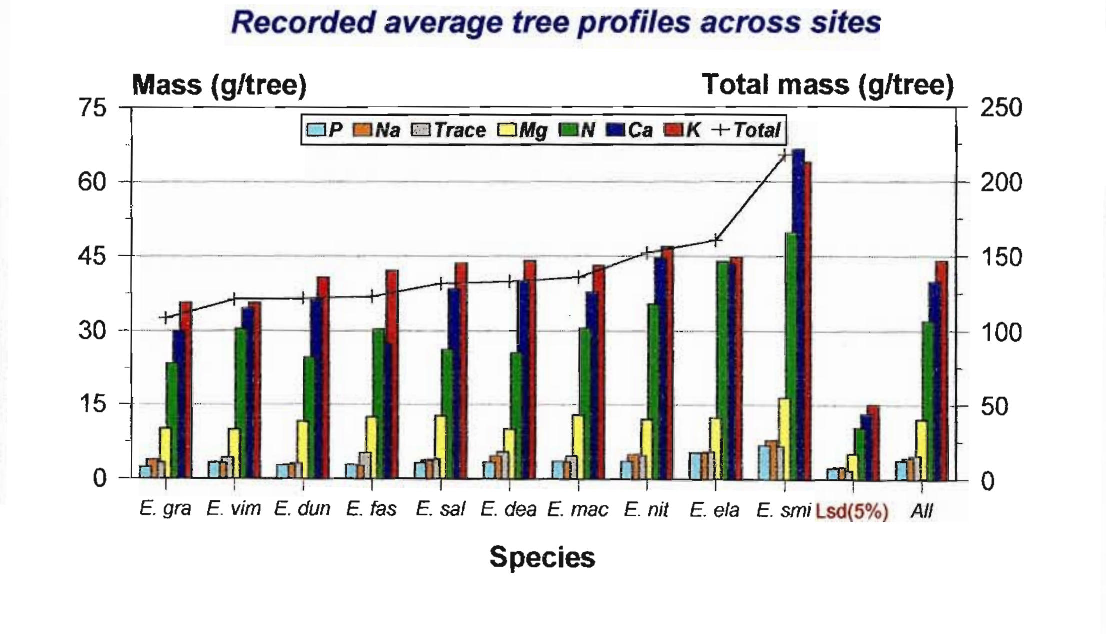


Fig. 5.4. Nutrient mass of dead matter per species

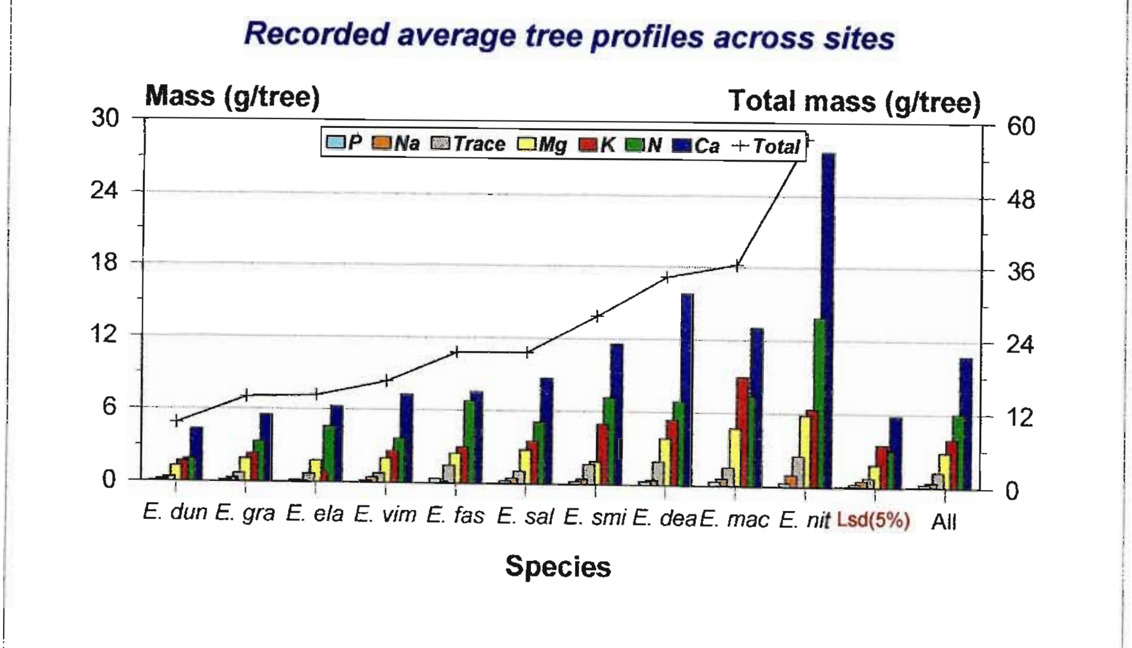


Fig. 5.5. Nutrient mass of bark biomass per species

Recorded average tree profiles across sites

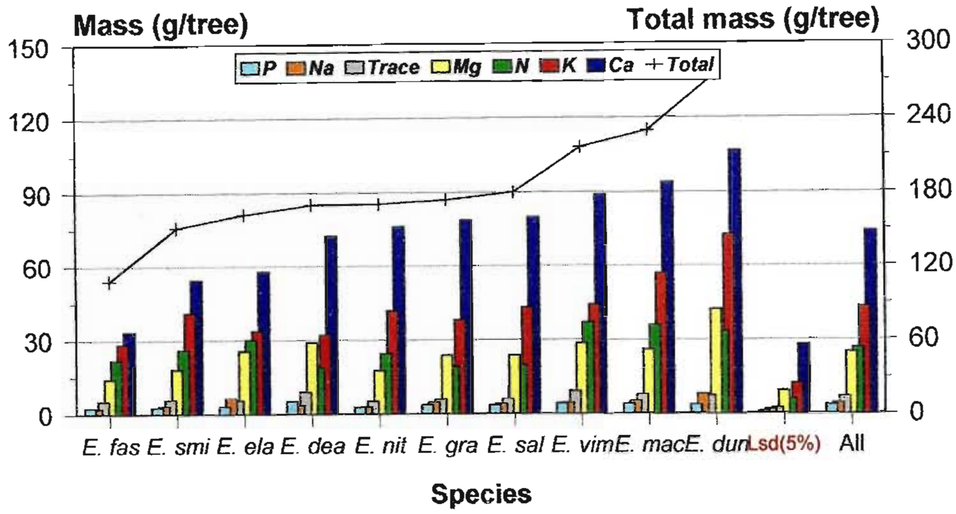


Fig. 5.6. Nutrient mass of bole wood biomass per species

Recorded average tree profiles across sites

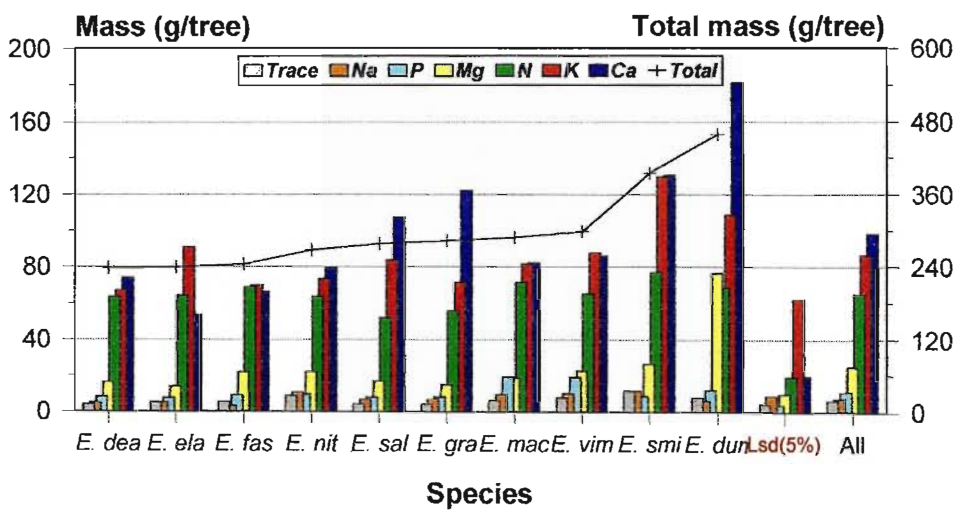


Fig. 5.7. Nutrient mass of total biomass per site

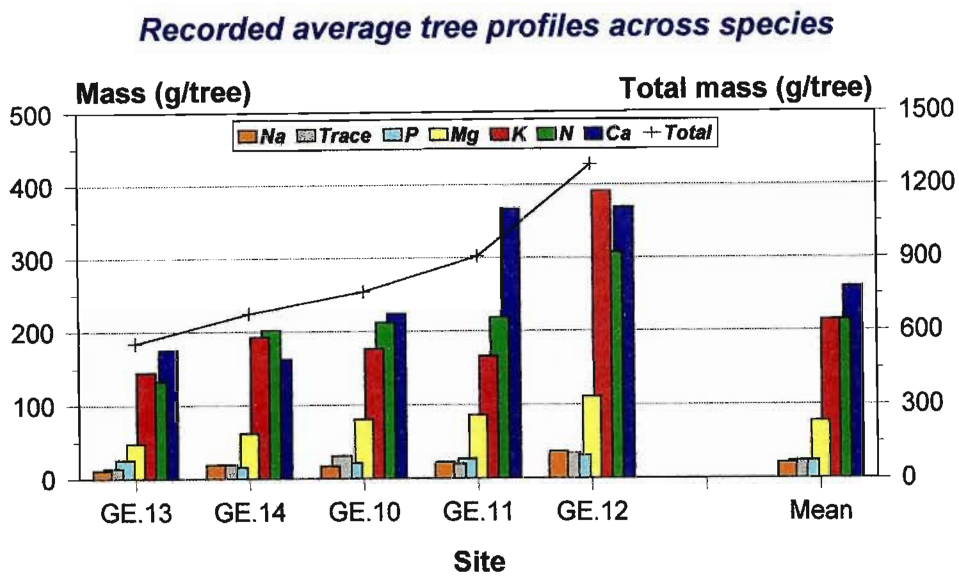


Fig. 5.8. Total nutrient mass per unit biomass per site

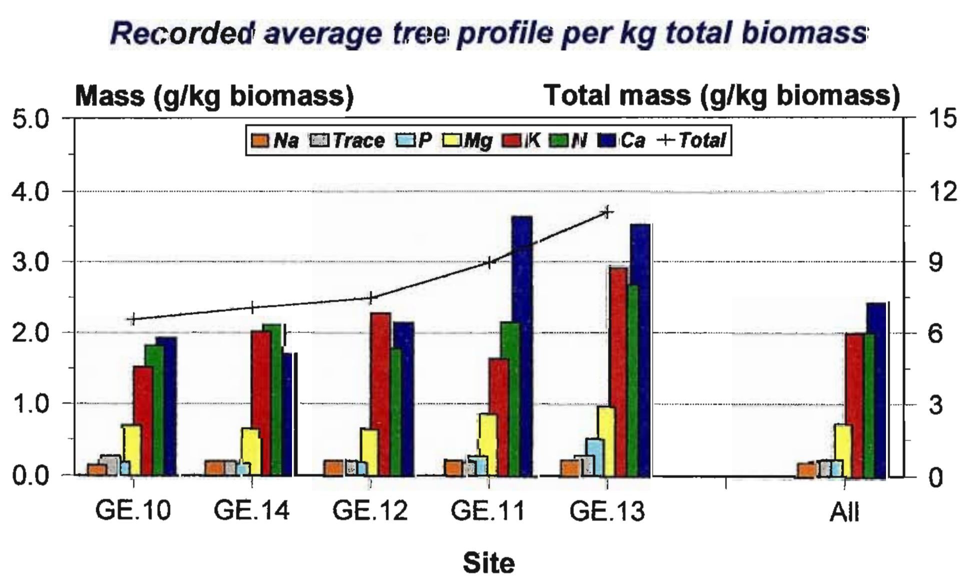


Fig. 5.9. Utilisation quotient per site: All nutrients

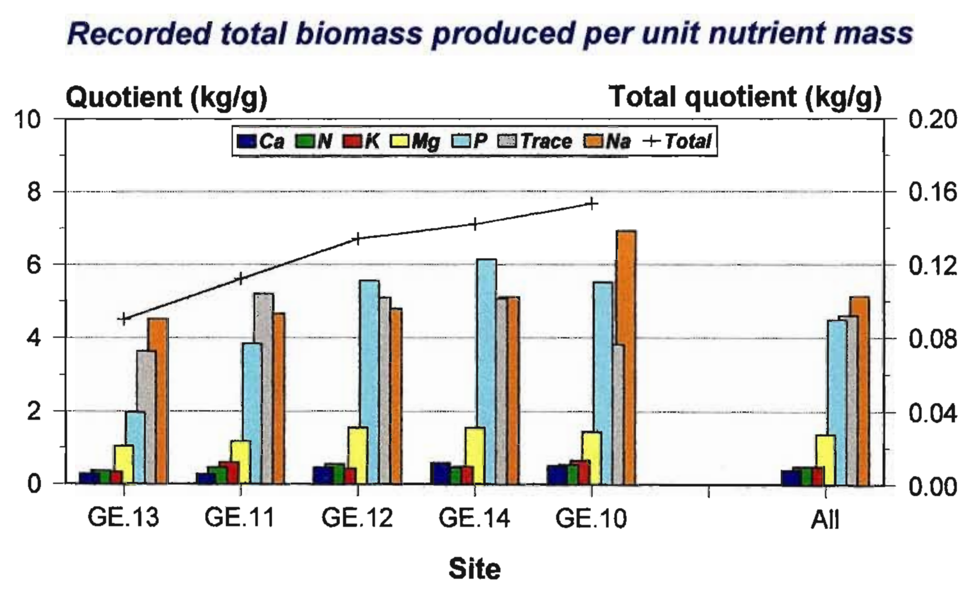


Fig. 5.10. Utilisation quotient per site: Ca, N and K

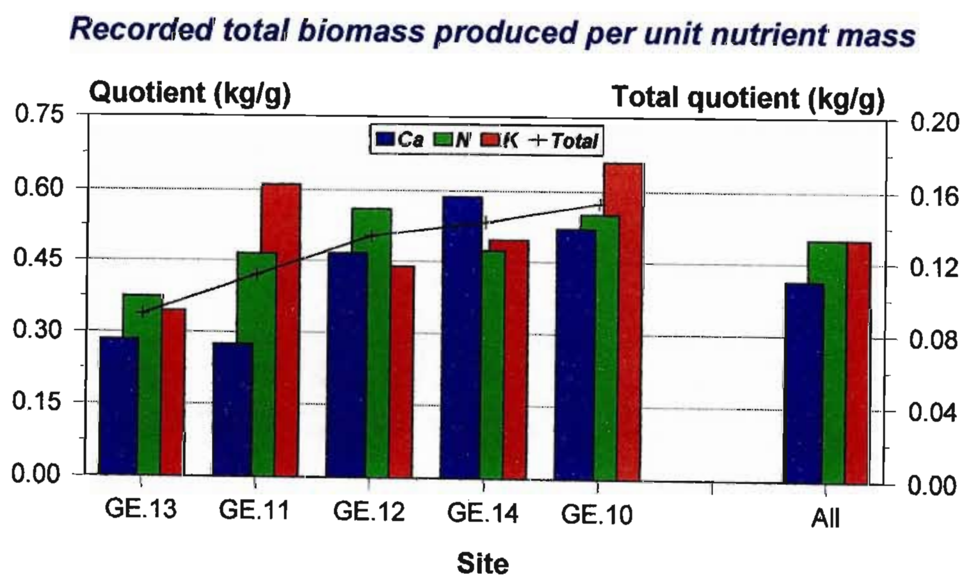


Fig. 5.11. Efficiency quotient per site: All nutrients

Recorded bole wood biomass produced per unit nutrient mass

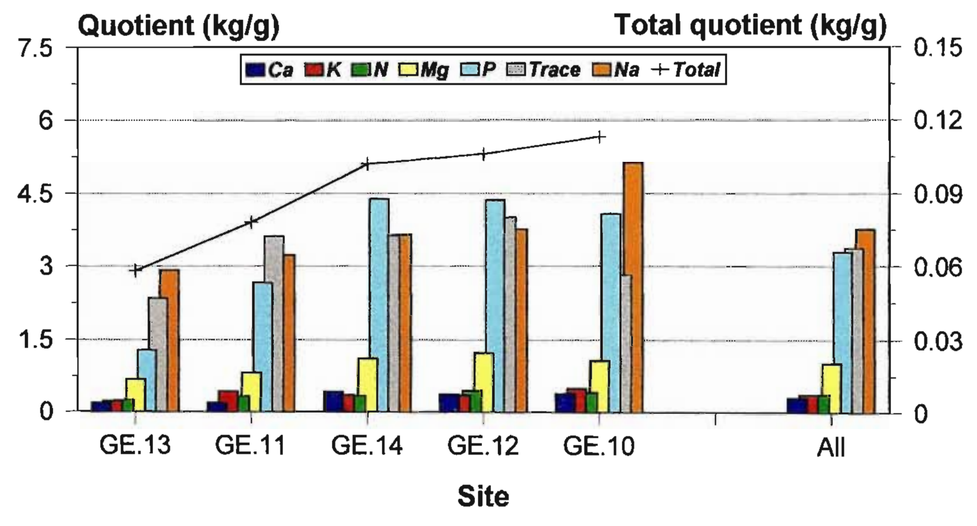


Fig. 5.12. Efficiency quotient per site: Ca, K and N

Recorded bole wood biomass produced per unit nutrient mass

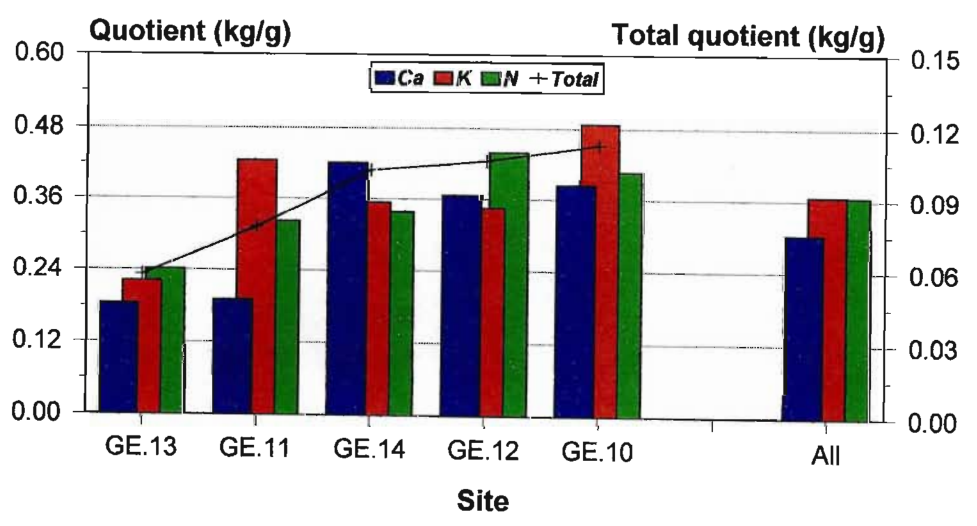


Fig. 5.13. Total nutrient mass per unit biomass per species

Recorded average tree profile per kg total biomass

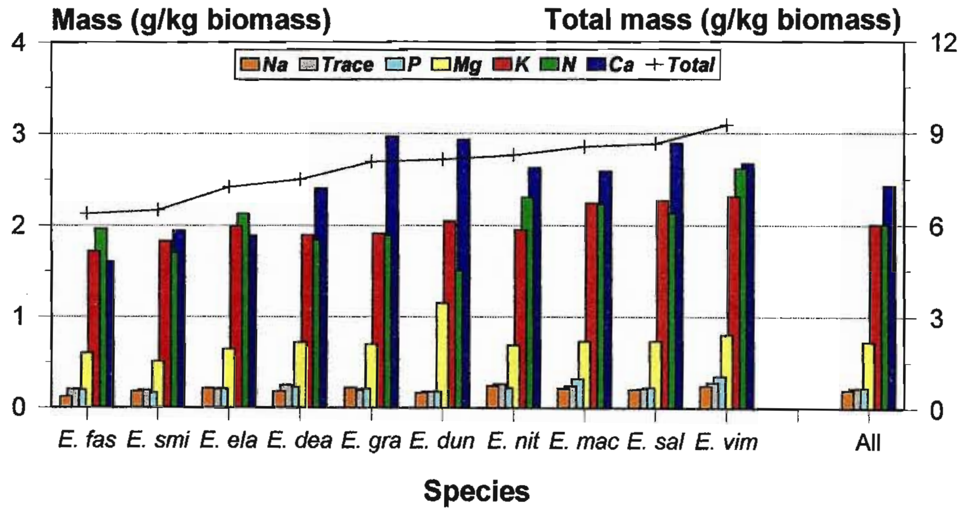


Fig. 5.14. Utilisation quotient per species: All nutrients

Recorded total biomass produced per unit nutrient mass

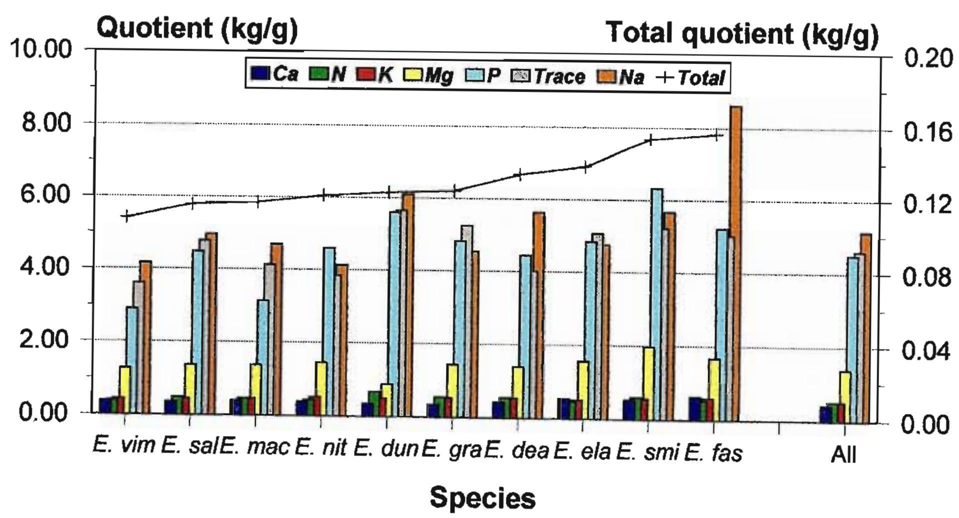


Fig. 5.15. Utilisation quotient per species for Ca, N and K

Recorded total biomass produced per unit nutrient mass

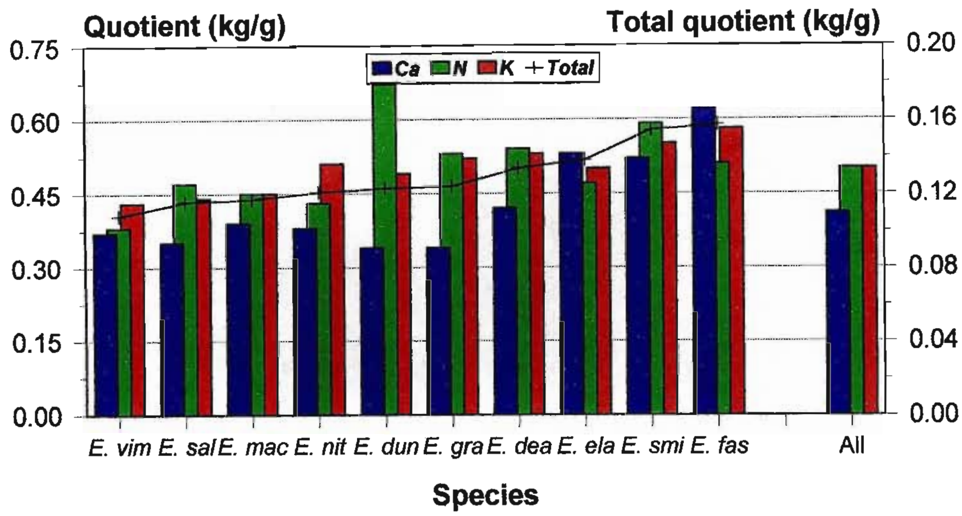
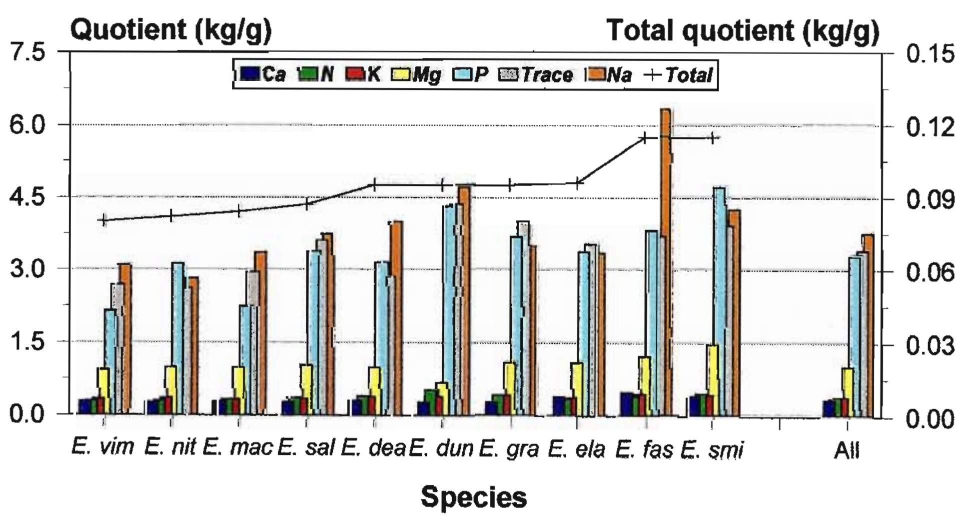


Fig. 5.16. Efficiency quotient per species: All nutrients

Recorded bole wood biomass produced per unit nutrient mass



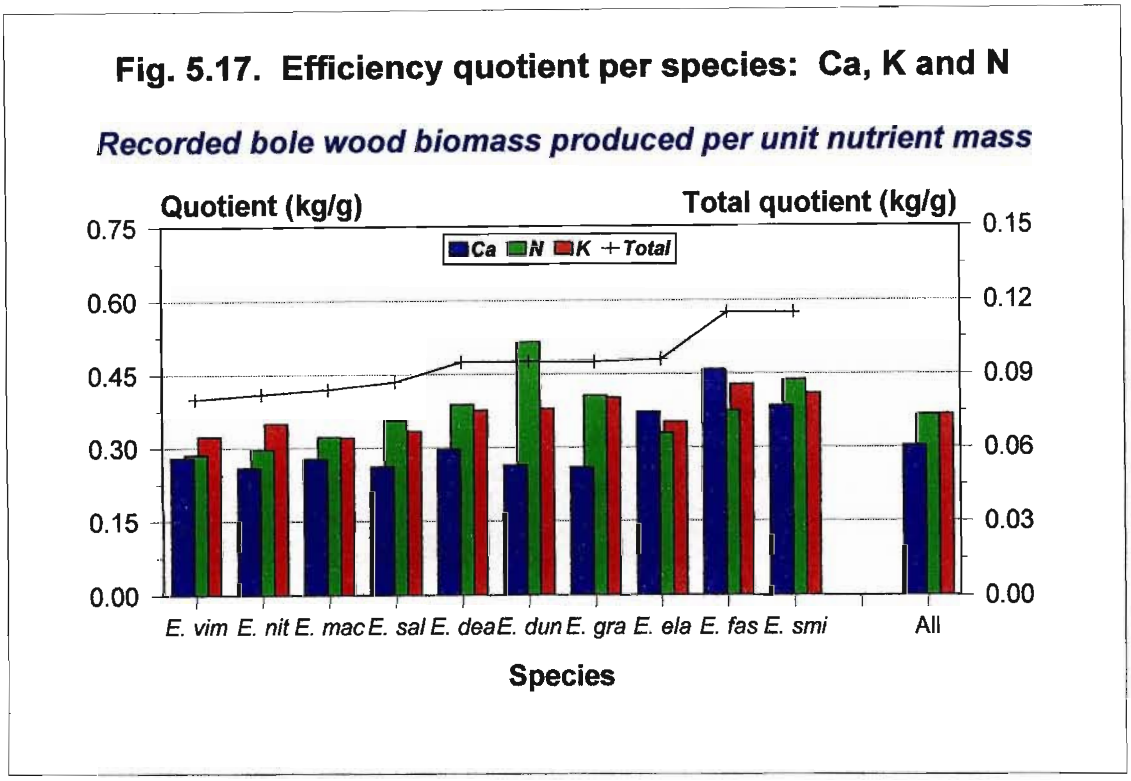


Fig. 5.17. Efficiency quotient per species: Ca, K and N
Recorded bole wood biomass produced per unit nutrient mass
Quotient (kg/g)
Total quotient (kg/g)
Ca
N
K
Total
0.75
0.60
0.45
0.30
0.15
0.00
0.15
0.12
0.09
0.06
0.03
0.00
E. vim E. nit E. mac E. sal E. dea E. dun E. gra E. ela E. fas E. smi
All
Species

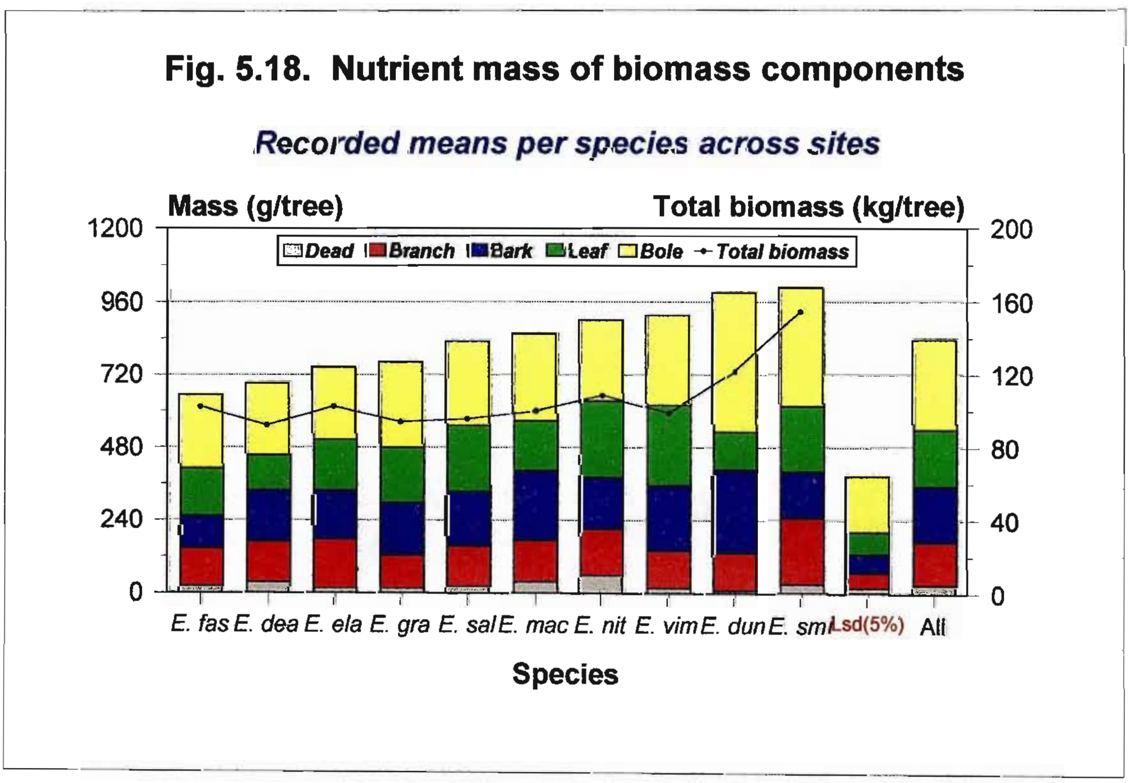


Fig. 5.18. Nutrient mass of biomass components
Recorded means per species across sites
Mass (g/tree)
Total biomass (kg/tree)
Dead
Branch
Bark
Leaf
Bole
Total biomass
1200
960
720
480
240
0
200
160
120
80
40
0
E. fas E. dea E. ela E. gra E. sal E. mac E. nit E. vim E. dun E. smi
Lsd(5%)
All
Species

Fig. 5.19. Modelled average biomass of species per component

Adjusted for total above-ground biomass

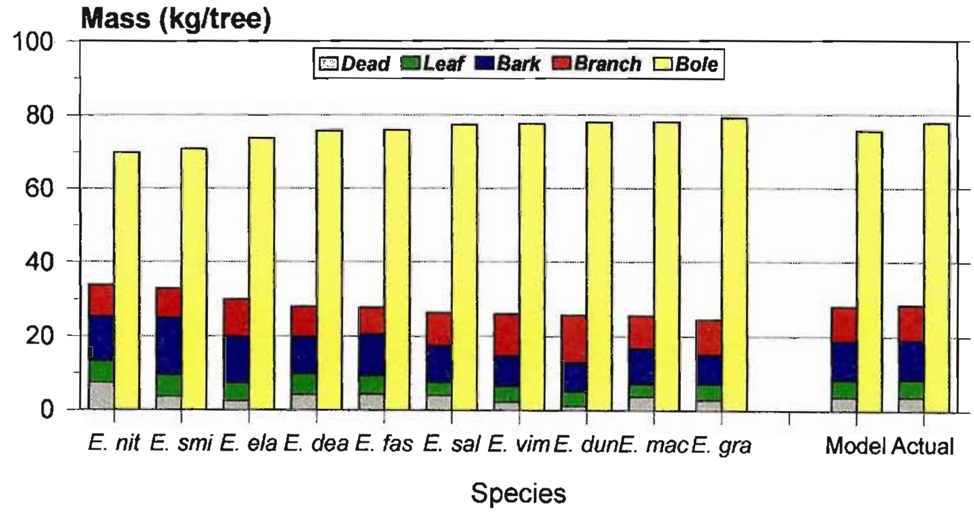


Fig. 5.20. Total nutrient mass per component at harvesting

Modelled biomass (adjusted for equivalence)

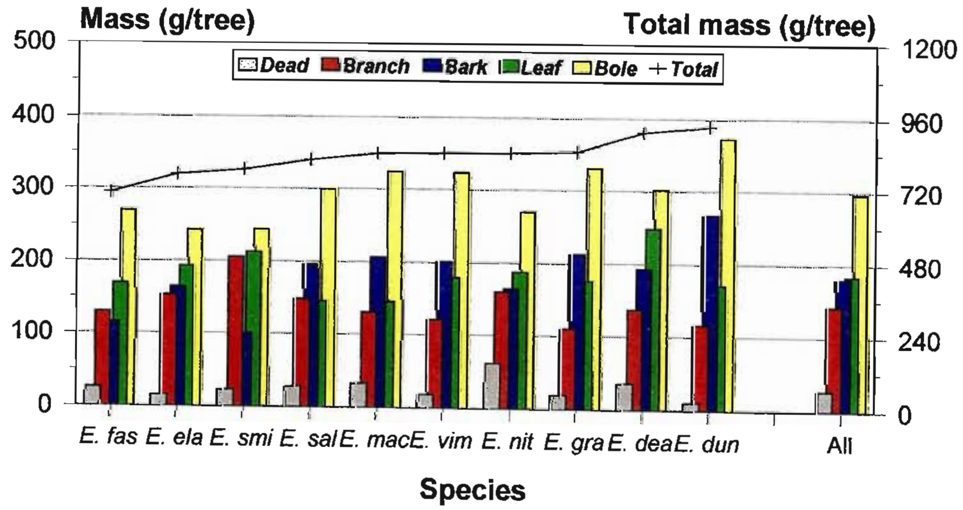


Fig. 5.21. Total nutrient mass per element at harvesting

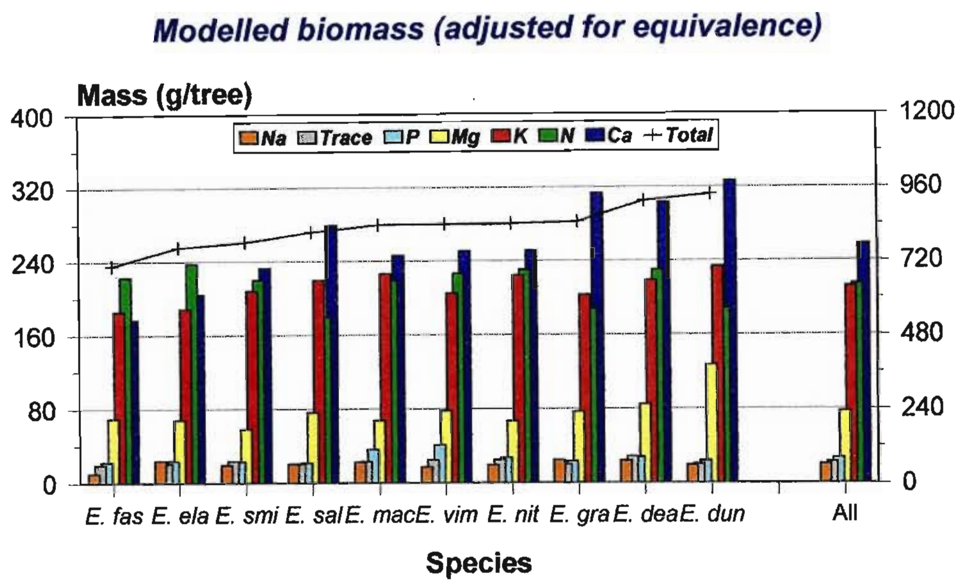
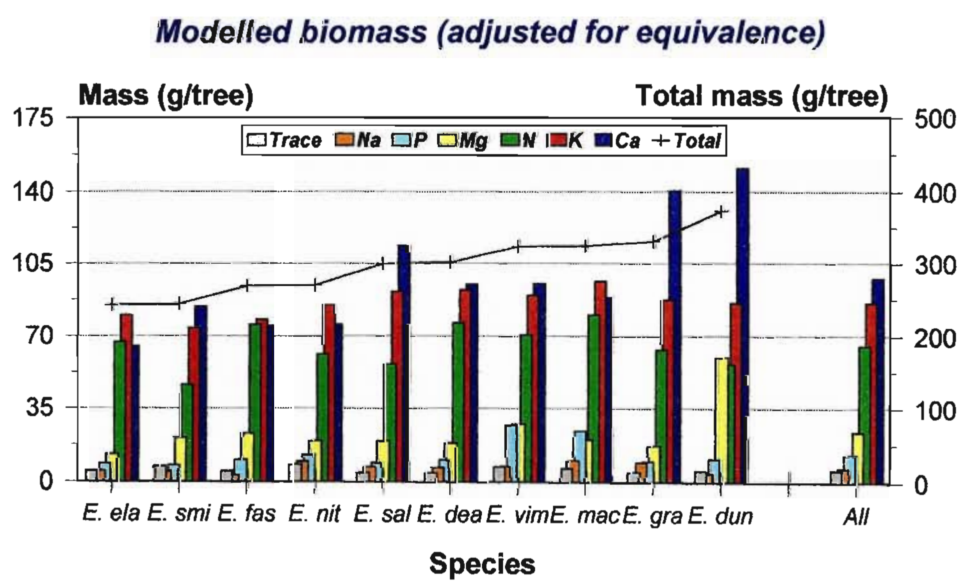


Fig. 5.22. Nutrient mass of bole wood at harvesting



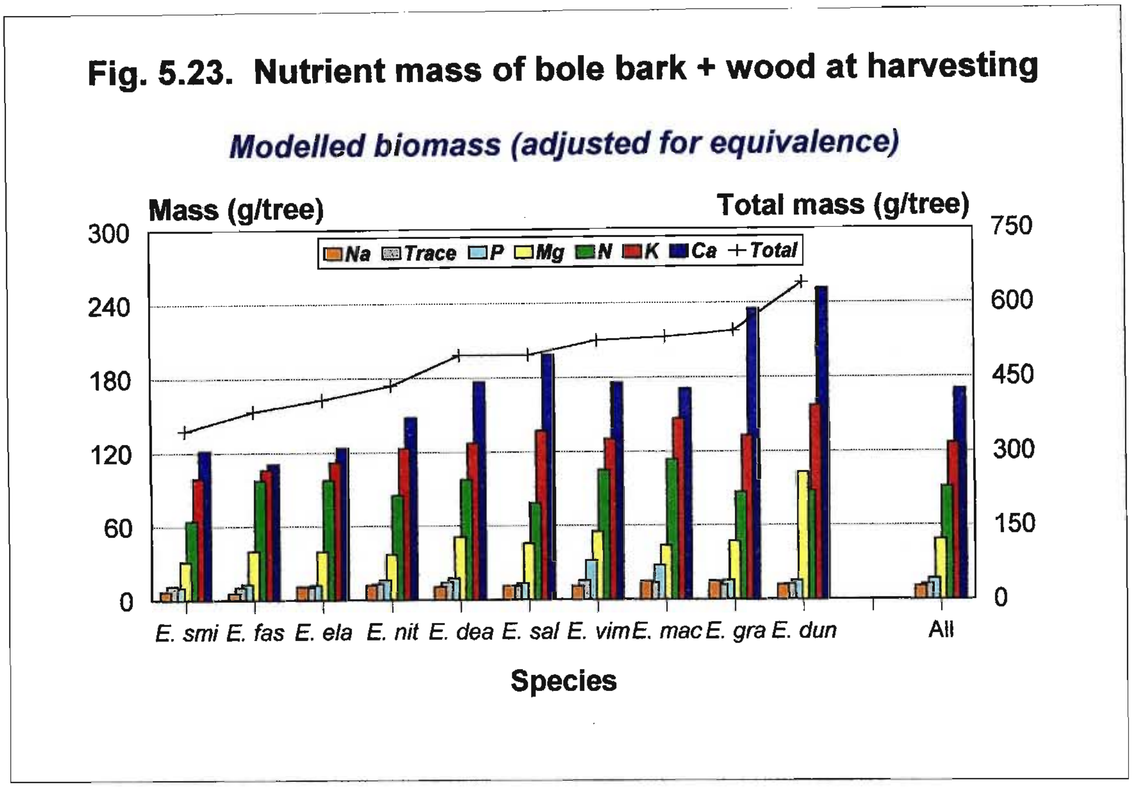


Fig. 5.23. Nutrient mass of bole bark + wood at harvesting
Modelled biomass (adjusted for equivalence)
Mass (g/tree)
Total mass (g/tree)
Na
Trace
P
Mg
N
K
Ca
Total
300
240
180
120
60
0
750
600
450
300
150
0
E. smi E. fas E. ela E. nit E. dea E. sal E. vim E. mac E. gra E. dun
All
Species

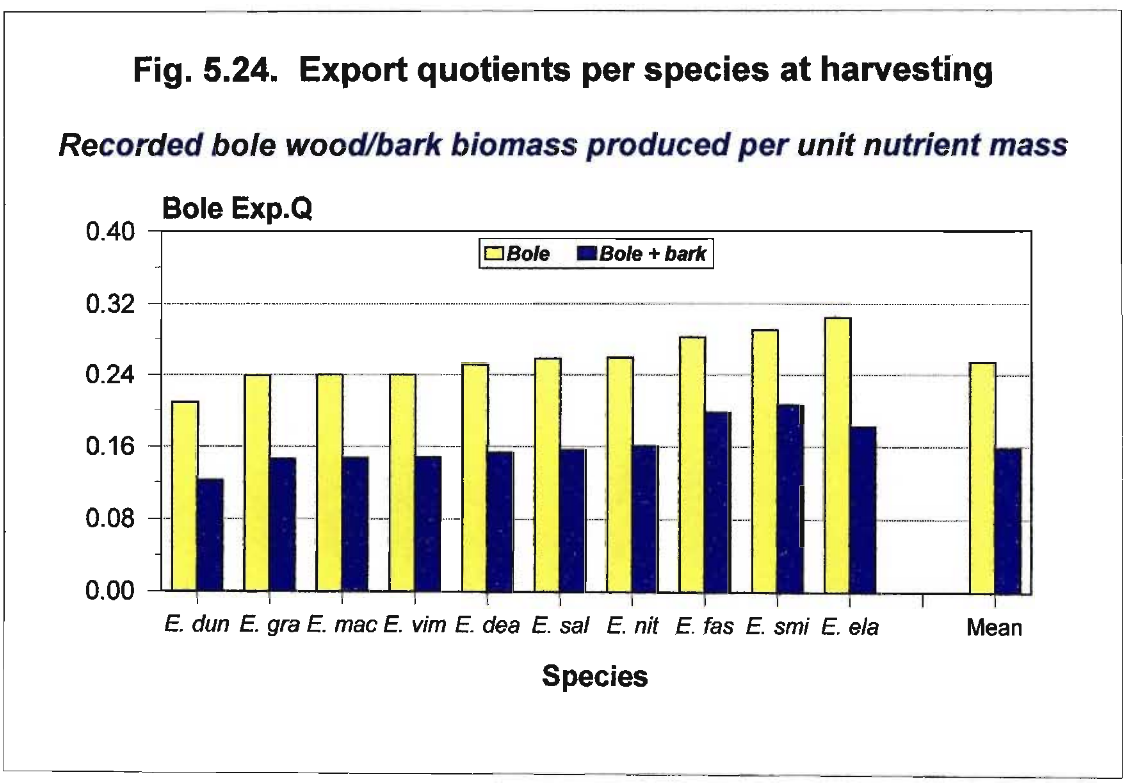


Fig. 5.24. Export quotients per species at harvesting
Recorded bole wood/bark biomass produced per unit nutrient mass
Bole Exp.Q
Bole
Bole + bark
0.40
0.32
0.24
0.16
0.08
0.00
E. dun E. gra E. mac E. vim E. dea E. sal E. nit E. fas E. smi E. ela
Mean
Species

Table 5.1. Nutrient content and Utilization and Efficiency Quotients per site								
	Biomass nutrient (g/tree)							
Site	*Trace*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*	*Total*
GE.10	30.50	21.09	16.79	223.72	80.56	176.47	211.83	760.97
GE.11	19.50	26.44	21.78	367.72	86.40	165.95	218.15	905.94
GE.12	33.82	31.04	35.98	369.55	110.90	391.92	308.10	1281.31
GE.13	13.70	25.12	11.01	175.04	47.65	144.67	133.17	550.35
GE.14	18.86	15.58	18.73	162.62	61.67	192.73	201.94	672.13
Average	**23.28**	**23.85**	**20.86**	**259.73**	**77.44**	**214.35**	**214.64**	**834.14**
	Nutrient mass per unit total biomass (g/kg)							
GE.10	0.26	0.18	0.14	1.93	0.69	1.52	1.82	6.55
GE.11	0.19	0.26	0.21	3.63	0.85	1.64	2.15	8.94
GE.12	0.20	0.18	0.21	2.15	0.64	2.28	1.79	7.44
GE.13	0.28	0.51	0.22	3.52	0.96	2.91	2.68	11.07
GE.14	0.20	0.16	0.20	1.70	0.65	2.02	2.11	7.03
Average	**0.22**	**0.22**	**0.19**	**2.43**	**0.72**	**2.00**	**2.01**	**7.80**
	Utilisation Quotient: Total biomass per unit total nutrient (kg/g)							
GE.10	3.809	5.509	6.920	0.519	1.442	0.658	0.549	0.153
GE.11	5.195	3.831	4.652	0.275	1.172	0.610	0.464	0.112
GE.12	5.093	5.550	4.787	0.466	1.553	0.439	0.559	0.134
GE.13	3.628	1.978	4.515	0.284	1.043	0.344	0.373	0.090
GE.14	5.068	6.136	5.103	0.588	1.550	0.496	0.473	0.142
Average	**4.597**	**4.486**	**5.130**	**0.412**	**1.382**	**0.499**	**0.499**	**0.128**
	Efficiency Quotient: Bole wood biomass per unit total nutrient (kg/g)							
GE.10	2.820	4.078	5.123	0.384	1.068	0.487	0.406	0.113
GE.11	3.608	2.660	3.231	0.191	0.814	0.424	0.322	0.078
GE.12	4.002	4.361	3.762	0.366	1.221	0.345	0.439	0.106
GE.13	2.346	1.279	2.919	0.184	0.674	0.222	0.241	0.058
GE.14	3.621	4.385	3.646	0.420	1.108	0.354	0.338	0.102
Average	**3.369**	**3.288**	**3.760**	**0.302**	**1.013**	**0.366**	**0.365**	**0.094**

Table 5.2. Nutrient content and Utilization and Efficiency Quotients per species								
	Biomass nutrient (g/tree)							
Species	***Trace***	***P***	***Na***	***Ca***	***Mg***	***K***	***N***	***Total***
E. deanei	22.95	20.74	16.38	221.12	66.17	174.14	169.02	690.52
E. dunnii	21.56	21.75	19.99	356.42	140.06	248.20	182.41	990.39
E. elata	20.25	21.23	21.56	193.03	65.69	203.67	217.95	743.39
E. fastigata	20.38	19.63	11.89	163.66	61.17	175.25	200.63	652.60
E. grandis	17.97	19.53	20.75	278.80	65.71	179.47	177.80	760.02
E. macarthurii	24.23	31.84	21.33	258.07	72.89	223.49	222.47	854.32
E. nitens	28.24	23.64	26.24	284.71	74.76	211.38	249.70	898.67
E. saligna	20.05	21.40	19.32	276.41	70.23	216.90	203.75	828.06
E. smithii	29.72	24.55	27.36	300.81	78.52	282.47	264.07	1007.50
E. viminalis	27.42	34.24	23.77	264.26	79.17	228.52	258.56	915.93
Mean	**23.28**	**23.85**	**20.86**	**259.73**	**77.44**	**214.35**	**214.64**	**834.14**
	Nutrient mass per unit total biomass (g/kg)							
E. deanei	0.25	0.23	0.18	2.40	0.72	1.89	1.84	7.50
E. dunnii	0.18	0.18	0.16	2.93	1.15	2.04	1.50	8.15
E. elata	0.20	0.21	0.21	1.88	0.64	1.99	2.13	7.25
E. fastigata	0.20	0.19	0.12	1.60	0.60	1.71	1.96	6.38
E. grandis	0.19	0.21	0.22	2.96	0.70	1.91	1.89	8.08
E. macarthurii	0.24	0.32	0.21	2.59	0.73	2.24	2.23	8.56
E. nitens	0.26	0.22	0.24	2.63	0.69	1.95	2.30	8.29
E. saligna	0.21	0.22	0.20	2.89	0.73	2.27	2.13	8.66
E. smithii	0.19	0.16	0.18	1.94	0.51	1.82	1.70	6.50
E. viminalis	0.28	0.35	0.24	2.67	0.80	2.31	2.62	9.27
Mean	**0.22**	**0.22**	**0.19**	**2.43**	**0.72**	**2.00**	**2.01**	**7.80**
	Utilisation Quotient: Total biomass per unit nutrient (kg/g)							
E. deanei	4.013	4.440	5.623	0.416	1.392	0.529	0.545	0.133
E. dunnii	5.637	5.588	6.080	0.341	0.868	0.490	0.666	0.123
E. elata	5.060	4.827	4.754	0.531	1.560	0.503	0.470	0.138
E. fastigata	5.018	5.210	8.600	0.625	1.672	0.583	0.510	0.157
E. grandis	5.235	4.818	4.535	0.337	1.432	0.524	0.529	0.124
E. macarthurii	4.118	3.133	4.678	0.387	1.369	0.446	0.448	0.117
E. nitens	3.840	4.587	4.132	0.381	1.450	0.513	0.434	0.121
E. saligna	4.770	4.469	4.949	0.346	1.362	0.441	0.469	0.115
E. smithii	5.213	6.313	5.664	0.515	1.973	0.549	0.587	0.154
E. viminalis	3.604	2.886	4.158	0.374	1.248	0.432	0.382	0.108
Mean	**4.597**	**4.486**	**5.130**	**0.412**	**1.382**	**0.499**	**0.499**	**0.128**
	Efficiency Quotient: Bole wood biomass per unit nutrient (kg/g)							
E. deanei	2.847	3.150	3.989	0.295	0.987	0.375	0.387	0.095
E. dunnii	4.349	4.312	4.691	0.263	0.670	0.378	0.514	0.095
E. elata	3.534	3.372	3.321	0.371	1.090	0.351	0.328	0.096
E. fastigata	3.679	3.820	6.305	0.458	1.225	0.428	0.374	0.115
E. grandis	4.006	3.686	3.470	0.258	1.096	0.401	0.405	0.095
E. macarthurii	2.948	2.243	3.349	0.277	0.980	0.320	0.321	0.084
E. nitens	2.616	3.124	2.815	0.259	0.988	0.349	0.296	0.082
E. saligna	3.604	3.376	3.739	0.261	1.029	0.333	0.355	0.087
E. smithii	3.886	4.705	4.222	0.384	1.471	0.409	0.437	0.115
E. viminalis	2.686	2.151	3.099	0.279	0.930	0.322	0.285	0.080
Mean	**3.369**	**3.288**	**3.760**	**0.302**	**1.013**	**0.366**	**0.365**	**0.094**

Table 5.4. Modelled mass of biomass components per species

Component	Species									
	E. dea	*E. dun*	*E. ela*	*E. fas*	*E. gra*	*E. mac*	*E. nit*	*E. sal*	*E. smi*	*E. vim*
	Average recorded biomass per component (kg/tree)									
Leaf	5.063	4.416	4.859	5.100	3.360	3.903	6.360	3.289	7.108	4.261
Branch	9.844	8.168	13.708	10.927	7.220	10.063	12.013	8.804	16.588	8.002
Dead	4.281	1.016	2.381	4.086	2.222	3.951	7.560	3.466	4.822	2.132
Bark	7.570	14.214	9.954	7.179	7.629	10.437	8.635	7.830	10.940	10.779
Bole	65.337	93.773	71.586	74.964	65.420	71.418	73.865	72.248	115.496	73.641
Total	**92.094**	**121.587**	**102.488**	**102.256**	**85.851**	**99.772**	**108.433**	**95.637**	**154.955**	**98.815**
	Modelled biomass of study mean tree per component (kg/tree)									
Leaf	5.809	3.753	5.005	4.984	3.360	3.738	6.434	3.289	6.728	4.358
Branch	10.395	7.346	13.007	10.729	6.221	10.063	13.133	8.674	17.952	8.002
Dead	4.281	1.016	2.479	4.086	2.222	3.951	8.138	3.466	4.114	2.132
Bark	8.410	11.980	10.407	7.042	7.524	9.782	9.483	7.972	9.105	11.372
Bole	78.403	73.371	76.254	73.732	62.641	84.180	76.995	68.930	81.867	77.360
Total	**107.298**	**97.466**	**107.152**	**100.573**	**81.968**	**111.714**	**114.183**	**92.331**	**119.766**	**103.224**
	Adjusted modelled biomass of study mean tree per component (kg/tree)									
Leaf	5.607	3.988	4.838	5.132	4.245	3.465	5.836	3.689	5.818	4.373
Branch	10.034	7.806	12.572	11.048	7.860	9.329	11.912	9.730	15.524	8.029
Dead	4.132	1.080	2.396	4.208	2.808	3.663	7.381	3.888	3.558	2.139
Bark	8.118	12.730	10.059	7.252	9.507	9.069	8.601	8.942	7.874	11.410
Bole	75.677	77.964	73.703	75.927	79.148	78.041	69.837	77.319	70.794	77.617
Total	**103.568**	**103.568**	**103.568**	**103.567**	**103.568**	**103.568**	**103.567**	**103.568**	**103.568**	**103.568**

Table 5.5. Estimated average nutrient mass for eucalypt species at harvesting									
Species	**Biomass (kg/tree)**	**Nutrient mass (g/tree)**							
		P	***Na***	***Ca***	***Mg***	***K***	***N***	***Trace***	***Total***
				Bulk leaves					
E. deanei	5.607	5.91	8.04	68.70	19.55	41.27	97.79	6.51	247.77
E. dunnii	3.988	5.56	3.80	36.85	11.51	34.91	73.96	3.99	170.58
E. elata	4.838	6.55	7.68	32.80	14.58	31.35	94.53	4.72	192.20
E. fastigata	5.132	5.71	2.02	24.57	13.04	33.98	86.29	3.01	168.62
E. grandis	4.245	5.46	5.43	39.11	16.56	31.78	73.30	3.68	175.34
E. macarthurii	3.465	4.32	3.33	26.85	7.85	31.10	67.60	3.64	144.68
E. nitens	5.836	5.91	1.67	28.98	10.54	44.43	90.96	4.41	186.92
E. saligna	3.689	4.38	4.25	25.23	12.27	29.49	65.74	3.47	144.85
E. smithii	5.818	6.52	4.96	39.68	11.44	45.07	99.76	4.41	211.84
E. viminalis	4.373	5.77	2.45	33.03	10.76	35.56	86.49	4.10	178.15
Mean	**4.699**	**5.68**	**4.45**	**35.81**	**12.99**	**36.26**	**84.32**	**4.25**	**183.76**
				Branches					
E. deanei	10.034	3.75	4.75	40.60	10.23	44.75	27.09	5.61	136.78
E. dunnii	7.806	2.50	2.81	33.72	11.03	39.19	23.52	3.05	115.82
E. elata	12.572	5.03	5.36	40.57	12.15	44.00	40.15	4.97	152.23
E. fastigata	11.048	3.46	2.58	31.60	13.85	41.69	30.94	4.92	129.03
E. grandis	7.860	2.36	3.93	30.92	10.48	35.37	23.16	3.35	109.57
E. macarthurii	9.329	3.55	3.36	36.14	11.69	40.80	30.23	4.32	130.08
E. nitens	11.912	4.37	4.69	45.58	12.47	49.55	38.12	4.87	159.65
E. saligna	9.730	3.50	4.15	43.98	14.46	48.26	28.86	4.52	147.74
E. smithii	15.524	6.31	7.04	61.37	14.08	59.82	49.57	6.47	204.66
E. viminalis	8.029	3.21	3.00	33.77	9.96	36.08	30.08	4.30	120.40
Mean	**10.384**	**3.76**	**4.15**	**40.26**	**12.38**	**44.75**	**32.19**	**4.68**	**142.17**
				Dead matter					
E. deanei	4.132	0.33	0.41	16.91	3.91	4.99	6.80	1.84	35.20
E. dunnii	1.080	0.10	0.21	4.05	1.48	1.84	2.10	0.38	10.15
E. elata	2.396	0.22	0.10	6.58	1.84	0.88	4.70	0.69	15.01
E. fastigata	4.208	0.39	0.22	9.12	3.00	3.25	7.46	1.42	24.87
E. grandis	2.808	0.26	0.43	8.09	2.71	2.62	4.25	0.80	19.16
E. macarthurii	3.663	0.37	0.54	11.89	4.00	7.03	7.06	1.53	32.42
E. nitens	7.381	0.49	0.79	28.05	6.69	6.50	15.75	2.51	60.77
E. saligna	3.888	0.26	0.54	11.35	3.84	4.15	6.14	1.11	27.40
E. smithii	3.558	0.26	0.43	9.44	1.57	3.56	5.74	1.23	22.22
E. viminalis	2.139	0.19	0.31	7.67	2.04	2.40	4.05	0.83	17.49
Mean	**3.525**	**0.30**	**0.42**	**11.23**	**3.22**	**3.87**	**6.34**	**1.23**	**26.61**
				Bole bark					
E. deanei	8.118	7.16	4.04	81.79	32.79	35.41	21.65	10.12	192.96
E. dunnii	12.730	4.43	7.86	100.46	43.09	71.46	32.16	7.44	266.89
E. elata	10.059	3.80	6.01	58.75	26.47	32.14	30.83	5.61	163.62
E. fastigata	7.252	2.82	2.43	35.97	17.05	28.64	22.15	5.35	114.42
E. grandis	9.507	5.67	5.60	94.53	29.93	45.62	23.67	7.07	212.08
E. macarthurii	9.069	3.63	4.86	82.42	23.99	50.64	33.59	7.09	206.23
E. nitens	8.601	3.38	2.50	72.79	17.70	38.56	24.13	4.97	164.03
E. saligna	8.942	4.38	4.61	85.15	26.38	46.11	22.18	6.68	195.48
E. smithii	7.874	2.25	2.10	37.58	10.32	25.55	18.04	4.15	100.00
E. viminalis	11.410	4.51	3.84	80.41	27.75	41.02	34.95	8.50	200.98
Mean	**9.356**	**4.25**	**4.25**	**72.50**	**25.08**	**41.03**	**26.38**	**6.78**	**180.27**

Table 5.5. Estimated average nutrient mass for eucalypt species at harvesting									
Species	**Biomass (kg/tree)**	**Nutrient mass (g/tree)**							
		P	***Na***	***Ca***	***Mg***	***K***	***N***	***Trace***	***Total***
Bole wood									
E. deanei	75.677	10.09	6.56	94.85	18.16	92.07	76.18	4.03	301.94
E. dunnii	77.964	10.91	4.16	150.73	59.77	85.76	56.13	5.26	372.73
E. elata	73.703	8.35	4.91	64.86	12.78	79.85	66.82	4.83	242.39
E. fastigata	75.927	10.12	3.04	74.91	22.78	77.70	75.42	4.86	268.83
E. grandis	79.148	9.50	8.97	140.36	16.88	87.33	63.32	4.52	330.87
E. macarthurii	78.041	23.93	9.89	88.45	19.77	96.25	80.12	6.27	324.68
E. nitens	69.837	12.57	9.31	75.42	19.09	84.74	60.99	7.89	270.01
E. saligna	77.319	8.76	6.70	113.40	19.07	91.24	56.18	4.24	299.59
E. smithii	70.794	7.55	4.72	84.01	20.77	73.63	46.25	7.04	243.97
E. viminalis	77.617	26.91	7.24	95.21	27.42	89.52	70.37	6.95	323.63
Mean	**75.603**	**12.80**	**6.55**	**97.68**	**23.54**	**85.78**	**65.12**	**5.63**	**297.10**
Total above-ground biomass									
E. deanei	103.568	27.23	23.79	302.86	84.65	218.49	229.52	28.11	914.65
E. dunnii	103.568	23.50	18.84	325.81	126.88	233.15	187.88	20.11	936.17
E. elata	103.568	23.95	24.06	203.56	67.81	188.21	237.02	20.83	765.45
E. fastigata	103.567	22.52	10.29	176.17	69.71	185.26	222.26	19.57	705.77
E. grandis	103.568	23.25	24.37	313.00	76.56	202.72	187.70	19.42	847.02
E. macarthurii	103.568	35.80	21.97	245.74	67.32	225.82	218.59	22.86	838.10
E. nitens	103.567	26.73	18.95	250.83	66.49	223.77	229.95	24.65	841.38
E. saligna	103.568	21.28	20.26	279.11	76.02	219.24	179.11	20.02	815.05
E. smithii	103.568	22.90	19.25	232.08	58.17	207.63	219.36	23.30	782.69
E. viminalis	103.568	40.59	16.84	250.10	77.92	204.57	225.95	24.68	840.65
Mean	**103.568**	**26.79**	**19.83**	**257.47**	**77.21**	**211.69**	**214.35**	**22.56**	**829.90**
Leaves + Branches + Dead matter + Bark									
E. deanei	27.890	17.14	17.23	208.01	66.49	126.41	153.34	24.08	612.71
E. dunnii	25.603	12.58	14.68	175.08	67.11	147.39	131.75	14.85	563.44
E. elata	29.864	15.60	19.15	138.70	55.04	108.37	170.20	16.00	523.05
E. fastigata	27.640	12.39	7.25	101.26	46.93	107.56	146.84	14.71	436.94
E. grandis	24.420	13.75	15.40	172.65	59.68	115.39	124.38	14.90	516.15
E. macarthurii	25.526	11.86	12.09	157.29	47.55	129.57	138.47	16.58	513.41
E. nitens	33.731	14.16	9.64	175.41	47.40	139.04	168.96	16.76	571.37
E. saligna	26.249	12.52	13.56	165.71	56.95	128.00	122.93	15.79	515.46
E. smithii	32.773	15.34	14.53	148.07	37.40	134.00	173.11	16.26	538.72
E. viminalis	25.950	13.68	9.60	154.89	50.50	115.05	155.57	17.73	517.02
Mean	**27.965**	**13.99**	**13.27**	**159.80**	**53.67**	**125.90**	**149.23**	**16.93**	**532.80**
Bole bark + Bole wood									
E. deanei	83.795	17.25	10.59	176.64	50.96	127.48	97.84	14.14	494.90
E. dunnii	90.694	15.34	12.02	251.19	102.86	157.22	88.29	12.70	639.62
E. elata	83.762	12.15	10.93	123.61	39.25	111.99	97.65	10.44	406.02
E. fastigata	83.179	12.95	5.47	110.89	39.82	106.34	97.57	10.21	383.25
E. grandis	88.654	15.17	14.57	234.89	46.81	132.94	86.98	11.59	542.95
E. macarthurii	87.110	27.56	14.75	170.87	43.76	146.90	113.71	13.36	530.91
E. nitens	78.438	15.95	11.81	148.21	36.79	123.29	85.12	12.86	434.04
E. saligna	86.261	13.14	11.31	198.55	45.45	137.34	78.36	10.91	495.07
E. smithii	78.668	9.81	6.82	121.59	31.09	99.18	64.29	11.19	343.97
E. viminalis	89.027	31.42	11.08	175.63	55.17	130.53	105.33	15.45	524.61
Mean	**84.959**	**17.05**	**10.80**	**170.18**	**48.62**	**126.81**	**91.50**	**12.40**	**477.37**

6. DISCUSSION

6.1. Approaching sustainability

The customary approach to using natural resources as if in endless supply and there for the taking has undergone profound change in the past century. The consequences of rapid industrialisation and high rates of population growth have resulted in increasing competition for land and a rising demand for food and goods. This in turn has generated a need for improved productivity, and the shortage of land and rising transport costs have forced yield expansion to increasingly adopt a more vertical than horizontal approach. Commercial timber growing has responded by developing intensive silviculture on short rotations, and harvesting more and smaller dimensioned roundwood. Rising costs have globally tended to shift production from manual to mechanical methods, with traditional operations such as in-field debarking sometimes dispensed with, and alternately undertaken at roadside or mill.

The on-going drastic deforestation from the past centuries, soil erosion, contamination of lands and aquifers have all contributed to a growing public awareness of the need for sustainable development and responsible environmental management. Markets have taken cognizance of this in increasingly demanding (especially in the first world) renewable natural resources and an accompanying certification of standards and production procedures. Accordingly, operational sustainability and the minimisation of environmental impacts have become an integral part of commercial timber growing in South Africa.

In this study, sustainability refers to the ability of the site to maintain its inherent viability, principally through the maintenance of natural resources. However, it is also important to link this to commercial profitability through better utilisation of resources, which can be judged by an improvement in marketable yields and a maximising of roundwood production per unit of site resource (water, nutrients) expended during the rotation. Both these aspects serve to promote active and on-going improvements to the site, which is the third component of sustainability. Implicit in these observations is that sustainability is a dynamic process, requiring constant monitoring and adaptations to changing conditions and circumstances.

Key site factors in managing sustainable forestry are water, growing stock and soils. Exotic plantations in South Africa and elsewhere are known to increase the rate of water consumption compared to native vegetation, as well as remove water in the soil and substratum to considerable depth (Scott, 1991; Dye and Poulter, 1992, Soares and Almeida, 2001). Musto (1994) found that, particularly under eucalypt stands in low precipitation environments, topsoils become very dry, leading to increased structure and pedality. Plant-available water has been linked to many studies in site factors (Boden, 1991; Adams, 1996), so its accumulation, availability and conservation are highly important in South Africa (Schönau and Grey, 1987).

While nutrients cycle through interchange between atmosphere, soil and water, the soils act specifically as a source and storage facility for plant nutrients. Nutrient inputs are in the form of particulate aerosols and dissolved salts in precipitation, while roots are able to "mine" deep-lying nutrients in the mineral-rich saprolite and deposit organic nutrients on the surface through litter fall and canopy leachate. Nutrients are lost from the soil through root uptake, subsoil leaching and soil erosion by water and wind (Hopmans, Flinn and Farrell, 1987). However, the generally negative water balance in many plantations (especially under eucalypts) and the near permanent tree canopy and thick litter layers minimise nutrient losses through leaching and erosion. Accordingly, the harvesting of timber and other tree products from plantations is one of the main causes of nutrient loss (Crane and Raison, 1980; Turner and Lambert, 1986; Judd, 1996; Spangenberg *et al.*, 1996; Turner and Lambert, 1996).

The site sustainability factors of soils and water are relatively "fixed" for commercial afforestation (if implemented under recommended practices), and thus management of the nutrients contained in the above-ground growing stock have a large potential to control the sustainability of nutritional site resources. It is important to specify here that recommended practices include the correct siting of roads, managed drainage lines and the prevention of soil erosion, the limiting of commercial operations to viable sites, correct site-species matching, weed control programmes, and the employment of sensitive harvesting practices (timing, choice of equipment, slope operational limits). The below-ground root portion usually remains *in situ* following harvesting, and thus cannot normally be actively managed, except indirectly through practices such as crop rotation (species with different rooting capacities and symbiotic relationships).

The soil not only acts as the reservoir of plant nutrients, but is also the main zone of root respiration, and therefore its friability, aeration and drainage status are also important. Organic matter is well known for its role in promoting desirable soil properties, and its rapid development in forests under closed canopies is well documented (Attiwill *et al.*, 1978). Intensive pulpwood rotations disrupt this process by exposing the soil's surface to full sun (increased volatilisation and mineralisation) and causing sudden surges in litter load for decomposition in the form of felling debris and slash. This indicates the necessity to actively manage slash through the selection of appropriate piece sizes, its distribution over the surface and subsequent treatment (chipping, chopping, etc.).

Knowledge of the size and nutrient content of above-ground tree biomass is able to afford management the opportunity to better understand their growing stock, and control nutrient reserves and cycling. This in turn provides the means to optimise the beneficial use of nutrients in producing timber products, promote the development of topsoil organic matter, and actively manage harvesting residues (Frederick *et al.*, 1985a; Judd, 1996). This study has been able to provide data on the biomass composition and nutrient content of several commercial eucalypts, and predict how these may be affected by tree size and soil chemical characteristics. It also provides an initial assessment of the degree of impact harvesting has on the site's nutrient resources, and how these may be managed to promote long-term sustainability.

6.2. Site factors

The five sites used in this study are located within the range of granite-derived sites found in the northen areas of KwaZulu/Natal, through southeastern Mpumalanga (Piet Retief, Iswepe and Amsterdam) and onto the highveld at Jessievale. This is an important forestry area in excess of 130 000 planted hectares, capable of above-average yields for the South African timber industry, with relatively easy harvesting access and a major source of hardwoods for the pulp mill at Richards Bay. Soils are typically well drained and moderately deep to very deep, but there are frequent domes and broken ridges of rockier material and ferricrete. Hydromorphy is confined mainly to drainage lines and pans. Precipitation is moderate to good, while the most distinguishing climatic variables are air temperature and frost. For these reasons, a wide range of eucalypt species have been commercially planted, including *E. dunnii, E. elata, E. fastigata, E. grandis, E. macarthurii, E. nitens, E. saligna* and *E. smithii.*

The lower elevation sites south of Piet Retief (warm, little or no frost) are climatically best suited to *E. grandis* (e.g. study sites GE.12 and GE.13), while the highveld regions north of Amsterdam (frosty, cold) grow excellent *E. nitens.* (e.g. study site GE.14). However the bulk of the region is cool rather than cold in winter with frosts concentrated along major drainage lines and depressions, favouring species such as *E. dunnii, E. macarthurii* and *E. smithii* (e.g. study sites GE.10 and GE.11). The past decade has also seen the introduction of *E. grandis* x *E. nitens* hybrids, and their general success is due to their being able to exploit the deep soils and bridge the transitional sites between the warm and cold districts.

While each of the study sites have a high degree of internal uniformity with regard to soil depth, drainage and chemical status, they differ widely between one another. Two of the sites are shallow lithosols with very limited rooting depth and imperfect to moderate drainage. The three "deep" soils are underlain by deeply weathered granite and have good to very good drainage. The relatively high precipitation and good drainage on these three have resulted in highly leached soils with a low base status of between 10 and 20 times less than that of the shallow soils. However, while base status is a clear distinguishing factor between the two major site types, all topsoils have similar (moderate) levels of topsoil OC. The ten eucalypt species and five sites selected for this study thus comprise a reasonably representative cross section of the region.

In terms of the other major eucalypt-growing regions in South Africa, the study sites have most similarities with the Mpumalanga and Limpopo lowveld and escarpment (summer rainfall, strong winter drought, granite-derived soils of comparable base status and OC content). While the results from this study would have important implications for these regions, the KwaZulu/Natal Midlands have very few granite-derived soils, but more base-rich and high OC soils (even on sandstones), while the Zululand coastal plain is dominated by sandy hydromorphic soils with very low base status and OC content.

Much biomass work in eucalypt-growing countries starting in the late 1960s and early 1970s has gone into examining the relationships between site factors and the growth and nutrient content of eucalypts (McColl and Humphreys, 1967; Turner *et al.*, 1978; Hingston *et al.*, 1979; Feller, 1980, Madgwick *et al.*, 1981; George, 1986; Pereira *et al.*, 1989; Lugo *et al.*, 1990; Bargali, 1991; Wang *et al.*, 1991; Bennett *et al.*, 1997; Binkley and Ryan, 1998; Harrison *et al.*, 2000; Santana *et al.*, 2000; Xu *et al.*, 2002). While results are diverse, collectively the findings show a highly adaptive genus with an ability to exploit whatever nutrients and growth viability a site may have to offer, while at the same time able to shield itself from toxicity, drought and flooding. Under favourable conditions it is able to repeatedly undergo shoot elongation, and is not generally limited by specific growing seasons, especially in exotic locations (Grove *et al.*, 1996; Kriedmann and Cromer, 1996).

Specht (1996) and others have drawn attention to the likelihood of the evolution of the genus being strongly linked to dramatic climatic and soil changes in Australia from the late Cretaceous period onwards, especially in relation to plant available water, sodicity and soil phosphorus (McColl, 1969; Enright, 1978). Particular attention is drawn to differences in lithology, especially granite, extrusive igneous material and Tertiary sediments, and the marked differences which exist in their soil's base status. There is also strong evidence to show that the subgenus *Symphyomyrtus*(e.g. *E. grandis*) requires more fertile sites than the *Monocalyptus* (e.g. *E. fastigata*), and that each species has adapted itself by sustainably exploiting varying conditions of site harshness or fertility (Lambert and Turner, 1983; Judd *et al.*, 1996). Other contributing evolutionary factors include temperature and topography (Austin *et al.*, 1983).

The soil nutrient status varies widely in Australia, and fertility gradients are frequently strong determinants of the natural distribution of the more than 500 eucalypt species (Beadle, 1954; Adams, 1996; Judd *et al.*, 1996). Species commonly used in South Africa are drawn from the more fertile Australasian sites (McColl and Humphreys, 1967; Turner and Lambert, 1983) which are as good or better than those represented in this study. In contrast, Brazilian soils derived from Tertiary sediments along the coastal regions are typically of much lower base cation and P status than soils in the southeastern Mpumalanga (de Barros and de Novais, 1996). Thus, despite the overlap in eucalypt species used, care should be taken when comparing results between this study and similar work undertaken in Brazil.

6.3. Results

As climatic and soil conditions over the study sites vary considerably, species have grown differentially according to their degree of site specificity. For example, as individual trees, *E. fastigata, E. nitens* and *E. viminalis* have grown poorly on the warmest sites, but are the top performers on the coldest site. *E. dunnii* and *E. smithii* are remarkably well adapted to cool sites and granitic soils, and thus have the greatest overall biomass, while *E. deanei, E. grandis* and *E. saligna* are generally outside their lower temperature limits and thus show only modest yields. It is therefore clear that differences in biomass are a combined expression of site and species. While knowledge of general nutrient content trends may be helpful in gaining perspective, its interpretation and application can be error prone if not also able to be linked to specific site conditions. However, if the relationships between site and species can be understood and quantified, it should then be possible to predict biomass responses from an appropriate site data base.

The differences in tree biomass between the ten eucalypt species investigated in this study can be assessed from two perspectives, namely in terms of total mass per component or in the proportions between the components. The total mass of all biomass components (except on-tree dead matter) increases as physiological conditions for tree growth improves. While this is directly proportional to plant available water as influenced by ERD, soil texture and effective precipitation, the relationship to temperature is highly species specific. For example, the growth of *E. grandis* improves as MAT increases above 16.5 °C, but the reverse is true for *E. nitens* (Herbert, 2000). While there are significant differences between the base status of soils across sites in this study, values are not critically low (compare Brazilian coastal plain). Topsoil OC levels are relatively uniform across sites, and thus major differences in soil N status are not evident. Accordingly, site/soil nutrient status does not appear to have influenced tree biomass as strongly as climate and soil rooting conditions, as found elsewhere (Cromer and Jarvis 1990; Cromer *et al.*, 1993a; Hunter, 2001).

The proportions of biomass components also change with the tree's physiological activity. Under general conditions suited to high activity, the relative bole mass increases. While this is partly an effect of growth rate, it is also related to the absolute size of the tree, i.e. large trees (even if grown over an extended period) have a high bole wood fraction present (Judd, 1996). Specht (1996) has suggested that the leaf area index of eucalypts in native forests increases in response to evaporation indices and climatic zone (temperate, subtropical, tropical). For this current study, off-site conditions produce trees with stunted boles and increased stem taper, and a larger combined proportion of leaf, branch, bark and dead matter biomass. In terms of optimising natural resources, the more marginal a site becomes the less efficiently (in terms of nutrient efficacy) it is able to produce merchantable roundwood. This situation is exacerbated if one also takes into account the higher proportion of root mass to total above and below ground biomass on nutritionally or water stressed sites (Fabiao *et al.*, 1995; Grove *et al.*, 1996). Differences in biomass proportioning are also evident between species in the study. For example, *E. nitens, E. elata* and *E. macarthurii* have overall lower bole wood fractions than *E. dunnii, E. grandis* and *E. saligna.*

The high water content found in bark and leaves is consistent with their high physiological activity. The slightly higher water content of bark indicates its role as the conduit of water from soil to leaves. Leaf moisture may be lower due to a higher fraction of air-filled spaces and thus less water content. While differences between sites are very small for most live biomass components, leaf moisture appears inversely proportional to soil ERD but increases with MAT. Differences are also evident between species, particularly in the bark and leaves. High water content species for these components include

E. saligna, E. grandis, E. deanei and E. dunnii, while *E. smithii* and *E. nitens* have the lowest moisture. Interestingly, this ranking shows that the pure gum bark species have higher water contents than the peppermints or species with "socks". The highest bole wood water content occurs with the *Monocalyptus* subgenus species *E. elata* and *E. fastigata*, while it is also invariably lower in the Viminales than Transversae. This suggests that following felling, timber from species such as *E. smithii, E. macarthurii* and *E. nitens* will be relatively drier sooner than *E. elata, E. fastigata* and *E. grandis* - an important factor to consider when trading in 6-weeks air-dry timber tonnage.

Wood density measurements on discs cut from four set sampling positions along the bole show greater differences between species than between sampling positions within species. Overall, there was no significant apparent difference between sampling positions, indicating uniform timber density throughout the bole (at between 7 and 8 years of age). Withing the Viminales group, *E. smithii* showed the highest density, followed by *E. viminalis, E. macarthurii, E. dunnii* and *E. nitens*. This group had higher densities than the *Monocalyptus* subgenus of *E. fastigata* and *E. elata* which in turn was denser than the Transversae group species of *E. grandis* (lowest), *E. saligna* and *E. deanei*. There were also differences between sites, with density decreasing on shallower soils and/or on sites with a MAT of 16.5 °C or greater.

Numerous studies have been conducted into the biomass nutrient content of eucalypts including *E. elata* (Braithwaite *et al.*, 1983, 1984), *E. fastigata* (Bevege, 1978; Knight, 1988), *E. grandis* (Mulligan and Sands, 1988; Tandon *et al.*, 1988; Herbert, 1990; Lambert and Turner, 1991; Sands *et al.*, 1992), *E. nitens* (Madgwick *et al.*, 1984; Judd *et al.*, 1991), *E. saligna* (Wise and Pitman, 1981; Bell and Ward, 1984; Frederick *et al.*, 1985b), and *E. viminalis* (Ladiges, 1977). Comparative studies by Adams (1996) and Judd *et al.* (1996) have drawn attention to the relationships between the evolution of the genus as shaped partly by soil nutrient factors. There is an increase in nutrient content of biomass from the subgenera *Monocalyptus* to *Symphyomyrtus*, as influenced by their occurrence on increasingly fertile (and better watered) sites. The foliar and bark nutrient levels are generally greater in *Symphyomyrtus* than *Monocalyptus* for all macro elements except Mg, but particularly for Ca and K.

Comparative data from a wide range of plantation sites for *E. grandis* (Judd *et al.*, 1996) are in general agreement with the data from this current study. However, while foliar N in this study is somewhat below their reported average, P, Ca and K are higher, especially in the bark and bole wood. In general, it is also apparent that bark nutrient contents are also higher than the average values found in Australia. It is also reported that nutrient concentrations are higher in intensive eucalypt plantations compared to native forests, especially for foliar N, P and K. The reasons for this are unclear, but may be related to the high level of weed control in plantations and the accompanying lack of competition for uptake of nutrients released through mineralisation of humus and surface litter.

Eucalypt (natural) forest and plantation studies in Australia have invariably examined single species (or only a few) per site unit. While this has enabled broad trends in nutrient concentrations of *Monocalyptus* versus *Symphyomyrtus* and *Corymbia* to be detected, there are little data available to examine specific site responses within the various species of these subgenera. This current investigation is the first comprehensively reported study where a cross section of species can be compared on equivalent sites. This has revealed that, while there are also site differences, the selected species do indeed differ significantly with regard to their biomass and nutrient composition per site type and condition.

The average leaf composition of macro elements is 72% higher in *E. deanei* than in *E. nitens*, but there are no trends for differences between groups of species. Differences in the branch nutrient concentration is only 30% greater in the extreme values for *E. saligna* compared to *E. fastigata*, and the *Monocalyptus* subgenus has significantly lower average nutrient concentrations than the *Symphyomyrtus*. The bark nutrient concentration shows a wide range of values, with up to a 70% increase between *E. smithii* (highest) and *E. deanei* (lowest). In addition, there is a definite pattern for (apart from *E. smithii*) the *Monocalyptus* to have the lowest nutrient concentration, followed by the Viminales, with the Transversae group having the highest nutrient concentrations. For bole wood, the *Monocalyptus* subgenus is again lowest in nutrient content along with *E. smithii*, while *E. dunnii* shows nutrient levels averaging 45% higher than these.

These distinct difference in the biomass nutrient composition of species must also be viewed as an average response to a range of climatic and edaphic site conditions. For this study, biomass nutrient values increase markedly with the availability of soil nutrients, a phenomenon noted by other researchers (Cameron *et al.*, 1986; Herbert, 1991; Cromer *et al.* 1993b). It may be possible that due to the evolution of the genus from nutrient rich to nutrient poor environments, and with marked differences in seasonal climate, eucalypts are able to opportunistically take up nutrients for internal re-distribution during later periods of less-favourable nutrient availability, such as in droughts and floods (Specht, 1996). This current study shows that additional uptake in response to an increase in soil nutrient availability is lowest in the *Monocalyptus* and highest in the Transversae group of the *Symphyomyrtus*. Accordingly, site conditions play an important role in estimating nutrient export budgets.

In order to compare the efficiency with which nutrients are used across species, the ratio of total biomass produced per unit of total biomass nutrients (Utilisation Quotient) and ratio of bole wood produced per unit of total biomass nutrients (Efficiency Quotient) are used. These quotients are very useful in differentiating between the actual nutritional effectiveness (also per element) of each species in producing biomass and/or roundwood. These quotients calculated for this study were derived using the actual recorded biomass averaged over five sites, together with their average nutrient contents per macro and combined trace elements. This provides an average ranking of species nutritional budgets in producing biomass, and thus serves as a basis for a regional overview of efficacies in the southeastern Mpumalanga. From this it is evident that *E. smithii* and *E. fastigata* are the most nutritionally effective species in producing debarked timber, while *E. viminalis, E. nitens* and *E. macarthurii* are the least efficient and require considerably more nutrients to produce an equivalent timber mass.

While comparisons between the biomass nutrient concentrations of different species and the effects of site are meaningful for this study, the mass of nutrients contained within the above-ground components is strongly biassed by the component's mass factor. Mass in turn is a function of the degree of site suitability to each species requirements, as well as the size of tree attained (also a function of age). While the rate of growth is obviously important for commercial timber growing, the use and consumption of soil nutrients in producing roundwood can only be compared on an equivalent mass basis, i.e. trees of the same size. This implies that all species have accordingly grown to yield the same total above-ground biomass per tree, even though there may be genotypic differences in how this biomass is allocated per component.

For purposes of growth equivalence, total biomass was selected as the basis for comparisons as it is common to all components. Accordingly, the biomass models developed for this study were employed to calculate leaf, branch, on-tree dead matter, bole bark and bole wood mass per "average" tree across species and study sites. While the model-estimated biomass component proportions are generally similar between species, the percentage of bole wood varies from 67% (*E. nitens*) to 76% (*E. grandis*) of total above-ground biomass.

Using the product of average nutrient concentration and biomass component mass, the species total nutrient mass per tree is able to be estimated. While *E. fastigata, E, elata* and *E. smithii* are still the most economical biomass producers, *E. dunnii* and *E. deanei* are now the least efficient by a factor of up to 33%. While the estimated biomass components are in line with the actual recorded averages, *E. smithii* (the best grower) had to be discounted by an average of 33%, while *E. grandis* (the most disappointing grower) had to be inflated by an average of 17%. All the other species were adjusted by less than 10%.

Extending the application of the estimated equivalent biomass data, it is possible to compare nutrient budgets on the basis of losses from the site following harvesting. The Export Quotient is defined as the nutrient content per unit mass of biomass removed from the site as debarked or un-debarked logs. This shows that *E. dunnii* exports the greatest quantity of nutrients during harvesting, and is 46% and 49% more "expensive" than debarked and un-debarked *E. elata* respectively. *E. smithii and E. fastigata* show similar scales of economy to *E. elata*, while *E. grandis* is about 20% less "expensive" than *E. dunnii*. These considerable differences between species can be exploited by timber managers to better manage site nutrient resources.

7. CONCLUSIONS

This study has provided an initial assessment of the above-ground biomass components for a range of commercial eucalypts grown in South Africa and other countries. It has been able to demonstrate that there are considerable differences between species with regard to the specific mass of individual components, their relative proportions and nutrient concentrations. These differences are partly due to inherent strategies evolved in Australasia, where conditions vary widely with regard to air temperature, precipitation and soil type and fertility. Accordingly, eucalypts are particularly adept at surviving under harsh conditions and exploiting site resources, especially nutrients.

While there are characteristic nutrient profiles for each species, this study supports the hypothesis that eucalypts will absorb nutrients in excess of current requirements if and when they are available. Consequently luxury consumption may occur, a situation more likely to be found when planted out of their specific natural environments. Accordingly, nutrient uptake and usage is a function of both genotypic and site factors.

Overall there is a consistent trend for species of the *Monocalyptus* subgenus (i.e. *E. elata* and *E. fastigata*) to have lower nutrient concentrations in their live biomass than the *Symphyomyrtus* subgenus. Within the Symphyomyrtus, there is no clear total biomass trend of differentiation *per se* between the Transversae (i.e. *E. deanei, E. grandis,* and *E. saligna*) and Viminales groups (i.e. *E. dunnii, E. macarthurii, E. nitens, E. smithii* and *E. viminalis*), although the Transversae have the highest nutrient concentrations in bark biomass. It is also notable that *E. smithii* has low nutrient levels on a par with those for the *Monocalyptus* species investigated.

It is normally more useful from a management point of view to adapt nutrient concentrations per biomass component into quotients of nutrient efficiency, specifically with regard to the mass of biomass produced per unit of nutrient used (inverse of concentration). This can be calculated in terms of total biomass (Efficiency Quotient), and is of particular use in programmes dealing with renewable plant resources for bio-energy, composting, etc. For timber growers, it is more apposite to examine the amount of roundwood produced per unit nutrient consumed (Utilisation Quotient) in order to derive the optimum growth production returns from the natural resources employed in plantations. This quotient provides an objective framework in which to determine appropriate strategies for responsible management of site resources, in much the same way that costs per tonne timber produced are more meaningful than costs per hectare.

The Export Quotient (biomass of logs per unit nutrient exported from the site) has particular application in examining nutrient budgets. There are large differences between species of up to 45% when the bark is removed in-field, but may increase to 69% if not debarked (i.e. bark transported off the growing site). The choice of species used for commercial timber production can thus have a very large influence on the expenditure and conservation of site nutrient budgets.

The export of nutrients from the sites investigated in this study appears to be in excess of inputs, except possibly for Mg. If the bark is left on logs, losses increase by an average of about 60%. Significantly, the bark of eucalypts is not usually merchantable, although it may provide nutritionally very expensive fuel for boilers. It is also clear that this negative balance is severely exacerbated by burning felling slash prior to replanting, with volatilisation and particulate convection losses more than doubling that removed in logs.

The actual nutrient losses incurred through harvesting need to be examined more completely than the scope of this study allows. The nutrient inputs sourced from literature for dissolved salts in precipitation may well be too low for the southeastern Mpumalanga region, especially for N (very high incidences of electrical storms). In addition, they do not consider the inputs of nutrients transferred from the subsoil and saprolite by roots and deposited in throughfall and litter to the topsoil. In determining complete nutrient budgets, it will also be necessary to calculate the amount of nutrients within the main rooting zone currently available to eucalypt tree roots, and consider the fraction of this pool removed during harvesting operations.

While there may be uncertainty about the precise rate at which the site's nutrient resources are being consumed, there are several steps which management can immediately implement to minimise on-going losses. The five principal eucalypt species grown in the southeastern Mpumalanga are *E. dunnii, E. grandis, E. macarthurii, E. nitens* and *E. smithii*. If *E. grandis* (the industry standard) is set at 100% efficiency in terms of its nutrient Export Quotient, then three of the other four species are more efficient at producing timber per unit nutrient consumed in the order of *E. macarthurii* (4%), *E. nitens* (8%) and *E. smithii* (21%). However, *E, dunnii* (a default species choice in the region due to its high site tolerances) is 13% less efficient than *E. grandis*. Export Quotients are bettered as growing conditions improve, and thus nutrient expenditure can be minimised through careful site-species matching and the excising from production of areas with more marginal growth rates. It is also clear that bark should be removed in-field during timber harvesting, and that felling slash should not be burnt.

The relationships found between soil nutrient status and biomass composition indicates the necessity for site-specific data in determining nutrient budgets and management strategies. The Utilisation Quotients vary by up to 70% between study sites, and thus similarly large differences can also be anticipated elsewhere, especially for Ca on dolerite, diorite and basalt-derived soils. In addition, the high OC content of clay textured escarpment soils can be expected to increase the amount of N exported during harvesting, while the Pietermaritzburg Formation shale-derived soils could result in greater P losses.

One of the strengths of this study is that it provides a reference for further biomass nutritional studies. For example, by selecting trees of similar age and size per species investigated, the relational data base between soil factors and biomass nutrient content can be enlarged to provide greater accuracy and confidence in estimating nutrient contents. For this reason, the Appendices in this document contain the study's complete data base.

The models for estimating biomass from mensurational parameters are useful for pulpwood rotations. While these models are consistent with the changing patterns of biomass distribution with tree size and total biomass, care should be taken in using them for very young trees (eg. less than 10-12 m tall or younger than about four years) or maturing saw timber stands (i.e. taller than 25-28 m or older than about 15 years). If estimates need to be made of eucalypt species or hybrids not covered in this study, there are several options available, *viz* to use the appropriate "combined" models for Transversae or Viminales. An alternate is to use the "All species" model or an average of two or more single species model (eg. *E. grandis* and *E. nitens* for *E. grandis* x *E. nitens* hybrids).

The models for estimating nutrient element content per biomass component should be used with discretion outside the specific study area. This is due to the limited data base of five sites with a high degree of uniformity within each site. It is not recommended for use on the sandy hydromorphic soils of the Zululand coastal plain, nor sites with high amounts of topsoil OC and/or very base-rich parent materials. However, the models do confirm the relationships between tree uptake and soil nutrients, and that these can be quantified in predictive models based on soil analyses. Further investigations are required to determine if other variables also need to be considered for inclusion in more general models, such as air temperature, precipitation and soil drainage status.

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Apendix A1. Soil physical and chemical parameters per trial, species and plot																		
Trial	Species	Plot No.	Soil texture (%)				Gravel (%)	pH (KCl)	Exchangeable cations (cmol(+)/kg soil)					S-value (/kg Cl.)	P (mg/kg)	OC (%)	Exch. acidity (cmol(+)/kg)
			Clay	*Silt*	*Sand*	*Class*			*Ca*	*Mg*	*K*	*Na*	*S-value*				
10	*E. deanei*	2	51	6	43	Cl	0	3.9	0.26	0.16	0.23	0.12	0.76	1.49	1.40	2.29	1.84
10	*E. deanei*	42	38	4	59	SaCl	0	4.0	0.28	0.13	0.16	0.09	0.66	1.74	1.90	1.66	1.30
10	*E. deanei*	44	42	6	53	SaCl	0	4.0	0.26	0.14	0.10	0.09	0.59	1.40	1.80	1.85	1.52
10	*E. dunnii*	21	48	6	47	Cl	0	3.4	0.34	0.25	0.22	0.10	0.91	1.90	1.30	2.18	1.50
10	*E. dunnii*	26	46	5	49	Cl	2	3.9	0.34	0.22	0.19	0.10	0.85	1.85	1.40	2.23	1.51
10	*E. dunnii*	35	42	4	54	SaCl	2	4.0	0.43	0.25	0.22	0.12	1.02	2.43	2.60	1.96	1.06
10	*E. elata*	3	49	6	45	Cl	0	3.8	0.25	0.27	0.14	0.12	0.78	1.59	1.20	2.02	1.52
10	*E. elata*	25	47	6	47	Cl	2	3.9	0.21	0.17	0.11	0.11	0.61	1.30	1.60	2.20	1.55
10	*E. elata*	41	36	3	61	SaCl	0	3.9	0.26	0.09	0.16	0.10	0.62	1.72	1.80	1.59	1.26
10	*E. fastigata*	5	47	6	47	Cl	0	3.8	0.23	0.16	0.10	0.11	0.60	1.28	1.50	1.98	1.87
10	*E. fastigata*	30	40	4	55	SaCl	2	3.9	0.25	0.14	0.10	0.10	0.58	1.45	1.50	1.92	1.61
10	*E. fastigata*	38	40	5	55	SaCl	0	3.9	0.29	0.15	0.10	0.08	0.62	1.55	1.60	1.84	1.25
10	*E. grandis*	24	31	4	65	SaClLm	1	3.9	0.23	0.11	0.11	0.11	0.56	1.81	1.30	1.19	1.02
10	*E. grandis*	31	43	6	51	SaCl	2	3.9	0.32	0.21	0.12	0.10	0.75	1.74	1.70	1.59	1.63
10	*E. grandis*	45	39	4	56	SaCl	0	4.0	0.27	0.15	0.17	0.08	0.68	1.74	1.50	1.77	1.34
10	*E. macarthurii*	6	46	6	48	Cl	0	3.8	0.35	0.20	0.14	0.10	0.78	1.70	1.40	2.13	1.61
10	*E. macarthurii*	39	37	5	58	SaCl	0	3.9	0.30	0.13	0.18	0.08	0.68	1.84	1.60	1.79	1.30
10	*E. macarthurii*	47	41	5	53	SaCl	0	4.0	0.24	0.16	0.12	0.08	0.59	1.44	1.60	1.78	1.40
10	*E. nitens*	12	42	6	52	SaCl	0	3.8	0.27	0.22	0.17	0.10	0.77	1.83	1.90	1.76	1.58
10	*E. nitens*	23	47	5	48	Cl	0	3.9	0.40	0.20	0.15	0.13	0.08	0.17	1.40	2.16	1.56
10	*E. nitens*	46	40	5	56	SaCl	0	4.0	0.36	0.15	0.10	0.08	0.69	1.73	1.80	1.89	1.38
10	*E. saligna*	1	47	6	47	Cl	0	3.9	0.61	0.31	0.16	0.11	1.19	2.53	1.20	1.81	1.46
10	*E. saligna*	29	46	5	49	Cl	2	3.9	0.29	0.15	0.15	0.11	0.69	1.50	1.60	1.94	1.75
10	*E. saligna*	40	40	5	55	SaCl	0	3.9	0.26	0.17	0.14	0.10	0.66	1.65	1.80	1.71	1.31
10	*E. smithii*	20	42	5	53	SaCl	0	3.9	0.25	0.13	0.15	0.10	0.63	1.50	1.50	1.72	1.68
10	*E. smithii*	28	43	5	52	SaCl	2	3.9	0.25	0.13	0.20	0.12	0.69	1.60	2.10	1.99	1.52
10	*E. smithii*	36	40	4	56	SaCl	0	3.9	0.25	0.14	0.23	0.12	0.74	1.85	1.80	1.89	1.37
10	*E. viminalis*	22	51	6	44	Cl	0	3.9	0.32	0.23	0.16	0.11	0.82	1.61	1.40	1.92	1.61
10	*E. viminalis*	27	47	5	47	Cl	2	3.9	0.33	0.18	0.18	0.10	0.80	1.70	1.60	2.31	1.60
10	*E. viminalis*	33	37	5	58	SaCl	2	3.9	0.28	0.12	0.08	0.10	0.58	1.57	1.40	1.66	1.37
11	*E. deanei*	5	31	5	64	SaClLm	0	3.8	2.56	2.62	0.16	0.12	5.45	17.58	3.60	2.56	1.30
11	*E. deanei*	13	45	7	48	SaCl	0	3.8	2.72	2.78	0.17	0.15	5.82	12.93	1.90	2.67	1.35
11	*E. deanei*	37	27	9	64	SaClLm	0	3.8	2.49	2.52	0.53	0.15	5.69	21.07	4.60	2.73	1.13
11	*E. dunnii*	7	29	12	59	SaClLm	0	4.2	3.63	2.96	0.22	0.18	7.00	24.14	3.30	2.97	0.50
11	*E. dunnii*	20	32	7	61	SaClLm	0	4.1	3.90	2.90	0.29	0.29	7.37	23.03	5.10	2.68	0.48
11	*E. dunnii*	32	32	10	58	SaClLm	0	3.9	1.63	1.53	0.26	0.16	3.58	11.19	3.20	2.04	0.96
11	*E. elata*	1	33	9	58	SaLm	0	3.9	1.88	2.19	0.06	0.09	4.23	22.26	3.80	1.71	0.58
11	*E. elata*	15	31	9	60	SaClLm	0	4.0	2.40	2.06	0.28	0.14	4.87	15.71	4.30	2.48	0.69

Apendix A1. Soil physical and chemical parameters per trial, species and plot

Trial	Species	Plot No.	Soil texture (%)				Gravel (%)	pH (KCl)	Exchangeable cations (cmol(+)/kg soil)					S-value (/kg Cl.)	P (mg/kg)	OC (%)	Exch. acidity (cmol(+)/kg)
			Clay	*Silt*	*Sand*	*Class*			*Ca*	*Mg*	*K*	*Na*	*S-value*				
11	*E. elata*	38	30	8	62	SaClLm	0	3.9	2.61	1.96	0.16	0.16	4.89	16.30	5.10	2.51	0.92
11	*E. fastigata*	17	30	11	59	SaClLm	0	3.8	1.87	1.63	0.16	0.12	3.78	12.60	3.90	2.33	0.89
11	*E. fastigata*	24	39	9	52	SaClLm	0	4.1	2.97	3.30	0.17	0.17	6.62	16.97	3.20	2.64	0.30
11	*E. fastigata*	36	30	11	59	SaClLm	0	4.2	4.23	3.33	0.19	0.18	7.93	26.43	1.90	2.99	0.45
11	*E. grandis*	11	39	6	55	SaClLm	0	4.0	2.33	2.30	0.21	0.09	4.92	12.62	3.40	2.38	0.64
11	*E. grandis*	22	36	9	55	SaClLm	0	4.2	3.63	3.89	0.15	0.27	7.94	22.06	2.20	2.43	0.36
11	*E. grandis*	42	30	12	58	SaClLm	0	3.8	1.42	2.11	0.15	0.16	3.85	12.83	3.20	2.05	2.05
11	*E. macarthurii*	3	34	8	58	SaClLm	0	3.9	2.87	2.64	0.16	0.14	5.80	17.06	3.00	2.21	0.59
11	*E. macarthurii*	8	26	11	63	SaClLm	0	3.8	3.05	2.65	0.22	0.13	6.05	23.27	4.50	2.67	1.04
11	*E. macarthurii*	31	32	10	58	SaClLm	0	3.8	1.98	1.95	0.17	0.20	4.30	13.44	3.70	2.55	1.08
11	*E. nitens*	4	35	8	57	SaClLm	0	3.9	2.24	1.95	0.24	0.13	4.55	13.00	3.70	2.06	0.82
11	*E. nitens*	18	38	7	55	SaClLm	0	4.2	3.81	3.60	0.29	0.13	7.83	20.61	4.00	3.18	0.30
11	*E. nitens*	34	41	7	52	SaCl	0	3.8	1.60	1.67	0.19	0.16	3.62	8.83	2.50	2.25	1.20
11	*E. saligna*	14	32	9	59	SaClLm	0	4.0	3.79	3.60	0.15	0.19	7.73	24.16	3.70	2.92	0.54
11	*E. saligna*	23	32	6	62	SaClLm	0	3.8	2.51	3.05	0.10	0.24	5.90	18.44	2.70	2.27	1.19
11	*E. saligna*	39	29	8	63	SaClLm	0	3.8	1.39	1.66	0.26	0.14	3.44	11.86	5.00	2.09	2.09
11	*E. smithii*	2	29	11	60	SaClLm	0	4.1	3.35	4.06	0.12	0.13	7.66	26.41	1.70	2.32	0.27
11	*E. smithii*	10	38	9	53	SaClLm	0	4.0	1.62	1.75	0.26	0.14	3.77	9.92	4.00	2.05	0.83
11	*E. smithii*	41	43	8	49	SaCl	0	4.1	2.50	1.73	0.25	0.20	4.68	10.88	2.30	2.05	2.05
11	*E. viminalis*	16	33	7	60	SaClLm	0	3.7	1.38	1.61	0.19	0.11	3.29	9.97	5.20	2.24	1.38
11	*E. viminalis*	21	38	8	54	SaClLm	0	4.1	4.18	3.52	0.18	0.24	8.13	21.39	2.70	2.68	0.36
11	*E. viminalis*	35	29	8	63	SaClLm	0	3.9	2.03	1.93	0.21	0.18	4.35	15.00	3.00	2.14	0.79
12	*E. deanei*	2	45	5	49	Cl	0	4.0	0.18	0.21	0.15	0.11	0.65	1.44	2.00	2.40	2.11
12	*E. deanei*	14	50	3	47	Cl	0	4.1	0.28	0.35	0.17	0.11	0.91	1.82	4.60	2.25	2.05
12	*E. deanei*	28	45	6	49	Cl	0	4.0	0.19	0.13	0.13	0.09	0.55	1.22	3.60	1.86	1.93
12	*E. dunnii*	13	42	5	53	SaCl	0	4.0	0.24	0.21	0.10	0.11	0.66	1.57	4.10	2.26	1.71
12	*E. dunnii*	19	51	4	45	Cl	0	4.0	0.38	0.41	0.17	0.11	1.06	2.08	3.90	1.87	1.70
12	*E. dunnii*	27	45	6	49	Cl	0	4.1	0.28	0.22	0.18	0.10	0.78	1.73	4.20	2.13	1.96
12	*E. elata*	15	52	1	47	Cl	0	4.1	0.26	0.18	0.08	0.11	0.63	1.21	4.90	2.23	1.98
12	*E. elata*	23	47	4	48	Cl	0	4.1	0.22	0.17	0.10	0.11	0.60	1.28	4.30	2.10	1.95
12	*E. elata*	43	44	6	50	Cl	0	4.0	0.22	0.21	0.14	0.12	0.70	1.59	3.00	2.09	1.83
12	*E. fastigata*	7	47	6	47	Cl	0	3.9	0.23	0.30	0.10	0.08	0.72	1.53	2.50	2.58	1.91
12	*E. fastigata*	22	46	5	49	Cl	0	4.1	0.34	0.28	0.09	0.09	0.79	1.72	5.50	2.00	1.83
12	*E. fastigata*	45	44	6	51	SaCl	0	4.0	0.26	0.20	0.12	0.12	0.70	1.59	3.60	2.09	1.72
12	*E. grandis*	1	46	6	49	Cl	0	3.9	0.45	0.49	0.24	0.14	1.32	2.87	1.64	2.52	1.53
12	*E. grandis*	9	46	6	48	Cl	0	4.0	0.32	0.45	0.18	0.12	1.06	2.30	2.40	2.50	1.82
12	*E. grandis*	29	45	6	48	Cl	0	4.1	0.22	0.17	0.16	0.11	0.66	1.47	3.20	1.95	1.96
12	*E. macarthurii*	3	44	3	53	SaCl	0	4.1	0.18	0.22	0.11	0.12	0.63	1.43	2.40	2.27	1.86

Apendix A1. Soil physical and chemical parameters per trial, species and plot

Trial	Species	Plot	Soil texture (%)				Gravel	pH	Exchangeable cations (cmol(+)/kg soil)					S-value	P	OC	Exch. acidity
		No.	*Clay*	*Silt*	*Sand*	*Class*	(%)	(KCl)	*Ca*	*Mg*	*K*	*Na*	*S-value*	(/kg Cl.)	(mg/kg)	(%)	(cmol(+)/kg)
12	*E. macarthurii*	16	50	14	37	Cl	0	4.0	0.26	0.18	0.08	0.11	0.72	1.44	4.90	2.37	1.95
12	*E. macarthurii*	30	46	7	47	Cl	0	4.0	0.19	0.16	0.17	0.14	0.66	1.43	3.00	2.02	1.93
12	*E. nitens*	6	48	6	47	Cl	0	4.2	0.22	0.22	0.15	0.09	0.68	1.42	1.90	2.52	2.07
12	*E. nitens*	18	50	4	47	Cl	0	4.0	0.30	0.26	0.12	0.10	0.79	1.58	4.00	2.48	1.68
12	*E. nitens*	47	48	6	46	Cl	0	4.0	0.25	0.20	0.18	0.12	0.74	1.54	3.90	2.26	1.80
12	*E. saligna*	10	46	6	48	Cl	0	4.2	0.33	0.32	0.12	0.13	0.89	1.93	1.90	2.19	1.82
12	*E. saligna*	21	46	4	50	Cl	0	4.0	0.29	0.29	0.16	0.11	0.85	1.85	4.00	1.82	1.83
12	*E. saligna*	26	46	7	48	Cl	0	4.2	0.20	0.15	0.22	0.11	0.68	1.48	3.80	2.03	1.91
12	*E. smithii*	4	45	6	49	Cl	0	4.0	0.35	0.37	0.12	0.13	0.97	2.16	2.40	2.31	2.02
12	*E. smithii*	8	46	6	48	Cl	0	4.1	0.37	0.35	0.19	0.11	1.02	2.22	2.70	2.30	1.68
12	*E. smithii*	48	48	7	46	Cl	0	4.1	0.24	0.19	0.17	0.15	0.75	1.56	3.20	2.27	2.03
12	*E. viminalis*	5	47	6	47	Cl	0	4.1	0.24	0.25	0.11	0.08	0.69	1.47	2.10	2.44	1.89
12	*E. viminalis*	11	45	5	49	Cl	0	4.1	0.35	0.34	0.09	0.11	0.89	1.98	4.70	2.29	1.87
12	*E. viminalis*	46	46	6	48	Cl	0	4.1	0.27	0.22	0.17	0.11	0.77	1.67	2.10	2.14	1.72
13	*E. deanei*	7	27	10	63	SaClLm	0	4.5	3.31	2.68	0.30	0.21	6.50	24.07	2.20	1.59	0.09
13	*E. deanei*	38	37	11	52	SaCl	0	4.4	8.04	4.66	0.18	0.18	13.06	35.30	4.10	1.75	0.13
13	*E. deanei*	44	36	11	53	SaCl	0	4.2	3.53	4.30	0.14	0.19	8.16	22.67	1.20	1.25	0.46
13	*E. dunnii*	21	35	12	53	SaClLm	0	4.4	5.06	3.63	0.32	0.16	9.18	26.23	1.00	1.64	0.14
13	*E. dunnii*	39	34	10	56	SaClLm	0	4.5	7.07	4.19	0.22	0.19	11.67	34.32	1.20	1.53	0.14
13	*E. dunnii*	48	26	9	65	SaClLm	0	4.5	2.32	2.23	0.14	0.18	4.86	18.69	2.00	0.90	0.15
13	*E. elata*	3	31	9	61	SaClLm	0	4.6	3.34	3.17	0.19	0.22	6.92	22.32	1.60	1.73	0.08
13	*E. elata*	30	34	12	54	SaClLm	0	4.7	7.43	4.36	0.27	0.15	12.21	35.91	1.30	1.66	0.09
13	*E. elata*	33	33	12	55	SaClLm	0	4.7	5.88	4.43	0.37	0.17	10.85	32.88	1.30	1.33	0.08
13	*E. fastigata*	9	30	11	59	SaClLm	0	4.3	5.73	3.50	0.49	0.16	9.89	32.97	1.70	1.77	0.07
13	*E. fastigata*	31	28	11	61	SaClLm	0	4.5	4.46	3.58	0.21	0.19	8.45	30.18	1.40	1.25	0.13
13	*E. fastigata*	43	37	12	51	SaCl	0	4.5	7.03	4.47	0.28	0.17	11.95	32.30	1.62	1.62	0.12
13	*E. grandis*	4	32	11	57	SaClLm	0	4.5	6.44	3.54	0.57	0.17	10.72	33.50	1.50	1.81	0.08
13	*E. grandis*	13	37	14	49	ClLm	0	4.7	6.14	2.73	0.66	0.17	9.70	26.22	3.00	1.76	0.05
13	*E. grandis*	41	37	11	52	SaCl	0	4.3	6.54	3.70	0.15	0.18	10.57	28.57	0.60	1.40	0.23
13	*E. macarthurii*	17	28	10	61	SaClLm	0	4.5	3.44	3.34	0.27	0.14	7.19	25.68	1.80	1.38	0.12
13	*E. macarthurii*	19	35	12	53	SaClLm	0	4.3	4.04	3.74	0.17	0.17	8.12	23.20	0.90	1.62	0.16
13	*E. macarthurii*	37	35	12	53	SaCl	0	4.7	8.49	3.85	0.23	0.19	12.76	36.46	5.80	1.70	0.10
13	*E. nitens*	1	29	7	64	SaClLm	0	4.5	3.51	2.19	0.24	0.28	6.21	21.41	2.60	1.50	0.07
13	*E. nitens*	10	38	13	49	ClLm	0	4.8	7.33	4.27	0.64	0.31	12.55	33.03	3.40	1.98	0.08
13	*E. nitens*	32	29	10	61	SaClLm	0	4.5	3.86	3.70	0.18	0.17	7.91	27.28	1.70	1.25	0.12
13	*E. saligna*	14	36	11	53	SaCl	0	4.7	7.34	4.52	0.45	0.15	12.47	34.54	4.70	1.83	0.08
13	*E. saligna*	29	35	12	54	SaClLm	0	4.6	7.11	4.45	0.27	0.20	12.03	34.37	0.90	1.83	0.09
13	*E. saligna*	35	39	12	50	ClLm	0	4.7	7.82	5.27	0.20	0.17	13.47	34.54	2.50	1.90	0.10

Apendix A1. Soil physical and chemical parameters per trial, species and plot

Trial	Species	Plot	Soil texture (%)				Gravel	pH	Exchangeable cations (cmol(+)/kg soil)					S-value	P	OC	Exch. acidity
		No.	*Clay*	*Silt*	*Sand*	*Class*	(%)	(KCl)	*Ca*	*Mg*	*K*	*Na*	*S-value*	(/kg Cl.)	(mg/kg)	(%)	(cmol(+)/kg)
13	*E. smithii*	8	28	11	62	SaClLm	0	4.7	3.25	2.69	0.27	0.16	6.37	22.75	2.40	1.28	0.07
13	*E. smithii*	42	33	11	56	SaClLm	0	4.5	7.18	4.22	0.28	0.16	11.84	35.88	2.60	1.21	0.13
13	*E. smithii*	45	36	11	53	SaCl	0	4.6	6.79	3.39	0.20	0.15	10.53	29.25	2.20	1.54	0.09
13	*E. viminalis*	11	36	12	52	SaCl	0	4.5	6.69	4.69	0.23	0.21	11.83	32.86	2.70	1.83	0.08
13	*E. viminalis*	34	36	12	52	SaCl	0	4.6	7.15	5.22	0.30	0.16	12.82	35.61	1.30	1.91	0.09
13	*E. viminalis*	46	35	11	54	SaClLm	0	4.6	5.19	3.71	0.15	0.17	9.23	26.37	1.10	1.39	0.06
14	*E. deanei*	2	39	6	55	SaCl	0	3.6	0.28	0.10	0.07	0.08	0.53	1.36	7.80	3.19	2.14
14	*E. deanei*	14	39	6	55	SaCl	0	3.7	0.19	0.07	0.09	0.04	0.40	1.03	4.90	2.15	1.88
14	*E. deanei*	35	43	6	51	Cl	0	3.7	0.33	0.17	1.81	1.34	3.65	8.49	5.30	2.99	2.14
14	*E. dunnii*	4	38	5	57	SaCl	0	3.8	0.39	0.09	0.07	0.03	0.59	1.55	4.40	1.74	1.26
14	*E. dunnii*	24	39	7	53	SaCl	0	3.7	0.17	0.07	0.23	0.13	0.60	1.54	6.90	2.54	1.69
14	*E. dunnii*	32	39	5	56	SaCl	0	3.7	0.20	0.08	0.10	0.11	0.50	1.28	4.30	2.35	1.98
14	*E. elata*	3	38	7	55	SaCl	0	3.6	0.26	0.13	0.15	0.05	0.58	1.53	6.40	3.01	2.12
14	*E. elata*	17	44	7	49	Cl	0	3.7	0.28	0.08	0.09	0.13	0.58	1.32	5.30	2.67	1.70
14	*E. elata*	36	46	6	48	Cl	0	3.9	0.24	0.15	0.24	0.09	0.72	1.57	4.70	2.85	1.78
14	*E. fastigata*	8	39	8	53	SaCl	0	3.6	0.27	0.12	0.13	0.05	0.56	1.44	6.00	3.12	2.46
14	*E. fastigata*	15	38	6	56	SaCl	0	3.8	0.13	0.06	0.06	0.03	0.29	0.76	4.70	2.13	1.40
14	*E. fastigata*	26	37	6	56	SaCl	0	3.7	0.22	0.08	0.12	0.08	0.50	1.35	4.80	2.65	1.75
14	*E. grandis*	9	38	6	57	SaCl	0	3.7	0.24	0.09	0.13	0.05	0.52	1.37	5.30	2.45	1.63
14	*E. grandis*	23	38	7	55	SaCl	0	3.8	0.21	0.08	0.11	0.12	0.52	1.37	5.40	2.42	1.90
14	*E. grandis*	27	37	5	58	SaCl	0	3.8	0.22	0.08	0.17	0.13	0.60	1.62	3.60	2.45	1.38
14	*E. macarthurii*	12	38	7	55	SaCl	0	3.6	0.30	0.11	0.07	0.05	0.52	1.37	6.70	3.25	2.10
14	*E. macarthurii*	13	40	7	53	SaCl	0	3.7	0.28	0.11	0.07	0.07	0.53	1.33	7.20	2.76	1.80
14	*E. macarthurii*	30	40	6	54	SaCl	0	3.7	0.19	0.07	0.08	0.12	0.46	1.15	4.90	2.63	2.05
14	*E. nitens*	1	40	7	52	SaCl	0	3.5	0.25	0.11	0.05	0.05	0.46	1.15	5.40	3.02	1.88
14	*E. nitens*	19	39	7	54	SaCl	0	3.6	0.16	0.06	0.07	0.13	0.43	1.10	4.60	2.46	1.89
14	*E. nitens*	34	40	7	53	SaCl	0	3.8	0.29	0.15	0.52	0.11	1.06	2.65	5.20	2.40	0.64
14	*E. saligna*	7	35	6	59	SaCl	0	3.7	0.21	0.07	0.09	0.06	0.43	1.23	5.60	2.89	2.18
14	*E. saligna*	18	37	6	57	SaCl	0	3.7	0.25	0.11	0.09	0.14	0.59	1.59	6.20	2.37	1.88
14	*E. saligna*	25	39	6	55	SaCl	0	3.8	0.20	0.12	0.24	0.12	0.67	1.72	4.70	2.49	1.64
14	*E. smithii*	5	32	5	63	SaClLm	0	3.8	0.18	0.09	0.19	0.05	0.52	1.63	4.00	1.82	1.53
14	*E. smithii*	16	40	6	54	SaCl	0	3.6	0.15	0.05	0.08	0.11	0.39	0.98	4.40	2.50	1.49
14	*E. smithii*	31	46	7	48	Cl	0	3.7	0.28	0.19	0.18	0.10	0.76	1.65	4.90	2.88	2.25
14	*E. viminalis*	10	36	5	59	SaCl	0	3.7	0.20	0.07	0.05	0.06	0.39	1.08	4.20	2.42	1.84
14	*E. viminalis*	22	37	6	57	SaCl	0	3.8	0.22	0.08	0.10	0.13	0.54	1.46	5.10	2.47	1.49
14	*E. viminalis*	29	33	5	62	SaClLm	0	3.7	0.25	0.14	1.80	0.21	2.40	7.27	3.90	2.38	1.53

Appendix A2.1. Sample tree characteristics per trial, species and plot

Trial	Species	Plot No.	Height (m)		OB Dbh (cm)		UB stem volume (dm³)	Stocking (N/ha)	Basal area (m²/ha)
			Total	*5cm top*	*Sample*	*Plot*			
10	*E. deanei*	2	19.9	15.9	16.0	15.2	139.4	1667	8.10
10	*E. deanei*	42	20.4	17.3	17.2	17.4	189.5	1667	30.80
10	*E. deanei*	44	19.6	16.2	17.7	15.4	169.4	1667	21.07
10	*E. dunnii*	21	20.4	16.6	14.7	14.4	119.1	1667	22.00
10	*E. dunnii*	26	21.9	18.3	17.5	17.1	171.8	1667	26.42
10	*E. dunnii*	35	21.8	18.3	16.5	16.4	166.8	1667	27.68
10	*E. elata*	3	19.7	16.1	15.2	15.3	122.9	1667	19.23
10	*E. elata*	25	22.3	18.9	18.1	17.8	213.7	1667	20.79
10	*E. elata*	41	18.0	14.7	15.0	13.6	99.5	1481	14.89
10	*E. fastigata*	5	20.6	16.9	16.5	16.6	155.8	1481	28.33
10	*E. fastigata*	30	19.3	15.7	16.8	16.4	140.4	1296	25.79
10	*E. fastigata*	38	18.2	14.6	17.5	16.2	146.1	1296	22.66
10	*E. grandis*	24	21.1	17.5	17.0	16.3	163.3	1667	34.87
10	*E. grandis*	31	21.5	17.9	17.4	17.6	173.5	1481	30.43
10	*E. grandis*	45	19.8	17.0	17.7	17.4	174.8	926	22.05
10	*E. macarthurii*	6	19.3	16.0	17.8	17.5	143.9	1667	32.09
10	*E. macarthurii*	39	19.9	16.4	18.8	17.6	186.8	1667	33.21
10	*E. macarthurii*	47	20.5	17.0	18.1	17.9	151.7	370	39.83
10	*E. nitens*	12	20.2	16.5	16.9	15.4	167.4	1296	29.18
10	*E. nitens*	23	19.1	15.9	16.5	16.9	166.6	1296	9.31
10	*E. nitens*	46	19.4	16.5	17.9	19.0	188.3	1667	*
10	*E. saligna*	1	19.3	15.8	16.2	15.5	146.3	1667	28.96
10	*E. saligna*	29	20.0	16.6	15.9	16.7	138.6	1481	27.63
10	*E. saligna*	40	20.4	16.8	15.5	14.9	139.6	926	16.07
10	*E. smithii*	20	24.5	20.1	18.8	17.7	241.9	1667	36.22
10	*E. smithii*	28	22.7	18.7	17.3	16.6	194.7	1667	36.19
10	*E. smithii*	36	20.9	17.1	19.1	20.3	216.0	1667	39.79
10	*E. viminalis*	22	20.2	16.5	14.8	15.2	112.8	1481	26.99
10	*E. viminalis*	27	20.9	17.6	17.5	15.9	157.4	1481	23.19
10	*E. viminalis*	33	16.2	12.2	13.2	13.4	65.2	1667	22.16
11	*E. deanei*	5	18.6	14.9	16.1	15.0	138.6	1667	26.98
11	*E. deanei*	13	14.2	11.1	15.6	15.1	103.1	1667	27.23
11	*E. deanei*	37	15.1	11.7	14.3	14.1	89.3	1667	24.27
11	*E. dunnii*	7	19.9	16.9	18.9	18.1	173.2	1481	34.04
11	*E. dunnii*	20	18.7	15.2	16.8	16.7	145.5	1481	30.91
11	*E. dunnii*	32	20.1	16.3	16.0	16.3	131.7	1667	30.79
11	*E. elata*	1	15.7	11.3	14.0	13.7	77.7	1111	10.51
11	*E. elata*	15	17.5	12.9	13.1	12.7	85.5	1667	11.95

Appendix A2.1. Sample tree characteristics per trial, species and plot									
Trial	Species	Plot No.	Height (m)		OB Dbh (cm)		UB stem volume (dm³)	Stocking (N/ha)	Basal area (m²/ha)
			Total	*5cm top*	*Sample*	*Plot*			
11	*E. elata*	38	16.9	13.1	13.0	14.8	91.3	1111	13.81
11	*E. fastigata*	17	17.8	13.4	13.5	11.5	89.2	1481	15.48
11	*E. fastigata*	24	16.5	11.5	12.7	11.6	67.4	741	7.81
11	*E. fastigata*	36	15.7	11.9	14.5	13.7	91.1	1296	19.18
11	*E. grandis*	11	17.6	13.5	14.7	14.7	107.8	1667	23.60
11	*E. grandis*	22	20.8	18.7	15.9	14.8	149.1	1667	27.06
11	*E. grandis*	42	20.9	17.4	18.2	15.8	180.0	1667	29.89
11	*E. macarthurii*	3	17.4	13.8	14.0	15.0	113.8	1667	26.79
11	*E. macarthurii*	8	19.1	14.4	20.2	17.2	179.4	1667	32.24
11	*E. macarthurii*	31	16.6	12.9	16.0	15.3	101.8	1667	25.62
11	*E. nitens*	4	19.7	16.9	18.9	18.9	208.7	1296	36.25
11	*E. nitens*	18	18.1	14.8	14.6	16.0	127.0	1667	25.74
11	*E. nitens*	34	19.3	15.9	18.7	16.5	222.9	1111	20.93
11	*E. saligna*	14	18.3	14.7	15.6	14.4	126.3	1667	23.01
11	*E. saligna*	23	22.1	18.8	16.2	15.5	177.6	1481	25.79
11	*E. saligna*	39	18.7	15.6	16.4	17.0	129.7	1481	27.91
11	*E. smithii*	2	19.9	15.9	17.1	15.0	165.5	1667	25.65
11	*E. smithii*	10	18.3	14.2	15.9	15.5	121.6	1667	27.38
11	*E. smithii*	41	19.4	15.3	17.2	15.6	173.9	1667	28.35
11	*E. viminalis*	16	18.7	14.8	15.7	14.7	118.2	1481	23.57
11	*E. viminalis*	21	20.8	17.2	16.3	16.2	150.8	1481	28.07
11	*E. viminalis*	35	17.3	13.9	16.1	15.8	120.4	1481	23.02
12	*E. deanei*	2	24.8	21.4	21.3	19.9	327.8	1667	37.62
12	*E. deanei*	14	18.1	14.2	15.6	15.1	114.3	926	16.51
12	*E. deanei*	28	20.1	16.4	17.3	16.9	215.0	1667	48.87
12	*E. dunnii*	13	25.5	22.4	24.6	19.5	401.4	1481	27.08
12	*E. dunnii*	19	27.6	23.6	22.3	20.5	372.2	1667	39.54
12	*E. dunnii*	27	26.4	24.2	23.7	21.5	346.1	1667	49.47
12	*E. elata*	15	25.4	20.7	21.0	16.0	280.9	1296	23.06
12	*E. elata*	23	28.0	24.0	21.7	20.7	325.7	1481	37.90
12	*E. elata*	43	25.6	21.5	22.7	27.6	345.9	370	11.37
12	*E. fastigata*	7	25.7	21.8	20.5	18.4	296.5	1481	26.49
12	*E. fastigata*	22	21.8	17.3	18.3	15.8	221.9	1296	16.90
12	*E. fastigata*	45	24.9	21.3	20.0	19.8	329.6	926	41.77
12	*E. grandis*	1	26.4	23.5	21.7	19.2	357.0	1667	44.12
12	*E. grandis*	9	27.5	23.5	20.3	19.3	269.1	1667	34.91
12	*E. grandis*	29	24.5	20.9	19.7	19.3	268.6	1667	38.01
12	*E. macarthurii*	3	18.5	14.3	15.4	18.6	114.2	1481	31.79

Appendix A2.1. Sample tree characteristics per trial, species and plot									
Trial	Species	Plot No.	Height (m)		OB Dbh (cm)		UB stem volume (dm³)	Stocking (N/ha)	Basal area (m²/ha)
			Total	*5cm top*	*Sample*	*Plot*			
12	*E. macarthurii*	16	19.7	15.4	16.3	18.2	148.5	1667	35.62
12	*E. macarthurii*	30	24.6	21.0	20.7	19.3	268.1	1296	34.54
12	*E. nitens*	6	21.9	17.1	13.8	18.0	120.1	1296	25.33
12	*E. nitens*	18	21.4	17.0	14.9	17.6	128.2	926	10.57
12	*E. nitens*	47	18.7	13.5	13.6	11.7	77.8	556	54.13
12	*E. saligna*	10	25.3	22.1	18.7	19.1	257.3	1111	27.78
12	*E. saligna*	21	26.0	22.7	21.8	18.5	353.8	1667	37.42
12	*E. saligna*	26	22.5	18.9	17.4	20.9	197.7	1667	57.07
12	*E. smithii*	4	26.3	21.1	16.8	17.6	239.3	1667	34.60
12	*E. smithii*	8	25.8	20.7	17.6	17.6	198.6	1667	40.36
12	*E. smithii*	48	31.6	28.2	29.9	21.3	776.8	1667	27.07
12	*E. viminalis*	5	21.0	16.3	16.5	19.3	167.2	1667	38.83
12	*E. viminalis*	11	24.9	21.6	20.0	19.7	263.5	1481	40.75
12	*E. viminalis*	46	24.9	21.2	22.4	20.0	313.8	1667	6.00
13	*E. deanei*	7	13.4	9.2	11.0	11.2	38.6	1481	14.58
13	*E. deanei*	38	14.2	9.5	13.1	12.8	59.7	1667	21.50
13	*E. deanei*	44	13.4	9.1	11.3	11.2	46.4	1667	12.96
13	*E. dunnii*	21	16.2	12.2	13.5	13.5	75.9	1667	23.98
13	*E. dunnii*	39	17.7	14.4	15.6	14.9	117.8	1667	23.64
13	*E. dunnii*	48	13.2	8.9	12.4	12.2	48.5	1667	15.86
13	*E. elata*	3	8.4	5.7	9.5	10.0	24.4	1481	11.51
13	*E. elata*	30	14.6	9.5	11.4	13.6	54.4	1296	16.82
13	*E. elata*	33	16.3	11.3	12.4	12.1	72.9	1296	9.15
13	*E. fastigata*	9	12.7	7.5	9.0	8.8	23.7	1667	10.08
13	*E. fastigata*	31	14.9	10.5	13.3	14.5	70.0	926	10.93
13	*E. fastigata*	43	13.5	9.0	9.9	11.4	36.5	1667	10.45
13	*E. grandis*	4	15.1	11.2	13.5	13.0	79.7	1667	22.01
13	*E. grandis*	13	15.8	11.6	13.6	12.6	88.6	1667	20.67
13	*E. grandis*	41	16.6	12.8	13.3	13.4	95.0	1481	20.76
13	*E. macarthurii*	17	16.3	12.0	14.0	12.9	76.5	1481	15.06
13	*E. macarthurii*	19	15.6	11.2	14.2	12.5	72.7	1481	18.16
13	*E. macarthurii*	37	15.1	10.9	13.8	12.9	75.7	1667	19.98
13	*E. nitens*	1	11.0	7.7	14.1	10.0	59.6	370	2.92
13	*E. nitens*	10	12.3	6.9	8.0	12.2	21.5	370	4.31
13	*E. nitens*	32	9.3	3.8	6.7	7.6	8.1	926	3.50
13	*E. saligna*	14	17.6	13.4	12.9	12.5	91.4	1667	20.45
13	*E. saligna*	29	16.3	12.4	12.8	12.7	104.2	1667	19.23
13	*E. saligna*	35	17.7	14.1	15.3	13.1	126.9	1667	22.38

Appendix A2.1. Sample tree characteristics per trial, species and plot

Trial	Species	Plot No.	Height (m)		OB Dbh (cm)		UB stem volume (dm^3)	Stocking (N/ha)	Basal area (m^2/ha)
			Total	*5cm top*	*Sample*	*Plot*			
13	*E. smithii*	8	16.0	12.0	11.5	12.5	67.0	1481	18.06
13	*E. smithii*	42	17.2	12.8	13.5	12.2	91.7	1667	17.41
13	*E. smithii*	45	15.4	9.9	12.2	11.1	58.1	1667	16.11
13	*E. viminalis*	11	13.7	8.8	12.0	12.3	44.6	1667	19.84
13	*E. viminalis*	34	15.2	11.1	12.7	12.4	61.1	1667	18.30
13	*E. viminalis*	46	14.1	9.5	11.5	11.4	51.2	1667	15.76
14	*E. deanei*	2	17.8	13.4	12.9	13.6	84.4	1667	24.09
14	*E. deanei*	14	15.3	10.5	11.6	11.8	54.0	1667	18.07
14	*E. deanei*	35	18.5	14.7	13.1	12.8	108.8	1481	18.94
14	*E. dunnii*	4	20.7	17.0	14.9	15.7	113.7	1667	32.23
14	*E. dunnii*	24	20.3	16.9	16.5	15.5	151.1	1667	31.28
14	*E. dunnii*	32	20.3	16.1	15.3	12.6	106.9	1667	20.77
14	*E. elata*	3	16.9	10.7	4.3	12.8	75.9	1667	21.34
14	*E. elata*	17	20.3	15.6	15.2	13.6	116.2	1667	21.63
14	*E. elata*	36	16.6	12.4	17.9	17.5	126.9	1481	35.51
14	*E. fastigata*	8	21.0	16.8	18.1	20.7	169.8	1111	32.45
14	*E. fastigata*	15	19.5	15.3	16.6	16.2	156.4	1667	30.65
14	*E. fastigata*	26	20.5	16.1	18.7	19.1	195.9	1111	31.77
14	*E. grandis*	9	19.7	16.2	13.3	13.9	106.9	1667	25.14
14	*E. grandis*	23	17.3	12.5	14.3	14.0	96.2	1667	25.67
14	*E. grandis*	27	18.9	14.3	13.5	13.2	112.1	1481	20.25
14	*E. macarthurii*	12	18.5	14.3	15.8	17.3	110.2	1481	34.67
14	*E. macarthurii*	13	17.6	13.2	13.9	14.2	92.4	1667	26.46
14	*E. macarthurii*	30	18.1	13.2	14.0	12.0	89.7	1667	18.79
14	*E. nitens*	1	22.0	18.6	20.2	20.4	268.1	1667	54.34
14	*E. nitens*	19	19.4	15.6	18.8	18.0	181.9	1667	42.16
14	*E. nitens*	34	19.2	16.7	16.5	17.5	172.6	1481	35.49
14	*E. saligna*	7	17.4	13.2	14.1	14.3	106.2	1667	26.93
14	*E. saligna*	18	16.9	12.5	13.2	13.4	76.5	1667	23.39
14	*E. saligna*	25	19.7	16.0	17.0	17.0	193.6	1481	33.79
14	*E. smithii*	5	21.5	17.6	16.1	16.7	149.6	1667	36.57
14	*E. smithii*	16	20.0	16.2	15.1	15.5	135.0	1667	31.62
14	*E. smithii*	31	24.1	18.9	18.0	16.3	204.4	1667	34.54
14	*E. viminalis*	10	18.9	14.6	15.1	15.0	108.4	1667	30.12
14	*E. viminalis*	22	20.1	15.8	15.2	14.7	130.0	1667	28.16
14	*E. viminalis*	29	18.6	14.4	15.1	15.1	101.4	1667	29.90

Appendix A2.2. Above ground tree biomass component parameters per trial, species and plot

Trial	Species	Plot No.	Above ground moisture content (%)						Above ground dry-mass (kg/tree)					
			Leaf	*Branch*	*Dead*	*Bark*	*Bole*	*Total*	*Leaf*	*Branch*	*Dead*	*Bark*	*Bole*	*Total*
10	*E. deanei*	2	54.6	51.9	15.6	68.4	49.5	51.3	4.991	11.055	5.064	8.366	78.550	108.027
10	*E. deanei*	42	53.3	50.8	15.4	67.4	52.1	53.2	6.540	12.050	4.228	11.422	99.240	133.479
10	*E. deanei*	44	55.7	49.9	10.8	66.7	48.3	49.9	7.088	13.026	8.925	11.818	98.722	139.580
10	*E. dunnii*	21	64.8	48.7	18.9	68.0	50.5	53.5	1.761	5.384	1.216	9.921	65.140	83.422
10	*E. dunnii*	26	56.5	47.9	13.0	64.2	53.0	54.7	4.350	7.027	0.087	15.209	89.709	116.382
10	*E. dunnii*	35	58.7	53.9	17.3	67.8	52.7	55.2	4.744	10.594	1.240	13.043	86.874	116.494
10	*E. elata*	3	57.0	49.3	17.4	63.3	56.4	55.8	5.159	10.134	3.303	9.185	57.726	85.508
10	*E. elata*	25	54.7	48.8	14.5	61.3	52.1	52.8	6.562	14.348	2.138	14.706	111.045	148.799
10	*E. elata*	41	53.0	49.3	16.6	60.2	51.1	51.8	3.524	11.406	1.669	9.161	53.065	78.825
10	*E. fastigata*	5	55.2	51.2	17.7	62.2	53.0	53.1	5.152	8.297	4.524	8.702	81.972	108.648
10	*E. fastigata*	30	55.5	51.3	14.3	63.1	53.7	53.5	4.003	8.283	4.712	7.556	72.632	97.185
10	*E. fastigata*	38	52.6	50.2	16.4	57.7	49.1	49.9	6.871	15.203	2.090	8.885	83.161	116.210
10	*E. grandis*	24	56.4	47.9	15.0	66.4	52.4	53.3	3.491	6.516	2.975	8.746	78.344	100.072
10	*E. grandis*	31	58.1	49.7	17.4	67.4	52.4	53.6	2.517	5.784	2.890	7.980	77.284	96.454
10	*E. grandis*	45	60.1	48.6	12.4	64.2	50.5	51.7	4.594	7.967	3.943	8.959	74.752	100.214
10	*E. macarthurii*	6	53.3	47.8	17.4	61.1	48.1	50.2	3.736	8.086	2.477	16.124	84.356	114.778
10	*E. macarthurii*	39	52.3	48.4	10.1	66.0	49.7	50.9	6.915	21.152	2.696	10.377	104.854	145.994
10	*E. macarthurii*	47	58.5	46.9	13.5	64.8	47.8	50.0	4.775	13.537	6.484	15.144	89.867	129.807
10	*E. nitens*	12	46.8	44.9	15.6	59.9	51.1	50.8	5.591	10.753	3.800	11.830	88.726	120.700
10	*E. nitens*	23	52.9	43.4	15.3	61.7	48.1	47.4	8.003	19.520	12.699	10.538	97.665	148.424
10	*E. nitens*	46	54.2	52.0	15.0	60.4	50.0	50.5	9.168	15.831	8.501	13.467	103.281	150.247
10	*E. saligna*	1	61.1	54.4	18.3	65.7	50.6	52.5	1.558	7.526	3.270	8.573	68.693	89.619
10	*E. saligna*	29	62.3	49.9	13.4	65.7	49.9	51.7	2.072	5.511	2.599	7.540	65.588	83.310
10	*E. saligna*	40	60.0	47.6	15.1	63.9	45.0	47.9	2.803	8.392	1.698	9.030	80.525	102.448
10	*E. smithii*	20	52.6	44.1	15.9	56.9	45.2	46.4	8.055	18.457	4.205	18.986	150.690	200.393
10	*E. smithii*	28	56.4	43.1	14.0	64.9	46.0	46.5	3.491	14.800	7.310	7.547	117.119	150.267
10	*E. smithii*	36	50.0	41.6	14.6	59.5	46.7	47.4	8.503	21.034	1.709	13.560	131.654	176.460
10	*E. viminalis*	22	56.4	44.6	15.2	70.7	47.4	51.1	2.618	4.987	0.848	7.917	66.843	83.213
10	*E. viminalis*	27	60.3	50.3	13.7	65.6	50.6	53.0	3.180	6.214	1.295	12.045	84.530	107.263
10	*E. viminalis*	33	58.9	54.1	17.5	65.0	48.0	52.0	2.055	5.740	0.825	7.167	37.958	53.745
11	*E. deanei*	5	61.1	52.2	14.9	67.9	49.4	52.1	7.972	15.999	5.108	9.322	76.723	115.123
11	*E. deanei*	13	60.3	58.8	23.9	70.7	53.8	55.6	5.166	12.370	6.089	6.149	52.942	82.716
11	*E. deanei*	37	64.4	60.6	31.7	70.1	54.9	57.7	4.097	7.486	3.417	6.421	43.028	64.449
11	*E. dunnii*	7	64.5	52.2	14.2	63.5	49.8	52.9	5.324	10.033	3.860	21.172	96.174	136.563
11	*E. dunnii*	20	66.3	55.4	23.2	67.1	51.4	55.1	4.893	9.368	0.384	12.701	78.549	105.895
11	*E. dunnii*	32	59.9	47.2	ERR	64.8	48.3	51.9	2.409	5.805	0.000	14.245	73.452	95.912
11	*E. elata*	1	58.3	52.7	32.6	58.5	52.0	52.7	2.711	8.758	2.359	6.229	40.042	60.098
11	*E. elata*	15	62.9	49.9	27.9	61.5	55.8	55.0	1.857	9.522	2.883	5.385	39.571	59.217

Appendix A2.2. Above ground tree biomass component parameters per trial, species and plot

Trial	Species	Plot No.	Above ground moisture content (%)						Above ground dry-mass (kg/tree)					
			Leaf	*Branch*	*Dead*	*Bark*	*Bole*	*Total*	*Leaf*	*Branch*	*Dead*	*Bark*	*Bole*	*Total*
11	*E. elata*	38	60.7	56.2	32.9	63.6	54.8	56.0	2.751	7.447	1.678	6.372	40.942	59.190
11	*E. fastigata*	17	54.8	50.8	21.3	60.1	52.9	52.6	3.614	7.378	3.148	5.584	45.651	65.376
11	*E. fastigata*	24	64.4	51.2	28.3	59.9	49.5	51.2	2.846	11.724	2.511	4.813	38.903	60.797
11	*E. fastigata*	36	66.4	55.4	27.9	61.7	52.2	53.3	3.025	8.697	5.050	5.550	47.516	69.837
11	*E. grandis*	11	66.4	53.9	22.0	64.0	49.2	51.6	1.678	5.296	3.120	7.568	50.081	67.743
11	*E. grandis*	22	64.5	56.7	38.2	65.9	54.6	56.4	3.193	6.067	1.854	8.187	64.235	83.536
11	*E. grandis*	42	66.5	57.5	30.4	64.1	50.2	53.0	3.015	8.919	0.696	10.234	91.146	114.008
11	*E. macarthurii*	3	57.0	52.1	23.0	66.9	48.3	51.5	4.088	11.249	5.776	12.075	66.452	99.640
11	*E. macarthurii*	8	61.3	51.6	ERR	65.1	47.0	51.6	6.766	17.435	0.000	18.157	100.144	142.503
11	*E. macarthurii*	31	57.8	51.7	25.5	67.7	51.4	53.4	2.952	13.512	3.725	8.734	56.324	85.247
11	*E. nitens*	4	52 8	52.6	15.5	61.5	52.0	51.4	8.729	12.316	13.100	14.247	110.960	159.352
11	*E. nitens*	18	53.8	45.0	27.5	60.6	48.3	48.1	6.936	13.740	10.871	8.471	69.265	109.284
11	*E. nitens*	34	54.3	44.6	25.7	62.6	50.3	49.5	13.720	28.809	14.856	11.606	116.414	185.404
11	*E. saligna*	14	65.3	49.6	28.6	68.3	50.4	53.1	3.473	7.561	1.428	6.964	64.481	83.908
11	*E. saligna*	23	65.5	58.7	30.7	71.8	52.2	55.4	3.449	5.988	2.773	9.295	87.871	109.375
11	*E. saligna*	39	59.5	56.6	ERR	70.3	50.1	54.5	3.237	11.272	0.000	9.639	68.607	92.755
11	*E. smithii*	2	53.7	44.6	16.4	60.8	45.5	46.9	9.255	17.161	6.691	11.757	97.020	141.884
11	*E. smithii*	10	54.6	44.9	18.3	59.0	45.3	46.6	6.806	29.186	5.718	11.071	74.389	127.169
11	*E. smithii*	41	61.0	49.5	30.3	62.4	52.4	52.8	7.993	27.533	6.269	10.902	90.468	143.165
11	*E. viminalis*	16	61.3	50.8	26.1	68.1	46.4	50.5	4.256	13.779	5.540	11.471	73.754	108.801
11	*E. viminalis*	21	65.6	53.4	24.7	67.6	47.4	51.6	4.126	9.551	3.390	12.784	89.235	119.085
11	*E. viminalis*	35	57.1	45.4	21.2	65.9	48.9	50.9	4.289	7.917	3.547	9.213	66.115	91.082
12	*E. deanei*	2	53.4	54.4	31.1	72.3	54.9	56.2	13.978	21.674	5.164	14.680	164.223	219.719
12	*E. deanei*	14	53.8	52.7	14.3	67.5	51.1	53.3	5.546	12.527	3.000	9.593	61.861	92.527
12	*E. deanei*	28	55.2	53.9	22.9	71.5	55.5	56.8	4.476	7.606	2.698	9.271	105.169	129.221
12	*E. dunnii*	13	56.9	51.2	14.0	69.6	52.6	55.1	7.761	15.618	0.258	24.738	204.745	252.861
12	*E. dunnii*	19	51.9	48.9	13.2	68.5	52.6	54.8	6.731	12.253	0.434	23.292	174.059	216.770
12	*E. dunnii*	27	57.3	51.6	32.9	68.7	49.6	52.6	7.901	7.495	1.006	23.040	202.410	241.851
12	*E. elata*	15	56.2	50.2	14.4	63.2	51.6	52.7	7.228	24.898	3.424	19.343	148.059	202.952
12	*E. elata*	23	61.3	52.8	19.8	63.3	51.2	52.8	9.283	23.147	5.615	21.676	176.744	236.466
12	*E. elata*	43	64.6	50.6	18.8	65.6	55.7	56.5	9.200	21.223	2.843	18.251	164.318	215.835
12	*E. fastigata*	7	55.0	51.2	22.3	68.4	52.6	53.4	10.358	25.361	5.442	11.532	157.277	209.970
12	*E. fastigata*	22	57.6	56.2	19.7	65.9	61.0	59.9	4.663	7.451	7.227	10.049	94.815	124.206
12	*E. fastigata*	45	60.2	52.6	18.5	69.5	57.8	58.2	9.356	16.112	1.223	10.218	153.546	190.455
12	*E. grandis*	1	62.6	51.8	35.9	70.2	48.1	51.7	11.217	17.838	2.565	13.714	163.953	209.287
12	*E. grandis*	9	57.1	51.1	19.2	68.6	52.1	53.6	4.935	10.507	3.232	11.620	127.484	157.777
12	*E. grandis*	29	61.5	56.7	20.6	72.3	57.5	59.0	4.814	8.228	1.589	9.125	99.415	123.171
12	*E. macarthurii*	3	57.4	51.8	23.7	70.7	52.3	54.2	1.277	4.335	2.289	6.154	62.268	76.324

Appendix A2.2. Above ground tree biomass component parameters per trial, species and plot

Trial	Species	Plot No.	Above ground moisture content (%)						Above ground dry-mass (kg/tree)					
			Leaf	*Branch*	*Dead*	*Bark*	*Bole*	*Total*	*Leaf*	*Branch*	*Dead*	*Bark*	*Bole*	*Total*
12	*E. macarthurii*	16	54.5	48.2	15.6	67.4	53.2	54.0	2.273	4.400	4.642	9.136	76.454	96.904
12	*E. macarthurii*	30	57.7	50.5	19.0	71.2	49.5	51.9	4.649	5.939	12.960	18.148	152.351	194.047
12	*E. nitens*	6	50.7	48.3	24.9	67.8	53.8	54.7	2.463	3.619	1.503	6.119	61.022	74.726
12	*E. nitens*	18	48.5	44.0	19.8	63.8	54.3	53.7	3.093	5.044	3.608	7.061	64.476	83.282
12	*E. nitens*	47	51.8	48.6	24.7	62.8	50.7	51.5	1.447	3.599	1.506	4.644	42.882	54.078
12	*E. saligna*	10	60.4	52.4	16.3	70.9	54.2	55.2	3.962	7.140	6.693	10.190	108.951	136.936
12	*E. saligna*	21	56.9	50.3	14.6	71.9	56.8	57.1	4.953	15.396	4.699	10.952	142.272	178.271
12	*E. saligna*	26	64.2	53.8	19.2	69.2	55.9	57.0	3.046	13.158	4.039	10.473	83.051	113.766
12	*E. smithii*	4	55.1	47.6	24.1	65.4	48.2	49.3	4.039	9.429	5.689	10.045	136.963	166.165
12	*E. smithii*	8	54.8	40.8	20.7	61.8	46.2	46.8	4.066	12.721	7.926	11.659	119.964	156.336
12	*E. smithii*	48	59.7	51.8	24.0	66.6	51.6	52.9	24.564	38.346	8.358	28.374	410.746	510.388
12	*E. viminalis*	5	56.6	48.9	18.5	70.8	48.9	52.7	2.823	5.362	0.815	12.570	96.578	118.149
12	*E. viminalis*	11	55.3	48.1	17.8	67.0	49.1	52.0	6.031	7.006	2.466	21.292	152.067	188.861
12	*E. viminalis*	46	58.6	52.1	31.5	69.3	56.0	58.0	8.486	10.787	1.371	22.990	152.524	196.157
13	*E. deanei*	7	58.6	47.7	23.6	64.0	48.3	49.9	1.865	4.973	3.057	3.777	19.400	33.072
13	*E. deanei*	38	59.3	49.7	20.9	67.9	54.9	55.2	5.496	8.796	2.770	4.656	28.634	50.352
13	*E. deanei*	44	52.2	51.2	22.7	66.5	51.2	52.8	2.390	6.098	1.159	3.520	22.210	35.377
13	*E. dunnii*	21	57.5	54.6	23.6	67.0	54.3	56.8	2.763	5.671	0.382	7.594	37.266	53.294
13	*E. dunnii*	39	61.0	54.4	28.4	68.1	52.6	55.4	6.429	9.117	0.716	7.982	62.128	86.372
13	*E. dunnii*	48	53.9	54.3	ERR	68.8	54.0	50.7	3.685	7.994	0.000	3.905	24.381	39.965
13	*E. elata*	3	58.6	52.0	28.8	57.9	52.3	53.1	2.690	5.525	0.712	1.684	11.681	22.292
13	*E. elata*	30	60.5	53.6	20.7	59.1	54.0	54.6	3.356	10.208	0.793	3.890	25.532	43.779
13	*E. elata*	33	62.0	50.9	21.8	64.2	53.5	54.3	3.990	12.024	1.565	4.650	35.565	57.795
13	*E. fastigata*	9	57.4	46.2	17.4	57.6	47.5	48.1	0.213	2.692	0.413	1.485	12.337	17.140
13	*E. fastigata*	31	58.9	50.0	20.0	60.2	50.8	51.7	5.141	10.510	2.001	4.377	35.935	57.965
13	*E. fastigata*	43	58.0	49.2	22.0	59.4	49.7	50.5	1.259	3.300	1.170	2.638	17.848	26.215
13	*E. grandis*	4	59.5	58.1	ERR	66.9	47.3	48.8	4.052	10.060	0.000	5.290	35.833	55.236
13	*E. grandis*	13	59.1	56.6	16.7	66.1	56.4	57.3	3.069	5.422	1.667	5.767	35.287	51.212
13	*E. grandis*	41	65.4	52.4	36.4	67.9	47.0	51.4	2.938	5.231	0.636	4.172	40.275	53.251
13	*E. macarthurii*	17	56.7	48.8	17.6	64.4	50.4	52.6	3.465	7.172	0.824	6.949	39.165	57.574
13	*E. macarthurii*	19	58.1	49.0	24.2	66.7	55.2	55.9	3.983	7.651	2.274	7.160	35.850	56.918
13	*E. macarthurii*	37	59.4	50.3	22.8	70.2	54.7	54.3	3.853	7.203	8.488	6.116	37.800	63.461
13	*E. nitens*	1	54.5	53.1	27.1	63.4	53.8	52.7	9.092	18.272	7.289	4.206	30.742	69.601
13	*E. nitens*	10	55.6	47.9	20.0	62.0	48.5	49.7	1.778	3.644	2.000	2.852	11.595	21.868
13	*E. nitens*	32	60.8	52.2	23.9	64.1	53.3	51.8	0.588	3.343	1.522	0.719	4.201	10.373
13	*E. saligna*	14	61.1	57.0	25.3	66.8	45.7	50.2	3.889	5.586	0.747	4.317	47.202	61.741
13	*E. saligna*	29	61.6	55.7	24.8	68.4	51.3	53.6	2.878	6.641	2.257	4.419	44.544	60.740
13	*E. saligna*	35	62.3	52.8	25.8	69.3	52.0	54.7	5.095	10.138	2.226	7.824	61.706	86.989

Appendix A2.2. Above ground tree biomass component parameters per trial, species and plot

Trial	Species	Plot No.	Above ground moisture content (%)						Above ground dry-mass (kg/tree)					
			Leaf	*Branch*	*Dead*	*Bark*	*Bole*	*Total*	*Leaf*	*Branch*	*Dead*	*Bark*	*Bole*	*Total*
13	*E. smithii*	8	52.8	49.9	19.3	60.0	42.8	45.7	3.065	6.767	1.614	4.404	40.594	56.444
13	*E. smithii*	42	51.3	45.3	19.8	61.6	45.2	47.1	6.083	11.223	0.401	4.799	52.614	75.120
13	*E. smithii*	45	52.0	50.5	20.8	62.8	48.3	49.6	4.319	7.420	2.376	3.907	32.582	50.604
13	*E. viminalis*	11	57.1	53.1	20.2	65.6	51.6	54.4	5.368	9.387	0.399	4.647	23.717	43.518
13	*E. viminalis*	34	59.7	50.4	21.5	67.8	54.1	56.0	4.027	6.942	1.177	6.122	30.079	48.347
13	*E. viminalis*	46	59.6	54.8	21.4	66.9	48.0	52.7	4.447	8.822	0.393	3.313	27.276	44.251
14	*E. deanei*	2	58.9	54.3	17.2	67.9	49.5	50.1	1.233	3.796	5.796	4.170	47.511	62.506
14	*E. deanei*	14	54.8	61.7	22.5	69.3	50.5	52.6	1.807	4.217	5.038	3.834	29.930	44.826
14	*E. deanei*	35	56.1	55.7	22.8	70.9	51.3	54.1	3.293	5.980	2.703	6.556	51.912	70.445
14	*E. dunnii*	4	55.5	54.0	16.8	63.8	46.8	50.4	2.758	5.655	2.081	12.294	64.920	87.708
14	*E. dunnii*	24	56.2	54.6	20.5	66.1	48.7	51.9	2.189	4.999	3.179	14.572	84.158	109.098
14	*E. dunnii*	32	53.8	54.1	19.6	67.8	50.3	53.6	2.543	5.511	0.402	9.497	62.628	80.580
14	*E. elata*	3	54.5	49.0	20.9	55.3	48.3	49.4	4.551	22.969	1.186	8.053	43.970	80.730
14	*E. elata*	17	50.9	52.2	16.7	61.2	50.2	51.3	5.651	9.074	2.083	8.739	65.014	90.560
14	*E. elata*	36	54.0	51.8	23.0	58.0	56.6	55.3	4.372	14.935	3.464	11.981	60.519	95.271
14	*E. fastigata*	8	53.9	49.5	17.3	62.0	56.7	55.6	5.527	9.602	4.964	9.690	80.352	110.136
14	*E. fastigata*	15	51.2	51.5	20.6	65.5	47.6	48.7	7.317	10.907	6.746	6.902	93.237	125.110
14	*E. fastigata*	26	52.3	51.6	16.1	62.7	50.1	50.1	7.162	18.390	10.063	9.704	109.276	154.595
14	*E. grandis*	9	55.6	54.5	17.8	67.7	54.9	56.5	2.218	4.550	0.411	5.810	46.868	59.857
14	*E. grandis*	23	56.8	53.9	17.8	66.8	50.9	51.9	3.459	9.228	5.757	5.640	44.235	68.320
14	*E. grandis*	27	56.2	54.3	22.0	65.0	51.7	53.5	3.069	7.310	2.339	7.702	50.690	71.109
14	*E. macarthurii*	12	60.0	54.6	23.6	67.0	48.6	52.1	4.403	9.755	3.818	9.403	63.458	90.837
14	*E. macarthurii*	13	57.7	51.4	30.4	67.9	49.5	52.3	3.174	11.915	2.087	6.736	51.747	75.659
14	*E. macarthurii*	30	55.4	55.3	27.2	65.9	49.1	52.1	2.231	7.606	0.728	6.142	50.180	66.886
14	*E. nitens*	1	49.4	48.8	19.3	67.7	56.6	55.6	10.728	12.796	10.485	12.611	125.561	172.181
14	*E. nitens*	19	47.8	49.3	18.1	65.9	54.5	52.9	8.609	16.741	11.462	9.031	99.292	145.135
14	*E. nitens*	34	48.0	51.3	21.6	63.8	56.0	54.5	5.459	12.171	10.197	12.121	81.886	121.834
14	*E. saligna*	7	57.3	54.1	16.9	67.1	49.3	50.9	3.843	11.577	4.989	4.107	45.124	69.640
14	*E. saligna*	18	58.5	49.3	18.5	66.3	52.7	52.3	1.454	5.829	6.115	5.730	34.764	53.891
14	*E. saligna*	25	59.8	51.9	19.5	67.7	50.1	51.2	3.619	10.338	8.453	8.404	80.343	111.156
14	*E. smithii*	5	46.8	46.3	17.8	66.1	48.7	49.6	6.381	10.750	2.054	6.775	85.408	111.368
14	*E. smithii*	16	47.7	49.6	23.1	58.8	45.2	46.8	5.757	15.376	4.232	9.671	81.940	116.977
14	*E. smithii*	31	46.9	49.3	18.1	62.0	50.1	50.1	4.245	8.623	7.782	10.646	110.296	141.591
14	*E. viminalis*	10	49.1	50.5	17.3	65.1	47.1	49.4	3.307	6.187	2.480	8.197	64.592	84.763
14	*E. viminalis*	22	54.1	46.5	19.0	66.7	45.9	49.0	4.824	9.895	3.646	11.000	78.708	108.073
14	*E. viminalis*	29	54.6	50.3	24.4	64.6	46.3	49.8	4.083	7.452	3.781	10.961	60.633	86.910

Appendix A2.3. Sample tree specific gravity per disc sample height							
Trial	**Species**	**Plot No.**	**Sample disc height**				**Weighted mean**
			1.3m	*25% height*	*75% height*	*5cm top*	
10	*E. deanei*	2	0.5629	0.5701	0.5532	0.5525	0.5636
10	*E. deanei*	42	0.5316	0.5121	0.5221	0.5086	0.5236
10	*E. deanei*	44	0.5796	0.5991	0.5698	0.5421	0.5829
10	*E. dunnii*	21	0.5328	0.5554	0.5568	0.5606	0.5470
10	*E. dunnii*	26	0.5080	0.5325	0.5392	0.5313	0.5223
10	*E. dunnii*	35	0.5256	0.5117	0.5339	0.5000	0.5207
10	*E. elata*	3	0.4576	0.4972	0.4629	0.4470	0.4696
10	*E. elata*	25	0.5107	0.5267	0.5281	0.5239	0.5196
10	*E. elata*	41	0.5365	0.5313	0.5335	0.5041	0.5332
10	*E. fastigata*	5	0.5320	0.5234	0.5143	0.5103	0.5263
10	*E. fastigata*	30	0.5074	0.5251	0.5187	0.5285	0.5174
10	*E. fastigata*	38	0.5732	0.5611	0.5780	0.5525	0.5691
10	*E. grandis*	24	0.4768	0.4846	0.4793	0.4858	0.4799
10	*E. grandis*	31	0.4606	0.4095	0.4783	0.5108	0.4455
10	*E. grandis*	45	0.4292	0.4137	0.4425	0.5073	0.4277
10	*E. macarthurii*	6	0.5911	0.5915	0.5511	0.5806	0.5863
10	*E. macarthurii*	39	0.5586	0.5666	0.5513	0.5600	0.5613
10	*E. macarthurii*	47	0.5892	0.6019	0.5819	0.5680	0.5925
10	*E. nitens*	12	0.5272	0.5088	0.5863	0.5441	0.5300
10	*E. nitens*	23	0.5739	0.5887	0.6079	0.6059	0.5863
10	*E. nitens*	46	0.5512	0.5382	0.5576	0.5974	0.5486
10	*E. saligna*	1	0.4663	0.4521	0.4990	0.5588	0.4694
10	*E. saligna*	29	0.4824	0.4568	0.4858	0.4831	0.4732
10	*E. saligna*	40	0.5996	0.5546	0.5683	0.5466	0.5770
10	*E. smithii*	20	0.6275	0.6146	0.6244	0.6418	0.6229
10	*E. smithii*	28	0.5919	0.6023	0.6173	0.6462	0.6014
10	*E. smithii*	36	0.5939	0.6204	0.6282	0.6019	0.6094
10	*E. viminalis*	22	0.6082	0.5752	0.5807	0.5645	0.5926
10	*E. viminalis*	27	0.5262	0.5519	0.5366	0.5588	0.5371
10	*E. viminalis*	33	0.5987	0.5909	0.5272	0.5520	0.5826
11	*E. deanei*	5	0.5549	0.5549	0.5497	0.5317	0.5537
11	*E. deanei*	13	0.5179	0.5218	0.4825	0.4867	0.5135
11	*E. deanei*	37	0.4747	0.4896	0.4810	0.5012	0.4819
11	*E. dunnii*	7	0.5585	0.5581	0.5469	0.5164	0.5554
11	*E. dunnii*	20	0.5378	0.5503	0.5285	0.5175	0.5398
11	*E. dunnii*	32	0.5506	0.5745	0.5638	0.5500	0.5578
11	*E. elata*	1	0.5207	0.5162	0.5117	0.4663	0.5151
11	*E. elata*	15	0.4661	0.4714	0.4349	0.4454	0.4626

Appendix A2.3. Sample tree specific gravity per disc sample height							
Trial	Species	Plot No.	Sample disc height				Weighted mean
			1.3m	*25% height*	*75% height*	*5cm top*	
11	*E. elata*	38	0.4491	0.4581	0.4308	0.4363	0.4483
11	*E. fastigata*	17	0.5192	0.5095	0.4900	0.5208	0.5116
11	*E. fastigata*	24	0.5878	0.5628	0.5924	0.5594	0.5768
11	*E. fastigata*	36	0.5176	0.5276	0.5193	0.5569	0.5216
11	*E. grandis*	11	0.4897	0.4339	0.4546	0.4868	0.4644
11	*E. grandis*	22	0.4422	0.4103	0.4225	0.4653	0.4309
11	*E. grandis*	42	0.5021	0.5167	0.4860	0.5096	0.5063
11	*E. macarthurii*	3	0.5978	0.5851	0.5359	0.5523	0.5837
11	*E. macarthurii*	8	0.5523	0.5617	0.5594	0.5717	0.5583
11	*E. macarthurii*	31	0.5536	0.5726	0.5108	0.5100	0.5532
11	*E. nitens*	4	0.5108	0.5632	0.5256	0.5480	0.5316
11	*E. nitens*	18	0.5501	0.5491	0.5281	0.5526	0.5455
11	*E. nitens*	34	0.5284	0.5109	0.5245	0.5395	0.5222
11	*E. saligna*	14	0.5208	0.5144	0.4844	0.4478	0.5105
11	*E. saligna*	23	0.4931	0.4986	0.4971	0.4652	0.4949
11	*E. saligna*	39	0.5528	0.5320	0.4931	0.4989	0.5290
11	*E. smithii*	2	0.5927	0.5715	0.6006	0.5719	0.5863
11	*E. smithii*	10	0.6103	0.6086	0.6186	0.6300	0.6119
11	*E. smithii*	41	0.5059	0.5354	0.5179	0.5474	0.5201
11	*E. viminalis*	16	0.6177	0.6085	0.6546	0.6801	0.6241
11	*E. viminalis*	21	0.6028	0.5928	0.5684	0.5468	0.5917
11	*E. viminalis*	35	0.5558	0.5308	0.5630	0.5728	0.5492
12	*E. deanei*	2	0.4948	0.5060	0.5223	0.4921	0.5010
12	*E. deanei*	14	0.5577	0.5397	0.5058	0.4904	0.5411
12	*E. deanei*	28	0.4850	0.4875	0.5224	0.4912	0.4892
12	*E. dunnii*	13	0.5122	0.5041	0.5166	0.5331	0.5101
12	*E. dunnii*	19	0.4427	0.4782	0.5243	0.5435	0.4676
12	*E. dunnii*	27	0.5954	0.5650	0.5892	0.5701	0.5849
12	*E. elata*	15	0.5209	0.5335	0.5295	0.5422	0.5271
12	*E. elata*	23	0.5336	0.5635	0.5196	0.5187	0.5427
12	*E. elata*	43	0.4768	0.4789	0.4605	0.4467	0.4751
12	*E. fastigata*	7	0.5359	0.5223	0.5326	0.5169	0.5304
12	*E. fastigata*	22	0.4404	0.4201	0.4067	0.4237	0.4272
12	*E. fastigata*	45	0.4634	0.4716	0.4528	0.4752	0.4659
12	*E. grandis*	1	0.4446	0.4796	0.4676	0.4254	0.4592
12	*E. grandis*	9	0.4830	0.4553	0.4974	0.4535	0.4738
12	*E. grandis*	29	0.3641	0.3691	0.4006	0.3683	0.3701
12	*E. macarthurii*	3	0.5484	0.5371	0.5591	0.5357	0.5453

Appendix A2.3. Sample tree specific gravity per disc sample height

Trial	Species	Plot No.	Sample disc height				Weighted mean
			1.3m	*25% height*	*75% height*	*5cm top*	
12	*E. macarthurii*	16	0.5134	0.5071	0.5317	0.5637	0.5148
12	*E. macarthurii*	30	0.5624	0.5809	0.5701	0.5694	0.5683
12	*E. nitens*	6	0.5100	0.4917	0.5319	0.5144	0.5080
12	*E. nitens*	18	0.4871	0.5070	0.5411	0.5442	0.5029
12	*E. nitens*	47	0.5500	0.5339	0.5711	0.5827	0.5511
12	*E. saligna*	10	0.4190	0.4228	0.4545	0.4472	0.4235
12	*E. saligna*	21	0.4178	0.3816	0.4279	0.4042	0.4021
12	*E. saligna*	26	0.4250	0.4034	0.4441	0.4489	0.4201
12	*E. smithii*	4	0.5723	0.5668	0.5800	0.6125	0.5723
12	*E. smithii*	8	0.5753	0.6429	0.6245	0.5989	0.6040
12	*E. smithii*	48	0.5361	0.5190	0.5246	0.5152	0.5288
12	*E. viminalis*	5	0.5796	0.5808	0.5638	0.5449	0.5776
12	*E. viminalis*	11	0.5843	0.5582	0.5993	0.5533	0.5770
12	*E. viminalis*	46	0.4671	0.5044	0.5197	0.5357	0.4861
13	*E. deanei*	7	0.5057	0.5083	0.4984	0.4708	0.5029
13	*E. deanei*	38	0.4909	0.4676	0.4642	0.4755	0.4793
13	*E. deanei*	44	0.4818	0.4642	0.4880	0.5000	0.4786
13	*E. dunnii*	21	0.5000	0.4955	0.4645	0.4983	0.4913
13	*E. dunnii*	39	0.5187	0.5512	0.5045	0.4736	0.5276
13	*E. dunnii*	48	0.5063	0.5100	0.4820	0.4749	0.5024
13	*E. elata*	3	0.4763	0.4815	0.4902	0.4667	0.4794
13	*E. elata*	30	0.4702	0.4823	0.4419	0.4567	0.4691
13	*E. elata*	33	0.4889	0.4967	0.4731	0.4514	0.4878
13	*E. fastigata*	9	0.5179	0.5297	0.5106	0.5192	0.5216
13	*E. fastigata*	31	0.5231	0.5046	0.5163	0.5138	0.5135
13	*E. fastigata*	43	0.4884	0.4915	0.4817	0.4901	0.4884
13	*E. grandis*	4	0.4472	0.4356	0.4765	0.4360	0.4497
13	*E. grandis*	13	0.4013	0.4026	0.3837	0.3874	0.3981
13	*E. grandis*	41	0.4261	0.4219	0.4200	0.4256	0.4238
13	*E. macarthurii*	17	0.5144	0.5128	0.5098	0.4903	0.5121
13	*E. macarthurii*	19	0.5161	0.4808	0.4583	0.4547	0.4933
13	*E. macarthurii*	37	0.5063	0.4904	0.5105	0.4811	0.4991
13	*E. nitens*	1	0.5108	0.5154	0.5412	0.4886	0.5154
13	*E. nitens*	10	0.5374	0.5361	0.5482	0.5432	0.5397
13	*E. nitens*	32	0.5136	0.5408	0.5081	0.5071	0.5214
13	*E. saligna*	14	0.5222	0.5341	0.4793	0.4706	0.5163
13	*E. saligna*	29	0.4207	0.4389	0.4138	0.4273	0.4273
13	*E. saligna*	35	0.4938	0.4885	0.4763	0.4375	0.4863

Appendix A2.3. Sample tree specific gravity per disc sample height

Trial	Species	Plot No.	Sample disc height: 1.3m	25% height	75% height	5cm top	Weighted mean
13	*E. smithii*	8	0.6001	0.6203	0.5918	0.5642	0.6056
13	*E. smithii*	42	0.5784	0.5702	0.5711	0.5476	0.5739
13	*E. smithii*	45	0.5605	0.5656	0.5637	0.5340	0.5609
13	*E. viminalis*	11	0.5234	0.5511	0.5137	0.5231	0.5314
13	*E. viminalis*	34	0.4936	0.4953	0.4926	0.4598	0.4926
13	*E. viminalis*	46	0.5524	0.5378	0.4918	0.5017	0.5324
14	*E. deanei*	2	0.5511	0.5685	0.5743	0.5920	0.5632
14	*E. deanei*	14	0.5548	0.5631	0.5366	0.5621	0.5547
14	*E. deanei*	35	0.4800	0.4547	0.5380	0.4531	0.4770
14	*E. dunnii*	4	0.5792	0.5634	0.5605	0.5513	0.5708
14	*E. dunnii*	24	0.5654	0.5425	0.5498	0.5974	0.5568
14	*E. dunnii*	32	0.5795	0.6095	0.5236	0.6594	0.5858
14	*E. elata*	3	0.5730	0.5755	0.5991	0.5983	0.5794
14	*E. elata*	17	0.5526	0.5757	0.5393	0.5254	0.5594
14	*E. elata*	36	0.4804	0.4645	0.4861	0.5294	0.4768
14	*E. fastigata*	8	0.4784	0.4625	0.4701	0.5000	0.4731
14	*E. fastigata*	15	0.5977	0.5842	0.6181	0.6181	0.5960
14	*E. fastigata*	26	0.5483	0.5729	0.5526	0.5474	0.5579
14	*E. grandis*	9	0.4272	0.4464	0.4262	0.5026	0.4384
14	*E. grandis*	23	0.4758	0.4327	0.4468	0.5435	0.4599
14	*E. grandis*	27	0.4645	0.4220	0.4460	0.5180	0.4521
14	*E. macarthurii*	12	0.5929	0.5667	0.5563	0.5469	0.5757
14	*E. macarthurii*	13	0.5755	0.5455	0.5588	0.5540	0.5600
14	*E. macarthurii*	30	0.5582	0.5569	0.5820	0.5212	0.5597
14	*E. nitens*	1	0.4726	0.4526	0.4847	0.5313	0.4683
14	*E. nitens*	19	0.5878	0.4974	0.5332	0.5510	0.5458
14	*E. nitens*	34	0.4603	0.4528	0.5436	0.5724	0.4745
14	*E. saligna*	7	0.3929	0.4486	0.4388	0.4548	0.4247
14	*E. saligna*	18	0.4546	0.4478	0.4631	0.4720	0.4546
14	*E. saligna*	25	0.3677	0.4623	0.4386	0.4866	0.4149
14	*E. smithii*	5	0.5655	0.5735	0.5833	0.5834	0.5708
14	*E. smithii*	16	0.5995	0.6051	0.6302	0.6210	0.6070
14	*E. smithii*	31	0.5253	0.5470	0.5679	0.6307	0.5396
14	*E. viminalis*	10	0.6011	0.5909	0.5832	0.5904	0.5960
14	*E. viminalis*	22	0.6058	0.6040	0.6080	0.6037	0.6055
14	*E. viminalis*	29	0.5991	0.5906	0.6122	0.5965	0.5979

Appendix A3.1. Nutrient concentration of selected foliar material per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	2	165	5	13	891	0.07	0.08	0.80	0.29	0.60	1.52
10	*E. deanei*	42	165	5	16	679	0.07	0.07	0.51	0.22	0.49	2.05
10	*E. deanei*	44	121	8	20	718	0.15	0.13	0.56	0.33	0.63	2.68
10	*E. dunnii*	21	88	7	26	586	0.14	0.09	0.53	0.38	1.30	2.30
10	*E. dunnii*	26	66	9	24	641	0.14	0.05	0.48	0.31	1.10	2.39
10	*E. dunnii*	35	81	8	20	1014	0.12	0.05	0.57	0.26	0.98	2.09
10	*E. elata*	3	142	4	18	660	0.10	0.20	1.03	0.27	0.67	2.17
10	*E. elata*	25	127	8	25	917	0.08	0.22	0.50	0.28	0.92	2.22
10	*E. elata*	41	80	6	23	677	0.09	0.15	0.36	0.16	0.74	2.05
10	*E. fastigata*	5	86	7	10	375	0.08	0.02	0.44	0.26	0.50	1.85
10	*E. fastigata*	30	81	10	11	427	0.08	0.02	0.29	0.20	0.65	1.86
10	*E. fastigata*	38	78	7	12	369	0.07	0.01	0.35	0.24	0.55	1.74
10	*E. grandis*	24	67	9	21	743	0.11	0.07	0.65	0.36	0.79	2.08
10	*E. grandis*	31	69	8	20	721	0.13	0.08	0.65	0.36	0.74	2.40
10	*E. grandis*	45	70	6	18	698	0.15	0.09	0.65	0.35	0.69	2.35
10	*E. macarthurii*	6	101	10	22	997	0.16	0.05	0.56	0.24	0.80	2.49
10	*E. macarthurii*	39	91	8	20	775	0.10	0.07	0.53	0.16	0.86	2.38
10	*E. macarthurii*	47	73	8	21	536	0.18	0.03	0.41	0.21	0.91	3.11
10	*E. nitens*	12	80	4	16	498	0.07	0.00	0.50	0.18	0.72	1.71
10	*E. nitens*	23	68	5	16	491	0.09	0.00	0.35	0.14	0.61	1.83
10	*E. nitens*	46	46	6	11	415	0.11	0.00	0.31	0.14	0.73	1.60
10	*E. saligna*	1	76	5	7	487	0.12	0.13	0.66	0.45	0.73	2.04
10	*E. saligna*	29	71	6	19	789	0.14	0.08	0.72	0.44	0.87	2.30
10	*E. saligna*	40	128	9	16	971	0.10	0.06	0.81	0.33	0.50	1.56
10	*E. smithii*	20	134	10	18	756	0.08	0.03	0.60	0.13	0.59	1.78
10	*E. smithii*	28	110	6	17	516	0.09	0.03	0.33	0.14	1.23	1.96
10	*E. smithii*	36	134	9	16	583	0.06	0.03	0.39	0.11	0.79	1.61
10	*E. viminalis*	22	86	15	38	457	0.08	0.05	0.65	0.30	1.33	3.14
10	*E. viminalis*	27	69	7	23	836	0.11	0.04	0.49	0.27	1.02	2.62
10	*E. viminalis*	33	98	8	16	880	0.09	0.02	0.59	0.26	0.51	2.06
11	*E. deanei*	5	198	7	14	875	0.08	0.05	0.97	0.23	0.41	2.10
11	*E. deanei*	13	185	7	17	680	0.08	0.11	0.90	0.24	0.45	1.98
11	*E. deanei*	37	179	7	10	1171	0.05	0.09	0.96	0.20	0.49	1.43
11	*E. dunnii*	7	175	6	14	717	0.10	0.07	0.97	0.28	0.52	2.01
11	*E. dunnii*	20	169	7	16	775	0.08	0.06	0.89	0.24	0.60	1.73
11	*E. dunnii*	32	163	7	12	853	0.06	0.06	0.89	0.26	0.45	1.65
11	*E. elata*	1	115	9	20	407	0.15	0.18	0.33	0.27	0.52	2.76
11	*E. elata*	15	123	5	15	445	0.08	0.12	0.48	0.24	0.47	1.80

Appendix A3.1. Nutrient concentration of selected foliar material per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
11	*E. elata*	38	182	7	15	990	0.10	0.10	0.81	0.26	0.43	1.99
11	*E. fastigata*	17	96	9	10	309	0.08	0.00	0.41	0.26	0.38	1.78
11	*E. fastigata*	24	113	3	7	393	0.07	0.03	0.31	0.22	0.44	1.44
11	*E. fastigata*	36	122	7	7	613	0.07	0.01	0.71	0.27	0.37	1.46
11	*E. grandis*	11	187	6	18	999	0.10	0.06	0.79	0.41	0.45	2.40
11	*E. grandis*	22	149	5	9	655	0.09	0.06	0.91	0.43	0.46	1.35
11	*E. grandis*	42	179	8	8	447	0.10	0.05	0.73	0.25	0.43	1.69
11	*E. macarthurii*	3	91	17	32	884	0.13	0.05	0.76	0.26	0.76	2.60
11	*E. macarthurii*	8	152	7	19	867	0.15	0.04	0.50	0.15	0.62	2.69
11	*E. macarthurii*	31	145	7	11	678	0.08	0.08	0.51	0.15	0.66	1.93
11	*E. nitens*	4	115	4	13	612	0.09	0.00	0.64	0.18	0.44	1.58
11	*E. nitens*	18	87	5	11	379	0.10	0.00	0.53	0.20	0.48	1.68
11	*E. nitens*	34	92	5	11	526	0.08	0.02	0.50	0.15	0.54	1.56
11	*E. saligna*	14	133	7	15	521	0.12	0.08	0.62	0.31	0.54	2.11
11	*E. saligna*	23	63	12	30	799	0.19	0.10	0.93	0.67	0.68	2.87
11	*E. saligna*	39	166	9	16	519	0.09	0.04	0.66	0.31	0.48	1.54
11	*E. smithii*	2	154	8	19	413	0.10	0.04	0.46	0.15	0.52	2.41
11	*E. smithii*	10	142	5	16	312	0.09	0.06	0.31	0.13	0.39	2.00
11	*E. smithii*	41	142	6	11	555	0.08	0.08	0.62	0.12	0.46	1.47
11	*E. viminalis*	16	111	6	18	665	0.11	0.03	0.88	0.15	0.54	2.31
11	*E. viminalis*	21	135	7	19	845	0.09	0.05	1.11	0.22	0.52	1.89
11	*E. viminalis*	35	175	6	14	940	0.10	0.02	0.63	0.14	0.50	2.01
12	*E. deanei*	2	109	7	16	362	0.10	0.13	0.56	0.28	0.63	2.07
12	*E. deanei*	14	153	7	13	678	0.10	0.10	0.96	0.27	0.64	2.04
12	*E. deanei*	28	88	8	18	428	0.11	0.19	0.72	0.41	0.75	1.71
12	*E. dunnii*	13	118	10	19	711	0.11	0.08	0.61	0.29	0.85	1.91
12	*E. dunnii*	19	104	5	15	375	0.12	0.08	0.48	0.24	0.72	1.69
12	*E. dunnii*	27	81	7	19	889	0.09	0.12	0.77	0.34	0.68	1.76
12	*E. elata*	15	139	10	19	806	0.12	0.21	0.62	0.28	0.67	2.37
12	*E. elata*	23	167	8	15	350	0.09	0.14	0.70	0.27	0.80	2.39
12	*E. elata*	43	165	8	21	1088	0.11	0.18	0.66	0.30	0.63	2.16
12	*E. fastigata*	7	68	6	7	476	0.08	0.03	0.36	0.22	0.53	1.85
12	*E. fastigata*	22	139	8	19	558	0.11	0.17	0.48	0.25	0.77	2.27
12	*E. fastigata*	45	106	5	10	267	0.07	0.02	0.31	0.22	0.56	1.93
12	*E. grandis*	1	99	8	16	421	0.11	0.09	0.53	0.33	0.75	1.68
12	*E. grandis*	9	119	8	17	810	0.11	0.08	0.71	0.35	0.76	2.24
12	*E. grandis*	29	121	11	21	829	0.12	0.11	0.60	0.18	0.95	1.81
12	*E. macarthurii*	3	104	8	18	818	0.10	0.06	0.49	0.22	0.77	2.62

Appendix A3.1. Nutrient concentration of selected foliar material per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
12	*E. macarthurii*	16	96	5	15	431	0.09	0.05	0.46	0.12	0.69	2.37
12	*E. macarthurii*	30	87	7	15	667	0.10	0.04	0.47	0.21	0.69	2.40
12	*E. nitens*	6	66	5	11	419	0.07	0.01	0.33	0.15	0.70	1.49
12	*E. nitens*	18	70	5	12	516	0.09	0.01	0.44	0.20	0.61	1.72
12	*E. nitens*	47	104	5	36	493	0.08	0.00	0.38	0.15	0.66	1.69
12	*E. saligna*	10	110	9	16	516	0.12	0.13	0.61	0.36	0.85	2.13
12	*E. saligna*	21	90	10	19	407	0.10	0.03	0.42	0.27	0.70	2.06
12	*E. saligna*	26	88	6	18	664	0.09	0.08	0.71	0.29	0.64	2.03
12	*E. smithii*	4	78	10	14	449	0.12	0.06	0.42	0.16	0.99	2.25
12	*E. smithii*	8	99	7	14	356	0.12	0.06	0.38	0.14	1.11	1.99
12	*E. smithii*	48	177	12	19	360	0.07	0.08	0.43	0.12	0.79	1.94
12	*E. viminalis*	5	91	8	17	621	0.11	0.02	0.48	0.21	0.69	2.09
12	*E. viminalis*	11	100	11	22	740	0.15	0.04	0.52	0.15	0.88	2.32
12	*E. viminalis*	46	106	10	16	861	0.11	0.02	0.61	0.16	0.66	2.00
13	*E. deanei*	7	71	10	30	954	0.16	0.15	1.11	0.34	0.57	2.48
13	*E. deanei*	38	122	5	13	878	0.09	0.60	1.59	0.24	0.45	1.29
13	*E. deanei*	44	117	5	12	786	0.09	0.11	1.06	0.22	0.51	1.60
13	*E. dunnii*	21	58	8	23	638	0.12	0.10	0.77	0.24	1.10	2.63
13	*E. dunnii*	39	133	3	9	1149	0.14	0.09	1.11	0.21	0.54	1.22
13	*E. dunnii*	48	51	6	16	764	0.16	0.14	1.07	0.43	0.85	2.16
13	*E. elata*	3	151	5	27	655	0.11	0.14	0.80	0.30	0.42	1.70
13	*E. elata*	30	82	3	23	495	0.14	0.14	0.51	0.33	0.64	2.01
13	*E. elata*	33	90	6	20	504	0.15	0.17	0.62	0.26	0.64	1.83
13	*E. fastigata*	9	69	8	18	200	0.14	0.05	0.40	0.24	0.60	2.10
13	*E. fastigata*	31	104	5	9	518	0.13	0.02	0.58	0.31	0.45	1.55
13	*E. fastigata*	43	88	6	13	283	0.18	0.04	0.71	0.26	0.54	1.72
13	*E. grandis*	4	104	7	21	748	0.15	0.12	1.13	0.31	0.65	2.28
13	*E. grandis*	13	47	9	18	610	0.15	0.15	0.93	0.46	0.71	1.99
13	*E. grandis*	41	138	5	11	1035	0.12	0.08	1.40	0.35	0.52	1.20
13	*E. macarthurii*	17	145	6	18	896	0.08	0.04	0.72	0.17	0.56	1.91
13	*E. macarthurii*	19	67	9	15	645	0.16	0.12	0.50	0.17	0.70	2.37
13	*E. macarthurii*	37	159	6	23	794	0.10	0.07	1.15	0.20	0.51	1.75
13	*E. nitens*	1	53	6	16	689	0.08	0.01	0.45	0.18	0.78	1.65
13	*E. nitens*	10	61	5	18	505	0.12	0.00	0.56	0.19	0.63	1.80
13	*E. nitens*	32	54	7	16	769	0.11	0.00	0.56	0.19	0.78	1.72
13	*E. saligna*	14	164	8	16	844	0.09	0.13	0.55	0.24	0.68	1.53
13	*E. saligna*	29	53	7	18	851	0.15	0.11	0.77	0.31	0.78	2.15
13	*E. saligna*	35	173	7	16	1014	0.13	0.05	1.13	0.43	0.55	1.49

Appendix A3.1. Nutrient concentration of selected foliar material per trial, species and plot													
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)						
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*	
13	*E. smithii*	8	79	10	22	604	0.16	0.07	0.74	0.22	0.54	2.32	
13	*E. smithii*	42	98	6	15	810	0.06	0.03	0.58	0.13	0.59	1.52	
13	*E. smithii*	45	61	7	17	460	0.12	0.10	0.36	0.13	0.77	1.79	
13	*E. viminalis*	11	55	8	26	471	0.16	0.04	0.66	0.23	0.85	2.13	
13	*E. viminalis*	34	117	7	16	819	0.08	0.07	0.82	0.82	0.58	1.73	
13	*E. viminalis*	46	50	8	22	474	0.15	0.07	0.55	0.25	1.01	2.56	
14	*E. deanei*	2	136	10	26	603	0.16	0.06	0.43	0.30	0.73	2.22	
14	*E. deanei*	14	170	10	18	424	0.09	0.11	0.36	0.29	0.54	2.07	
14	*E. deanei*	35	179	7	17	1087	0.08	0.09	0.89	0.21	0.50	1.81	
14	*E. dunnii*	4	151	4	11	616	0.08	0.06	0.37	0.23	0.64	1.55	
14	*E. dunnii*	24	185	10	19	899	0.09	0.06	0.61	0.15	0.69	1.82	
14	*E. dunnii*	32	157	5	15	757	0.08	0.07	0.49	0.16	0.53	1.64	
14	*E. elata*	3	185	7	13	572	0.13	0.11	0.15	0.27	0.45	2.06	
14	*E. elata*	17	159	11	12	494	0.09	0.18	0.24	0.13	0.44	1.80	
14	*E. elata*	36	205	6	16	854	0.08	0.16	0.56	0.13	0.41	1.98	
14	*E. fastigata*	8	134	4	11	380	0.07	0.03	0.18	0.17	0.59	1.59	
14	*E. fastigata*	15	122	3	9	218	0.08	0.02	0.18	0.14	0.56	1.56	
14	*E. fastigata*	26	176	4	10	348	0.07	0.01	0.30	0.14	0.55	1.46	
14	*E. grandis*	9	127	4	12	479	0.08	0.18	0.28	0.26	0.61	1.57	
14	*E. grandis*	23	144	5	12	591	0.08	0.09	0.38	0.27	0.38	1.74	
14	*E. grandis*	27	178	6	16	939	0.09	0.09	0.66	0.32	0.46	1.77	
14	*E. macarthurii*	12	208	8	29	1029	0.16	0.12	0.50	0.21	0.74	2.27	
14	*E. macarthurii*	13	214	4	15	455	0.09	0.03	0.31	0.16	0.54	1.93	
14	*E. macarthurii*	30	214	12	25	1174	0.13	0.16	0.66	0.21	0.85	1.86	
14	*E. nitens*	1	155	5	10	583	0.08	0.04	0.27	0.15	0.48	1.88	
14	*E. nitens*	19	131	4	11	751	0.07	0.00	0.36	0.18	0.40	1.53	
14	*E. nitens*	34	128	5	19	550	0.08	0.00	0.38	0.12	0.42	1.79	
14	*E. saligna*	7	158	7	14	756	0.08	0.13	0.36	0.24	0.54	1.54	
14	*E. saligna*	18	141	9	18	841	0.09	0.20	0.36	0.23	0.57	1.68	
14	*E. saligna*	25	185	6	13	1163	0.08	0.09	1.02	0.29	0.52	1.49	
14	*E. smithii*	5	200	7	16	432	0.09	0.10	0.13	0.13	0.71	1.71	
14	*E. smithii*	16	146	13	19	299	0.08	0.05	0.25	0.10	0.45	1.62	
14	*E. smithii*	31	159	6	15	455	0.07	0.04	0.32	0.10	0.44	1.68	
14	*E. viminalis*	10	142	15	13	552	0.09	0.02	0.32	0.20	0.51	1.82	
14	*E. viminalis*	22	112	10	11	413	0.07	0.04	0.31	0.10	0.41	1.26	
14	*E. viminalis*	29	137	11	12	705	0.09	0.04	0.55	0.18	0.46	1.83	

Appendix A3.2. Nutrient concentration of bulk foliar material per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	2	363	6	15	884	0.09	0.11	0.74	0.28	0.71	1.46
10	*E. deanei*	42	349	6	12	749	0.09	0.14	1.11	0.44	0.80	1.58
10	*E. deanei*	44	229	6	14	670	0.10	0.13	0.76	0.35	0.95	1.65
10	*E. dunnii*	21	110	9	26	474	0.19	0.11	0.39	0.33	0.91	2.30
10	*E. dunnii*	26	111	8	15	836	0.12	0.07	0.60	0.24	0.87	1.78
10	*E. dunnii*	35	271	7	20	1088	0.13	0.08	0.69	0.22	0.99	1.75
10	*E. elata*	3	203	5	13	614	0.10	0.22	0.41	0.22	0.60	1.74
10	*E. elata*	25	222	8	17	922	0.15	0.14	0.53	0.28	0.73	2.00
10	*E. elata*	41	220	14	24	901	0.14	0.17	0.70	0.35	0.67	1.79
10	*E. fastigata*	5	197	7	10	389	0.10	0.05	0.40	0.19	0.55	1.62
10	*E. fastigata*	30	241	8	11	598	0.11	0.04	0.40	0.27	0.61	1.62
10	*E. fastigata*	38	306	8	13	301	0.09	0.03	0.33	0.23	0.59	1.42
10	*E. grandis*	24	130	9	16	729	0.12	0.10	0.60	0.30	0.87	1.77
10	*E. grandis*	31	159	9	17	897	0.10	0.10	0.60	0.32	0.67	1.58
10	*E. grandis*	45	131	11	19	705	0.11	0.12	1.03	0.49	0.79	1.74
10	*E. macarthurii*	6	402	6	28	1159	0.11	0.08	0.75	0.21	0.67	1.51
10	*E. macarthurii*	39	216	8	18	893	0.11	0.10	0.64	0.20	0.87	1.84
10	*E. macarthurii*	47	422	8	21	588	0.13	0.05	0.86	0.30	0.97	2.02
10	*E. nitens*	12	421	9	22	587	0.09	0.03	0.48	0.16	0.70	1.37
10	*E. nitens*	23	440	9	23	622	0.11	0.02	0.37	0.17	0.75	1.60
10	*E. nitens*	46	320	7	13	468	0.11	0.07	0.67	0.23	0.80	1.50
10	*E. saligna*	1	474	7	21	522	0.11	0.11	0.57	0.33	0.78	1.66
10	*E. saligna*	29	229	6	16	746	0.14	0.11	0.69	0.35	0.93	1.85
10	*E. saligna*	40	334	9	25	1067	0.10	0.12	0.68	0.33	0.70	1.46
10	*E. smithii*	20	271	10	17	683	0.13	0.07	0.41	0.12	0.68	1.70
10	*E. smithii*	28	316	14	22	546	0.13	0.06	0.35	0.13	0.79	1.95
10	*E. smithii*	36	187	8	15	593	0.07	0.06	0.45	0.11	0.83	1.50
10	*E. viminalis*	22	151	13	25	702	0.14	0.08	0.56	0.20	0.82	2.00
10	*E. viminalis*	27	170	8	28	770	0.14	0.06	0.47	0.24	1.04	2.19
10	*E. viminalis*	33	131	11	19	696	0.14	0.06	0.54	0.25	0.85	2.07
11	*E. deanei*	5	175	5	13	1627	0.08	0.15	2.19	0.45	0.61	1.74
11	*E. deanei*	13	217	7	16	1048	0.11	0.19	1.97	0.57	0.80	1.86
11	*E. deanei*	37	189	7	14	1114	0.12	0.12	2.00	0.33	0.62	1.91
11	*E. dunnii*	7	139	5	13	865	0.10	0.14	1.70	0.42	0.73	1.65
11	*E. dunnii*	20	162	6	15	666	0.15	0.10	0.93	0.39	0.97	2.02
11	*E. dunnii*	32	109	6	14	613	0.14	0.10	0.88	0.31	0.83	2.06
11	*E. elata*	1	134	5	13	357	0.12	0.15	0.57	0.29	0.60	2.01
11	*E. elata*	15	126	6	16	375	0.19	0.20	0.76	0.41	0.73	2.07

Appendix A3.2. Nutrient concentration of bulk foliar material per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
11	*E. elata*	38	166	7	18	806	0.15	0.20	1.20	0.41	0.67	2.37
11	*E. fastigata*	17	112	7	11	333	0.08	0.03	0.82	0.37	0.57	1.71
11	*E. fastigata*	24	120	5	13	336	0.13	0.04	0.32	0.25	0.62	1.90
11	*E. fastigata*	36	115	7	10	569	0.11	0.03	0.81	0.34	0.52	1.85
11	*E. grandis*	11	134	7	20	787	0.15	0.10	0.82	0.48	0.75	2.42
11	*E. grandis*	22	144	4	9	598	0.11	0.11	1.41	0.59	0.66	1.47
11	*E. grandis*	42	202	6	13	477	0.16	0.10	1.81	0.44	0.65	1.97
11	*E. macarthurii*	3	122	6	15	840	0.13	0.10	1.20	0.28	0.89	1.86
11	*E. macarthurii*	8	194	5	21	976	0.12	0.09	1.23	0.29	0.96	2.05
11	*E. macarthurii*	31	135	5	15	780	0.12	0.09	0.65	0.17	0.96	2.07
11	*E. nitens*	4	103	4	18	585	0.09	0.03	0.77	0.23	0.74	1.46
11	*E. nitens*	18	91	4	11	392	0.08	0.01	0.95	0.27	0.80	1.59
11	*E. nitens*	34	87	5	12	401	0.11	0.05	0.44	0.15	0.70	1.68
11	*E. saligna*	14	138	7	15	490	0.10	0.13	0.81	0.53	0.87	2.09
11	*E. saligna*	23	139	8	19	773	0.15	0.10	1.00	0.53	0.72	2.17
11	*E. saligna*	39	183	7	15	549	0.11	0.07	1.50	0.42	0.63	1.48
11	*E. smithii*	2	108	5	17	434	0.09	0.10	0.80	0.36	0.64	1.83
11	*E. smithii*	10	130	5	17	545	0.10	0.11	0.80	0.33	0.68	1.75
11	*E. smithii*	41	163	5	14	454	0.11	0.12	1.62	0.27	0.62	1.77
11	*E. viminalis*	16	105	7	18	525	0.17	0.05	1.01	0.31	0.90	2.50
11	*E. viminalis*	21	129	6	15	788	0.10	0.09	1.64	0.31	0.77	1.99
11	*E. viminalis*	35	179	6	15	952	0.12	0.08	0.93	0.18	0.65	2.14
12	*E. deanei*	2	249	8	13	545	0.10	0.14	0.76	0.21	0.62	1.66
12	*E. deanei*	14	186	10	16	847	0.13	0.13	1.50	0.51	0.76	1.96
12	*E. deanei*	28	183	17	19	813	0.09	0.12	0.75	0.27	0.85	1.53
12	*E. dunnii*	13	107	9	17	687	0.14	0.09	1.24	0.42	0.83	1.95
12	*E. dunnii*	19	121	8	15	533	0.12	0.09	0.58	0.19	0.85	1.69
12	*E. dunnii*	27	129	7	14	814	0.10	0.10	0.91	0.26	0.84	1.78
12	*E. elata*	15	161	10	14	690	0.14	0.13	0.51	0.23	0.69	2.15
12	*E. elata*	23	162	7	15	667	0.12	0.13	0.54	0.21	0.85	2.16
12	*E. elata*	43	186	9	18	1176	0.13	0.16	0.89	0.36	0.68	2.03
12	*E. fastigata*	7	114	12	11	724	0.09	0.03	0.84	0.34	0.63	1.65
12	*E. fastigata*	22	120	6	12	486	0.09	0.04	0.42	0.22	0.76	1.76
12	*E. fastigata*	45	194	7	9	317	0.10	0.05	0.40	0.24	0.74	1.70
12	*E. grandis*	1	136	10	13	490	0.13	0.10	0.95	0.35	0.85	1.76
12	*E. grandis*	9	155	9	17	861	0.13	0.08	0.95	0.43	0.74	1.85
12	*E. grandis*	29	177	7	13	457	0.11	0.18	0.63	0.40	0.80	1.71
12	*E. macarthurii*	3	147	9	15	922	0.13	0.08	0.91	0.38	0.87	2.37

Appendix A3.2. Nutrient concentration of bulk foliar material per trial, species and plot													
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)						
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*	
12	*E. macarthurii*	16	145	9	17	594	0.15	0.08	0.59	0.17	1.10	2.19	
12	*E. macarthurii*	30	183	8	17	835	0.12	0.12	0.66	0.17	1.07	1.93	
12	*E. nitens*	6	105	7	8	426	0.09	0.02	0.51	0.24	0.70	1.58	
12	*E. nitens*	18	111	10	11	489	0.07	0.02	0.39	0.15	0.80	1.51	
12	*E. nitens*	47	121	9	11	485	0.09	0.02	0.37	0.12	0.84	1.53	
12	*E. saligna*	10	134	10	13	391	0.11	0.11	0.59	0.27	0.88	1.87	
12	*E. saligna*	21	151	10	12	509	0.13	0.13	0.55	0.29	0.81	1.98	
12	*E. saligna*	26	128	10	14	365	0.11	0.14	0.58	0.27	0.95	1.97	
12	*E. smithii*	4	133	10	14	684	0.11	0.06	1.20	0.27	1.02	1.89	
12	*E. smithii*	8	106	7	13	535	0.14	0.08	0.57	0.25	1.06	1.91	
12	*E. smithii*	48	200	6	13	561	0.09	0.14	0.73	0.18	0.90	1.72	
12	*E. viminalis*	5	89	9	13	681	0.14	0.02	0.68	0.34	0.89	1.94	
12	*E. viminalis*	11	149	9	19	694	0.15	0.02	0.64	0.21	1.00	2.24	
12	*E. viminalis*	46	148	9	11	1020	0.12	0.06	0.79	0.21	0.87	1.91	
13	*E. deanei*	7	189	8	20	904	0.14	0.18	1.28	0.29	0.72	1.99	
13	*E. deanei*	38	161	7	18	1654	0.12	0.08	1.79	0.40	0.62	1.66	
13	*E. deanei*	44	186	5	15	1161	0.15	0.16	1.65	0.36	0.46	1.49	
13	*E. dunnii*	21	175	6	20	1188	0.16	0.07	1.25	0.28	0.84	1.94	
13	*E. dunnii*	39	161	5	15	1015	0.21	0.06	1.37	0.37	0.80	1.55	
13	*E. dunnii*	48	378	6	29	1087	0.18	0.09	1.66	0.29	0.53	1.70	
13	*E. elata*	3	143	5	17	551	0.15	0.20	0.61	0.30	0.61	1.62	
13	*E. elata*	30	324	7	22	535	0.15	0.15	0.47	0.29	0.56	1.76	
13	*E. elata*	33	210	7	27	581	0.14	0.14	0.94	0.40	0.57	1.90	
13	*E. fastigata*	9	97	7	17	156	0.15	0.07	0.33	0.25	0.73	1.87	
13	*E. fastigata*	31	131	6	20	424	0.17	0.08	0.39	0.26	0.56	1.74	
13	*E. fastigata*	43	141	7	20	396	0.20	0.04	0.74	0.37	0.64	1.94	
13	*E. grandis*	4	208	5	15	804	0 17	0.12	1.58	0.35	0.78	1.68	
13	*E. grandis*	13	116	6	13	774	0.16	0.16	1.03	0.45	0.79	1.42	
13	*E. grandis*	41	283	7	20	871	0.22	0.12	1.01	0.37	0.67	1.68	
13	*E. macarthurii*	17	133	6	22	1073	0.13	0.05	0.64	0.20	0.70	1.93	
13	*E. macarthurii*	19	182	6	24	867	0.14	0.10	0.96	0.22	0.80	1.81	
13	*E. macarthurii*	37	183	7	29	872	0.13	0.08	1.47	0.39	0.62	1.78	
13	*E. nitens*	1	149	4	16	569	0.12	0.05	0.55	0.20	0.80	1.40	
13	*E. nitens*	10	247	9	24	511	0.14	0.02	0.52	0.22	0.88	1.73	
13	*E. nitens*	32	66	6	17	903	0.13	0.01	0.42	0.18	0.82	1.81	
13	*E. saligna*	14	172	10	24	671	0.15	0.05	0.64	0.36	0.78	1.94	
13	*E. saligna*	29	138	6	16	973	0.14	0.10	0.62	0.27	0.77	1.69	
13	*E. saligna*	35	146	8	19	948	0.14	0.04	0.44	0.28	0.67	1.53	

Appendix A3.2. Nutrient concentration of bulk foliar material per trial, species and plot													
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)						
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. smithii*	8	175	5	20	384	0.10	0.07	0.38	0.15	0.60	1.61
13	*E. smithii*	42	156	8	22	1006	0.19	0.05	0.87	0.22	0.62	1.63
13	*E. smithii*	45	123	7	19	719	0.18	0.08	1.22	0.31	0.61	1.45
13	*E. viminalis*	11	479	10	17	707	0.16	0.08	0.86	0.26	0.89	1.73
13	*E. viminalis*	34	315	10	24	850	0.11	0.04	1.05	0.38	0.64	1.75
13	*E. viminalis*	46	316	10	10	843	0.18	0.04	1.00	0.32	0.58	1.90
14	*E. deanei*	2	188	9	25	535	0.04	0.21	0.72	0.33	0.67	1.90
14	*E. deanei*	14	220	9	15	359	0.10	0.16	0.37	0.22	0.84	1.97
14	*E. deanei*	35	213	10	16	858	0.12	0.13	0.79	0.22	1.01	1.80
14	*E. dunnii*	4	209	7	16	816	0.09	0.13	0.45	0.25	0.98	1.68
14	*E. dunnii*	24	164	9	21	795	0.14	0.10	0.62	0.15	1.21	2.04
14	*E. dunnii*	32	154	6	14	647	0.12	0.10	0.59	0.21	0.95	1.93
14	*E. elata*	3	191	10	18	655	0.14	0.10	0.76	0.39	0.53	2.13
14	*E. elata*	17	266	9	15	1095	0.11	0.17	0.52	0.19	0.62	1.84
14	*E. elata*	36	266	6	13	1368	0.10	0.12	0.76	0.19	0.61	1.74
14	*E. fastigata*	8	148	5	10	470	0.07	0.02	0.32	0.16	0.81	1.58
14	*E. fastigata*	15	140	4	9	309	0.11	0.03	0.28	0.16	0.88	1.56
14	*E. fastigata*	26	119	4	10	412	0.07	0.01	0.38	0.16	0.72	1.30
14	*E. grandis*	9	158	6	13	412	0.08	0.23	0.32	0.27	0.85	1.61
14	*E. grandis*	23	198	5	12	624	0.09	0.15	0.46	0.30	0.65	1.61
14	*E. grandis*	27	152	5	16	704	0.09	0.15	0.62	0.31	0.71	1.63
14	*E. macarthurii*	12	154	7	22	753	0.12	0.13	0.38	0.16	1.01	2.20
14	*E. macarthurii*	13	191	7	23	629	0.11	0.12	0.37	0.15	1.01	1.94
14	*E. macarthurii*	30	236	8	24	520	0.12	0.17	0.31	0.11	0.96	1.76
14	*E. nitens*	1	147	10	17	591	0.10	0.06	0.27	0.12	0.55	1.66
14	*E. nitens*	19	129	4	12	692	0.09	0.01	0.32	0.15	0.68	1.40
14	*E. nitens*	34	124	5	18	629	0.10	0.01	0.42	0.12	0.86	1.56
14	*E. saligna*	7	164	7	15	823	0.10	0.18	0.42	0.27	0.81	1.68
14	*E. saligna*	18	199	10	18	961	0.09	0.21	0.45	0.23	0.87	1.74
14	*E. saligna*	25	192	6	13	1041	0.10	0.13	0.72	0.26	0.82	1.62
14	*E. smithii*	5	193	7	14	404	0.08	0.12	0.25	0.10	0.93	1.66
14	*E. smithii*	16	149	9	19	332	0.09	0.09	0.27	0.09	0.68	1.80
14	*E. smithii*	31	199	6	13	517	0.07	0.07	0.31	0.06	0.96	1.55
14	*E. viminalis*	10	153	14	14	489	0.09	0.01	0.32	0.17	0.72	1.69
14	*E. viminalis*	22	135	12	20	581	0.11	0.07	0.41	0.12	0.82	1.91
14	*E. viminalis*	29	136	8	12	581	0.11	0.08	0.43	0.19	0.76	1.71

Appendix A3.3. Nutrient concentration of branches per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	2	109	3	9	515	0.02	0.02	0.23	0.13	0.41	0.13
10	*E. deanei*	42	55	4	6	651	0.02	0.05	0.25	0.10	0.45	0.24
10	*E. deanei*	44	76	3	14	546	0.02	0.05	0.23	0.11	0.76	0.14
10	*E. dunnii*	21	117	2	7	501	0.01	0.03	0.17	0.14	0.42	0.18
10	*E. dunnii*	26	115	7	9	463	0.01	0.02	0.39	0.21	0.30	0.18
10	*E. dunnii*	35	91	4	6	219	0.03	0.04	0.39	0.11	0.56	0.29
10	*E. elata*	3	107	7	11	242	0.04	0.07	0.21	0.09	0.24	0.30
10	*E. elata*	25	127	7	8	431	0.04	0.05	0.20	0.09	0.35	0.29
10	*E. elata*	41	117	9	16	376	0.07	0.07	0.22	0.11	0.36	0.21
10	*E. fastigata*	5	65	6	4	337	0.03	0.02	0.15	0.14	0.30	0.18
10	*E. fastigata*	30	60	3	5	353	0.01	0.02	0.16	0.11	0.28	0.23
10	*E. fastigata*	38	74	3	4	369	0.01	0.08	0.14	0.11	0.43	0.28
10	*E. grandis*	24	60	5	7	329	0.01	0.04	0.40	0.11	0.38	0.23
10	*E. grandis*	31	89	6	11	413	0.01	0.07	0.29	0.16	0.46	0.26
10	*E. grandis*	45	61	4	6	367	0.02	0.07	0.12	0.13	0.48	0.17
10	*E. macarthurii*	6	101	4	8	252	0.03	0.02	0.35	0.19	0.34	0.28
10	*E. macarthurii*	39	76	5	6	356	0.02	0.03	0.31	0.15	0.34	0.23
10	*E. macarthurii*	47	73	4	8	284	0.02	0.03	0.27	0.14	0.47	0.28
10	*E. nitens*	12	142	4	9	353	0.03	0.01	0.29	0.10	0.45	0.30
10	*E. nitens*	23	89	4	9	406	0.02	0.07	0.37	0.12	0.30	0.26
10	*E. nitens*	46	53	6	6	467	0.03	0.05	0.36	0.10	0.52	0.24
10	*E. saligna*	1	91	6	8	314	0.03	0.05	0.40	0.11	0.50	0.27
10	*E. saligna*	29	51	4	6	346	0.02	0.05	0.38	0.12	0.40	0.22
10	*E. saligna*	40	84	6	7	399	0.02	0.05	0.36	0.15	0.49	0.22
10	*E. smithii*	20	110	3	5	174	0.04	0.05	0.25	0.07	0.28	0.21
10	*E. smithii*	28	109	4	10	310	0.05	0.03	0.33	0.15	0.49	0.40
10	*E. smithii*	36	105	3	5	371	0.00	0.03	0.28	0.06	0.43	0.19
10	*E. viminalis*	22	91	4	8	374	0.03	0.06	0.43	0.17	0.53	0.33
10	*E. viminalis*	27	65	3	8	590	0.02	0.02	0.32	0.13	0.42	0.36
10	*E. viminalis*	33	95	3	6	552	0.03	0.02	0.29	0.10	0.43	0.41
11	*E. deanei*	5	30	8	9	525	0.03	0.06	0.66	0.11	0.36	0.28
11	*E. deanei*	13	35	7	10	310	0.03	0.05	0.38	0.09	0.44	0.30
11	*E. deanei*	37	100	14	19	624	0.09	0.06	0.61	0.14	0.48	0.47
11	*E. dunnii*	7	49	9	8	211	0.05	0.03	0.72	0.22	0.49	0.26
11	*E. dunnii*	20	32	7	7	290	0.03	0.03	0.46	0.14	0.55	0.35
11	*E. dunnii*	32	37	10	6	213	0.02	0.05	0.69	0.17	0.29	0.22
11	*E. elata*	1	44	8	6	250	0.04	0.04	0.35	0.12	0.35	0.29
11	*E. elata*	15	40	6	6	200	0.02	0.04	0.32	0.11	0.31	0.24

Appendix A3.3. Nutrient concentration of branches per trial, species and plot													
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)						
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
11	*E. elata*	38	52	10	9	235	0.06	0.08	0.38	0.09	0.41	0.40
11	*E. fastigata*	17	33	4	5	272	0.02	0.01	0.34	0.18	0.32	0.28
11	*E. fastigata*	24	83	6	6	367	0.04	0.01	0.25	0.12	0.29	0.26
11	*E. fastigata*	36	42	11	6	324	0.05	0.03	0.41	0.15	0.35	0.36
11	*E. grandis*	11	49	8	7	341	0.04	0.06	0.47	0.15	0.48	0.34
11	*E. grandis*	22	53	10	9	472	0.05	0.06	0.70	0.28	0.44	0.38
11	*E. grandis*	42	84	10	9	224	0.05	0.04	0.54	0.15	0.47	0.34
11	*E. macarthurii*	3	64	10	10	312	0.05	0.04	0.40	0.07	0.49	0.31
11	*E. macarthurii*	8	83	7	14	306	0.02	0.02	0.38	0.10	0.37	0.29
11	*E. macarthurii*	31	89	11	8	308	0.06	0.01	0.58	0.19	0.51	0.15
11	*E. nitens*	4	109	8	6	314	0.05	0.02	0.64	0.09	0.50	0.33
11	*E. nitens*	18	37	6	5	129	0.01	0.02	0.52	0.13	0.33	0.27
11	*E. nitens*	34	26	6	8	127	0.01	0.06	0.34	0.08	0 27	0.21
11	*E. saligna*	14	36	12	5	244	0.01	0.05	0.63	0.20	0.41	0.17
11	*E. saligna*	23	75	10	12	447	0.05	0.05	0.72	0.26	0.57	0.43
11	*E. saligna*	39	39	9	10	189	0.06	0.03	0.61	0.25	0.42	0.40
11	*E. smithii*	2	48	5	7	232	0.02	0.05	0.67	0.13	0.29	0.32
11	*E. smithii*	10	42	4	7	238	0.04	0.04	0.45	0.09	0.30	0.21
11	*E. smithii*	41	37	8	10	232	0.03	0.04	0.43	0.08	0.30	0.29
11	*E. viminalis*	16	42	7	6	253	0.02	0.03	0.43	0.11	0.37	0.34
11	*E. viminalis*	21	46	11	6	207	0.05	0.08	0.60	0.17	0.49	0.41
11	*E. viminalis*	35	74	9	9	449	0.02	0.03	0.69	0.12	0.28	0.36
12	*E. deanei*	2	59	3	11	393	0.03	0.04	0.37	0.09	0.38	0.27
12	*E. deanei*	14	35	5	7	409	0.04	0.04	0.39	0.07	0.45	0.29
12	*E. deanei*	28	40	2	3	534	0.01	0.03	0.34	0.11	0.51	0.17
12	*E. dunnii*	13	35	3	7	186	0.02	0.03	0.31	0.15	0.47	0.30
12	*E. dunnii*	19	43	3	5	231	0.02	0.02	0.54	0.09	0.45	0.27
12	*E. dunnii*	27	33	7	6	291	0.03	0.01	0.48	0.11	0.52	0.32
12	*E. elata*	15	46	6	6	340	0.04	0.02	0.28	0.09	0.22	0.30
12	*E. elata*	23	46	5	10	230	0.03	0.02	0.30	0.07	0.31	0.30
12	*E. elata*	43	67	7	11	282	0.03	0.05	0.42	0.07	0.27	0.31
12	*E. fastigata*	7	48	2	5	546	0.02	0.01	0.26	0.08	0.39	0.29
12	*E. fastigata*	22	88	2	5	462	0.02	0.02	0.36	0.11	0.38	0.27
12	*E. fastigata*	45	47	3	4	255	0.01	0.02	0.17	0.06	0.34	0.23
12	*E. grandis*	1	30	7	7	260	0.03	0.04	0.29	0.08	0.44	0.23
12	*E. grandis*	9	48	8	8	399	0.02	0.04	0.43	0.13	0.50	0.32
12	*E. grandis*	29	58	5	6	204	0.04	0.03	0.38	0.11	0.50	0.32
12	*E. macarthurii*	3	117	6	7	199	0.04	0.03	0.37	0.11	0.51	0.32

Appendix A3.3. Nutrient concentration of branches per trial, species and plot													
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)						
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
12	*E. macarthurii*	16	66	6	6	272	0.03	0.03	0.37	0.06	0.52	0.40
12	*E. macarthurii*	30	33	4	9	510	0.03	0.01	0.37	0.10	0.43	0.29
12	*E. nitens*	6	42	4	7	296	0.04	0.00	0.38	0.10	0.51	0.35
12	*E. nitens*	18	74	3	7	241	0.03	0.05	0.29	0.08	0.47	0.30
12	*E. nitens*	47	78	6	8	397	0.06	0.06	0.47	0.13	0.58	0.43
12	*E. saligna*	10	53	7	6	385	0.02	0.04	0.49	0.13	0.49	0.30
12	*E. saligna*	21	49	5	4	235	0.02	0.04	0.34	0.10	0.47	0.30
12	*E. saligna*	26	68	6	5	263	0.04	0.04	0.31	0.06	0.54	0.28
12	*E. smithii*	4	40	4	9	420	0.05	0.01	0.53	0.08	0.44	0.34
12	*E. smithii*	8	43	1	6	337	0.01	0.02	0.27	0.02	0.38	0.22
12	*E. smithii*	48	97	5	9	343	0.08	0.07	0.48	0.18	0.52	0.31
12	*E. viminalis*	5	35	4	6	369	0.03	0.02	0.35	0.07	0.50	0.27
12	*E. viminalis*	11	62	6	10	664	0.03	0.03	0.42	0.04	0.44	0.37
12	*E. viminalis*	46	127	6	8	609	0.06	0.05	0.53	0.13	0.54	0.40
13	*E. deanei*	7	66	5	12	596	0.04	0.05	0.60	0.12	0.34	0.26
13	*E. deanei*	38	97	4	10	514	0.05	0.04	0.65	0.09	0.35	0.23
13	*E. deanei*	44	42	5	10	479	0.05	0.08	0.52	0.09	0.35	0.27
13	*E. dunnii*	21	51	5	9	206	0.03	0.06	0.35	0.08	0.44	0.34
13	*E. dunnii*	39	44	6	8	671	0.06	0.04	0.49	0.13	0.56	0.37
13	*E. dunnii*	48	52	7	8	366	0.08	0.06	0.58	0.19	0.55	0.37
13	*E. elata*	3	40	6	8	151	0.04	0.04	0.26	0.12	0.43	0.34
13	*E. elata*	30	86	8	11	172	0.03	0.02	0.54	0.13	0.42	0.23
13	*E. elata*	33	146	6	6	269	0.07	0.03	0.53	0.12	0.68	0.44
13	*E. fastigata*	9	42	5	16	343	0.05	0.01	0.62	0.14	0.46	0.36
13	*E. fastigata*	31	67	4	8	170	0.06	0.06	0.25	0.08	0.33	0.28
13	*E. fastigata*	43	71	5	11	362	0.08	0.01	0.49	0.20	0.37	0.26
13	*E. grandis*	4	41	3	7	439	0.03	0.02	0.37	0.06	0.41	0.40
13	*E. grandis*	13	111	6	10	419	0.03	0.05	0.62	0.07	0.46	0.33
13	*E. grandis*	41	66	6	7	351	0.06	0.05	0.56	0.15	0.42	0.23
13	*E. macarthurii*	17	57	5	10	599	0.06	0.04	0.83	0.29	0.38	0.42
13	*E. macarthurii*	19	117	5	16	590	0.05	0.04	0.50	0.14	0.41	0.32
13	*E. macarthurii*	37	107	7	10	229	0.06	0.08	0.48	0.12	0.40	0.41
13	*E. nitens*	1	55	4	7	364	0.05	0.02	0.38	0.11	0.46	0.36
13	*E. nitens*	10	65	5	11	454	0.06	0.05	0.34	0.16	0.37	0.37
13	*E. nitens*	32	61	8	13	269	0.07	0.07	0.53	0.12	0.32	0.42
13	*E. saligna*	14	59	5	11	577	0.07	0.02	0.57	0.14	0.52	0.36
13	*E. saligna*	29	77	8	10	582	0.07	0.06	0.55	0.19	0.61	0.30
13	*E. saligna*	35	71	7	15	392	0.06	0.03	0.51	0.15	0.50	0.25

Appendix A3.3. Nutrient concentration of branches per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. smithii*	8	82	3	11	214	0.05	0.04	0.55	0.12	0.35	0.43
13	*E. smithii*	42	65	3	6	455	0.05	0.05	0.51	0.08	0.30	0.24
13	*E. smithii*	45	70	4	7	548	0.08	0.07	0.44	0.08	0.40	0.32
13	*E. viminalis*	11	57	6	7	336	0.05	0.05	0.43	0.13	0.37	0.46
13	*E. viminalis*	34	100	9	13	316	0.06	0.06	0.72	0.19	0.61	0.32
13	*E. viminalis*	46	40	7	11	454	0.09	0.04	0.40	0.11	0.58	0.43
14	*E. deanei*	2	38	13	17	513	0.05	0.06	0.21	0.06	0.45	0.31
14	*E. deanei*	14	63	11	16	245	0.04	0.04	0.17	0.09	0.44	0.35
14	*E. deanei*	35	48	17	14	368	0.04	0.04	0.46	0.13	0.52	0.34
14	*E. dunnii*	4	31	11	10	362	0.03	0.03	0.23	0.14	0.58	0.33
14	*E. dunnii*	24	67	11	14	243	0.02	0.06	0.39	0.13	0.76	0.29
14	*E. dunnii*	32	46	8	7	355	0.04	0.03	0.29	0.11	0.59	0.45
14	*E. elata*	3	27	12	12	352	0.04	0.03	0.23	0.06	0.26	0.37
14	*E. elata*	17	43	12	12	643	0.02	0.04	0.30	0.08	0.39	0.36
14	*E. elata*	36	65	11	13	439	0.03	0.04	0.30	0.10	0.25	0.41
14	*E. fastigata*	8	44	10	6	444	0.02	0.02	0.19	0.17	0.44	0.31
14	*E. fastigata*	15	43	11	10	403	0.03	0.02	0.22	0.09	0.46	0.33
14	*E. fastigata*	26	54	7	7	632	0.02	0.01	0.28	0.14	0.52	0.28
14	*E. grandis*	9	40	16	13	315	0.02	0.03	0.17	0.09	0.46	0.24
14	*E. grandis*	23	46	8	4	314	0.02	0.06	0.22	0.15	0.37	0.33
14	*E. grandis*	27	85	15	16	384	0.02	0.09	0.34	0.18	0.48	0.30
14	*E. macarthurii*	12	73	7	13	501	0.04	0.07	0.22	0.05	0.55	0.42
14	*E. macarthurii*	13	94	12	10	287	0.03	0.02	0.22	0.09	0.44	0.30
14	*E. macarthurii*	30	90	10	12	455	0.03	0.07	0.16	0.08	0.40	0.44
14	*E. nitens*	1	17	8	7	245	0.02	0.04	0.23	0.04	0.30	0.25
14	*E. nitens*	19	51	15	9	383	0.03	0.07	0.28	0.12	0.33	0.36
14	*E. nitens*	34	99	9	19	461	0.04	0.00	0.32	0.09	0.53	0.35
14	*E. saligna*	7	53	12	12	416	0.04	0.04	0.23	0.14	0.55	0.38
14	*E. saligna*	18	57	10	10	543	0.01	0.04	0.23	0.09	0.50	0.32
14	*E. saligna*	25	75	12	11	446	0.02	0.05	0.45	0.14	0.47	0.25
14	*E. smithii*	5	44	7	9	324	0.04	0.06	0.21	0.07	0.43	0.35
14	*E. smithii*	16	58	6	16	439	0.03	0.08	0.21	0.08	0.39	0.48
14	*E. smithii*	31	30	8	9	438	0.04	0.04	0.32	0.07	0.48	0.48
14	*E. viminalis*	10	51	7	16	483	0.04	0.01	0.16	0.12	0.41	0.39
14	*E. viminalis*	22	57	7	12	591	0.04	0.03	0.31	0.11	0.39	0.42
14	*E. viminalis*	29	88	8	15	522	0.03	0.03	0.23	0.16	0.38	0.35

Appendix A3.4. Nutrient concentration of on-tree dead matter per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	2	65	3	7	307	0.00	0.00	0.13	0.09	0.31	0.12
10	*E. deanei*	42	92	7	9	370	0.02	0.01	0.18	0.10	0.16	0.12
10	*E. deanei*	44	173	3	11	377	0.00	0.00	0.22	0.08	0.04	0.17
10	*E. dunnii*	21	78	2	7	254	0.00	0.00	0.23	0.17	0.33	0.17
10	*E. dunnii*	26	138	2	6	272	0.01	0.02	0.25	0.13	0.28	0.15
10	*E. dunnii*	35	216	5	5	288	0.00	0.01	0.34	0.15	0.14	0.12
10	*E. elata*	3	149	7	12	80	0.00	0.00	0.18	0.05	0.03	0.34
10	*E. elata*	25	179	0	12	221	0.01	0.00	0.18	0.09	0.09	0.21
10	*E. elata*	41	94	4	10	114	0.00	0.00	0.43	0.19	0.06	0.19
10	*E. fastigata*	5	229	2	5	134	0.00	0.00	0.16	0.06	0.02	0.23
10	*E. fastigata*	30	90	2	5	262	0.01	0.00	0.14	0.06	0.07	0.15
10	*E. fastigata*	38	125	2	5	262	0.00	0.00	0.15	0.05	0.05	0.20
10	*E. grandis*	24	97	3	3	340	0.00	0.00	0.31	0.07	0.06	0.13
10	*E. grandis*	31	45	4	5	317	0.00	0.02	0.18	0.11	0.14	0.12
10	*E. grandis*	45	119	2	6	218	0.00	0.00	0.22	0.04	0.04	0.16
10	*E. macarthurii*	6	79	3	7	170	0.00	0.00	0.31	0.19	0.16	0.20
10	*E. macarthurii*	39	92	3	8	426	0.00	0.00	0.16	0.03	0.09	0.16
10	*E. macarthurii*	47	86	2	8	241	0.00	0.00	0.22	0.10	0.45	0.16
10	*E. nitens*	12	129	2	8	171	0.00	0.00	0.33	0.10	0.07	0.17
10	*E. nitens*	23	272	5	9	241	0.00	0.00	0.42	0.08	0.05	0.23
10	*E. nitens*	46	77	3	8	177	0.00	0.00	0.27	0.10	0.14	0.16
10	*E. saligna*	1	60	2	15	451	0.01	0.01	0.36	0.13	0.38	0.17
10	*E. saligna*	29	73	3	7	181	0.00	0.01	0.25	0.12	0.09	0.16
10	*E. saligna*	40	119	4	5	222	0.00	0.00	0.29	0.12	0.11	0.19
10	*E. smithii*	20	264	3	8	220	0.00	0.00	0.18	0.03	0.05	0.13
10	*E. smithii*	28	125	4	8	250	0.00	0.00	0.19	0.04	0.03	0.14
10	*E. smithii*	36	126	2	5	232	0.01	0.00	0.20	0.05	0.06	0.20
10	*E. viminalis*	22	151	3	7	317	0.00	0.00	0.29	0.11	0.06	0.19
10	*E. viminalis*	27	75	2	8	344	0.01	0.00	0.25	0.09	0.06	0.15
10	*E. viminalis*	33	143	3	8	355	0.01	0.00	0.34	0.09	0.07	0.19
11	*E. deanei*	5	58	3	8	292	0.00	0.00	0.57	0.12	0.03	0.13
11	*E. deanei*	13	39	3	6	433	0.01	0.04	0.46	0.12	0.31	0.15
11	*E. deanei*	37	61	4	13	456	0.00	0.00	0.65	0.12	0.13	0.18
11	*E. dunnii*	7	162	4	9	216	0.00	0.00	0.80	0.17	0.07	0.17
11	*E. dunnii*	20	92	3	15	253	0.01	0.00	0.44	0.11	0.07	0.14
11	*E. dunnii*	32	109	3	13	237	0.02	0.01	0.46	0.12	0.09	0.19
11	*E. elata*	1	77	3	4	131	0.03	0.01	0.16	0.09	0.07	0.19
11	*E. elata*	15	79	3	3	82	0.00	0.00	0.30	0.08	0.03	0.17

Appendix A3.4. Nutrient concentration of on-tree dead matter per trial, species and plot													
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)						
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*	
11	*E. elata*	38	176	4	5	160	0.00	0.00	0.32	0.10	0.04	0.17	
11	*E. fastigata*	17	55	2	4	141	0.02	0.01	0.27	0.11	0.31	0.18	
11	*E. fastigata*	24	37	1	5	186	0.01	0.01	0.23	0.08	0.14	0.15	
11	*E. fastigata*	36	46	3	5	191	0.00	0.02	0.26	0.15	0.17	0.14	
11	*E. grandis*	11	40	4	4	162	0.02	0.03	0.29	0.08	0.36	0.20	
11	*E. grandis*	22	73	3	4	104	0.00	0.00	0.50	0.11	0.03	0.12	
11	*E. grandis*	42	66	2	6	146	0.00	0.01	0.33	0.06	0.07	0.16	
11	*E. macarthurii*	3	65	4	12	469	0.00	0.04	0.46	0.14	0.40	0.17	
11	*E. macarthurii*	8	39	3	10	311	0.03	0.03	0.24	0.14	0.33	0.21	
11	*E. macarthurii*	31	64	2	6	243	0.01	0.01	0.36	0.14	0.25	0.20	
11	*E. nitens*	4	76	2	4	151	0.00	0.01	0.50	0.05	0.09	0.15	
11	*E. nitens*	18	63	2	4	106	0.00	0.00	0.43	0.11	0.07	0.12	
11	*E. nitens*	34	60	3	10	177	0.00	0.04	0.44	0.10	0.15	0.17	
11	*E. saligna*	14	90	3	3	158	0.00	0.00	0.28	0.12	0.04	0.13	
11	*E. saligna*	23	53	2	4	94	0.01	0.02	0.35	0.16	0.06	0.08	
11	*E. saligna*	39	36	2	6	105	0.01	0.03	0.18	0.13	0.09	0.16	
11	*E. smithii*	2	46	1	4	270	0.00	0.03	0.30	0.06	0.12	0.13	
11	*E. smithii*	10	23	1	4	188	0.01	0.01	0.20	0.06	0.18	0.09	
11	*E. smithii*	41	130	5	6	100	0.00	0.01	0.55	0.08	0.05	0.13	
11	*E. viminalis*	16	58	2	3	228	0.00	0.02	0.55	0.13	0.09	0.14	
11	*E. viminalis*	21	69	2	5	143	0.01	0.01	0.41	0.11	0.09	0.16	
11	*E. viminalis*	35	82	2	7	340	0.00	0.02	0.35	0.09	0.25	0.17	
12	*E. deanei*	2	142	13	8	320	0.00	0.00	0.53	0.09	0.09	0.18	
12	*E. deanei*	14	97	2	11	258	0.00	0.00	0.73	0.27	0.02	0.17	
12	*E. deanei*	28	105	4	7	201	0.01	0.02	0.37	0.15	0.07	0.16	
12	*E. dunnii*	13	221	8	15	208	0.01	0.01	0.38	0.22	0.10	0.36	
12	*E. dunnii*	19	364	9	12	118	0.01	0.00	0.52	0.20	0.08	0.31	
12	*E. dunnii*	27	101	3	11	47	0.01	0.05	0.31	0.28	0.18	0.20	
12	*E. elata*	15	73	6	6	160	0.01	0.00	0.18	0.08	0.01	0.14	
12	*E. elata*	23	77	2	9	107	0.00	0.00	0.27	0.07	0.02	0.17	
12	*E. elata*	43	114	6	9	73	0.01	0.00	0.24	0.07	0.01	0.17	
12	*E. fastigata*	7	129	5	12	377	0.00	0.00	0.20	0.06	0.01	0.19	
12	*E. fastigata*	22	92	2	12	137	0.01	0.00	0.16	0.03	0.02	0.20	
12	*E. fastigata*	45	56	2	9	157	0.00	0.00	0.13	0.09	0.03	0.17	
12	*E. grandis*	1	120	5	4	98	0.00	0.00	0.31	0.07	0.02	0.17	
12	*E. grandis*	9	61	3	6	256	0.00	0.01	0.28	0.15	0.13	0.15	
12	*E. grandis*	29	79	4	9	30	0.01	0.01	0.22	0.13	0.05	0.20	
12	*E. macarthurii*	3	125	16	9	179	0.00	0.00	0.51	0.06	0.04	0.26	

Appendix A3.4. Nutrient concentration of on-tree dead matter per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
12	*E. macarthurii*	16	64	3	6	160	0.01	0.03	0.22	0.09	0.35	0.16
12	*E. macarthurii*	30	69	2	11	131	0.01	0.01	0.24	0.15	0.25	0.19
12	*E. nitens*	6	140	4	19	263	0.01	0.00	0.37	0.08	0.07	0.27
12	*E. nitens*	18	98	10	9	340	0.01	0.02	0.37	0.19	0.17	0.32
12	*E. nitens*	47	80	3	8	206	0.01	0.01	0.30	0.14	0.15	0.27
12	*E. saligna*	10	122	5	6	146	0.00	0.00	0.28	0.07	0.02	0.14
12	*E. saligna*	21	65	3	6	138	0.00	0.00	0.30	0.09	0.07	0.11
12	*E. saligna*	26	213	8	11	35	0.01	0.00	0.26	0.08	0.02	0.15
12	*E. smithii*	4	56	2	6	179	0.00	0.00	0.18	0.05	0.21	0.14
12	*E. smithii*	8	42	1	5	219	0.00	0.00	0.09	0.01	0.15	0.19
12	*E. smithii*	48	123	12	13	136	0.00	0.00	0.16	0.00	0.04	0.17
12	*E. viminalis*	5	87	3	18	291	0.01	0.01	0.26	0.09	0.20	0.19
12	*E. viminalis*	11	112	3	11	195	0.01	0.00	0.32	0.13	0.07	0.27
12	*E. viminalis*	46	191	16	11	261	0.00	0.00	0.60	0.10	0.04	0.22
13	*E. deanei*	7	51	5	10	292	0.02	0.03	0.55	0.06	0.31	0.18
13	*E. deanei*	38	175	5	12	473	0.02	0.01	0.60	0.09	0.04	0.28
13	*E. deanei*	44	114	4	16	399	0.02	0.01	0.64	0.08	0.04	0.20
13	*E. dunnii*	21	131	4	7	188	0.02	0.01	0.49	0.09	0.05	0.28
13	*E. dunnii*	39	60	4	5	180	0.01	0.07	0.45	0.16	0.31	0.17
13	*E. dunnii*	48	75	3	8	183	0.01	0.02	0.31	0.12	0.22	0.15
13	*E. elata*	3	108	6	8	229	0.02	0.01	0.31	0.09	0.03	0.28
13	*E. elata*	30	92	4	14	153	0.02	0.01	0.50	0.09	0.02	0.22
13	*E. elata*	33	83	4	9	151	0.01	0.01	0.33	0.06	0.04	0.18
13	*E. fastigata*	9	69	3	8	140	0.01	0.01	0.26	0.07	0.04	0.20
13	*E. fastigata*	31	103	4	17	430	0.02	0.01	0.42	0.12	0.06	0.26
13	*E. fastigata*	43	93	3	10	302	0.03	0.01	0.48	0.13	0.07	0.18
13	*E. grandis*	4	90	3	19	156	0.03	0.02	0.33	0.16	0.10	0.12
13	*E. grandis*	13	76	4	10	163	0.03	0.01	0.46	0.16	0.08	0.20
13	*E. grandis*	41	105	4	17	175	0.03	0.06	0.52	0.17	0.10	0.17
13	*E. macarthurii*	17	312	11	9	450	0.02	0.02	0.59	0.17	0.11	0.24
13	*E. macarthurii*	19	125	4	11	693	0.02	0.01	0.53	0.14	0.04	0.29
13	*E. macarthurii*	37	72	4	10	494	0.02	0.02	0.60	0.17	0.07	0.20
13	*E. nitens*	1	142	4	13	257	0.02	0.01	0.57	0.08	0.05	0.36
13	*E. nitens*	10	119	4	15	192	0.02	0.01	0.55	0.11	0.11	0.22
13	*E. nitens*	32	129	4	15	222	0.02	0.01	0.56	0.11	0.05	0.34
13	*E. saligna*	14	51	4	13	246	0.02	0.04	0.48	0.14	0.30	0.17
13	*E. saligna*	29	129	5	10	206	0.01	0.01	0.46	0.09	0.03	0.27
13	*E. saligna*	35	144	6	16	166	0.01	0.01	0.52	0.12	0.03	0.21

Appendix A3.4. Nutrient concentration of on-tree dead matter per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. smithii*	8	81	3	8	147	0.02	0.04	0.33	0.06	0.19	0.26
13	*E. smithii*	42	106	4	7	218	0.02	0.02	0.52	0.08	0.07	0.27
13	*E. smithii*	45	72	2	5	514	0.02	0.01	0.42	0.05	0.03	0.14
13	*E. viminalis*	11	164	3	11	255	0.02	0.02	0.60	0.09	0.10	0.32
13	*E. viminalis*	34	66	3	9	364	0.02	0.02	0.53	0.12	0.10	0.21
13	*E. viminalis*	46	57	3	7	297	0.02	0.02	0.45	0.13	0.12	0.22
14	*E. deanei*	2	178	4	13	125	0.01	0.00	0.22	0.00	0.01	0.15
14	*E. deanei*	14	94	5	5	240	0.01	0.02	0.14	0.01	0.15	0.15
14	*E. deanei*	35	127	3	8	355	0.00	0.01	0.15	0.04	0.10	0.13
14	*E. dunnii*	4	134	8	10	192	0.01	0.01	0.17	0.01	0.04	0.14
14	*E. dunnii*	24	81	6	6	169	0.01	0.04	0.27	0.06	0.28	0.21
14	*E. dunnii*	32	65	4	2	227	0.01	0.04	0.21	0.06	0.31	0.16
14	*E. elata*	3	84	5	14	156	0.01	0.01	0.15	0.02	0.02	0.15
14	*E. elata*	17	219	5	19	282	0.01	0.01	0.18	0.00	0.03	0.21
14	*E. elata*	36	114	6	8	312	0.01	0.00	0.39	0.07	0.05	0.15
14	*E. fastigata*	8	98	2	4	215	0.01	0.00	0.13	0.00	0.04	0.18
14	*E. fastigata*	15	50	3	8	231	0.01	0.01	0.11	0.01	0.08	0.13
14	*E. fastigata*	26	124	3	7	346	0.01	0.00	0.15	0.05	0.05	0.10
14	*E. grandis*	9	69	7	12	251	0.01	0.02	0.13	0.02	0.03	0.13
14	*E. grandis*	23	44	4	4	198	0.00	0.02	0.02	0.03	0.07	0.09
14	*E. grandis*	27	125	13	14	249	0.01	0.02	0.22	0.09	0.12	0.15
14	*E. macarthurii*	12	51	4	5	207	0.01	0.02	0.10	0.01	0.11	0.14
14	*E. macarthurii*	13	92	4	11	140	0.01	0.02	0.12	0.02	0.20	0.18
14	*E. macarthurii*	30	81	3	6	336	0.01	0.01	0.21	0.09	0.03	0.13
14	*E. nitens*	1	97	3	5	164	0.00	0.01	0.14	0.00	0.02	0.15
14	*E. nitens*	19	77	2	4	214	0.00	0.01	0.17	0.02	0.04	0.15
14	*E. nitens*	34	107	6	19	348	0.01	0.03	0.28	0.09	0.09	0.12
14	*E. saligna*	7	90	11	15	186	0.01	0.04	0.12	0.03	0.10	0.20
14	*E. saligna*	18	47	3	4	195	0.00	0.03	0.13	0.01	0.12	0.14
14	*E. saligna*	25	68	2	4	222	0.01	0.01	0.12	0.07	0.14	0.09
14	*E. smithii*	5	68	4	7	252	0.01	0.03	0.24	0.03	0.13	0.17
14	*E. smithii*	16	38	6	2	300	0.01	0.02	0.10	0.03	0.04	0.11
14	*E. smithii*	31	85	3	13	433	0.01	0.01	0.32	0.03	0.15	0.15
14	*E. viminalis*	10	37	2	5	252	0.01	0.02	0.12	0.04	0.15	0.12
14	*E. viminalis*	22	37	2	4	303	0.00	0.03	0.16	0.05	0.14	0.13
14	*E. viminalis*	29	100	3	13	265	0.01	0.05	0.15	0.06	0.14	0.16

Appendix A3.5. Nutrient concentration of bole bark per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	2	69	3	11	1288	0.03	0.04	0.57	0.31	0.48	0.23
10	*E. deanei*	42	204	3	9	1422	0.04	0.03	0.47	0.35	0.34	0.23
10	*E. deanei*	44	49	3	8	1574	0.06	0.04	1.32	0.59	0.39	0.25
10	*E. dunnii*	21	76	2	7	458	0.02	0.05	0.38	0.36	0.62	0.21
10	*E. dunnii*	26	104	3	8	731	0.03	0.03	0.59	0.33	0.55	0.24
10	*E. dunnii*	35	46	2	6	560	0.03	0.05	0.42	0.28	0.62	0.21
10	*E. elata*	3	91	2	10	599	0.03	0.06	0.32	0.19	0.39	0.30
10	*E. elata*	25	64	3	9	609	0.03	0.07	0.35	0.24	0.41	0.32
10	*E. elata*	41	50	3	8	811	0.04	0.04	0.41	0.28	0.39	0.30
10	*E. fastigata*	5	219	3	13	678	0.04	0.04	0.44	0.18	0.47	0.28
10	*E. fastigata*	30	70	3	7	747	0.04	0.04	0.36	0.18	0.44	0.30
10	*E. fastigata*	38	51	3	9	866	0.03	0.02	0.35	0.20	0.36	0.32
10	*E. grandis*	24	72	3	11	863	0.03	0.05	0.65	0.28	0.55	0.23
10	*E. grandis*	31	58	2	11	917	0.03	0.03	0.48	0.31	0.56	0.18
10	*E. grandis*	45	56	2	7	940	0.05	0.04	0.77	0.26	0.50	0.25
10	*E. macarthurii*	6	50	2	12	564	0.03	0.04	0.50	0.18	0.47	0.28
10	*E. macarthurii*	39	89	3	10	942	0.05	0.03	0.66	0.25	0.63	0.35
10	*E. macarthurii*	47	56	3	8	787	0.04	0.03	0.71	0.29	0.48	0.32
10	*E. nitens*	12	59	3	9	741	0.02	0.02	0.66	0.20	0.57	0.28
10	*E. nitens*	23	57	3	9	592	0.03	0.04	0.51	0.19	0.50	0.26
10	*E. nitens*	46	56	3	9	449	0.03	0.01	0.40	0.17	0.50	0.24
10	*E. saligna*	1	58	3	9	797	0.02	0.08	0.69	0.19	0.44	0.23
10	*E. saligna*	29	53	9	10	640	0.05	0.06	0.65	0.26	0.54	0.22
10	*E. saligna*	40	59	3	11	961	0.04	0.03	0.76	0.27	0.59	0.29
10	*E. smithii*	20	172	3	12	478	0.02	0.03	0.26	0.10	0.33	0.22
10	*E. smithii*	28	65	2	8	707	0.04	0.02	0.44	0.17	0.43	0.24
10	*E. smithii*	36	25	2	7	364	0.02	0.02	0.42	0.12	0.40	0.21
10	*E. viminalis*	22	57	3	11	961	0.04	0.02	0.60	0.37	0.56	0.39
10	*E. viminalis*	27	59	3	9	863	0.03	0.02	0.54	0.27	0.43	0.29
10	*E. viminalis*	33	68	2	8	571	0.03	0.02	0.60	0.29	0.42	0.36
11	*E. deanei*	5	32	2	9	944	0.07	0.06	1.37	0.41	0.41	0.23
11	*E. deanei*	13	32	2	2	1363	0.06	0.06	1.64	0.47	0.35	0.24
11	*E. deanei*	37	37	4	5	992	0.10	0.06	1.29	0.47	0.56	0.29
11	*E. dunnii*	7	33	2	6	521	0.02	0.04	1.37	0.38	0.30	0.21
11	*E. dunnii*	20	32	2	4	471	0.03	0.09	1.05	0.36	0.62	0.24
11	*E. dunnii*	32	34	2	3	252	0.02	0.09	0.67	0.31	0.46	0.22
11	*E. elata*	1	45	2	9	431	0.03	0.02	0.55	0.32	0.28	0.27
11	*E. elata*	15	57	2	5	248	0.02	0.06	0.61	0.29	0.26	0.27

Appendix A3.5. Nutrient concentration of bole bark per trial, species and plot													
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)						
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
11	*E. elata*	38	72	3	7	491	0.04	0.07	0.67	0.34	0.28	0.29
11	*E. fastigata*	17	40	2	4	526	0.04	0.03	0.55	0.27	0.39	0.31
11	*E. fastigata*	24	36	3	6	690	0.04	0.05	0.60	0.41	0.38	0.29
11	*E. fastigata*	36	23	4	6	737	0.04	0.05	0.74	0.32	0.31	0.26
11	*E. grandis*	11	33	4	8	816	0.06	0.07	1.49	0.28	0.57	0.25
11	*E. grandis*	22	66	3	4	339	0.06	0.10	1.22	0.18	0.47	0.21
11	*E. grandis*	42	28	3	6	417	0.00	0.08	1.48	0.28	0.49	0.25
11	*E. macarthurii*	3	70	3	12	768	0.04	0.04	1.13	0.32	0.55	0.35
11	*E. macarthurii*	8	47	3	11	518	0.04	0.02	1.25	0.24	0.62	0.34
11	*E. macarthurii*	31	54	3	10	513	0.03	0.07	1.59	0.33	0.51	0.35
11	*E. nitens*	4	45	2	8	301	0.03	0.03	1.28	0.19	0.54	0.25
11	*E. nitens*	18	39	3	9	227	0.03	0.04	0.93	0.27	0.36	0.28
11	*E. nitens*	34	29	3	9	481	0.03	0.06	1.12	0.22	0.45	0.29
11	*E. saligna*	14	26	3	6	643	0.03	0.07	1.05	0.39	0.40	0.28
11	*E. saligna*	23	93	4	6	779	0.09	0.07	1.75	0.24	0.88	0.32
11	*E. saligna*	39	36	3	6	443	0.05	0.05	1.35	0.46	0.49	0.30
11	*E. smithii*	2	37	2	6	302	0.03	0.01	0.80	0.21	0.29	0.26
11	*E. smithii*	10	36	1	5	294	0.02	0.03	0.79	0.14	0.36	0.21
11	*E. smithii*	41	62	2	6	316	0.03	0.06	0.66	0.14	0.27	0.23
11	*E. viminalis*	16	40	2	6	614	0.03	0.06	1.52	0.32	0.48	0.32
11	*E. viminalis*	21	54	2	5	472	0.03	0.08	1.06	0.28	0.33	0.36
11	*E. viminalis*	35	27	3	7	866	0.04	0.07	1.09	0.24	0.45	0.32
12	*E. deanei*	2	16	2	4	1010	0.05	0.05	0.60	0.24	0.43	0.24
12	*E. deanei*	14	56	2	4	907	0.05	0.06	1.06	0.39	0.46	0.23
12	*E. deanei*	28	29	3	6	590	0.06	0.05	0.96	0.42	0.55	0.26
12	*E. dunnii*	13	17	1	6	443	0.02	0.05	0.35	0.23	0.50	0.20
12	*E. dunnii*	19	125	2	7	503	0.03	0.05	0.63	0.10	0.48	0.24
12	*E. dunnii*	27	55	3	6	351	0.03	0.07	1.05	0.32	0.46	0.25
12	*E. elata*	15	137	3	6	624	0.04	0.09	0.90	0.39	0.42	0.33
12	*E. elata*	23	49	4	9	405	0.02	0.05	0.49	0.22	0.37	0.28
12	*E. elata*	43	54	4	7	243	0.03	0.11	0.48	0.20	0.35	0.29
12	*E. fastigata*	7	48	2	3	1010	0.04	0.03	0.20	0.07	0.35	0.31
12	*E. fastigata*	22	49	2	5	520	0.03	0.04	0.41	0.07	0.50	0.30
12	*E. fastigata*	45	64	2	8	482	0.03	0.04	0.44	0.20	0.56	0.29
12	*E. grandis*	1	41	3	4	828	0.03	0.08	1.03	0.24	0.49	0.24
12	*E. grandis*	9	47	3	3	832	0.02	0.06	0.99	0.30	0.56	0.25
12	*E. grandis*	29	61	3	10	732	0.03	0.05	1.03	0.40	0.52	0.21
12	*E. macarthurii*	3	301	3	15	664	0.04	0.04	0.72	0.24	0.52	0.40

Appendix A3.5. Nutrient concentration of bole bark per trial, species and plot												
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
12	*E. macarthurii*	16	147	3	11	625	0.03	0.04	0.79	0.30	0.70	0.31
12	*E. macarthurii*	30	69	4	10	727	0.04	0.08	1.32	0.27	0.70	0.39
12	*E. nitens*	6	144	3	7	627	0.03	0.04	0.87	0.25	0.42	0.31
12	*E. nitens*	18	26	3	7	707	0.03	0.01	0.94	0.26	0.37	0.30
12	*E. nitens*	47	107	4	14	327	0.03	0.02	0.60	0.23	0.42	0.27
12	*E. saligna*	10	32	2	4	917	0.03	0.09	0.98	0.36	0.62	0.20
12	*E. saligna*	21	52	3	8	1027	0.03	0.04	1.42	0.27	0.73	0.22
12	*E. saligna*	26	216	3	8	427	0.03	0.03	0.62	0.16	0.52	0.17
12	*E. smithii*	4	32	0	7	455	0.02	0.04	0.38	0.07	0.53	0.23
12	*E. smithii*	8	24	1	2	896	0.02	0.02	0.56	0.07	0.34	0.18
12	*E. smithii*	48	45	2	10	386	0.02	0.04	0.45	0.40	0.56	0.27
12	*E. viminalis*	5	55	3	5	1054	0.09	0.04	0.61	0.20	0.41	0.36
12	*E. viminalis*	11	33	2	6	1188	0.03	0.05	0.88	0.20	0.44	0.34
12	*E. viminalis*	46	56	5	17	857	0.03	0.05	0.92	0.26	0.41	0.31
13	*E. deanei*	7	23	3	8	598	0.21	0.04	0.93	0.35	0.39	0.24
13	*E. deanei*	38	132	4	9	1904	0.21	0.02	0.95	0.40	0.46	0.24
13	*E. deanei*	44	202	3	12	1521	0.22	0.03	1.25	0.57	0.37	0.28
13	*E. dunnii*	21	58	2	3	553	0.04	0.04	1.28	0.27	0.66	0.21
13	*E. dunnii*	39	29	2	4	987	0.04	0.06	0.66	0.36	0.57	0.22
13	*E. dunnii*	48	29	2	4	646	0.13	0.05	0.57	0.53	0.44	0.28
13	*E. elata*	3	37	3	11	275	0.07	0.04	0.52	0.17	0.14	0.26
13	*E. elata*	30	264	5	8	316	0.06	0.05	0.53	0.24	0.28	0.28
13	*E. elata*	33	40	2	5	362	0.09	0.08	0.49	0.29	0.39	0.30
13	*E. fastigata*	9	61	4	13	412	0.04	0.06	0.59	0.30	0.34	0.28
13	*E. fastigata*	31	23	3	6	888	0.06	0.04	0.42	0.36	0.39	0.24
13	*E. fastigata*	43	101	4	11	665	0.07	0.00	0.38	0.29	0.31	0.24
13	*E. grandis*	4	39	5	9	437	0.17	0.07	1.50	0.44	0.47	0.28
13	*E. grandis*	13	78	4	14	654	0.12	0.02	1.20	0.33	0.44	0.20
13	*E. grandis*	41	26	2	6	672	0.20	0.05	0.58	0.35	0.43	0.25
13	*E. macarthurii*	17	100	4	9	660	0.04	0.06	0.71	0.28	0.48	0.35
13	*E. macarthurii*	19	234	4	11	785	0.06	0.06	0.85	0.23	0.56	0.36
13	*E. macarthurii*	37	79	3	9	631	0.04	0.02	0.85	0.20	0.44	0.27
13	*E. nitens*	1	229	6	13	696	0.07	0.04	1.09	0.22	0.66	0.36
13	*E. nitens*	10	72	4	13	275	0.11	0.01	0.88	0.16	0.41	0.30
13	*E. nitens*	32	24	2	10	444	0.09	0.00	0.81	0.25	0.30	0.29
13	*E. saligna*	14	25	3	5	862	0.11	0.03	1.30	0.36	0.48	0.24
13	*E. saligna*	29	25	3	10	635	0.15	0.05	0.83	0.28	0.54	0.23
13	*E. saligna*	35	26	3	6	928	0.06	0.03	0.94	0.48	0.49	0.25

Appendix A3.5. Nutrient concentration of bole bark per trial, species and plot													
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)						
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. smithii*	8	95	4	9	182	0.04	0.06	0.48	0.05	0.25	0.28
13	*E. smithii*	42	141	4	9	731	0.07	0.02	0.51	0.13	0.38	0.27
13	*E. smithii*	45	177	3	10	751	0.06	0.01	0.43	0.13	0.23	0.22
13	*E. viminalis*	11	17	2	11	727	0.05	0.02	0.82	0.31	0.37	0.31
13	*E. viminalis*	34	53	6	16	622	0.06	0.04	0.63	0.27	0.37	0.31
13	*E. viminalis*	46	48	8	13	1599	0.11	0.02	0.89	0.29	0.39	0.37
14	*E. deanei*	2	55	7	15	1183	0.05	0.10	0.33	0.25	0.38	0.27
14	*E. deanei*	14	26	11	11	492	0.02	0.03	0.36	0.25	0.23	0.29
14	*E. deanei*	35	26	25	12	824	0.03	0.04	1.29	0.30	0.43	0.29
14	*E. dunnii*	4	35	12	11	207	0.00	0.06	0.36	0.27	0.58	0.22
14	*E. dunnii*	24	29	21	11	235	0.02	0.05	0.76	0.36	0.59	0.27
14	*E. dunnii*	32	66	3	7	391	0.03	0.09	0.98	0.31	0.46	0.34
14	*E. elata*	3	79	21	12	269	0.00	0.01	0.35	0.21	0.23	0.34
14	*E. elata*	17	60	22	12	600	0.02	0.06	0.92	0.23	0.20	0.31
14	*E. elata*	36	110	19	8	407	0.03	0.06	0.91	0.22	0.26	0.32
14	*E. fastigata*	8	72	32	11	421	0.02	0.01	0.55	0.20	0.23	0.32
14	*E. fastigata*	15	87	5	10	479	0.03	0.02	0.61	0.24	0.40	0.36
14	*E. fastigata*	26	69	31	11	445	0.02	0.02	0.62	0.15	0.35	0.37
14	*E. grandis*	9	64	5	13	473	0.02	0.05	0.27	0.28	0.34	0.27
14	*E. grandis*	23	69	24	12	400	0.02	0.06	0.77	0.29	0.39	0.25
14	*E. grandis*	27	101	27	12	341	0.02	0.04	0.88	0.32	0.14	0.27
14	*E. macarthurii*	12	57	3	11	366	0.03	0.07	0.94	0.18	0.57	0.38
14	*E. macarthurii*	13	50	13	18	315	0.03	0.04	0.34	0.21	0.35	0.36
14	*E. macarthurii*	30	69	8	11	364	0.02	0.11	0.35	0.18	0.23	0.37
14	*E. nitens*	1	75	40	16	924	0.03	0.08	0.88	0.18	0.39	0.27
14	*E. nitens*	19	62	2	10	327	0.02	0.02	1.08	0.24	0.41	0.32
14	*E. nitens*	34	87	15	10	475	0.03	0.03	1.07	0.16	0.65	0.33
14	*E. saligna*	7	67	6	14	386	0.02	0.07	0.31	0.25	0.33	0.31
14	*E. saligna*	18	51	6	12	354	0.01	0.07	0.32	0.16	0.34	0.20
14	*E. saligna*	25	66	34	15	540	0.03	0.02	1.62	0.39	0.51	0.34
14	*E. smithii*	5	34	5	12	306	0.01	0.00	0.24	0.15	0.13	0.27
14	*E. smithii*	16	65	7	10	308	0.02	0.03	0.33	0.12	0.15	0.26
14	*E. smithii*	31	61	29	13	540	0.03	0.03	0.75	0.06	0.45	0.25
14	*E. viminalis*	10	40	7	12	447	0.05	0.03	0.37	0.27	0.35	0.44
14	*E. viminalis*	22	34	24	13	484	0.03	0.02	0.91	0.28	0.28	0.38
14	*E. viminalis*	29	46	9	11	374	0.02	0.03	0.50	0.27	0.40	0.33

Appendix A3.6. Nutrient concentration of bole wood per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
10	*E. deanei*	2	50	2	6	29	0.01	0.00	0.08	0.03	0.05	0.08
10	*E. deanei*	42	46	1	3	28	0.01	0.00	0.10	0.02	0.07	0.09
10	*E. deanei*	44	16	0	1	15	0.00	0.00	0.08	0.02	0.04	0.10
10	*E. dunnii*	21	46	1	1	26	0.01	0.00	0.10	0.05	0.06	0.06
10	*E. dunnii*	26	27	2	2	37	0.01	0.00	0.14	0.10	0.05	0.06
10	*E. dunnii*	35	28	2	6	35	0.01	0.01	0.16	0.08	0.06	0.07
10	*E. elata*	3	69	2	2	20	0.01	0.01	0.06	0.02	0.03	0.08
10	*E. elata*	25	40	2	3	24	0.01	0.00	0.06	0.00	0.03	0.09
10	*E. elata*	41	68	1	12	30	0.01	0.00	0.10	0.01	0.04	0.07
10	*E. fastigata*	5	75	2	6	20	0.01	0.00	0.06	0.02	0.03	0.10
10	*E. fastigata*	30	101	2	1	22	0.01	0.00	0.06	0.04	0.04	0.09
10	*E. fastigata*	38	75	1	8	18	0.01	0.00	0.08	0.02	0.03	0.10
10	*E. grandis*	24	40	2	2	32	0.00	0.00	0.20	0.00	0.04	0.06
10	*E. grandis*	31	33	2	5	33	0.01	0.01	0.12	0.04	0.05	0.06
10	*E. grandis*	45	26	1	4	42	0.00	0.01	0.22	0.03	0.06	0.07
10	*E. macarthurii*	6	104	2	4	39	0.02	0.01	0.12	0.03	0.06	0.09
10	*E. macarthurii*	39	19	1	4	30	0.01	0.01	0.12	0.03	0.06	0.13
10	*E. macarthurii*	47	46	1	4	15	0.02	0.02	0.12	0.02	0.05	0.07
10	*E. nitens*	12	118	2	3	29	0.01	0.02	0.08	0.03	0.06	0.08
10	*E. nitens*	23	222	2	3	31	0.01	0.01	0.10	0.01	0.04	0.09
10	*E. nitens*	46	183	1	6	20	0.01	0.01	0.12	0.03	0.06	0.09
10	*E. saligna*	1	68	2	5	23	0.01	0.01	0.14	0.02	0.05	0.05
10	*E. saligna*	29	136	2	3	23	0.01	0.01	0.14	0.03	0.04	0.06
10	*E. saligna*	40	23	1	6	32	0.01	0.00	0.20	0.03	0.05	0.08
10	*E. smithii*	20	58	1	3	50	0.01	0.00	0.12	0.04	0.03	0.07
10	*E. smithii*	28	170	2	7	33	0.01	0.00	0.10	0.03	0.03	0.06
10	*E. smithii*	36	127	1	8	30	0.01	0.00	0.14	0.02	0.04	0.05
10	*E. viminalis*	22	38	2	4	34	0.03	0.00	0.10	0.01	0.07	0.10
10	*E. viminalis*	27	107	2	3	27	0.02	0.00	0.08	0.05	0.06	0.09
10	*E. viminalis*	33	239	1	3	23	0.03	0.00	0.12	0.03	0.06	0.13
11	*E. deanei*	5	30	1	3	8	0.01	0.01	0.14	0.02	0.05	0.09
11	*E. deanei*	13	17	1	3	6	0.02	0.01	0.14	0.01	0.07	0.13
11	*E. deanei*	37	31	3	6	11	0.02	0.01	0.26	0.02	0.07	0.13
11	*E. dunnii*	7	23	1	7	15	0.02	0.00	0.22	0.05	0.05	0.07
11	*E. dunnii*	20	23	1	3	31	0.02	0.01	0.22	0.06	0.07	0.08
11	*E. dunnii*	32	17	2	3	14	0.01	0.00	0.22	0.09	0.05	0.06
11	*E. elata*	1	91	1	5	6	0.01	0.00	0.12	0.03	0.04	0.10
11	*E. elata*	15	74	1	5	5	0.01	0.00	0.14	0.02	0.04	0.08

Appendix A3.6. Nutrient concentration of bole wood per trial, species and plot													
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)						
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
11	*E. elata*	38	18	2	7	3	0.01	0.01	0.12	0.03	0.05	0.08
11	*E. fastigata*	17	53	2	9	4	0.01	0.00	0.12	0.02	0.04	0.12
11	*E. fastigata*	24	22	1	3	19	0.01	0.01	0.26	0.03	0.05	0.09
11	*E. fastigata*	36	54	2	5	15	0.02	0.01	0.18	0.03	0.04	0.09
11	*E. grandis*	11	16	1	3	15	0.02	0.01	0.24	0.03	0.05	0.08
11	*E. grandis*	22	2	2	5	31	0.02	0.01	0.28	0.03	0.05	0.09
11	*E. grandis*	42	16	2	3	0	0.02	0.01	0.20	0.03	0.06	0.11
11	*E. macarthurii*	3	57	1	7	19	0.03	0.02	0.14	0.02	0.07	0.10
11	*E. macarthurii*	8	36	1	5	6	0.03	0.00	0.12	0.02	0.06	0.09
11	*E. macarthurii*	31	43	1	9	25	0.03	0.01	0.16	0.03	0.06	0.09
11	*E. nitens*	4	189	2	2	11	0.02	0.02	0.14	0.03	0.06	0.07
11	*E. nitens*	18	44	2	5	17	0.01	0.02	0.18	0.03	0.04	0.09
11	*E. nitens*	34	31	2	5	12	0.02	0.01	0.18	0.03	0.06	0.09
11	*E. saligna*	14	54	1	4	5	0.01	0.01	0.16	0.03	0.04	0.08
11	*E. saligna*	23	36	2	3	11	0.01	0.01	0.18	0.02	0.05	0.08
11	*E. saligna*	39	18	2	4	0	0.01	0.00	0.24	0.02	0.05	0.08
11	*E. smithii*	2	17	1	5	16	0.01	0.01	0.18	0.02	0.04	0.08
11	*E. smithii*	10	42	1	7	13	0.01	0.01	0.14	0.02	0.06	0.06
11	*E. smithii*	41	114	3	1	4	0.01	0.01	0.16	0.03	0.03	0.07
11	*E. viminalis*	16	22	1	7	7	0.03	0.01	0.18	0.02	0.06	0.07
11	*E. viminalis*	21	25	2	4	23	0.04	0.01	0.18	0.03	0.05	0.08
11	*E. viminalis*	35	25	2	3	39	0.04	0.01	0.18	0.05	0.05	0.10
12	*E. deanei*	2	65	2	5	14	0.02	0.01	0.12	0.03	0.10	0.10
12	*E. deanei*	14	51	1	3	33	0.01	0.01	0.08	0.03	0.18	0.11
12	*E. deanei*	28	19	0	2	39	0.01	0.01	0.08	0.03	0.18	0.07
12	*E. dunnii*	13	15	0	3	44	0.01	0.01	0.10	0.11	0.21	0.08
12	*E. dunnii*	19	91	2	3	23	0.01	0.01	0.40	0.10	0.07	0.09
12	*E. dunnii*	27	129	2	1	32	0.01	0.01	0.20	0.08	0.18	0.06
12	*E. elata*	15	38	1	2	37	0.01	0.01	0.06	0.02	0.30	0.08
12	*E. elata*	23	33	3	2	31	0.01	0.01	0.06	0.02	0.15	0.08
12	*E. elata*	43	28	0	2	25	0.01	0.01	0.06	0.03	0.16	0.10
12	*E. fastigata*	7	17	1	3	5	0.01	0.00	0.14	0.03	0.05	0.07
12	*E. fastigata*	22	50	0	2	42	0.01	0.01	0.08	0.03	0.17	0.10
12	*E. fastigata*	45	65	0	3	35	0.01	0.01	0.06	0.02	0.17	0.06
12	*E. grandis*	1	17	2	4	0	0.01	0.00	0.16	0.02	0.05	0.07
12	*E. grandis*	9	31	1	4	43	0.01	0.01	0.14	0.00	0.16	0.07
12	*E. grandis*	29	8	0	2	23	0.01	0.01	0.10	0.03	0.18	0.07
12	*E. macarthurii*	3	71	2	3	27	0.02	0.00	0.10	0.04	0.07	0.10

Appendix A3.6. Nutrient concentration of bole wood per trial, species and plot													
Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)						
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
12	*E. macarthurii*	16	12	0	2	35	0.02	0.02	0.08	0.03	0.16	0.10
12	*E. macarthurii*	30	80	3	3	84	0.03	0.02	0.14	0.03	0.19	0.10
12	*E. nitens*	6	67	2	2	2	0.01	0.00	0.08	0.02	0.05	0.08
12	*E. nitens*	18	35	0	2	39	0.01	0.01	0.08	0.02	0.17	0.07
12	*E. nitens*	47	56	1	2	27	0.01	0.03	0.08	0.01	0.24	0.11
12	*E. saligna*	10	17	0	2	31	0.01	0.02	0.12	0.02	0.17	0.05
12	*E. saligna*	21	13	0	1	29	0.01	0.01	0.14	0.02	0.18	0.08
12	*E. saligna*	26	13	0	2	31	0.01	0.01	0.10	0.01	0.18	0.08
12	*E. smithii*	4	12	2	3	7	0.01	0.00	0.08	0.02	0.04	0.07
12	*E. smithii*	8	156	1	4	76	0.01	0.00	0.12	0.04	0.15	0.06
12	*E. smithii*	48	27	1	2	36	0.00	0.03	0.10	0.00	0.23	0.07
12	*E. viminalis*	5	12	2	3	22	0.01	0.00	0.12	0.04	0.06	0.05
12	*E. viminalis*	11	64	1	4	89	0.02	0.03	0.12	0.04	0.18	0.08
12	*E. viminalis*	46	164	1	2	43	0.01	0.04	0.08	0.00	0.27	0.10
13	*E. deanei*	7	11	1	3	13	0.02	0.01	0.12	0.00	0.27	0.10
13	*E. deanei*	38	7	1	3	11	0.01	0.02	0.34	0.02	0.10	0.09
13	*E. deanei*	44	30	1	6	27	0.02	0.02	0.14	0.06	0.22	0.10
13	*E. dunnii*	21	8	0	2	17	0.03	0.00	0.26	0.07	0.24	0.09
13	*E. dunnii*	39	13	1	3	35	0.02	0.00	0.14	0.08	0.21	0.07
13	*E. dunnii*	48	7	1	3	24	0.02	0.01	0.40	0.09	0.10	0.04
13	*E. elata*	3	33	1	3	18	0.01	0.03	0.10	0.01	0.20	0.08
13	*E. elata*	30	15	0	4	0	0.01	0.00	0.10	0.01	0.18	0.10
13	*E. elata*	33	18	1	3	8	0.04	0.00	0.12	0.01	0.20	0.10
13	*E. fastigata*	9	8	1	3	0	0.01	0.01	0.08	0.00	0.21	0.10
13	*E. fastigata*	31	31	1	3	0	0.02	0.00	0.12	0.04	0.18	0.16
13	*E. fastigata*	43	25	1	6	13	0.03	0.00	0.10	0.06	0.20	0.10
13	*E. grandis*	4	16	1	3	18	0.02	0.03	0.30	0.02	0.27	0.09
13	*E. grandis*	13	7	1	7	5	0.03	0.00	0.24	0.04	0.22	0.07
13	*E. grandis*	41	20	1	5	27	0.02	0.02	0.24	0.01	0.17	0.09
13	*E. macarthurii*	17	24	1	8	34	0.07	0.02	0.14	0.04	0.24	0.11
13	*E. macarthurii*	19	16	1	11	23	0.06	0.01	0.12	0.02	0.25	0.14
13	*E. macarthurii*	37	18	1	3	74	0.09	0.00	0.16	0.02	0.19	0.15
13	*E. nitens*	1	17	1	5	43	0.02	0.03	0.12	0.03	0.24	0.08
13	*E. nitens*	10	225	0	8	4	0.04	0.00	0.12	0.03	0.22	0.10
13	*E. nitens*	32	15	1	10	6	0.07	0.00	0.12	0.02	0.19	0.09
13	*E. saligna*	14	5	0	3	0	0.02	0.00	0.14	0.01	0.19	0.06
13	*E. saligna*	29	10	1	4	2	0.02	0.00	0.22	0.00	0.22	0.06
13	*E. saligna*	35	18	1	4	0	0.02	0.00	0.18	0.03	0.17	0.09

Appendix A3.6. Nutrient concentration of bole wood per trial, species and plot

Trial	Species	Plot	Micronutrient (mg/kg)				Macronutrient (%)					
			Fe	*Cu*	*Zn*	*Mn*	*P*	*Na*	*Ca*	*Mg*	*K*	*N*
13	*E. smithii*	8	124	0	4	14	0.02	0.01	0.14	0.00	0.22	0.07
13	*E. smithii*	42	5	1	6	54	0.02	0.01	0.14	0.06	0.17	0.04
13	*E. smithii*	45	15	1	4	41	0.03	0.01	0.14	0.05	0.17	0.07
13	*E. viminalis*	11	5	0	7	12	0.06	0.00	0.14	0.06	0.22	0.07
13	*E. viminalis*	34	12	1	3	0	0.10	0.01	0.14	0.05	0.19	0.10
13	*E. viminalis*	46	9	1	5	49	0.09	0.01	0.18	0.07	0.20	0.10
14	*E. deanei*	2	7	1	4	16	0.01	0.01	0.06	0.04	0.17	0.09
14	*E. deanei*	14	20	1	6	5	0.02	0.00	0.04	0.02	0.21	0.13
14	*E. deanei*	35	19	1	3	50	0.01	0.01	0.10	0.01	0.08	0.10
14	*E. dunnii*	4	9	1	4	19	0.01	0.00	0.06	0.07	0.20	0.06
14	*E. dunnii*	24	18	1	3	56	0.01	0.01	0.16	0.06	0.07	0.07
14	*E. dunnii*	32	26	1	2	60	0.01	0.01	0.12	0.06	0.07	0.12
14	*E. elata*	3	39	1	2	31	0.01	0.01	0.08	0.00	0.04	0.10
14	*E. elata*	17	11	3	7	11	0.01	0.00	0.06	0.05	0.16	0.09
14	*E. elata*	36	26	1	4	49	0.00	0.01	0.08	0.00	0.03	0.13
14	*E. fastigata*	8	12	1	4	4	0.02	0.00	0.04	0.05	0.16	0.11
14	*E. fastigata*	15	35	1	6	0	0.01	0.00	0.04	0.05	0.16	0.13
14	*E. fastigata*	26	25	1	2	34	0.01	0.01	0.06	0.01	0.04	0.07
14	*E. grandis*	9	92	1	6	4	0.01	0.01	0.06	0.00	0.19	0.10
14	*E. grandis*	23	85	2	5	42	0.00	0.02	0.08	0.02	0.08	0.09
14	*E. grandis*	27	8	1	2	44	0.00	0.02	0.08	0.02	0.06	0.08
14	*E. macarthurii*	12	8	1	6	32	0.01	0.01	0.06	0.03	0.19	0.08
14	*E. macarthurii*	13	63	1	6	2	0.01	0.01	0.06	0.02	0.20	0.10
14	*E. macarthurii*	30	15	1	3	53	0.01	0.03	0.06	0.00	0.05	0.09
14	*E. nitens*	1	41	1	5	31	0.01	0.03	0.06	0.05	0.18	0.09
14	*E. nitens*	19	18	1	4	0	0.01	0.00	0.06	0.05	0.17	0.09
14	*E. nitens*	34	20	1	3	58	0.01	0.01	0.10	0.02	0.07	0.09
14	*E. saligna*	7	10	1	7	28	0.01	0.03	0.06	0.05	0.17	0.08
14	*E. saligna*	18	13	1	4	12	0.01	0.01	0.06	0.06	0.19	0.10
14	*E. saligna*	25	41	1	6	47	0.00	0.01	0.12	0.02	0.06	0.06
14	*E. smithii*	5	9	1	4	27	0.00	0.00	0.06	0.04	0.18	0.06
14	*E. smithii*	16	35	1	5	12	0.01	0.00	0.06	0.07	0.16	0.07
14	*E. smithii*	31	18	1	3	66	0.00	0.01	0.10	0.00	0.05	0.08
14	*E. viminalis*	10	11	1	9	20	0.01	0.00	0.06	0.03	0.18	0.09
14	*E. viminalis*	22	11	2	3	55	0.02	0.01	0.08	0.03	0.06	0.09
14	*E. viminalis*	29	15	2	4	56	0.01	0.01	0.08	0.02	0.06	0.10

APPENDIX B1.1. TOPSOIL CLAY PERCENTAGE: ANALYSIS OF VARIANCE

Variate: Clay %

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	4176.09	1044.02		
LOC.REP.SPECIES stratum					
SPECIES	9	65.49	7.28	0.43	0.915
SPECIES.TRIAL	36	587.11	16.31	0.97	0.527
Residual	100	1682.00	16.82		
Total	149	6510.69			

APPENDIX B1.2. TOPSOIL SILT PERCENTAGE: ANALYSIS OF VARIANCE

Variate: Silt %

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	749.507	187.377		
LOC.REP.SPECIES stratum					
SPECIES	9	26.940	2.993	1.36	0.214
SPECIES.TRIAL	36	64.493	1.791	0.82	0.751
Residual	100	219.333	2.193		
Total	149	1060.273			

APPENDIX B1.3. TOPSOIL SAND PERCENTAGE: ANALYSIS OF VARIANCE

Variate: Sand %

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1898.84	474.71		
LOC.REP.SPECIES stratum					
SPECIES	9	28.54	3.17	0.16	0.998
SPECIES.TRIAL	36	730.76	20.30	1.00	0.486
Residual	100	2034.00	20.34		
Total	149	4692.14			

APPENDIX B1.4. TOPSOIL PH (KCL): ANALYSIS OF VARIANCE

Variate: pH

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	11.64867	2.91217		
LOC.REP.SPECIES stratum					
SPECIES	9	0.14400	0.01600	1.19	0.307
SPECIES.TRIAL	36	0.54067	0.01502	1.12	0.323
Residual	100	1.34000	0.01340		
Total	149	13.67333			

APPENDIX B1.5. TOPSOIL EXCHANGEABLE CA: ANALYSIS OF VARIANCE

Variate: Ca (cmol(+)/kg soil)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	691.5558	172.8890		
LOC.REP.SPECIES stratum					
SPECIES	9	3.4550	0.3839	0.41	0.929
SPECIES.TRIAL	36	16.1312	0.4481	0.48	0.993
Residual	100	94.2460	0.9425		
Total	149	805.3879			

APPENDIX B1.6. TOPSOIL EXCHANGEABLE MG: ANALYSIS OF VARIANCE

Variate: Mg (cmol(+)/kg soil)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	347.0600	86.7650		
LOC.REP.SPECIES stratum					
SPECIES	9	1.6707	0.1856	0.68	0.723
SPECIES.TRIAL	36	6.5286	0.1813	0.67	0.916
Residual	100	27.1970	0.2720		
Total	149	382.4562			

APPENDIX B1.7. TOPSOIL EXCHANGEABLE K: ANALYSIS OF VARIANCE

Variate: K (cmol(+)/kg soil)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.43976	0.10994		
LOC.REP.SPECIES stratum					
SPECIES	9	0.28109	0.03123	0.65	0.751
SPECIES.TRIAL	36	1.28850	0.03579	0.75	0.839
Residual	100	4.79540	0.04795		
Total	149	6.80474			

APPENDIX B1.8. TOPSOIL EXCHANGEABLE NA: ANALYSIS OF VARIANCE

Variate: Na (cmol(+)/kg soil)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.13851	0.03463		
LOC.REP.SPECIES stratum					
SPECIES	9	0.08222	0.00914	0.76	0.657
SPECIES.TRIAL	36	0.38796	0.01078	0.89	0.643
Residual	100	1.20833	0.01208		
Total	149	1.81702			

Appendix B1.9. Topsoil Bray 2 P: Analysis of variance

Variate: P (mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	238.7297	59.6824		
LOC.REP.SPECIES stratum					
SPECIES	9	11.6868	1.2985	1.31	0.243
SPECIES.TRIAL	36	22.5756	0.6271	0.63	0.941
Residual	100	99.4387	0.9944		
Total	149	372.4308			

Appendix B1.10. Topsoil S-value: Analysis of variance

Variate: S-value (cmol(+)/kg soil)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	2077.882	519.471		
LOC.REP.SPECIES stratum					
SPECIES	9	9.962	1.107	0.52	0.856
SPECIES.TRIAL	36	38.221	1.062	0.50	0.990
Residual	100	212.445	2.124		
Total	149	2338.511			

Appendix B1.11. Topsoil S-value (clay): Analysis of variance

Variate: S-value:cl (cmol(+)/kg clay)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	19500.34	4875.08		
LOC.REP.SPECIES stratum					
SPECIES	9	48.70	5.41	0.36	0.949
SPECIES.TRIAL	36	224.34	6.23	0.42	0.998
Residual	100	1483.97	14.84		
Total	149	21257.35			

Appendix B1.12. Topsoil Organic carbon: Analysis of variance

Variate: OC%

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	20.08961	5.02240		
LOC.REP.SPECIES stratum					
SPECIES	9	0.74365	0.08263	0.96	0.474
SPECIES.TRIAL	36	2.97068	0.08252	0.96	0.538
Residual	100	8.57180	0.08572		
Total	149	32.37574			

APPENDIX B1.13. TOPSOIL EXCHANGEABLE ACIDITY: ANALYSIS OF VARIANCE

Variate: EA (cmol(+)/kg soil)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	63.5260	15.8815		
LOC.REP.SPECIES stratum					
SPECIES	9	1.1968	0.1330	1.30	0.249
SPECIES.TRIAL	36	1.7466	0.0485	0.47	0.994
Residual	100	10.2607	0.1026		
Total	149	76.7302			

Appendix B2.1. Total tree height: Analysis of variance

Variate: Height (m)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1426.646	356.661		
LOC.REP.SPECIES stratum					
SPECIES	9	212.296	23.586	8.28	<.001
SPECIES.TRIAL	36	210.306	5.842	2.05	0.003
Residual	100	284.832	2.848		
Total	149	2134.080			

Appendix B2.2. 5cm top diameter tree height: Analysis of variance

Variate: Height-5 (m)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1565.262	391.316		
LOC.REP.SPECIES stratum					
SPECIES	9	228.450	25.383	7.57	<.001
SPECIES.TRIAL	36	280.683	7.797	2.32	<.001
Residual	100	335.453	3.355		
Total	149	2409.848			

Appendix B2.3. Tree Dbh: Analysis of variance

Variate: Dbh (cm)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	825.906	206.477		
LOC.REP.SPECIES stratum					
SPECIES	9	72.490	8.054	2.32	0.020
SPECIES.TRIAL	36	340.720	9.464	2.73	<.001
Residual	100	347.173	3.472		
Total	149	1586.290			

Appendix B2.4. Mean plot tree Dbh: Analysis of variance

Variate: M-Dbh (cm)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	717.947	179.487		
LOC.REP.SPECIES stratum					
SPECIES	9	33.480	3.720	1.31	0.239
SPECIES.TRIAL	36	250.225	6.951	2.46	<.001
Residual	100	282.909	2.829		
Total	149	1284.560			

APPENDIX B2.5. TREE VOLUME (UB): ANALYSIS OF VARIANCE

Variate: Volume per tree (dm^3)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	673401.	168350.		
LOC.REP.SPECIES stratum					
SPECIES	9	78162.	8685.	2.49	0.013
SPECIES.TRIAL	36	236079.	6558.	1.88	0.007
Residual	100	348590.	3486.		
Total	149	1336232.			

APPENDIX B2.6. STOCKING: ANALYSIS OF VARIANCE

Variate: Stocking (N/ha)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	509851.	127463.		
LOC.REP.SPECIES stratum					
SPECIES	9	3406769.	378530.	6.96	<.001
SPECIES.TRIAL	36	3376893.	93803.	1.72	0.018
Residual	100	5441525.	54415.		
Total	149	12735039.			

APPENDIX B3.1. LEAF DRY MASS (KG/TREE): ANALYSIS OF VARIANCE

Variate: Leaf

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	128.288	32.072		
LOC.REP.SPECIES stratum					
SPECIES	9	184.268	20.474	3.32	0.001
SPECIES.TRIAL	36	382.375	10.622	1.72	0.018
Residual	100	616.939	6.169		
Total	149	1311.871			

APPENDIX B3.2. BRANCH DRY MASS (KG/TREE): ANALYSIS OF VARIANCE

Variate: Branch

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	478.80	119.70		
LOC.REP.SPECIES stratum					
SPECIES	9	1072.70	119.19	6.03	<.001
SPECIES.TRIAL	36	1647.14	45.75	2.31	<.001
Residual	100	1977.66	19.78		
Total	149	5176.31			

APPENDIX B3.3. DEAD MATTER DRY MASS (KG/TREE): ANALYSIS OF VARIANCE

Variate: Dead matter

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	151.233	37.808		
LOC.REP.SPECIES stratum					
SPECIES	9	452.543	50.283	13.41	<.001
SPECIES.TRIAL	36	390.448	10.846	2.89	<.001
Residual	100	375.075	3.751		
Total	149	1369.299			

APPENDIX B3.4. BARK DRY MASS (KG/TREE): ANALYSIS OF VARIANCE

Variate: Bark

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1415.716	353.929		
LOC.REP.SPECIES stratum					
SPECIES	9	626.627	69.625	9.04	<.001
SPECIES.TRIAL	36	805.878	22.386	2.91	<.001
Residual	100	770.510	7.705		
Total	149	3618.731			

APPENDIX B3.5. BOLE WOOD DRY MASS (KG/TREE): ANALYSIS OF VARIANCE

Variate: Bole wood

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	168279.2	42069.8		
LOC.REP.SPECIES stratum					
SPECIES	9	30183.2	3353.7	3.76	<.001
SPECIES.TRIAL	36	67209.6	1866.9	2.09	0.002
Residual	100	89118.7	891.2		
Total	149	354790.7			

APPENDIX B3.6. TOTAL ABOVE-GROUND DRY MASS (KG/TREE): ANALYSIS OF VARIANCE

Variate: Total biomass

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	233652.	58413.		
LOC.REP.SPECIES stratum					
SPECIES	9	47904.	5323.	3.74	<.001
SPECIES.TRIAL	36	116958.	3249.	2.28	<.001
Residual	100	142365.	1424.		
Total	149	540878.			

APPENDIX B4.1. LEAF MOISTURE CONTENT (%): ANALYSIS OF VARIANCE

Variate: Leaf moisture

Source of variation	d.f.(m.v.)	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	864.196	216.049		
LOC.REP.SPECIES stratum					
SPECIES	9	1152.650	128.072	19.84	<.001
SPECIES.TRIAL	36	475.413	13.206	2.05	0.003
Residual	95(5)	613.401	6.457		
Total	144(5)	2939.428			

APPENDIX B4.2. BRANCH MOISTURE CONTENT (%): ANALYSIS OF VARIANCE

Variate: Branch moisture

Source of variation	d.f.(m.v.)	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	240.471	60.118		
LOC.REP.SPECIES stratum					
SPECIES	9	687.173	76.353	11.10	<.001
SPECIES.TRIAL	36	359.189	9.977	1.45	0.079
Residual	95(5)	653.579	6.880		
Total	144(5)	1897.708			

APPENDIX B4.3. DEAD MATTER MOISTURE CONTENT (%): ANALYSIS OF VARIANCE

Variate: Dead matter moisture

Source of variation	d.f.(m.v.)	s.s.	m.s.	v.r.	F pr.
LCC stratum					
TRIAL	4	1655.28	413.82		
LOC.REP.SPECIES stratum					
SPECIES	9	136.88	15.21	0.75	0.659
SPECIES.TRIAL	36	857.52	23.82	1.18	0.259
Residual	95(5)	1915.94	20.17		
Total	144(5)	4414.40			

APPENDIX B4.4. BARK MOISTURE CONTENT (%): ANALYSIS OF VARIANCE

Variate: Bark moisture

Source of variation	d.f.(m.v.)	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	298.244	74.561		
LOC.REP.SPECIES stratum					
SPECIES	9	1095.141	121.682	30.76	<.001
SPECIES.TRIAL	36	236.224	6.562	1.66	0.027
Residual	95(5)	375.804	3.956		
Total	144(5)	1970.488			

APPENDIX B4.5. BOLE WOOD MOISTURE CONTENT (%): ANALYSIS OF VARIANCE

Variate: Bole wood moisture

Source of variation	d.f.(m.v.)	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	139.411	34.853		
LOC.REP.SPECIES stratum					
SPECIES	9	409.192	45.466	6.81	<.001
SPECIES.TRIAL	36	332.534	9.237	1.38	0.108
Residual	95(5)	634.369	6.678		
Total	144(5)	1507.579			

APPENDIX B4.6. TOTAL ABOVE-GROUND BIOMASS MOISTURE CONTENT (%): ANALYSIS OF VARIANCE

Variate: Total biomass moisture

Source of variation	d.f.(m.v.)	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	147.431	36.858		
LOC.REP.SPECIES stratum					
SPECIES	9	383.941	42.660	10.12	<.001
SPECIES.TRIAL	36	236.076	6.558	1.56	0.046
Residual	95(5)	400.350	4.214		
Total	144(5)	1146.346			

APPENDIX B5. BOLE WOOD SPECIFIC GRAVITY PER DISC: ANALYSIS OF VARIANCE

Variate: Specific gravity (kg/dm^3)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.1868749	0.0467187		
LOC.REP.SPECIES stratum					
SPECIES	9	0.8969820	0.0996647	27.87	<.001
SPECIES.TRIAL	36	0.1970289	0.0054730	1.53	0.051
Residual	100	0.3576481	0.0035765	9.59	
LOC.REP.SPECIES.SECTION stratum					
SECTION	3	0.0003857	0.0001286	0.34	0.793
SPECIES.SECTION	27	0.0275494	0.0010203	2.73	<.001
SECTION.TRIAL	12	0.0300948	0.0025079	6.72	<.001
SPECIES.SECTION.TRIAL	108	0.0566925	0.0005249	1.41	0.013
Residual	300	0.1119318	0.0003731		
Total	599	1.8651881			

***** Tables of means *****

Variate: Specific gravity (kg/dm^3)

Grand mean 0.5221

SPECIES	dea	dun	ela	fas	gra	mac	nit
	0.5181	0.5363	0.4994	0.5198	0.4504	0.5462	0.5336

SPECIES	sal	smi	vim
	0.4696	0.5848	0.5630

SECTION	1	2	3	4
	0.5220	0.5211	0.5220	0.5234

TRIAL	10	11	12	13	14
	0.5422	0.5291	0.5080	0.4954	0.5359

SPECIES	SECTION 1	2	3	4
dea	0.5216	0.5205	0.5206	0.5100
dun	0.5342	0.5401	0.5323	0.5385
ela	0.5009	0.5102	0.4961	0.4906
fas	0.5220	0.5179	0.5169	0.5222
gra	0.4490	0.4356	0.4485	0.4684
mac	0.5553	0.5505	0.5418	0.5373
nit	0.5247	0.5191	0.5422	0.5482
sal	0.4686	0.4691	0.4709	0.4700
smi	0.5757	0.5842	0.5896	0.5898
vim	0.5677	0.5642	0.5610	0.5589

SPECIES	TRIAL 10	11	12	13	14
dea	0.5503	0.5122	0.5079	0.4846	0.5357
dun	0.5323	0.5461	0.5312	0.4983	0.5735
ela	0.5050	0.4673	0.5104	0.4730	0.5416
fas	0.5354	0.5386	0.4718	0.5072	0.5459
gra	0.4649	0.4683	0.4340	0.4220	0.4626
mac	0.5743	0.5553	0.5483	0.4938	0.5596
nit	0.5656	0.5359	0.5304	0.5242	0.5116
sal	0.5128	0.4999	0.4247	0.4669	0.4440
smi	0.6175	0.5759	0.5723	0.5723	0.5860
vim	0.5642	0.5912	0.5493	0.5114	0.5988

SECTION	TRIAL	10	11	12	13	14
1		0.5403	0.5345	0.5033	0.5029	0.5289
2		0.5389	0.5330	0.5037	0.5040	0.5260
3		0.5438	0.5226	0.5164	0.4922	0.5350
4		0.5458	0.5262	0.5087	0.4824	0.5538

SPECIES	SECTION	TRIAL	10	11	12	13	14
dea	1		0.5580	0.5158	0.5125	0.4928	0.5286
	2		0.5604	0.5221	0.5111	0.4800	0.5288
	3		0.5484	0.5044	0.5168	0.4835	0.5496
	4		0.5344	0.5065	0.4912	0.4821	0.5357
dun	1		0.5221	0.5490	0.5168	0.5083	0.5747
	2		0.5332	0.5610	0.5158	0.5189	0.5718
	3		0.5433	0.5464	0.5434	0.4837	0.5446
	4		0.5306	0.5280	0.5489	0.4823	0.6027
ela	1		0.5016	0.4786	0.5104	0.4785	0.5353
	2		0.5184	0.4819	0.5253	0.4868	0.5386
	3		0.5082	0.4591	0.5032	0.4684	0.5415
	4		0.4917	0.4493	0.5025	0.4583	0.5510
fas	1		0.5375	0.5415	0.4799	0.5098	0.5415
	2		0.5365	0.5333	0.4713	0.5086	0.5399
	3		0.5370	0.5339	0.4640	0.5029	0.5469
	4		0.5304	0.5457	0.4719	0.5077	0.5552
gra	1		0.4555	0.4780	0.4306	0.4249	0.4558
	2		0.4359	0.4536	0.4347	0.4200	0.4337
	3		0.4667	0.4544	0.4552	0.4267	0.4397
	4		0.5013	0.4872	0.4157	0.4163	0.5214
mac	1		0.5796	0.5679	0.5414	0.5123	0.5755
	2		0.5867	0.5731	0.5417	0.4947	0.5564
	3		0.5614	0.5354	0.5536	0.4929	0.5657
	4		0.5695	0.5447	0.5563	0.4754	0.5407
nit	1		0.5508	0.5298	0.5157	0.5206	0.5069
	2		0.5452	0.5411	0.5109	0.5308	0.4676
	3		0.5839	0.5261	0.5480	0.5325	0.5205
	4		0.5825	0.5467	0.5471	0.5130	0.5516
sal	1		0.5161	0.5222	0.4206	0.4789	0.4051
	2		0.4878	0.5150	0.4026	0.4872	0.4529
	3		0.5177	0.4915	0.4422	0.4565	0.4468
	4		0.5295	0.4706	0.4334	0.4451	0.4711
smi	1		0.6044	0.5696	0.5612	0.5797	0.5634
	2		0.6124	0.5718	0.5762	0.5854	0.5752
	3		0.6233	0.5790	0.5764	0.5755	0.5938
	4		0.6300	0.5831	0.5755	0.5486	0.6117
vim	1		0.5777	0.5921	0.5437	0.5231	0.6020
	2		0.5727	0.5774	0.5478	0.5281	0.5952
	3		0.5482	0.5953	0.5609	0.4994	0.6011
	4		0.5584	0.5999	0.5446	0.4949	0.5969

APPENDIX B6.1. SELECT FOLIAR FE CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Fe (mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	108219.7	27054.9		
LOC.REP.SPECIES stratum					
SPECIES	9	39636.1	4404.0	5.87	<.001
SPECIES.TRIAL	36	43027.2	1195.2	1.59	0.037
Residual	100	75054.0	750.5		
Total	149	265937.1			

APPENDIX B6.2. SELECT FOLIAR CU CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Cu (mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	24.093	6.023		
LOC.REP.SPECIES stratum					
SPECIES	9	177.493	19.721	4.39	<.001
SPECIES.TRIAL	36	205.373	5.705	1.27	0.178
Residual	100	449.333	4.493		
Total	149	856.293			

APPENDIX B6.3. SELECT FOLIAR ZN CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Zn (mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	296.16	74.04		
LOC.REP.SPECIES stratum					
SPECIES	9	849.13	94.35	4.01	<.001
SPECIES.TRIAL	36	908.37	25.23	1.07	0.384
Residual	100	2355.33	23.55		
Total	149	4408.99			

APPENDIX B6.4. SELECT FOLIAR MN CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Mn (mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	229858.	57464.		
LOC.REP.SPECIES stratum					
SPECIES	9	2390499.	265611.	7.53	<.001
SPECIES.TRIAL	36	1183666.	32880.	0.93	0.583
Residual	100	3527738.	35277.		
Total	149	7331761.			

APPENDIX B6.5. SELECT FOLIAR P CONCENTRATION: ANALYSIS OF VARIANCE

Variate: P(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0223000	0.0055750		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0154000	0.0017111	2.85	0.005
SPECIES.TRIAL	36	0.0306333	0.0008509	1.42	0.090
Residual	100	0.0600667	0.0006007		
Total	149	0.1284000			

APPENDIX B6.6. SELECT FOLIAR NA CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Na(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.032033	0.008008		
LOC.REP.SPECIES stratum					
SPECIES	9	0.304600	0.033844	14.16	<.001
SPECIES.TRIAL	36	0.104500	0.002903	1.21	0.224
Residual	100	0.239000	0.002390		
Total	149	0.680133			

APPENDIX B6.7. SELECT FOLIAR CA CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Ca(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	2.73402	0.68350		
LOC.REP.SPECIES stratum					
SPECIES	9	2.83042	0.31449	10.94	<.001
SPECIES.TRIAL	36	1.14997	0.03194	1.11	0.334
Residual	100	2.87413	0.02874		
Total	149	9.58854			

APPENDIX B6.8. SELECT FOLIAR MG CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Mg(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.123703	0.030926		
LOC.REP.SPECIES stratum					
SPECIES	9	0.610593	0.067844	12.30	<.001
SPECIES.TRIAL	36	0.234391	0.006511	1.18	0.257
Residual	100	0.551400	0.005514		
Total	149	1.520086			

Appendix B6.9. Select foliar K concentration: Analysis of variance

Variate: K(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1.82162	0.45540		
LOC.REP.SPECIES stratum					
SPECIES	9	0.74503	0.08278	5.09	<.001
SPECIES.TRIAL	36	1.03076	0.02863	1.76	0.015
Residual	100	1.62573	0.01626		
Total	149	5.22314			

APPENDIX B6.10. SELECT FOLIAR N CONCENTRATION: ANALYSIS OF VARIANCE

Variate: N(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	2.5587	0.6397		
LOC.REP.SPECIES stratum					
SPECIES	9	4.5771	0.5086	4.93	<.001
SPECIES.TRIAL	36	3.2362	0.0899	0.87	0.674
Residual	100	10.3163	0.1032		
Total	149	20.6883			

APPENDIX B7.1.1. BULK FOLIAR FE CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Fe(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	261779.	65445.		
LOC.REP.SPECIES stratum					
SPECIES	9	55843.	6205.	2.45	0.015
SPECIES.TRIAL	36	369314.	10259.	4.05	<.001
Residual	100	253281.	2533.		
Total	149	940216.			

APPENDIX B7.1.2. BULK FOLIAR CU CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Cu(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	185.040	46.260		
LOC.REP.SPECIES stratum					
SPECIES	9	96.140	10.682	3.56	<.001
SPECIES.TRIAL	36	168.293	4.675	1.56	0.044
Residual	100	300.000	3.000		
Total	149	749.473			

APPENDIX B7.1.3. BULK FOLIAR ZN CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Zn(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	723.47	180.87		
LOC.REP.SPECIES stratum					
SPECIES	9	610.83	67.87	5.62	<.001
SPECIES.TRIAL	36	485.87	13.50	1.12	0.325
Residual	100	1206.67	12.07		
Total	149	3026.83			

APPENDIX B7.1.4. BULK FOLIAR MN CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Mn(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	493373.	123343.		
LOC.REP.SPECIES stratum					
SPECIES	9	2990601.	332289.	10.38	<.001
SPECIES.TRIAL	36	2857474.	79374.	2.48	<.001
Residual	100	3200312.	32003.		
Total	149	9541761.			

APPENDIX B7.1.5. BULK FOLIAR P CONCENTRATION: ANALYSIS OF VARIANCE

Variate: P(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0488707	0.0122177		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0232007	0.0025779	5.61	<.001
SPECIES.TRIAL	36	0.0191827	0.0005329	1.16	0.279
Residual	100	0.0459333	0.0004593		
Total	149	0.1371873			

APPENDIX B7.1.6. BULK FOLIAR NA CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Na(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0107827	0.0026957		
LOC.REP.SPECIES stratum					
SPECIES	9	0.2550727	0.0283414	42.22	<.001
SPECIES.TRIAL	36	0.0513373	0.0014260	2.12	0.002
Residual	100	0.0671333	0.0006713		
Total	149	0.3843260			

APPENDIX B7.1.7. BULK FOLIAR CA CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Ca(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	8.35862	2.08965		
LOC.REP.SPECIES stratum					
SPECIES	9	6.55100	0.72789	12.29	<.001
SPECIES.TRIAL	36	3.72398	0.10344	1.75	0.016
Residual	100	5.92240	0.05922		
Total	149	24.55600			

APPENDIX B7.1.8. BULK FOLIAR MG CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Mg(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.419057	0.104764		
LOC.REP.SPECIES stratum					
SPECIES	9	0.622304	0.069145	15.29	<.001
SPECIES.TRIAL	36	0.127969	0.003555	0.79	0.792
Residual	100	0.452267	0.004523		
Total	149	1.621597			

APPENDIX B7.1.9. BULK FOLIAR K CONCENTRATION: ANALYSIS OF VARIANCE

Variate: K(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.471956	0.117989		
LOC.REP.SPECIES stratum					
SPECIES	9	0.874163	0.097129	10.74	<.001
SPECIES.TRIAL	36	0.672164	0.018671	2.06	0.003
Residual	100	0.904533	0.009045		
Total	149	2.922816			

APPENDIX B7.1.10. BULK FOLIAR N CONCENTRATION: ANALYSIS OF VARIANCE

Variate: N(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.93358	0.23340		
LOC.REP.SPECIES stratum					
SPECIES	9	2.53839	0.28204	9.09	<.001
SPECIES.TRIAL	36	1.35100	0.03753	1.21	0.229
Residual	100	3.10193	0.03102		
Total	149	7.92491			

APPENDIX B7.2.1. BULK FOLIAR FE MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Fe(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	8.2152	2.0538		
LOC.REP.SPECIES stratum					
SPECIES	9	7.4782	0.8309	2.88	0.005
SPECIES.TRIAL	36	26.1099	0.7253	2.51	<.001
Residual	100	28.8653	0.2887		
Total	149	70.6687			

APPENDIX B7.2.2. BULK FOLIAR CU MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Cu(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0188011	0.0047003		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0072594	0.0008066	2.41	0.016
SPECIES.TRIAL	36	0.0216331	0.0006009	1.80	0.012
Residual	100	0.0334102	0.0003341		
Total	149	0.0811039			

APPENDIX B7.2.3. BULK FOLIAR ZN MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Zn(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.011812	0.002953		
LOC.REP.SPECIES stratum					
SPECIES	9	0.045667	0.005074	3.87	<.001
SPECIES.TRIAL	36	0.084502	0.002347	1.79	0.012
Residual	100	0.130996	0.001310		
Total	149	0.272977			

APPENDIX B7.2.4. BULK FOLIAR MN MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Mn(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	35.939	8.985		
LOC.REP.SPECIES stratum					
SPECIES	9	83.375	9.264	2.57	0.011
SPECIES.TRIAL	36	247.053	6.863	1.90	0.007
Residual	100	360.618	3.606		
Total	149	726.985			

APPENDIX B7.2.5. BULK FOLIAR P MASS PER TREE: ANALYSIS OF VARIANCE

Variate: P(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	151.527	37.882		
LOC.REP.SPECIES stratum					
SPECIES	9	137.365	15.263	2.01	0.046
SPECIES.TRIAL	36	437.501	12.153	1.60	0.036
Residual	100	760.391	7.604		
Total	149	1486.784			

APPENDIX B7.2.6. BULK FOLIAR NA MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Na(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	196.49	49.12		
LOC.REP.SPECIES stratum					
SPECIES	9	573.42	63.71	5.78	<.001
SPECIES.TRIAL	36	398.42	11.07	1.00	0.476
Residual	100	1101.57	11.02		
Total	149	2269.90			

APPENDIX B7.2.7. BULK FOLIAR CA MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Ca(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	25674.4	6418.6		
LOC.REP.SPECIES stratum					
SPECIES	9	20712.3	2301.4	4.30	<.001
SPECIES.TRIAL	36	33294.6	924.9	1.73	0.018
Residual	100	53577.6	535.8		
Total	149	133258.9			

APPENDIX B7.2.8. BULK FOLIAR MG MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Mg(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1853.29	463.32		
LOC.REP.SPECIES stratum					
SPECIES	9	906.59	100.73	2.57	0.011
SPECIES.TRIAL	36	2936.34	81.57	2.08	0.002
Residual	100	3923.44	39.23		
Total	149	9619.66			

APPENDIX B7.2.9. BULK FOLIAR K MASS PER TREE: ANALYSIS OF VARIANCE

Variate: K(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	12207.5	3051.9		
LOC.REP.SPECIES stratum					
SPECIES	9	9795.2	1088.4	2.64	0.009
SPECIES.TRIAL	36	23433.3	650.9	1.58	0.040
Residual	100	41211.4	412.1		
Total	149	86647.4			

APPENDIX B7.2.10. BULK FOLIAR N MASS PER TREE: ANALYSIS OF VARIANCE

Variate: N(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	55717.	13929.		
LOC.REP.SPECIES stratum					
SPECIES	9	41668.	4630.	2.61	0.010
SPECIES.TRIAL	36	107701.	2992.	1.68	0.023
Residual	100	177674.	1777.		
Total	149	382759.			

APPENDIX B8.1.1. BRANCH FE CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Fe(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	25815.2	6453.8		
LOC.REP.SPECIES stratum					
SPECIES	9	8087.5	898.6	1.60	0.124
SPECIES.TRIAL	36	16772.6	465.9	0.83	0.731
Residual	100	56025.3	560.3		
Total	149	106700.7			

APPENDIX B8.1.2. BRANCH CU CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Cu(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	786.027	196.507		
LOC.REP.SPECIES stratum					
SPECIES	9	162.960	18.107	5.50	<.001
SPECIES.TRIAL	36	162.773	4.521	1.37	0.111
Residual	100	329.333	3.293		
Total	149	1441.093			

APPENDIX B8.1.3. BRANCH ZN CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Zn(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	442.333	110.583		
LOC.REP.SPECIES stratum					
SPECIES	9	190.967	21.219	2.98	0.003
SPECIES.TRIAL	36	282.867	7.857	1.10	0.342
Residual	100	711.333	7.113		
Total	149	1627.500			

APPENDIX B8.1.4. BRANCH MN CONCENTRATION: ANALYSIS OF VARIANCE
Variate: Mn(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	279945.	69986.		
LOC.REP.SPECIES stratum					
SPECIES	9	434805.	48312.	4.40	<.001
SPECIES.TRIAL	36	615111.	17086.	1.56	0.045
Residual	100	1097275.	10973.		
Total	149	2427136.			

APPENDIX B8.1.5. BRANCH P CONCENTRATION: ANALYSIS OF VARIANCE

Variate: P(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0176373	0.0044093		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0020007	0.0002223	0.99	0.451
SPECIES.TRIAL	36	0.0086960	0.0002416	1.08	0.375
Residual	100	0.0224000	0.0002240		
Total	149	0.0507340			

APPENDIX B8.1.6. BRANCH NA CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Na(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0035267	0.0008817		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0077067	0.0008563	2.50	0.013
SPECIES.TRIAL	36	0.0113667	0.0003157	0.92	0.597
Residual	100	0.0342000	0.0003420		
Total	149	0.0568000			

APPENDIX B8.1.7. BRANCH CA CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Ca(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1.70018	0.42504		
LOC.REP.SPECIES stratum					
SPECIES	9	0.33239	0.03693	3.59	<.001
SPECIES.TRIAL	36	0.31578	0.00877	0.85	0.702
Residual	100	1.02953	0.01030		
Total	149	3.37788			

APPENDIX B8.1.8. BRANCH MG CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Mg(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.046144	0.011536		
LOC.REP.SPECIES stratum					
SPECIES	9	0.052277	0.005809	4.14	<.001
SPECIES.TRIAL	36	0.065416	0.001817	1.30	0.159
Residual	100	0.140267	0.001403		
Total	149	0.304104			

APPENDIX B8.1.9. BRANCH K CONCENTRATION: ANALYSIS OF VARIANCE

Variate: K(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.060589	0.015147		
LOC.REP.SPECIES stratum					
SPECIES	9	0.329696	0.036633	6.07	<.001
SPECIES.TRIAL	36	0.418384	0.011622	1.93	0.006
Residual	100	0.603600	0.006036		
Total	149	1.412269			

APPENDIX B8.1.10. BRANCH N CONCENTRATION: ANALYSIS OF VARIANCE

Variate: N(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.182287	0.045572		
LOC.REP.SPECIES stratum					
SPECIES	9	0.114600	0.012733	3.29	0.001
SPECIES.TRIAL	36	0.151847	0.004218	1.09	0.359
Residual	100	0.386467	0.003865		
Total	149	0.835200			

APPENDIX B8.2.1. BRANCH FE MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Fe(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	4.0674	1.0168		
LOC.REP.SPECIES stratum					
SPECIES	9	6.7559	0.7507	4.72	<.001
SPECIES.TRIAL	36	7.9437	0.2207	1.39	0.104
Residual	100	15.9122	0.1591		
Total	149	34.6793			

APPENDIX B8.2.2. BRANCH CU MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Cu(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.084082	0.021021		
LOC.REP.SPECIES stratum					
SPECIES	9	0.040440	0.004493	4.47	<.001
SPECIES.TRIAL	36	0.080325	0.002231	2.22	0.001
Residual	100	0.100492	0.001005		
Total	149	0.305339			

Appendix B8.2.3. Branch Zn mass per tree: Analysis of variance

Variate: Zn(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.026887	0.006722		
LOC.REP.SPECIES stratum					
SPECIES	9	0.106649	0.011850	5.30	<.001
SPECIES.TRIAL	36	0.143536	0.003987	1.78	0.013
Residual	100	0.223574	0.002236		
Total	149	0.500646			

Appendix B8.2.4. Branch Mn mass per tree: Analysis of variance

Variate: Mn(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	43.425	10.856		
LOC.REP.SPECIES stratum					
SPECIES	9	105.416	11.713	3.29	0.001
SPECIES.TRIAL	36	257.775	7.160	2.01	0.003
Residual	100	355.713	3.557		
Total	149	762.329			

Appendix B8.2.5. Branch P mass per tree: Analysis of variance

Variate: P(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	67.438	16.859		
LOC.REP.SPECIES stratum					
SPECIES	9	249.803	27.756	3.14	0.002
SPECIES.TRIAL	36	244.607	6.795	0.77	0.813
Residual	100	884.008	8.840		
Total	149	1445.856			

Appendix B8.2.6. Branch Na mass per tree: Analysis of variance

Variate: Na(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	47.37	11.84		
LOC.REP.SPECIES stratum					
SPECIES	9	325.29	36.14	3.32	0.001
SPECIES.TRIAL	36	291.01	8.08	0.74	0.844
Residual	100	1089.29	10.89		
Total	149	1752.96			

APPENDIX B8.2.7. BRANCH CA MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Ca(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	21489.1	5372.3		
LOC.REP.SPECIES stratum					
SPECIES	9	15668.8	1741.0	5.24	<.001
SPECIES.TRIAL	36	27911.5	775.3	2.34	<.001
Residual	100	33193.4	331.9		
Total	149	98262.8			

APPENDIX B8.2.8. BRANCH MG MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Mg(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	678.14	169.54		
LOC.REP.SPECIES stratum					
SPECIES	9	499.60	55.51	1.11	0.363
SPECIES.TRIAL	36	2176.80	60.47	1.21	0.229
Residual	100	5000.71	50.01		
Total	149	8355.26			

APPENDIX B8.2.9. BRANCH K MASS PER TREE: ANALYSIS OF VARIANCE

Variate: K(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	5961.5	1490.4		
LOC.REP.SPECIES stratum					
SPECIES	9	8422.6	935.8	2.17	0.030
SPECIES.TRIAL	36	24684.2	685.7	1.59	0.038
Residual	100	43169.6	431.7		
Total	149	82237.9			

APPENDIX B8.2.10. BRANCH N MASS PER TREE: ANALYSIS OF VARIANCE

Variate: N(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	3241.8	810.4		
LOC.REP.SPECIES stratum					
SPECIES	9	10187.5	1131.9	5.57	<.001
SPECIES.TRIAL	36	12219.1	339.4	1.67	0.024
Residual	100	20318.5	203.2		
Total	149	45966.8			

Appendix B9.1.1. Dead matter Fe concentration: Analysis of variance
Variate: Fe(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	55094.	13774.		
LOC.REP.SPECIES stratum					
SPECIES	9	33009.	3668.	1.52	0.153
SPECIES.TRIAL	36	105227.	2923.	1.21	0.230
Residual	100	241927.	2419.		
Total	149	435258.			

Appendix B9.1.2. Dead matter Cu concentration: Analysis of variance
Variate: Cu(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	153.373	38.343		
LOC.REP.SPECIES stratum					
SPECIES	9	54.240	6.027	0.87	0.552
SPECIES.TRIAL	36	122.360	3.399	0.49	0.991
Residual	100	690.000	6.900		
Total	149	1019.973			

Appendix B9.1.3. Dead matter Zn concentration: Analysis of variance
Variate: Zn(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	378.91	94.73		
LOC.REP.SPECIES stratum					
SPECIES	9	123.17	13.69	1.23	0.287
SPECIES.TRIAL	36	734.96	20.42	1.83	0.010
Residual	100	1115.33	11.15		
Total	149	2352.37			

Appendix B9.1.4. Dead matter Mn concentration: Analysis of variance
Variate: Mn(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	185833.	46458.		
LOC.REP.SPECIES stratum					
SPECIES	9	416447.	46272.	7.57	<.001
SPECIES.TRIAL	36	460327.	12787.	2.09	0.002
Residual	100	611507.	6115.		
Total	149	1674114.			

APPENDIX B9.1.5. DEAD MATTER P CONCENTRATION: ANALYSIS OF VARIANCE

Variate: P(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.00483733	0.00120933		
LOC.REP.SPECIES stratum					
SPECIES	9	0.00020067	0.00002230	0.58	0.813
SPECIES.TRIAL	36	0.00144267	0.00004007	1.04	0.431
Residual	100	0.00386667	0.00003867		
Total	149	0.01034733			

APPENDIX B9.1.6. DEAD MATTER NA CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Na(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0064867	0.0016217		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0029600	0.0003289	2.32	0.021
SPECIES.TRIAL	36	0.0043533	0.0001209	0.85	0.702
Residual	100	0.0142000	0.0001420		
Total	149	0.0280000			

APPENDIX B9.1.7. DEAD MATTER 7 CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Ca(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1.733091	0.433273		
LOC.REP.SPECIES stratum					
SPECIES	9	0.504974	0.056108	6.85	<.001
SPECIES.TRIAL	36	0.570949	0.015860	1.94	0.005
Residual	100	0.819533	0.008195		
Total	149	3.628547			

APPENDIX B9.1.8. DEAD MATTER MG CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Mg(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.124663	0.031166		
LOC.REP.SPECIES stratum					
SPECIES	9	0.080166	0.008907	8.47	<.001
SPECIES.TRIAL	36	0.095044	0.002640	2.51	<.001
Residual	100	0.105133	0.001051		
Total	149	0.405006			

APPENDIX B9.1.9. DEAD MATTER K CONCENTRATION: ANALYSIS OF VARIANCE

Variate: K(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.051753	0.012938		
LOC.REP.SPECIES stratum					
SPECIES	9	0.266377	0.029597	4.25	<.001
SPECIES.TRIAL	36	0.320420	0.008901	1.28	0.172
Residual	100	0.696933	0.006969		
Total	149	1.335483			

APPENDIX B9.1.10. DEAD MATTER N CONCENTRATION: ANALYSIS OF VARIANCE

Variate: N(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.131731	0.032933		
LOC.REP.SPECIES stratum					
SPECIES	9	0.055891	0.006210	3.94	<.001
SPECIES.TRIAL	36	0.105376	0.002927	1.86	0.009
Residual	100	0.157600	0.001576		
Total	149	0.450597			

APPENDIX B9.2.1. DEAD MATTER FE MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Fe(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1.7949	0.4487		
LOC.REP.SPECIES stratum					
SPECIES	9	5.4551	0.6061	5.38	<.001
SPECIES.TRIAL	36	4.4996	0.1250	1.11	0.337
Residual	100	11.2755	0.1128		
Total	149	23.0251			

APPENDIX B9.2.2. DEAD MATTER CU MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Cu(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0031576	0.0007894		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0057885	0.0006432	3.72	<.001
SPECIES.TRIAL	36	0.0048040	0.0001334	0.77	0.810
Residual	100	0.0172928	0.0001729		
Total	149	0.0310429			

APPENDIX B9.2.3. DEAD MATTER ZN MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Zn(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0063379	0.0015845		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0357014	0.0039668	5.62	<.001
SPECIES.TRIAL	36	0.0228515	0.0006348	0.90	0.631
Residual	100	0.0705341	0.0007053		
Total	149	0.1354250			

APPENDIX B9.2.4. DEAD MATTER MN MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Mn(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	6.3301	1.5825		
LOC.REP.SPECIES stratum					
SPECIES	9	28.4542	3.1616	7.43	<.001
SPECIES.TRIAL	36	22.4195	0.6228	1.46	0.072
Residual	100	42.5446	0.4254		
Total	149	99.7484			

APPENDIX B9.2.5. DEAD MATTER P MASS PER TREE: ANALYSIS OF VARIANCE

Variate: P(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1.54597	0.38649		
LOC.REP.SPECIES stratum					
SPECIES	9	1.18366	0.13152	1.63	0.116
SPECIES.TRIAL	36	2.59370	0.07205	0.89	0.640
Residual	100	8.05685	0.08057		
Total	149	13.38018			

APPENDIX B9.2.6. DEAD MATTER NA MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Na(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	11.9595	2.9899		
LOC.REP.SPECIES stratum					
SPECIES	9	8.6591	0.9621	2.35	0.019
SPECIES.TRIAL	36	16.2087	0.4502	1.10	0.348
Residual	100	40.9421	0.4094		
Total	149	77.7693			

APPENDIX B9.2.7. DEAD MATTER CA MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Ca(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1925.62	481.40		
LOC.REP.SPECIES stratum					
SPECIES	9	6479.21	719.91	11.31	<.001
SPECIES.TRIAL	36	5409.45	150.26	2.36	<.001
Residual	100	6367.94	63.68		
Total	149	20182.21			

APPENDIX B9.2.8. DEAD MATTER MG MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Mg(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	149.159	37.290		
LOC.REP.SPECIES stratum					
SPECIES	9	295.823	32.869	5.11	<.001
SPECIES.TRIAL	36	267.235	7.423	1.15	0.285
Residual	100	643.197	6.432		
Total	149	1355.415			

APPENDIX B9.2.9. DEAD MATTER K MASS PER TREE: ANALYSIS OF VARIANCE

Variate: K(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	321.68	80.42		
LOC.REP.SPECIES stratum					
SPECIES	9	811.44	90.16	4.03	<.001
SPECIES.TRIAL	36	936.74	26.02	1.16	0.275
Residual	100	2237.31	22.37		
Total	149	4307.17			

APPENDIX B9.2.10. DEAD MATTER N MASS PER TREE: ANALYSIS OF VARIANCE

Variate: N(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	143.81	35.95		
LOC.REP.SPECIES stratum					
SPECIES	9	1492.76	165.86	10.02	<.001
SPECIES.TRIAL	36	751.48	20.87	1.26	0.184
Residual	100	1654.58	16.55		
Total	149	4042.63			

APPENDIX B10.1.1. BARK FE CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Fe(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	29093.	7273.		
LOC.REP.SPECIES stratum					
SPECIES	9	31660.	3518.	1.59	0.128
SPECIES.TRIAL	36	90571.	2516.	1.14	0.304
Residual	100	221225.	2212.		
Total	149	372549.			

APPENDIX B10.1.2. BARK CU CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Cu(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	3964.43	991.11		
LOC.REP.SPECIES stratum					
SPECIES	9	142.56	15.84	0.52	0.855
SPECIES.TRIAL	36	452.51	12.57	0.41	0.998
Residual	100	3032.00	30.32		
Total	149	7591.49			

APPENDIX B10.1.3. BARK ZN CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Zn(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	514.093	128.523		
LOC.REP.SPECIES stratum					
SPECIES	9	252.693	28.077	4.93	<.001
SPECIES.TRIAL	36	239.373	6.649	1.17	0.270
Residual	100	569.333	5.693		
Total	149	1575.493			

APPENDIX B10.1.4. BARK MN CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Mn(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	2032020.	508005.		
LOC.REP.SPECIES stratum					
SPECIES	9	5245086.	582787.	12.90	<.001
SPECIES.TRIAL	36	1789164.	49699.	1.10	0.348
Residual	100	4517572.	45176.		
Total	149	13583843.			

Appendix B10.1.5. Bark P concentration: Analysis of variance
Variate: P(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0970973	0.0242743		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0340673	0.0037853	12.48	<.001
SPECIES.TRIAL	36	0.0548493	0.0015236	5.02	<.001
Residual	100	0.0303333	0.0003033		
Total	149	0.2163473			

Appendix B10.1.6. Bark Na concentration: Analysis of variance
Variate: Na(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0085507	0.0021377		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0191740	0.0021304	5.63	<.001
SPECIES.TRIAL	36	0.0139560	0.0003877	1.02	0.449
Residual	100	0.0378667	0.0003787		
Total	149	0.0795473			

Appendix B10.1.7. Bark Ca concentration: Analysis of variance
Variate: Ca(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	4.95544	1.23886		
LOC.REP.SPECIES stratum					
SPECIES	9	4.88985	0.54332	8.10	<.001
SPECIES.TRIAL	36	2.03233	0.05645	0.84	0.716
Residual	100	6.70627	0.06706		
Total	149	18.58389			

Appendix B10.1.8. Bark Mg concentration: Analysis of variance
Variate: Mg(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.118756	0.029689		
LOC.REP.SPECIES stratum					
SPECIES	9	0.610269	0.067808	14.12	<.001
SPECIES.TRIAL	36	0.247951	0.006888	1.43	0.083
Residual	100	0.480133	0.004801		
Total	149	1.457109			

Appendix B10.1.9. Bark K concentration: Analysis of variance

Variate: K(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.336069	0.084017		
LOC.REP.SPECIES stratum					
SPECIES	9	0.811563	0.090174	10.38	<.001
SPECIES.TRIAL	36	0.318531	0.008848	1.02	0.457
Residual	100	0.869133	0.008691		
Total	149	2.335296			

Appendix B10.1.10. Bark N concentration: Analysis of variance

Variate: N(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0347827	0.0086957		
LOC.REP.SPECIES stratum					
SPECIES	9	0.2371527	0.0263503	28.39	<.001
SPECIES.TRIAL	36	0.0393640	0.0010934	1.18	0.259
Residual	100	0.0928000	0.0009280		
Total	149	0.4040993			

Appendix B10.2.1. Bark Fe mass per tree: Analysis of variance

Variate: Fe(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	7.0448	1.7612		
LOC.REP.SPECIES stratum					
SPECIES	9	3.3533	0.3726	1.69	0.100
SPECIES.TRIAL	36	8.2990	0.2305	1.05	0.416
Residual	100	22.0067	0.2201		
Total	149	40.7038			

Appendix B10.2.2. Bark Cu mass per tree: Analysis of variance

Variate: Cu(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.342825	0.085706		
LOC.REP.SPECIES stratum					
SPECIES	9	0.016008	0.001779	0.48	0.883
SPECIES.TRIAL	36	0.086321	0.002398	0.65	0.927
Residual	100	0.368188	0.003682		
Total	149	0.813342			

APPENDIX B10.2.3. BARK ZN MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Zn(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.091588	0.022897		
LOC.REP.SPECIES stratum					
SPECIES	9	0.053887	0.005987	3.30	0.001
SPECIES.TRIAL	36	0.078677	0.002185	1.20	0.235
Residual	100	0.181621	0.001816		
Total	149	0.405772			

APPENDIX B10.2.4. BARK MN MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Mn(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	833.280	208.320		
LOC.REP.SPECIES stratum					
SPECIES	9	306.980	34.109	5.56	<.001
SPECIES.TRIAL	36	544.473	15.124	2.46	<.001
Residual	100	613.720	6.137		
Total	149	2298.453			

APPENDIX B10.2.5. BARK P MASS PER TREE: ANALYSIS OF VARIANCE

Variate: P(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	109.348	27.337		
LOC.REP.SPECIES stratum					
SPECIES	9	92.616	10.291	5.64	<.001
SPECIES.TRIAL	36	237.964	6.610	3.62	<.001
Residual	100	182.515	1.825		
Total	149	622.443			

APPENDIX B10.2.6. BARK NA MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Na(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	548.767	137.192		
LOC.REP.SPECIES stratum					
SPECIES	9	408.416	45.380	9.22	<.001
SPECIES.TRIAL	36	459.611	12.767	2.59	<.001
Residual	100	492.184	4.922		
Total	149	1908.978			

APPENDIX B10.2.7. BARK CA MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Ca(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	120394.	30098.		
LOC.REP.SPECIES stratum					
SPECIES	9	60663.	6740.	4.56	<.001
SPECIES.TRIAL	36	77913.	2164.	1.46	0.072
Residual	100	147840.	1478.		
Total	149	406809.			

APPENDIX B10.2.8. BARK MG MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Mg(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	7955.7	1988.9		
LOC.REP.SPECIES stratum					
SPECIES	9	8117.9	902.0	5.64	<.001
SPECIES.TRIAL	36	6616.2	183.8	1.15	0.290
Residual	100	15984.7	159.8		
Total	149	38674.5			

APPENDIX B10.2.9. BARK K MASS PER TREE: ANALYSIS OF VARIANCE

Variate: K(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	39636.6	9909.2		
LOC.REP.SPECIES stratum					
SPECIES	9	22799.6	2533.3	8.64	<.001
SPECIES.TRIAL	36	17599.9	488.9	1.67	0.025
Residual	100	29323.6	293.2		
Total	149	109359.7			

APPENDIX B10.2.10. BARK N MASS PER TREE: ANALYSIS OF VARIANCE

Variate: N(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	10196.40	2549.10		
LOC.REP.SPECIES stratum					
SPECIES	9	6512.57	723.62	10.13	<.001
SPECIES.TRIAL	36	6808.39	189.12	2.65	<.001
Residual	100	7143.65	71.44		
Total	149	30661.02			

APPENDIX B11.1.1. BOLE WOOD FE CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Fe(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	60210.	15053.		
LOC.REP.SPECIES stratum					
SPECIES	9	43830.	4870.	3.15	0.002
SPECIES.TRIAL	36	64197.	1783.	1.15	0.285
Residual	100	154512.	1545.		
Total	149	322748.			

APPENDIX B11.1.2. BOLE WOOD CU CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Cu(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	12.9733	3.2433		
LOC.REP.SPECIES stratum					
SPECIES	9	1.8733	0.2081	0.46	0.899
SPECIES.TRIAL	36	11.5600	0.3211	0.71	0.879
Residual	100	45.3333	0.4533		
Total	149	71.7400			

APPENDIX B11.1.3. BOLE WOOD ZN CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Zn(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	93.627	23.407		
LOC.REP.SPECIES stratum					
SPECIES	9	39.393	4.377	1.12	0.357
SPECIES.TRIAL	36	117.707	3.270	0.84	0.725
Residual	100	391.333	3.913		
Total	149	642.060			

APPENDIX B11.1.4. BOLE WOOD MN CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Mn(mg/kg)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	8844.7	2211.2		
LOC.REP.SPECIES stratum					
SPECIES	9	6267.3	696.4	2.46	0.014
SPECIES.TRIAL	36	5428.5	150.8	0.53	0.983
Residual	100	28326.0	283.3		
Total	149	48866.5			

APPENDIX B11.1.5. BOLE WOOD P CONCENTRATION: ANALYSIS OF VARIANCE

Variate: P(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.01312933	0.00328233		
LOC.REP.SPECIES stratum					
SPECIES	9	0.00997600	0.00110844	22.17	<.001
SPECIES.TRIAL	36	0.01008400	0.00028011	5.60	<.001
Residual	100	0.00500000	0.00005000		
Total	149	0.03818933			

APPENDIX B11.1.6. BOLE WOOD NA CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Na(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.00078000	0.00019500		
LOC.REP.SPECIES stratum					
SPECIES	9	0.00129333	0.00014370	2.07	0.039
SPECIES.TRIAL	36	0.00212667	0.00005907	0.85	0.702
Residual	100	0.00693333	0.00006933		
Total	149	0.01113333			

APPENDIX B11.1.7. BOLE WOOD CA CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Ca(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.226277	0.056569		
LOC.REP.SPECIES stratum					
SPECIES	9	0.153517	0.017057	9.22	<.001
SPECIES.TRIAL	36	0.076443	0.002123	1.15	0.292
Residual	100	0.185067	0.001851		
Total	149	0.641304			

APPENDIX B11.1.8. BOLE WOOD MG CONCENTRATION: ANALYSIS OF VARIANCE

Variate: Mg(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0003107	0.0000777		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0378407	0.0042045	17.23	<.001
SPECIES.TRIAL	36	0.0095560	0.0002654	1.09	0.363
Residual	100	0.0244000	0.0002440		
Total	149	0.0721073			

APPENDIX B11.1.9. **BOLE WOOD K CONCENTRATION: ANALYSIS OF VARIANCE**
Variate: K(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.528863	0.132216		
LOC.REP.SPECIES stratum					
SPECIES	9	0.007966	0.000885	0.34	0.958
SPECIES.TRIAL	36	0.032124	0.000892	0.35	1.000
Residual	100	0.257667	0.002577		
Total	149	0.826619			

APPENDIX B11.1.10. **BOLE WOOD N CONCENTRATION: ANALYSIS OF VARIANCE**
Variate: N(%)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.0032040	0.0008010		
LOC.REP.SPECIES stratum					
SPECIES	9	0.0232907	0.0025879	9.68	<.001
SPECIES.TRIAL	36	0.0111293	0.0003091	1.16	0.282
Residual	100	0.0267333	0.0002673		
Total	149	0.0643573			

APPENDIX B11.2.1. **BOLE WOOD FE MASS PER TREE: ANALYSIS OF VARIANCE**
Variate: Fe(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	963.90	240.98		
LOC.REP.SPECIES stratum					
SPECIES	9	421.88	46.88	3.38	0.001
SPECIES.TRIAL	36	991.91	27.55	1.98	0.004
Residual	100	1388.58	13.89		
Total	149	3766.28			

APPENDIX B11.2.2. **BOLE WOOD CU MASS PER TREE: ANALYSIS OF VARIANCE**
Variate: Cu(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.281725	0.070431		
LOC.REP.SPECIES stratum					
SPECIES	9	0.070682	0.007854	1.12	0.353
SPECIES.TRIAL	36	0.232477	0.006458	0.92	0.595
Residual	100	0.698894	0.006989		
Total	149	1.283778			

APPENDIX B11.2.3. BOLE WOOD ZN MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Zn(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	0.96025	0.24006		
LOC.REP.SPECIES stratum					
SPECIES	9	0.52530	0.05837	2.31	0.021
SPECIES.TRIAL	36	1.15423	0.03206	1.27	0.178
Residual	100	2.52646	0.02526		
Total	149	5.16624			

APPENDIX B11.2.4. BOLE WOOD MN MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Mn(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	299.859	74.965		
LOC.REP.SPECIES stratum					
SPECIES	9	100.138	11.126	2.84	0.005
SPECIES.TRIAL	36	109.175	3.033	0.77	0.806
Residual	100	391.380	3.914		
Total	149	900.552			

APPENDIX B11.2.5. BOLE WOOD P MASS PER TREE: ANALYSIS OF VARIANCE

Variate: P(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	1360.76	340.19		
LOC.REP.SPECIES stratum					
SPECIES	9	2735.70	303.97	10.94	<.001
SPECIES.TRIAL	36	2296.54	63.79	2.30	<.001
Residual	100	2778.48	27.78		
Total	149	9171.48			

APPENDIX B11.2.6. BOLE WOOD NA MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Na(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	4226.6	1056.7		
LOC.REP.SPECIES stratum					
SPECIES	9	1091.6	121.3	0.81	0.605
SPECIES.TRIAL	36	4243.4	117.9	0.79	0.786
Residual	100	14913.5	149.1		
Total	149	24475.1			

APPENDIX B11.2.7. BOLE WOOD CA MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Ca(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	262957.	65739.		
LOC.REP.SPECIES stratum					
SPECIES	9	193083.	21454.	7.38	<.001
SPECIES.TRIAL	36	233314.	6481.	2.23	<.001
Residual	100	290561.	2906.		
Total	149	979916.			

APPENDIX B11.2.8. BOLE WOOD MG MASS PER TREE: ANALYSIS OF VARIANCE

Variate: Mg(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	16300.8	4075.2		
LOC.REP.SPECIES stratum					
SPECIES	9	46416.4	5157.4	27.70	<.001
SPECIES.TRIAL	36	43319.7	1203.3	6.46	<.001
Residual	100	18621.8	186.2		
Total	149	124658.7			

APPENDIX B11.2.9. BOLE WOOD K MASS PER TREE: ANALYSIS OF VARIANCE

Variate: K(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	668010.	167003.		
LOC.REP.SPECIES stratum					
SPECIES	9	54668.	6074.	0.83	0.594
SPECIES.TRIAL	36	247474.	6874.	0.93	0.580
Residual	100	735802.	7358.		
Total	149	1705955.			

APPENDIX B11.2.10. BOLE WOOD N MASS PER TREE: ANALYSIS OF VARIANCE

Variate: N(g)

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
LOC stratum					
TRIAL	4	93591.1	23397.8		
LOC.REP.SPECIES stratum					
SPECIES	9	7009.9	778.9	1.12	0.358
SPECIES.TRIAL	36	46816.8	1300.5	1.87	0.008
Residual	100	69705.6	697.1		
Total	149	217123.4			