



Climate and Soil Based Information for Farm Forestry: Progress Report 2001-2003

P.M. Feikema, T.G. Baker and M.J. Duncan

Forest Science Centre, 123 Brown Street, Heidelberg, Victoria 3084, Australia

Report No. 2003/019

June 2003

A report prepared for the Private Forestry Unit, Department of Sustainability and Environment, under the 2002/2003 FSC-DSE Private Forestry Research and Development Service Agreement.



**Forest Science Centre
Department of Sustainability and Environment**

This is an unpublished report and may not be cited, abstracted, reproduced or distributed without permission of the Department of Sustainability and Environment

While the information contained in this report has been formulated with due care, the State of Victoria, its servants and agents accept no responsibility for any person acting or relying on the information contained in this report, and disclaims any liability for any error, omission, loss or other consequence which may arise from any person acting or relying on anything contained in this report.

TABLE OF CONTENTS

	Page
1. Introduction	1
2. Methods	1
2.1 Plot selection and establishment	1
2.2 Tree growth measurements	2
2.3 Foliar nutrient analysis	2
2.4 Surface soil chemistry	2
2.5 Soil profile morphology and chemistry	2
3. Results and Discussion	3
3.1 Tree growth	3
3.2 Tree nutrition	4
3.3 Surface soil chemistry	5
3.4 Soil profile morphology	5
3.5 Tree growth and site factors	6
4. Conclusions and Recommendations	7
5. Acknowledgments	7
6. References	7

Figures

Tables

- Appendix A.** Geology and average annual climate data from ESOCLIM for all PSPs.
- Appendix B.** Tree measurements at age 1 year for PSPs of *E. globulus* and *E. nitens* planted in 1998, 1999, 2000 and 2001.
- Appendix C.** Tree measurements at age 2 years for PSPs of *E. globulus* and *E. nitens* planted in 1997, 1998, 1999 and 2000.
- Appendix D.** Tree measurements at age 4 years for PSPs of *E. globulus* and *E. nitens* planted in 1997 and 1998.
- Appendix E.** Foliar analysis results at age 1 year for PSPs of *E. globulus* and *E. nitens* planted in 1998, 1999, 2000 and 2001.
- Appendix F.** Foliar analysis results at age 2 years for PSPs of *E. globulus* and *E. nitens* planted in 1997, 1998 1999 and 2000.
- Appendix G.** Foliar analysis results at age 4 years PSPs of *E. globulus* and *E. nitens* planted in 1997 and 1998.
- Appendix H.** Chemical analysis of surface soil samples (0-10 cm depth) from a subset of PSPs in north-eastern and central Victoria.
- Appendix I.** An example of completed soil profile morphology description for a PSP.

1. INTRODUCTION

A rapidly expanding *Eucalyptus* plantation forestry resource is emerging in south-eastern Australia. In north-eastern Victoria, approximately 130 plantations (totalling 1800 ha) of *Eucalyptus globulus* or *E. nitens* have been established and are primarily being managed for sawlog production. The area of *Eucalyptus* pulpwood plantations in this region is also likely to increase during the next 10 years with the development of a commercial joint venture project aiming to establish 10,000 ha. In south-western Victoria and south-eastern South Australia, state agencies and private investment companies are well on the way to achieving their goal of establishing over 100,000 ha of *E. globulus* plantations on ex-agricultural land for the production of pulpwood on short rotations (10-12 years). Private forestry companies are also continuing to expand their pulpwood *E. globulus* and *E. nitens* estates in central Victoria, Gippsland and south-eastern New South Wales.

The potential for eucalypt farm forestry in Victoria will only be realised if landholders and investors can be confident of commercial returns that are competitive with alternative land uses or investment opportunities. A greater knowledge and understanding of where best to plant trees will encourage the incorporation of commercial forestry into traditional farming systems.

In 1999, a study commenced to develop knowledge and predictive tools, based on a variety of soil and climatic conditions, for the production of *E. globulus* and *E. nitens* on ex-agricultural land in south-eastern mainland Australia. The establishment details and initial measurement of the permanent sampling plots (PSPs) were presented in Feikema *et al.* (2000). This report presents data collected in the PSPs to age 4 years.

2. METHODS

2.1 Plot selection and establishment

A total of 302 permanent sample plots (PSPs) have been established in 93 plantations of *E. globulus* or *E. nitens* (planted between 1997 to 2001) in north-eastern Victoria (NE Victoria), central Victoria (CE Victoria) and in south-western Victoria (SW Victoria; including south-eastern South Australia). The location of the plantations in which PSPs have been established is presented in Figure 1. Each point represents a plantation in which between 2 and 8 PSPs (usually 3 or 4) are located. The details of PSP establishment are given in Feikema *et al.* (2000).

Twenty of the PSPs representing six plantations from NE Victoria have now been discarded from this study because the landholders wished to thin their stands, whereas all PSPs in this study must remain unthinned to facilitate comparison between the PSPs. Nearly all trees in another two PSPs on three separate plantations died due to waterlogging and will no longer be measured. The PSPs subsequently removed from this study are referred to in this report as discarded PSPs. Data from previous measurements in these PSPs are presented in this report. The total number of PSPs currently being measured is 282 representing 87 plantations.

The number of PSPs by species, regions and year of planting is presented in Table 1. The number of PSPs summarised by geology and rainfall class is presented in Table 2.

A summary of climate data estimated from ESOCIM (Hutchison *et al.*, 1999) for all PSPs is presented in Table 3. Geology and climate data for individual PSPs is presented in Appendix A.

2.2 Tree growth measurements

All tree measurements were made in winter. At age 1 year, all trees in the PSPs were measured for total height. At age 2 years, all trees in the PSPs were measured for total height and diameter at breast height over bark (1.3m above ground level, DBHOB). At age 4 years, all trees in the PSPs were measured for DBHOB and a subset of trees representing the 200 largest diameter trees per hectare, and additional trees representing smaller diameter classes, were measured for total height.

For each PSP, survival, mean dominant height (height of the 200 largest diameter trees of good form per hectare), basal area and stem volume (underbark) were calculated from individual tree measurements. Volume was calculated using a generalised individual tree volume function developed for fast growing eucalypts (Wong *et al.*, 1999).

2.3 Foliar nutrient analysis

At age 4 years, 10 adult leaves were sampled from a branch (removed from the tree using a shotgun) from each of 6 trees resulting in a 60 leaf sample per PSP. At age 2 years (NE and CE Victoria), 6 adult leaves were sampled from a branch cut using secateurs on an extension pole from each of 2 trees in each of 5 rows resulting in a 60 leaf sample per PSP. At age 1 and 2 years (SW Victoria), 3 leaves were sampled from each of 20 trees. All foliage samples consisted of fully expanded leaves sampled from the upper third of the live crown of co-dominant trees in each row in winter.

The leaves were washed in deionised water and then dried at 70°C for 48 hr. Samples were then ground and analysed for nitrogen (N), sulphur (S), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sodium (Na), chloride (Cl), iron (Fe), manganese (Mn), zinc (Zn), copper (Cu), boron (B) and aluminium (Al).

2.4 Surface soil chemistry

Soil cores (0-10 and 10-20 cm depths) were taken in each plot from the undisturbed interrows. In each plot, 16 soil cores were taken systematically, four along the centre of each of the 4 interrows. The soil cores from each plot were then bulked and mixed thoroughly before a 500 g subsample was taken for analysis. Samples were dried (<40°C), and ground to pass through a 2 mm sieve.

A subset of samples from 0-10 cm depth, representing one PSP from each plantation in NE and CV Victoria has been analysed for pH (1 : 5 soil : water), total-N (high temperature induction furnace - Dumas), total-C (high temperature induction furnace – infrared), exchangeable-cations (Ca, Mg, Na, K extraction with 1 : 10 soil : solution 0.1 M BaCl₂ & 0.1 M NH₄Cl; after pre-treatment with aqueous ethanol to remove soluble salts if EC was above 0.3 dS/cm), and an index of available-P (1 : 10 soil : solution 0.03 M NH₄F & 0.01 M HCl, 10 minutes). The analyses to be conducted on the remaining surface soil samples are yet to be finalised.

2.5 Soil profile morphology and chemistry

Soil profiles were described in a soil pit for each PSP in NE Victoria (n=129), all PSPs in CE Victoria (n=18), and PSPs selected to represent the range in geologies in SW Victoria (n=65). Each soil pit was located adjacent to the PSP in order to best represent the soil profile within the PSP, while not adversely affecting tree growth surrounding the pit due to root disturbance and altered soil and hydrological properties. The pits were dug using a backhoe to create a vertical pit face of 1.5 m depth, 0.6 m width, approximately 2 m length, and sloping at the rear to allow access.

The description of the soil profile followed the conventions of McDonald *et al.* (1990), to allow classification of the soil by the Principal Profile Form (Northcote, 1979), the Great Soil Group (Stace *et al.*, 1968), and the Australian Soil Classification (Isbell, 1996).

Once the soil profile had been described to 1.5 m depth, the pit was excavated further to a maximum depth of 4 m, or to groundwater level or an impeding layer. Assessment of texture, colour, coarse fragments, root abundance, groundwater depth (if present) and impeding layer (if present) was made.

The following characteristics were assessed in each soil pit:

- Horizons/Layers
- Depth of horizons
- Boundaries between horizons
- Depth to R horizon or impeding layer
- Colour (Munsell Soil Colour Chart)
- Mottles or other colour patterns
- Field texture
- Coarse fragments (if present)
- Structure
- Pores
- Consistence
- Segregations of pedogenic origin (if present)
- Roots
- Soil water status
- Pan (if present)
- Depth to groundwater (if present)

In addition, an estimate of areal porosity using porosity charts developed (McKenzie and Jacquier, 2000.) was made for each layer.

A representative soil sample was collected from each layer for laboratory analysis. The following analyses were performed on a subset of these samples:

- pH (water & CaCl₂)
- EC
- Exchangeable cations (Ca, Mg, K, Na)
- Exchangeable Al
- Exchangeable Ac
- % Coarse sand (0.2-2.0 mm)
- % Fine sand (0.02-0.2 mm)
- % Silt (0.002-0.02 mm)
- % Clay (<0.002 mm)
- Field capacity (pF 2.5)
- Wilting point (pF 4.2)
- LAT (loss on acid treatment)
- Total N
- Organic C
- Dispersion

All soil profile descriptions, together with chemical and physical analyses, will be presented in Feikema *et al.*, (in prep).

3. RESULTS AND DISCUSSION

3.1 Tree growth

A summary of tree growth measurements for all PSPs at age 1, 2 and 4 years is presented in Table 4. The data has been summarised according to year of planting to facilitate direct comparison of the same set of PSPs at different ages. Individual plot data for all PSPs are presented in Appendices B (age 1 year), C (age 2 years) and D (age 4 years).

To age 1 year, survival of *E. globulus* and *E. nitens* ranged between 63 and 100 % (average 95 %) and between 87 and 100 % (average 97 %) respectively. There were only three PSPs of *E. globulus* with survival below 70 %, and this resulted from seasonal waterlogged conditions in each case. At age 2 years, survival ranged between 63 and 100 % (averaging 94 %) and between 80 and 100 % (average 96 %) for *E. globulus* and *E. nitens* respectively. To age 4 years, survival ranged between 72 and 100 % (average 93 %) and 44 and 100 % (average 93 %) for *E. globulus* and *E. nitens* respectively. There was one PSP of *E. nitens* in which plot survival was only 44 % at age 4 years, due to suspected drought deaths.

The average mean dominant height at age 1 year (average height of the tallest 200 trees per hectare) for *E. globulus* and *E. nitens* ranged between 1.5 and 4.2 m (average 2.7 m) and ranged between 1.5 and 3.6 m (average 2.4 m) respectively. The average plot mean dominant height (average height of the 200 largest diameter trees per hectare) of *E. globulus* and *E. nitens* at age 2 years ranged between 3.9 and 10.5 m (average 6.4 m) and between 4.3 and 8.9 m (average 6.2 m) respectively. The average plot mean dominant height of *E. globulus* and *E. nitens* at age 4 years ranged between 8.5 and 19.2 m (average 12.2 m) and between 9.7 and 19.3 m (average 13.2 m) respectively.

Average stem volume of *E. globulus* and *E. nitens* at age 2 years ranged between 2 and 30 m³/ha (average 11 m³/ha) and 3 and 27 m³/ha (average 9 m³/ha) respectively. Average stem volume of *E. globulus* and *E. nitens* at age 4 years respectively ranged between 22 and 138 m³/ha (average 57 m³/ha) and 22 and 158 m³/ha (average 72 m³/ha). Stem volume for the best and worst PSPs at age 4 years varied by over 600 % for *E. globulus*, and up to 700 % for *E. nitens*.

Volume increments between age 2 and 4 years varied from 10 to 54 m³/ha/yr for *E. globulus* and from 32 to 66 m³/ha/yr for *E. nitens*. This large observed range in volume increments is consistent with the wide variety of climatic and edaphic conditions in which the PSPs are growing.

Growth rates at age 4 years correspond to mean annual increment (MAI) values of between 6 and 35 m³/ha/yr (average 14 m³/ha/yr) for *E. globulus* and between 6 and 40 m³/ha/yr (average 18 m³/ha/yr) for *E. nitens*. Higher average volume production of *E. nitens* relative to *E. globulus* is indicative of the higher rainfall sites in which it is grown.

3.2 Tree nutrition

A summary of foliar concentrations of N, S, P and K at age 1, 2 and 4 years is presented in Table 5. Nutrient concentrations in the foliage of PSPs at age 1, 2 and 4 years are presented in Appendices E, F and G. At age 1 year, foliar concentrations of the macronutrients (N, S, P, K, C, and Mg) and some micronutrients (Fe and Mn) were generally adequate and are unlikely to be limiting growth at any of the sites. The general adequacy of tree nutrition was not surprising given that these plantations have been established on ex-agricultural land.

Interpretative foliar nutrient concentrations for older (>2 years) eucalypt plantations are not well developed. There were no outstanding indications of macronutrient deficiency in *E. globulus* or *E. nitens* at age 4 years with average concentrations of N at all sites being relatively high (>14 g/kg). Concentrations of S in relation to N (indicated by an N:S ratio of <15) are adequate at all PSPs. Average concentrations of P are relatively high (>0.9 g/kg) at most PSPs. Average concentrations of K are relatively low (<6 g/kg) at about half of the PSP's. Average concentrations of Ca and Mg, rarely

found to be deficient, are within the range of commonly observed values for age 4 years plantations (Ca: 5-11 g/kg; Mg: 1.2-2.4 g/kg).

The foliar concentrations of chloride (Cl) were below 3.7 µg/g in all PSPs at age 1 year, 4.1 µg/g in PSPs at age 2 years and 4.4 µg/g in PSPs at age 4 years. Chloride concentrations greater than 5 mg/g suggest that significant solute accumulation is occurring in the root zone, which may affect tree growth and health. While the concentrations of Cl in the foliage appear to be higher in older trees, salt stress does not appear to be a problem in any of the PSPs.

The foliar concentrations of Zn, Cu and B at age 4 years were marginal or deficient at some PSPs when compared to nutrient concentrations in younger foliage. There are no outstanding indications of micronutrient deficiency. Generally, average concentrations of Zn are 'marginal' (11-15 g/kg), but relatively high (>12 mg/kg). Average concentrations of Cu are 'marginal' (2.6-5 mg/kg) or 'adequate' (>5 mg/kg), although generally relatively low (<6 mg/kg). Average concentrations of B are 'adequate' (>12 mg/kg), although relatively low (<20 mg/kg) at most of the PSP's.

There is no requirement to address any nutrient disorder in these plantations. While growth responses to fertiliser application may be obtained in some plantations, these are unlikely to be economic.

A trend for decreasing concentrations of N, S, P and K in the foliage with age is present (Table 5a). The level of Ca tended to increase with tree age, while levels of Mg, Na, Cl, Fe, Zn, Cu, B and Al were did not change much with tree age (Tables 5b and 5c). The level of Mn in the foliage decreased with tree age. Because interpretive foliar nutrient concentrations for older plantations are not well developed, it is not known at which concentrations a fertiliser response may be observed. The FSC has established a separate study to investigate the growth response of *E. globulus* and *E. nitens* to later age (4 years) fertiliser application of N and P in four FFORNE plantations in north eastern Victoria (Bandara *et al.*, 2003).

3.3 Surface soil chemistry

A summary of surface soil (0-10 cm) chemical analysis for one PSP at each plantation in NE and CE Victoria is presented in Table 6, and the individual data for each PSP are presented in Appendix H. Analysis of the remaining soil samples, and interpretation in relation to tree growth and nutrition, will be undertaken in the future.

3.4 Soil profile morphology

In total, 212 soil pits have been dug, with 1038 samples taken from the pits. Most of the soil profile morphologies for each PSP has been described, and chemical analysis of samples is continuing. Detailed soil profile descriptions, together with chemical and physical analyses, will be presented later in Feikema *et al.*, (in prep). An example of a completed soil profile description is presented in Appendix I.

Surface soil textures across the PSPs ranged from sands to light clays. Growth tended to be considerably lower in PSPs with heavier top soil and or subsoil textures, due in part to the adverse effects of waterlogging (indicated by field observations). Roots were observed growing down to 4 m (and beyond) in 2-3 year old trees. In heavy soils, roots were only observed following cracks or remnant root channels left by native vegetation. It is possible that the presence of remnant roots could

assist trees in obtaining water and nutrients, particularly in heavy soils. Large stem volumes in some PSPs may have resulted from high tree water availability from shallow groundwater (less than 4 m).

3.5 Tree growth and site factors

When stem volume at age 4 years was averaged according to the geology-rainfall combinations (Table 7), plot volume tended to increase with increasing rainfall for most PSPs. Also, within a given rainfall zone, plot volume tended to be lower on Paleozoic sediments than on any other geology. Plot volumes on metamorphic geology were relatively high for a given rainfall, but there are only 4 PSPs on this geology type, too few to make rigorous comparisons.

At age 4 years, there are positive trends (although not significant) with plot volume and water availability factors such as average annual rainfall, soil texture and soil depth. The strongest relationship ($r^2=0.34$ for *E. globulus* and $r^2=0.09$ for *E. nitens*) was between volume and an index of available water (IAW; mm) where:

$$IAW = \frac{\text{Average annual rainfall}}{\text{Average annual evaporation}} \times PAW$$

where *PAW* (mm) is the plant available water estimated from soil field texture and soil depth (to a maximum of 4 m); discounted for the presence of coarse fragments. The relationship between volume and IAW is presented in Figure 2.

While many trends between site factors and tree growth were evident, these were not significant due to the scatter associated with the many factors that interact together to affect the growth of trees. In order to investigate these trends, PSPs (in stands of both *E. globulus* and *E. nitens*) were ranked by standing volume at age 4 years, and where the soil profile had been described (n=164) to enable examination of edaphic and climatic characteristics associated with relatively low (<8 m³/ha/yr) medium (14-17 m³/ha/yr) and high (>25m³/ha/yr) volume production. These groupings are completely arbitrary, are relative only to the volumes observed in the current set of PSPs and were chosen to allow the comparison of sites where tree growth is significantly different. A selection of known climatic, soil and nutritional characteristics associated with relatively low, medium and high growth rates at age 4 years are presented in Table 8. The values represent the average of the individual PSPs that were classified as either low, medium or high.

The most productive PSPs were associated with higher rainfall and lower pan evaporation, an indication of greater water availability. Differences in average minimum and maximum daily temperatures were not clearly associated with volume production.

The PSPs with greater volumes were associated with deeper A horizons with greater plant available water (expressed as mm/m of soil depth). Greater growth was also associated with lighter subsoils (those with lower clay contents) and higher plant available water in the subsoil. Deeper soils with higher total plant available water (estimated from soil profile descriptions) were associated with the more productive PSPs. These soil characteristics are indicative of greater water storage capacity, the ability for water to move more rapidly through the soil, and a lower soil density that is more conducive to root growth.

The foliar concentration of several nutrients analysed showed clear relationships with volume production. Subtle trends of increasing levels of N and P in the foliage were associated with increasing stand volume although it is unlikely that either of these are severely limiting growth.

4. CONCLUSIONS AND RECOMMENDATIONS

Establishment and initial measurement of additional PSPs in CE and SW Victoria has been completed, resulting in a total of 282 PSPs (across 87 plantations). Survival and growth in the PSPs to age 4 years has generally been excellent, except for isolated PSPs where growth was reduced due extreme factors (waterlogging or drought). Relationships between tree growth and the water availability of a particular site are beginning to emerge. The PSPs with greatest volume growth were characterised by high rainfall, deep soils and lighter subsoils.

Although these relationships are not yet statistically significant, they are stronger at age 4 years than they were at age 2 years. It is expected that this relationship will become stronger once stored soil water had been depleted, which could possibly occur in the near future for the older PSPs.

Investigations of soil profile morphology under the PSPs has revealed a wide range of soil textures and soil depth. Analysis of this information with tree growth and climate is continuing.

Additional funding will be sought to continue PSP measurements at age 6, 8, and 10 years. The task schedule for 2003-04 is presented in Table 9.

It is hoped that additional PSPs will be included in this study in the future, especially in the Corangamite and in Gippsland regions. Further work to apply the data collected in this study to the 3PG Forest Growth Model (Landsberg and Waring, 1997) has commenced.

5. ACKNOWLEDGMENTS

This project was undertaken with funding from the Natural Heritage Trust (NHT), the Department of Sustainability and Environment (Private Forestry Unit), Timbercorp Treefarms Ltd and Central Victorian Farm Plantations Inc (CVFP). In particular we would like to thank Ian Bail, Paul Smale and James Bulinski (Timbercorp Treefarms Ltd), Bruce Sonogan and Philippa Noble (Department of Primary Industries) and Richard Stone (CVFP) for their contributions to this study. Thanks to the landholders who continue to provide access to their properties to measure plots, and to John Costenaro, Mike McCormick, David Smith, Andrew Clark, Gamini Bandara and Nimal Wijesinghe for helping establish and measure the PSPs in NE and in CE Victoria. Gabi Szegedy, Emma Flatman, Sharon Edwards and Debbie Renfree carried out the foliar and soil analyses.

6. REFERENCES

Bandara, G., Duncan, M., Baker, T., and Feikema, P. 2003. Eucalypt Post-Establishment Fertiliser Trials at Docker, Fawcett, Highlands and Porepunkah, North Eastern Victoria: Establishment Report.

Unpublished. Report No. 2003/005. Forest Science Centre, Department of Sustainability and Environment.

Feikema, P.M., Baker T.G. and Duncan, M.J. 2000. Climate and Soil Based Information for Farm Forestry: Progress report 1999/2000. Unpublished. Report No. CFTT 1999/038. Centre for Forest Tree Technology, Department of Natural Resources and Environment.

Feikema, P.M, Sargeant, I.J. and Imhof, M.P. (in prep). Characterisation of Soils Used for Farm Forestry in South-eastern Mainland Australia. Department of Sustainability and Environment.

Hutchison, M.F., Nix, A.A., Houlder, D.J. and McMahon, J.P. 1999. ANUCLIM Version 1.8 User guide. Centre for Resource and Environmental Studies, The Australian National University.

Isbell, R.F. 1996. *The Australian Soil Classification*. Collingwood, Victoria. CSIRO Publishing. pp. 143.

Landsberg, J.J. and Waring, R.H. 1997. A generalised model of forest productivity using simplified concepts of radiation-use efficiency, carbon balance and partitioning. *Forest Ecology and Management*, 95: 209-228.

McDonald, R.C., Isbell, R.F., Speight, J.G., Walker, J. and Hopkins, M.S. 1990. *Australian soil and land survey field handbook* (2nd ed). Canberra. CSIRO. pp. 190.

McKenzie, N.J. and Jacquier, D.W. 2000. Soil Areal Porosity Charts. pers.comm. CSIRO Land and Water, Canberra.

Murtha, G.G. 1988. Soil properties and soil performance. In "Australian Soil and Land Survey Handbook" (Eds. R.H. Gunn, J.A. Beattie, R.E. Reid and R.H.M. van de Graaff). Inkata Press, Melbourne/Sydney.

Northcote, K.H. 1979. *A Factual Key for the Recognition of Australian Soils (4th ed)*. Adelaide, South Australia. Rellim Technical Publications. pp. 123.

Rayment, G.E., and Higginson, F.R. (1992). *Australian Laboratory Handbook of Soil and Water Chemical Methods*, Inkata Press, Melbourne.

Stace, H.C.T., Hubble, G.D., Brewer, R., Northcote, K.H., Sleeman, J.R., Mulcahy, M.J. and Hallsworth, E.G. 1968. *A Handbook of Australian Soils*. Adelaide, South Australia. Rellim Technical Publications. pp. 429.

Wong, J., Baker, T.G., Duncan, M.J., Stackpole, D.J. and Stokes, R.C. 1999. Individual tree Volume Functions for Plantation Eucalypts. Unpublished. Report No. CFTT 1999/037. Centre for Forest Tree Technology, Department of Natural Resources and Environment.

Williams, J. 1983. Soil hydrology. In "Soils – An Australian Viewpoint" Division of Soils, CSIRO. Melbourne Academic Press, London.

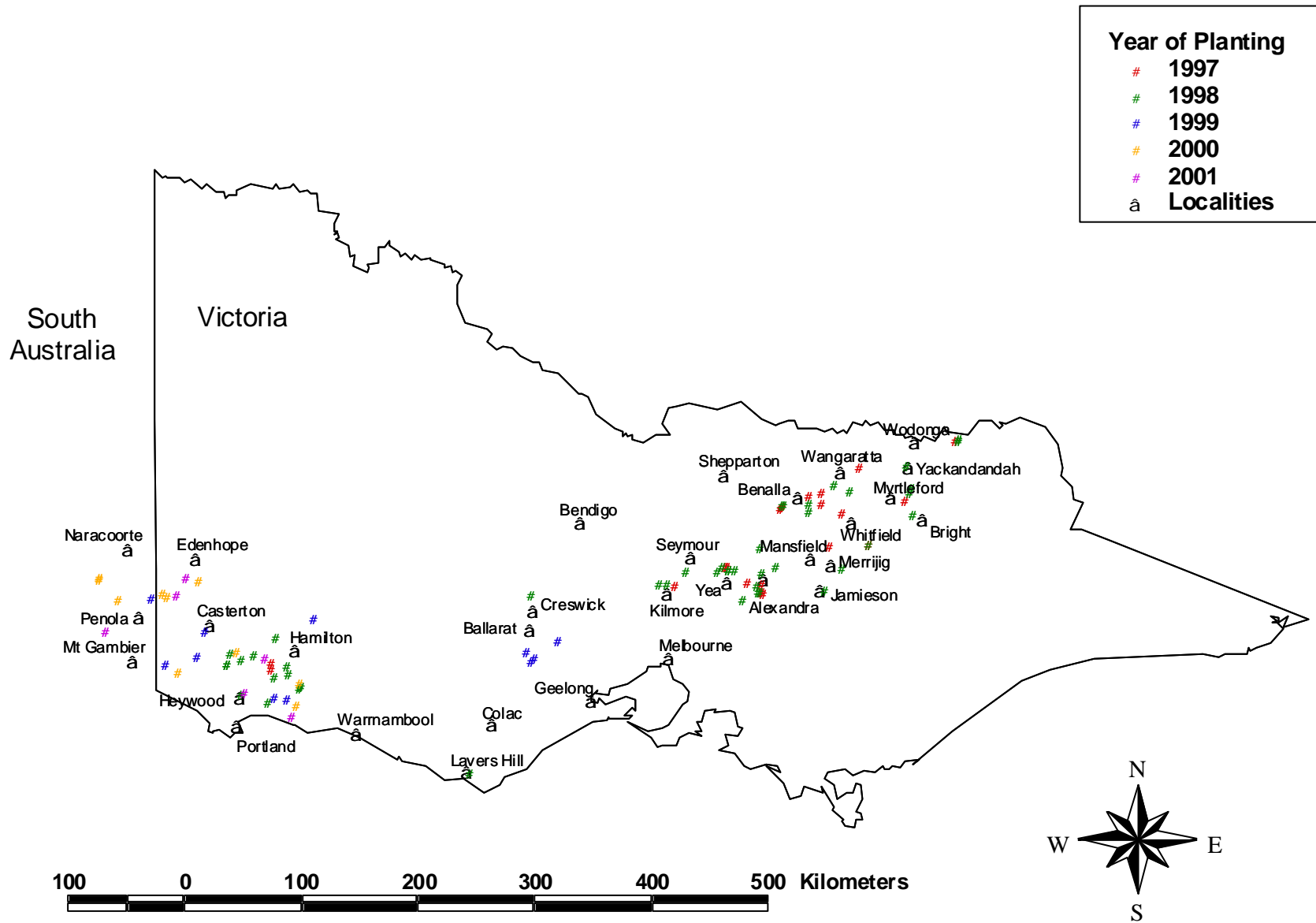


Figure 1. Location of plantations containing PSPs.

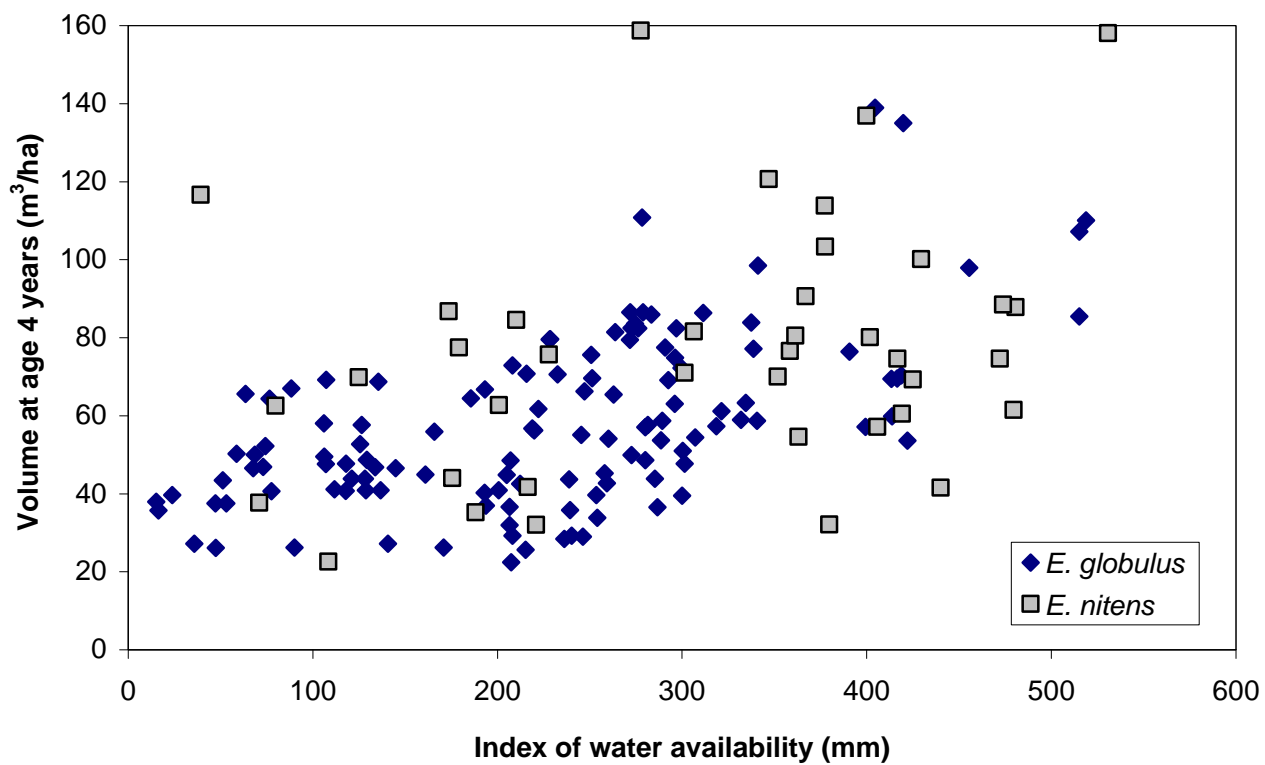


Figure 2. The relationship between volume at age 4 years and an index of water availability.

Table 1. Number¹ of permanent sampling plots by species, region, and year of establishment. The value in brackets represents the percentage of all plots.

Year of planting	<i>E. globulus</i>			<i>E. nitens</i>	Total
	NE Vic. ²	SW Vic. ³	CE Vic. ⁴	NE Vic.	
1997	36 (12%)	8 (3%)	*	18 (6%)	62 (21%)
1998	60 (20%)	52 (17%)	6 (2%)	30 (10%)	148 (49%)
1999	*	25 (8%)	12 (4%)	*	37 (12%)
2000	*	39 (13%)	*	*	39 (13%)
2001	*	16 (5%)	*	*	16 (5%)
Total	96 (32%)	140 (46%)	18 (6%)	48 (16%)	302 (100%)

¹includes now discarded PSPs

²north-eastern Victoria

³south-western Victoria

⁴central Victoria

Table 2. Number¹ of permanent sampling plots established for each geology-rainfall combination. The first number is the total number of *E. globulus* PSPs, while the second number (separated by "&") is the total number of *E. nitens* PSPs. Black cells indicate geology-rainfall combinations that do not exist in the study area, and grey cells indicate combinations that do exist, but for which no plantations are being monitored in this study.

Geology		Average annual rainfall (mm)					
Type	Code	600-699	700-799	800-899	900-999	>1000	Total
Paleozoic sediments	PS	15	9	8	9 & 3	6 & 10	47 & 13
Mesozoic sediments	MS					3 & 0	3 & 0
Tertiary sediments (calcareous)	TS(c)	4	2				6
Tertiary sediments (non-calcareous)	TS(nc)	3	23				26
Quaternary sediments	QS	47	49	3	0 & 6	0 & 3	99 & 9
Igneous extrusive (eg. basalt)	IE	13	44			0 & 8	57 & 8
Igneous intrusive (eg. granite)	II			6	6 & 9	0 & 6	12 & 15
Metamorphic	M			1	3 & 3		4 & 3
Total		82	127	18	18 & 21	9 & 27	302

¹includes now discarded PSPs

Table 3. Average annual plot climate data from ESOCLIM¹ for all PSPs².

	Average rainfall (mm/yr)	Average pan evaporation (mm/yr)	Average daily temperature (°C)				Average radiation (MJ/m ² .day)
			January		July		
			Max.	Min.	Max.	Min.	
Average	799	1260	26.0	11.3	11.6	3.4	15.9
Minimum	635	1023	21.1	9.3	6.9	0.4	14.6
Maximum	1285	1426	30.5	13.7	14.1	5.9	16.9
Range	650	403	9.4	4.4	7.2	5.5	2.3
Std. Dev.	157	89	2.1	0.9	1.6	1.4	0.5

¹Hutchison *et al.* (1999)

²includes now discarded PSPs

Table 4. Summary of tree measurements in *E. globulus* and *E. nitens* PSPs at age 1, 2, and 4 years.

Year of planting	Species		Density (trees/ha)			Survival (%)			MDH ¹ (m)			Basal area (m ² /ha)		Volume (m ³ /ha)	
			1 year	2 years	4 years	1 year	2 years	4 years	1 year	2 years	4 years	2 years	4 years	2 years	4 years
1997	<i>E. globulus</i> n=44	Average	*	893	884	*	93	93	*	5.9	12.0	2.8	10.9	7.6	52.7
		Minimum	*	585	585	*	78	78	*	3.9	9.4	1.0	7.0	2.4	27.9
		Maximum	*	1022	1022	*	100	100	*	7.9	17.1	7.2	21.1	23.2	138.4
	<i>E. nitens</i> n=18	Average	*	937	873	*	96	91	*	5.6	12.5	2.7	12.8	6.7	62.1
		Minimum	*	673	400	*	80	44	*	4.3	9.7	1.3	4.8	3.2	22.1
		Maximum	*	1044	1044	*	100	100	*	6.8	16.3	4.0	17.7	9.7	90.1
1998	<i>E. globulus</i> n=112	Average	942	939	917	97	97	94	2.7	6.8	12.4	4.0	12.4	11.6	61.4
		Minimum	720	720	720	88	86	72	1.8	4.6	8.5	1.2	5.9	3.0	21.9
		Maximum	1250	1250	1125	100	100	100	4.2	10.5	19.2	7.4	18.5	30.1	110.3
	<i>E. nitens</i> n=30	Average	965	963	967	97	96	94	2.4	6.9	14.0	3.9	15.1	11.6	82.6
		Minimum	711	711	740	87	87	82	1.5	4.5	10.2	1.4	8.3	3.3	31.5
		Maximum	1150	1150	1150	100	100	100	3.6	8.9	19.3	7.3	22.1	26.9	158.2
1999	<i>E. globulus</i> n=37	Average	1044	1033		93	92		2.7	6.3		3.8		10.3	
		Minimum	718	725		63	63		1.5	4.4		1.4		3.2	
		Maximum	1241	1225		100	100		3.6	7.8		6.3		19.3	
2000	<i>E. globulus</i> n=39	Average	900	1070		93	92		2.8	6.8		4.5		13.1	
		Minimum	595	841		68	68		2.0	5.2		1.6		3.6	
		Maximum	1020	1208		100	100		3.9	8.3		7.4		23.2	
2001	<i>E. globulus</i> n=16	Average	1160			97			2.5						
		Minimum	975			89			2.0						
		Maximum	1323			100			3.1						
<i>E. globulus</i>	Overall average		1012	984	900	95	94	93	2.7	6.4	12.2	3.8	11.7	10.6	57.0
	Overall minimum		595	585	585	63	63	72	1.5	3.9	8.5	1.0	5.9	2.4	21.9
	Overall maximum		1323	1250	1125	100	100	100	4.2	10.5	19.2	7.4	21.1	30.1	138.4
<i>E. nitens</i>	Overall average		965	950	920	97	96	93	2.4	6.2	13.2	3.3	13.9	9.1	72.3
	Overall minimum		711	673	400	87	80	44	1.5	4.3	9.7	1.3	4.8	3.2	22.1
	Overall maximum		1150	1150	1150	100	100	100	3.6	8.9	19.3	7.3	22.1	26.9	158.2

¹MDH (mean dominant height) at age 1 year = average height of the 200 tallest trees per hectare; at age 2 years and older = average height of the 200 largest diameter trees per hectare

* not measured

table includes measurements (where available) of plots subsequently discarded

Table 5a. Summary of foliar analysis for N, S, P and K for *E. globulus* and *E. nitens* at age 1, 2, and 4 years.

Year of planting	Species	Age (years)	N (g/kg)			S (g/kg)			P (g/kg)			K (g/kg)		
			1	2	4	1	2	4	1	2	4	1	2	4
1997	<i>E. globulus</i> n=44	Average	*	19.2	17.3	*	1.5	1.2	*	1.5	1.0	*	6.8	6.2
		Minimum	*	15.9	14.1	*	1.0	0.9	*	1.0	0.8	*	4.9	4.9
		Maximum	*	25.5	19.4	*	1.7	1.4	*	2.4	1.2	*	12.3	8.3
	<i>E. nitens</i> n=18	Average	*	21.9	16.8	*	1.5	1.2	*	1.4	1.0	*	6.5	5.1
		Minimum	*	15.7	14.4	*	1.1	1.0	*	1.1	0.9	*	4.1	3.9
		Maximum	*	27.8	20.1	*	1.9	1.3	*	1.7	1.2	*	8.5	7.5
1998	<i>E. globulus</i> n=112	Average	20.9	20.2	16.5	1.5	1.5	1.3	1.8	1.4	1.0	8.9	7.2	6.1
		Minimum	15.3	15.7	13.5	1.2	1.1	0.9	1.0	1.0	0.7	5.5	5.1	3.8
		Maximum	28.9	25.8	21.5	2.0	1.9	1.8	3.0	2.0	1.6	13.2	10.3	9.2
	<i>E. nitens</i> n=30	Average	19.7	20.5	16.5	1.3	1.4	1.0	1.4	1.3	0.9	6.5	6.9	5.4
		Minimum	15.0	14.4	14.2	1.0	1.0	0.9	1.1	1.0	0.7	4.9	3.7	3.4
		Maximum	21.8	26.9	19.4	1.5	1.9	1.2	1.7	1.9	1.1	7.9	8.3	8.2
1999	<i>E. globulus</i> n=37	Average	22.5	21.8		1.6	1.6		1.9	1.8		8.5	8.0	
		Minimum	18.9	17.9		1.4	1.2		1.1	1.1		5.4	5.4	
		Maximum	26.0	29.6		2.0	1.9		3.5	3.2		13.1	13.9	
2000	<i>E. globulus</i> n=39	Average	22.9	22.3		1.7	2.0		2.3	1.7		9.4	7.3	
		Minimum	17.3	17.5		1.2	1.5		1.4	1.2		5.2	5.4	
		Maximum	28.4	28.2		2.2	2.5		3.1	2.8		14.2	9.3	
2001	<i>E. globulus</i> n=16	Average	19.4			1.6			2.1			7.5		
		Minimum	15.2			1.2			1.4			3.6		
		Maximum	28.2			2.3			3.3			11.1		
<i>E. globulus</i>	Overall average		21.4	20.9	16.9	1.6	1.6	1.3	2.0	1.6	1.0	8.6	7.3	6.2
	Overall minimum		15.2	15.7	13.5	1.2	1.0	0.9	1.0	1.0	0.7	3.6	4.9	3.8
	Overall maximum		28.9	29.6	21.5	2.3	2.5	1.8	3.5	3.2	1.6	14.2	13.9	9.2
<i>E. nitens</i>	Overall average		19.7	21.2	16.6	1.3	1.4	1.1	1.4	1.3	1.0	6.5	6.7	5.3
	Overall minimum		15.0	14.4	14.2	1.0	1.0	0.9	1.1	1.0	0.7	4.9	3.7	3.4
	Overall maximum		21.8	27.8	20.1	1.5	1.9	1.3	1.7	1.9	1.2	7.9	8.5	8.2

* not measured

Table 5b. Summary of foliar analysis for Ca, Mg, Na and Cl for *E. globulus* and *E. nitens* at age 1, 2, and 4 years.

Year of planting	Species	Age (years)	Ca (mg/g)			Mg (mg/g)			Na (mg/g)			Cl (mg/g)		
			1	2	4	1	2	4	1	2	4	1	2	4
1997	<i>E. globulus</i> n=44	Average	*	6.8	7.9	*	1.8	1.6	*	1.6	1.6	*	2.1	2.4
		Minimum	*	3.7	4.5	*	0.9	1.1	*	0.5	0.8	*	0.7	0.8
		Maximum	*	11.6	15.2	*	2.2	2.2	*	2.8	3.2	*	3.7	4.4
	<i>E. nitens</i> n=18	Average	*	4.3	5.3	*	1.2	1.4	*	0.3	0.4	*	0.8	1.0
		Minimum	*	2.7	4.4	*	1.0	1.1	*	0.0	0.0	*	0.4	0.8
		Maximum	*	5.6	7.1	*	1.4	1.5	*	1.8	1.4	*	1.3	1.4
1998	<i>E. globulus</i> n=112	Average	5.7	7.5	10.8	1.6	2.0	2.0	1.2	1.4	1.7	1.9	2.2	
		Minimum	3.5	4.2	5.2	0.9	1.4	1.0	0.1	0.3	0.3	0.6	0.7	
		Maximum	11.2	13.0	17.4	2.6	2.8	3.1	2.5	2.7	3.9	3.3	4.1	
	<i>E. nitens</i> n=30	Average	3.4	5.8	5.1	0.8	1.4	1.3	0.0	0.1	0.1	0.6	0.9	
		Minimum	2.0	2.6	3.8	0.6	1.1	1.1	0.0	0.0	0.0	0.4	0.5	
		Maximum	6.7	8.2	6.2	1.1	1.7	1.5	0.1	0.9	0.1	0.8	1.7	
1999	<i>E. globulus</i> n=37	Average	5.2	8.3		1.8	2.1		2.1	2.6		3.0		
		Minimum	3.6	4.8		1.3	1.4		0.8	1.1		1.9		
		Maximum	7.5	12.4		2.4	2.8		3.2	5.7		3.7		
2000	<i>E. globulus</i> n=39	Average	6.8	10.1		1.8	2.6		2.3	2.4				
		Minimum	4.9	6.7		1.4	1.9		1.1	1.5				
		Maximum	9.7	16.9		2.7	3.3		4.3	3.5				
2001	<i>E. globulus</i> n=16	Average	6.3			2.1			2.3					
		Minimum	4.2			1.6			1.4					
		Maximum	9.7			3.1			4.2					
<i>E. globulus</i>	Overall average		6.0	8.2	9.4	1.8	2.1	1.8	2.0	2.0	1.7	2.4	2.2	2.4
	Overall minimum		3.5	3.7	4.5	0.9	0.9	1.0	0.1	0.3	0.3	0.6	0.7	0.8
	Overall maximum		11.2	16.9	17.4	3.1	3.3	3.1	4.3	5.7	3.9	3.7	4.1	4.4
<i>E. nitens</i>	Overall average		3.4	5.1	5.2	0.8	1.3	1.3	0.0	0.2	0.2	0.6	0.9	1.0
	Overall minimum		2.0	2.6	3.8	0.6	1.0	1.1	0.0	0.0	0.0	0.4	0.4	0.8
	Overall maximum		6.7	8.2	7.1	1.1	1.7	1.5	0.1	1.8	1.4	0.8	1.7	1.4

Table 5c. Summary of foliar analysis for Fe, Mn, Zn, Cu, B and Al for *E. globulus* and *E. nitens* at age 1, 2, and 4 years.

Year of planting	Species	Age (years)	Fe (mg/kg)			Mn (mg/kg)			Zn (mg/kg)			Cu (mg/kg)			B (mg/kg)			Al (mg/kg)		
			1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4
1997	<i>E. globulus</i> n=44	Average	*	47	53	*	1358	770	*	16	14	*	5	6	*	15	23	*	34	45
		Minimum	*	18	26	*	409	227	*	8	11	*	2	3	*	7	13	*	6	22
		Maximum	*	354	216	*	2757	2152	*	30	19	*	10	12	*	25	46	*	157	80
	<i>E. nitens</i> n=18	Average	*	39	53	*	1008	929	*	17	11	*	5	3	*	14	23	*	36	52
		Minimum	*	28	29	*	442	383	*	14	9	*	0	2	*	6	12	*	16	25
		Maximum	*	55	88	*	1926	2133	*	20	14	*	8	5	*	28	50	*	57	65
1998	<i>E. globulus</i> n=112	Average	45	49	43	1599	818	665	21	17	13	6	8	5	11	20	25	30	45	60
		Minimum	27	31	26	226	172	104	9	10	7	0	1	2	2	7	9	6	9	21
		Maximum	71	83	85	5077	2397	2609	40	120	36	11	25	9	23	52	50	104	95	92
	<i>E. nitens</i> n=30	Average	27	48	38	1206	778	626	14	14	11	3	4	3	7	47	18	29	47	47
		Minimum	22	35	29	314	205	173	10	10	9	1	2	2	2	7	6	11	0	24
		Maximum	38	85	57	1962	1349	1056	22	21	13	7	9	4	12	160	28	72	83	76
1999	<i>E. globulus</i> n=37	Average	49	52		667	531		20	19		6	8		18	23		37	29	
		Minimum	34	39		97	64		14	11		1	1		9	12		19	11	
		Maximum	74	72		1676	1538		25	46		19	18		33	50		78	57	
2000	<i>E. globulus</i> n=39	Average	53	47		457	382		21	23		4	5		21	24		27	29	
		Minimum	33	35		47	54		13	18		1	1		11	14		7	11	
		Maximum	79	79		2112	1649		30	33		14	9		39	38		55	59	
2001	<i>E. globulus</i> n=16	Average	66			958			27			11			25			59		
		Minimum	38			351			17			6			17			32		
		Maximum	133			2357			36			29			54			143		
<i>E. globulus</i>	Overall average	53	49	48	920	772	718	22	19	14	7	6	5	19	21	24	38	34	52	
	Overall minimum	27	18	26	47	54	104	9	8	7	0	1	2	2	7	9	6	6	21	
	Overall maximum	133	354	216	5077	2757	2609	40	120	36	29	25	12	54	52	50	143	157	92	
<i>E. nitens</i>	Overall average	27	43	45	1206	893	777	14	15	11	3	4	3	7	30	20	29	41	49	
	Overall minimum	22	28	29	314	205	173	10	10	9	1	0	2	2	6	6	11	0	24	
	Overall maximum	38	85	88	1962	1926	2133	22	21	14	7	9	5	12	160	50	72	83	76	

Table 6. Summary of chemical analysis of surface soil samples (0-10 cm depth) from a subset of PSPs in north-eastern and central Victoria.

	EC	pH	Total C	Total N	Available P	Ca	Mg	K	Na
	dS/m		(g/kg)	(g/kg)	(mg/kg)		(cmol(+)/kg)		
Average	0.067	5.2	37.5	2.9	17.4	3.4	1.5	0.4	0.1
Minimum	0.034	4.7	13.9	1.3	5.2	0.6	0.3	0.1	0.0
Maximum	0.170	5.9	73.1	6.5	99.2	12.5	6.5	1.7	0.6
Range	0.136	1.3	59.2	5.2	94.0	12.0	6.3	1.6	0.6

Table 7. Average mean annual increment ($m^3/ha/yr$) of *Eucalyptus globulus* and *E. nitens* PSPs at age 4 years. The numbers in brackets represent the number of PSPs. Total number of PSPs is 192. Black cells indicate geology-rainfall combinations that do not exist in the study area, and grey cells indicate combinations that do exist, but for which no data are available.

Geology	<i>E. globulus</i>					<i>E. nitens</i>	
	Average annual rainfall (mm)						
	600-699	700-799	800-899	900-999	>1000	900-999	>1000
Paleozoic sediments	9.9 (9)	12.3 (6)	11.0 (8)	13.1 (9)	12.3 (6)	17.2 (3)	24.1 (7)
Mesozoic sediments					25.1 (3)		
Tertiary sediments (calcareous)	16.3 (4)						
Tertiary sediments (non-calcareous)		15.9 (16)					
Quaternary sediments	7.6 (9)	15.1 (19)	15.0 (3)			20.5 (6)	17.1 (3)
Igneous extrusive (eg. basalt)	10.3 (7)	17.6 (41)					19.5 (8)
Igneous intrusive (eg. granite)			15.8 (6)	12.2 (3)		19.6 (6)	12.5 (6)
Metamorphic			19.8 (1)	25.5 (3)			

Table 8. Average site characteristics for PSPs with high, medium and low growth rates for *E. globulus* and *E. nitens*. The number of PSPs represented by high = 12 (7% of total), medium = 27 (17% of total), low = 15 (9% of total). Total number of PSPs = 164.

	Mean annual increment at age 4 years		
	Low <8 m ³ /ha/yr	Medium 14-17 m ³ /ha/yr	High >25 m ³ /ha/yr
Climate			
Rainfall (mm/yr)	735	860	1050
Evaporation (mm/yr)	1270	1230	1210
Ave max temp Jan (°C)	28.2	26.3	26.7
Ave min temp Jan (°C)	12.2	11.3	11.4
Ave max temp Jul (°C)	11.2	11.1	11.0
Ave min temp Jul (°C)	2.5	2.9	2.8
Ave Radiation (MJ/m ² .day)	16.4	15.9	15.8
Soils			
Texture of A horizon	Clay loams to light clays	Sandy loams & clay loams	Clay loams
Depth of A horizon (m)	0.22	0.43	0.54
PAW ¹ of A horizon (mm/m)	154	160	161
Texture of B horizon	Light to medium heavy clays	Light clays to light medium clays	Clay loams to light medium clays
PAW ¹ of B horizon (mm/m)	123	132	137
Clay ² in B horizon (%)	47	40	39
Soil depth ³ (m)	2.9	3.1	3.8
PAW ⁴ (mm)	325	375	440
Foliar Nutrition			
N (mg/g)	16.4	16.9	17
P (mg/g)	0.9	1.0	1.0
Cl (mg/g)	2.7	2.3	1.9
Fe (µg/g)	66	38	34
Mn (µg/g)	1186	573	567
B (µg/g)	30	20	15

¹ Plant available water calculated from estimates of soil water holding capacity for different field textures given by Williams (1983) and Murtha (1988)

² Estimated from field texture

³ Soil profiles dug to a maximum of 4 m were assigned a depth of 4m. The actual soil depth of these profiles may have been considerably deeper

⁴ Total plant available water estimated from texture, percentage of coarse fragments and soil depth

Table 9. Schedule of completed and proposed measurements and sampling of PSPs to age 10 years. Proposed tasks in bold. M = tree measurement; L = leaf area index; F = foliar sample; S = surface soil sample; P = soil profile description; (age in years)

Year	Year of planting				
	1997	1998	1999	2000	2001
1999	MFS (2)	MFS (1)			
2000	P (3)	MFP (2)	MFS (1)		
2001	MFLP (4)	P(3)	MFP (2)	MFS (1)	
2002		MFL (4)		MFP (2)	MFS (1)
2003	MFL (6)		MFL (4)		MF (2)
2004		MFL (6)		MFL (4)	
2005	MFL(8)		MFL (6)		MFL (4)
2006		MFL(8)		MFL (6)	
2007	MFL(10)		MFL(8)		MFL (6)
2008		MFL(10)		MFL(8)	
2009			MFL(10)		MFL(8)
2010				MFL(10)	
2011					MFL(10)

Appendix A. Geology and average annual climate data from ESOCLIM for all PSPs.

PSP no.	Geology ¹	Average rainfall (mm/yr)	Average pan evaporation (mm/yr)	Average daily temperature (°C)				Average radiation (MJ/m ² .day)
				January		July		
				Max.	Min.	Max.	Min.	
1	IE	705	1299	24.4	10.7	12.3	4.4	15.4
2	IE	704	1299	24.4	10.7	12.3	4.4	15.4
3	IE	708	1298	24.4	10.7	12.3	4.4	15.4
4	IE	707	1298	24.4	10.7	12.3	4.4	15.4
5	TS(nc)	704	1308	24.3	11.0	12.6	4.6	15.4
6	TS(nc)	701	1308	24.3	11.0	12.6	4.6	15.4
7	TS(nc)	705	1307	24.3	11.0	12.6	4.7	15.4
8	TS(nc)	706	1306	24.2	11.0	12.6	4.7	15.4
9	IE	716	1328	29.3	13.1	11.7	2.6	16.7
10	IE	717	1327	29.2	13.1	11.7	2.6	16.7
11	IE	720	1326	29.2	13.1	11.7	2.6	16.7
12	PS	912	1186	27.3	11.4	11.0	2.9	15.7
13	PS	918	1183	27.3	11.3	11.0	2.8	15.7
14	PS	902	1189	27.4	11.4	11.1	2.9	15.7
15	IE	696	1234	26.3	11.8	10.9	2.9	15.9
16	IE	712	1226	26.1	11.7	10.7	2.9	15.9
17	IE	731	1214	26.0	11.6	10.5	2.8	15.9
18	PS	711	1341	29.6	13.2	11.7	2.5	16.7
19	PS	711	1342	29.7	13.3	11.8	2.5	16.7
20	PS	708	1344	29.7	13.3	11.8	2.5	16.7
21	PS	818	1287	28.9	12.6	11.1	2.3	16.6
22	PS	810	1291	29.0	12.7	11.2	2.4	16.6
23	PS	823	1285	28.9	12.6	11.0	2.3	16.6
24	QS	654	1426	30.5	13.7	12.2	2.4	16.9
25	QS	654	1426	30.5	13.7	12.2	2.4	16.9
26	QS	654	1426	30.5	13.7	12.2	2.4	16.9
27	II	928	1114	24.7	10.3	8.3	1.6	16.1
28	II	933	1112	24.7	10.3	8.3	1.6	16.1
29	II	956	1105	24.5	10.2	8.2	1.6	16.1
30	QS	681	1355	29.8	13.5	12.0	2.7	16.7
31	QS	683	1355	29.8	13.4	12.0	2.7	16.7
32	QS	685	1354	29.8	13.4	12.0	2.7	16.7
33	PS	1070	1282	29.2	11.6	11.2	1.6	16.5
34	PS	1071	1281	29.2	11.5	11.2	1.6	16.5
35	PS	1082	1277	29.1	11.5	11.2	1.5	16.5
36	IE	738	1313	29.0	12.9	11.5	2.5	16.7
37	IE	739	1312	29.0	12.9	11.5	2.5	16.7
38	IE	741	1309	28.9	12.8	11.4	2.5	16.7

PSP no.	Geology ¹	Average rainfall (mm/yr)	Average pan evaporation (mm/yr)	Average daily temperature (°C)				Average radiation (MJ/m ² .day)
				January		July		
				Max.	Min.	Max.	Min.	
39	QS	764	1224	28.1	11.8	11.4	3.0	15.8
40	QS	765	1224	28.1	11.8	11.4	3.0	15.8
41	QS	766	1223	28.1	11.8	11.4	3.0	15.8
42	QS	863	1183	26.7	11.1	10.2	2.6	15.9
43	QS	831	1197	27.0	11.3	10.5	2.7	15.9
44	QS	831	1197	27.0	11.3	10.5	2.7	15.9
45	PS	1275	1025	23.8	9.3	6.9	0.4	16.2
46	PS	1276	1025	23.8	9.3	6.9	0.4	16.2
47	PS	1285	1023	23.7	9.3	6.9	0.4	16.2
48	PS	885	1196	27.5	11.5	11.2	2.9	15.7
49	PS	886	1195	27.5	11.5	11.2	2.9	15.7
50	PS	898	1192	27.4	11.4	11.1	2.9	15.7
51	IE	1026	1217	27.8	11.7	10.1	2.0	16.5
52	IE	1042	1205	27.6	11.6	9.9	1.9	16.5
53	IE	1049	1200	27.5	11.5	9.8	1.9	16.5
54	II	924	1116	24.7	10.3	8.4	1.7	16.1
55	II	917	1119	24.8	10.4	8.4	1.7	16.1
56	II	911	1121	24.8	10.4	8.5	1.7	16.1
57	IE	1285	1138	27.0	10.8	9.9	1.7	16.2
58	IE	1283	1152	27.3	11.0	10.2	1.8	16.2
59	IE	1285	1143	27.1	10.9	10.0	1.7	16.2
60	M	982	1299	27.4	11.8	9.0	0.8	16.9
61	M	993	1293	27.3	11.7	8.9	0.7	16.9
62	M	978	1299	27.4	11.8	9.0	0.8	16.9
63	IE	758	1290	24.0	10.8	12.5	4.5	15.3
64	IE	759	1289	24.0	10.8	12.5	4.5	15.3
65	IE	758	1289	24.0	10.8	12.5	4.5	15.3
66	IE	759	1288	24.0	10.8	12.5	4.5	15.3
67	TS(nc)	778	1269	23.8	10.5	12.1	4.3	15.3
68	TS(nc)	779	1269	23.8	10.5	12.1	4.3	15.3
69	TS(nc)	778	1269	23.8	10.5	12.1	4.3	15.3
70	TS(nc)	780	1268	23.7	10.5	12.1	4.3	15.3
71	IE	722	1296	23.9	10.9	12.6	4.7	15.3
72	IE	722	1295	23.9	10.9	12.6	4.7	15.3
73	IE	723	1295	23.9	10.9	12.6	4.7	15.3
74	IE	723	1295	23.9	10.9	12.6	4.7	15.3
75	IE	716	1291	24.5	10.5	12.1	4.2	15.5
76	IE	716	1291	24.5	10.5	12.1	4.2	15.5
77	IE	718	1290	24.4	10.5	12.1	4.2	15.5
78	IE	717	1290	24.4	10.5	12.1	4.2	15.5

PSP no.	Geology ¹	Average rainfall (mm/yr)	Average pan evaporation (mm/yr)	Average daily temperature (°C)				Average radiation (MJ/m ² .day)
				January		July		
				Max.	Min.	Max.	Min.	
79	QS	764	1285	22.9	11.5	13.0	5.3	15.0
80	QS	766	1285	22.9	11.5	13.0	5.3	15.0
81	QS	762	1285	22.9	11.5	13.0	5.3	15.0
82	QS	764	1285	22.9	11.5	13.0	5.3	15.0
83	TS(c)	659	1325	25.5	10.7	12.3	4.1	15.7
84	TS(c)	659	1325	25.5	10.7	12.3	4.1	15.7
85	TS(c)	662	1324	25.5	10.7	12.3	4.1	15.7
86	TS(c)	666	1322	25.4	10.7	12.3	4.1	15.7
87	IE	718	1286	24.2	10.5	12.1	4.3	15.4
88	IE	719	1285	24.1	10.6	12.1	4.3	15.4
89	IE	719	1285	24.1	10.6	12.1	4.3	15.4
90	IE	724	1284	24.1	10.6	12.1	4.4	15.4
91	TS(nc)	740	1290	24.2	10.7	12.4	4.4	15.4
92	TS(nc)	739	1291	24.2	10.7	12.4	4.4	15.4
93	TS(nc)	739	1290	24.2	10.7	12.4	4.4	15.4
94	TS(nc)	738	1291	24.2	10.7	12.4	4.4	15.4
95	IE	734	1280	23.8	10.6	12.1	4.5	15.4
96	IE	734	1280	23.8	10.6	12.1	4.5	15.4
97	IE	735	1280	23.8	10.6	12.1	4.5	15.4
98	IE	737	1279	23.8	10.7	12.1	4.5	15.4
99	IE	739	1272	23.4	10.9	12.3	4.7	15.3
100	IE	739	1273	23.4	10.9	12.3	4.7	15.3
101	IE	742	1271	23.3	10.9	12.3	4.7	15.3
102	IE	747	1269	23.2	10.9	12.3	4.7	15.2
103	IE	798	1271	23.0	11.1	12.7	5.0	15.1
104	IE	798	1271	23.0	11.1	12.7	5.0	15.1
105	IE	798	1270	22.9	11.1	12.7	5.0	15.1
106	IE	790	1275	23.0	11.2	12.8	5.1	15.1
107	TS(nc)	738	1297	24.4	10.7	12.4	4.3	15.4
108	TS(nc)	736	1297	24.4	10.7	12.4	4.3	15.4
109	TS(nc)	742	1291	24.3	10.6	12.3	4.2	15.4
110	TS(nc)	741	1291	24.4	10.6	12.3	4.2	15.4
111	IE	726	1282	23.4	11.1	12.5	4.8	15.2
112	IE	736	1277	23.3	11.0	12.4	4.8	15.2
113	IE	751	1269	23.2	10.9	12.3	4.7	15.2
114	IE	753	1268	23.2	10.9	12.3	4.7	15.2
115	QS	731	1337	29.7	13.3	12.0	2.7	16.7
116	QS	731	1337	29.7	13.3	11.9	2.7	16.7
117	QS	732	1336	29.7	13.3	11.9	2.7	16.7
118	PS	689	1264	27.4	12.1	11.3	3.1	16.0

PSP no.	Geology ¹	Average rainfall (mm/yr)	Average pan evaporation (mm/yr)	Average daily temperature (°C)				Average radiation (MJ/m ² .day)
				January		July		
				Max.	Min.	Max.	Min.	
119	PS	698	1257	27.3	12.0	11.1	3.0	16.0
120	PS	676	1273	27.6	12.2	11.4	3.2	16.0
121	PS	788	1201	27.3	11.3	10.4	2.5	16.0
122	PS	781	1204	27.4	11.3	10.5	2.5	16.0
123	PS	777	1205	27.4	11.3	10.5	2.5	16.0
124	QS	653	1386	30.3	13.7	12.2	2.6	16.8
125	QS	652	1387	30.3	13.7	12.3	2.6	16.8
126	QS	654	1386	30.3	13.7	12.2	2.6	16.8
127	QS	707	1372	30.3	13.4	12.3	2.6	16.7
128	QS	708	1372	30.3	13.4	12.3	2.6	16.7
129	QS	710	1372	30.3	13.4	12.3	2.6	16.7
130	PS	698	1225	26.1	11.7	10.7	2.8	16.0
131	PS	683	1234	26.3	11.8	10.9	2.8	16.0
132	PS	691	1228	26.2	11.7	10.8	2.8	16.0
133	II	988	1096	24.4	10.1	8.1	1.5	16.0
134	II	992	1094	24.4	10.1	8.0	1.5	16.0
135	II	1001	1092	24.3	10.1	8.0	1.5	16.0
136	PS	803	1312	29.4	13.0	11.8	2.6	16.6
137	PS	803	1312	29.4	13.0	11.8	2.6	16.6
138	PS	799	1312	29.4	13.0	11.8	2.6	16.6
139	PS	958	1167	26.8	11.1	10.5	2.7	15.7
140	PS	952	1168	26.9	11.1	10.5	2.7	15.7
141	PS	945	1172	26.9	11.2	10.6	2.7	15.7
142	PS	1087	1086	25.1	10.0	8.4	1.3	16.0
143	PS	1086	1086	25.1	10.0	8.4	1.3	16.0
144	PS	1093	1084	25.0	9.9	8.3	1.2	16.0
145	M	911	1349	29.2	12.4	10.8	1.6	16.8
146	M	905	1350	29.2	12.4	10.8	1.6	16.8
147	M	906	1353	29.2	12.4	10.9	1.6	16.8
148	II	846	1155	25.5	10.8	9.1	2.0	16.1
149	II	868	1143	25.2	10.6	8.9	1.9	16.1
150	II	866	1144	25.2	10.6	8.9	1.9	16.1
151	PS	790	1222	27.3	11.4	10.2	2.2	16.2
152	PS	792	1222	27.2	11.4	10.2	2.2	16.2
153	PS	790	1223	27.3	11.5	10.2	2.2	16.2
154	QS	711	1331	29.3	13.1	11.8	2.6	16.7
155	QS	711	1331	29.3	13.1	11.8	2.6	16.7
156	QS	711	1330	29.3	13.1	11.8	2.6	16.7
157	IE	690	1213	25.9	11.6	10.6	2.6	16.0
158	IE	680	1219	26.0	11.6	10.7	2.7	16.0

PSP no.	Geology ¹	Average rainfall (mm/yr)	Average pan evaporation (mm/yr)	Average daily temperature (°C)				Average radiation (MJ/m ² .day)
				January		July		
				Max.	Min.	Max.	Min.	
159	IE	682	1219	26.0	11.6	10.7	2.7	16.0
160	PS	862	1190	27.2	11.3	10.7	2.8	15.8
161	PS	848	1194	27.3	11.4	10.8	2.8	15.8
162	PS	847	1195	27.3	11.4	10.8	2.8	15.8
163	PS	680	1269	27.0	12.2	11.2	3.0	16.1
164	PS	672	1275	27.1	12.2	11.3	3.0	16.1
165	PS	670	1276	27.1	12.2	11.4	3.0	16.1
166	II	867	1148	25.5	10.7	9.1	2.0	16.0
167	II	858	1153	25.6	10.7	9.2	2.0	16.0
168	II	860	1153	25.6	10.7	9.2	2.0	16.0
169	QS	718	1328	29.3	13.1	11.8	2.6	16.7
170	QS	716	1329	29.3	13.1	11.8	2.6	16.7
171	QS	714	1330	29.3	13.1	11.8	2.6	16.7
172	II	897	1357	28.6	12.6	10.1	1.3	16.9
173	II	901	1354	28.5	12.6	10.0	1.2	16.9
174	II	898	1357	28.6	12.6	10.1	1.3	16.9
175	PS	1162	1251	28.9	11.4	11.3	1.5	16.4
176	PS	1170	1248	28.8	11.3	11.2	1.5	16.4
177	PS	1175	1247	28.8	11.3	11.2	1.5	16.4
178	II	954	1106	24.6	10.2	8.3	1.6	16.0
179	II	972	1101	24.5	10.2	8.2	1.6	16.0
180	II	963	1104	24.6	10.2	8.2	1.6	16.0
181	IE	1010	1076	25.9	10.0	9.1	1.2	16.0
182	IE	1010	1075	25.9	10.0	9.1	1.2	16.0
183	IE	1009	1074	25.9	10.0	9.1	1.2	16.0
184	QS	955	1184	26.5	11.3	10.8	3.1	15.7
185	QS	960	1183	26.5	11.3	10.8	3.1	15.7
186	QS	959	1184	26.5	11.3	10.8	3.1	15.6
187	PS	926	1178	27.0	11.2	10.7	2.8	15.7
188	PS	939	1173	26.9	11.2	10.6	2.7	15.7
189	PS	949	1169	26.8	11.1	10.5	2.7	15.7
190	II	1086	1269	28.6	11.4	10.6	1.3	16.6
191	II	1098	1264	28.5	11.3	10.5	1.3	16.6
192	II	1099	1263	28.5	11.3	10.5	1.3	16.6
193	IE	1284	1147	27.2	10.9	10.1	1.8	16.2
194	IE	1285	1137	27.0	10.8	9.9	1.7	16.2
195	IE	1280	1153	27.4	11.0	10.2	1.9	16.2
196	PS	1089	1111	27.0	10.6	10.6	1.8	15.8
197	PS	1076	1116	27.1	10.7	10.7	1.9	15.8
198	PS	1089	1109	26.9	10.6	10.6	1.8	15.8

PSP no.	Geology ¹	Average rainfall (mm/yr)	Average pan evaporation (mm/yr)	Average daily temperature (°C)				Average radiation (MJ/m ² .day)
				January		July		
				Max.	Min.	Max.	Min.	
199	QS	1011	1304	29.2	11.8	11.1	1.5	16.6
200	QS	1010	1305	29.2	11.8	11.1	1.5	16.6
201	QS	1009	1306	29.2	11.8	11.1	1.5	16.6
202	II	946	1319	27.9	12.1	9.4	0.9	16.9
203	II	932	1330	28.1	12.2	9.6	1.0	16.9
204	II	924	1336	28.2	12.3	9.7	1.1	16.9
205	MS	1253	1122	21.1	10.9	11.2	5.0	14.6
206	MS	1244	1124	21.1	10.9	11.2	5.0	14.6
207	MS	1244	1124	21.1	10.9	11.2	5.0	14.6
208	IE	654	1111	26.0	10.5	10.2	2.4	16.1
209	IE	653	1114	26.1	10.6	10.2	2.4	16.1
210	IE	653	1115	26.1	10.6	10.2	2.4	16.1
211	IE	665	1103	25.5	10.8	11.0	3.1	15.5
212	IE	665	1104	25.5	10.8	11.0	3.1	15.5
213	IE	665	1101	25.4	10.8	10.9	3.1	15.5
214	IE	684	1058	24.0	10.1	9.8	2.7	15.7
215	IE	686	1057	24.0	10.1	9.7	2.6	15.7
216	IE	684	1058	24.0	10.1	9.7	2.7	15.7
217	IE	678	1086	25.1	10.6	10.6	3.0	15.5
218	IE	663	1097	25.3	10.7	10.8	3.1	15.5
219	IE	657	1104	25.4	10.8	10.9	3.1	15.5
220	PS	684	1085	25.2	10.5	10.5	2.9	15.6
221	PS	682	1087	25.2	10.5	10.5	2.9	15.6
222	PS	677	1090	25.3	10.6	10.6	3.0	15.6
223	QS	651	1315	26.1	10.6	12.4	4.1	15.9
224	QS	651	1315	26.1	10.6	12.4	4.1	15.9
225	QS	651	1316	26.1	10.6	12.4	4.1	15.9
226	QS	744	1291	23.1	11.5	13.6	5.9	15.1
227	QS	744	1291	23.0	11.5	13.5	5.9	15.1
228	QS	742	1292	23.1	11.5	13.6	5.9	15.1
229	QS	743	1292	23.1	11.5	13.6	5.9	15.1
230	QS	744	1291	23.0	11.5	13.5	5.9	15.1
231	QS	653	1364	26.2	11.0	13.8	4.6	15.8
232	QS	657	1360	26.2	10.9	13.7	4.6	15.8
233	QS	657	1361	26.2	10.9	13.7	4.6	15.8
234	QS	757	1281	23.6	11.0	13.5	5.1	15.2
235	QS	756	1282	23.7	11.0	13.5	5.1	15.2
236	QS	758	1281	23.6	11.0	13.5	5.1	15.2
237	QS	760	1280	23.6	11.0	13.5	5.2	15.2
238	QS	756	1282	23.6	11.0	13.5	5.1	15.2

PSP no.	Geology ¹	Average rainfall (mm/yr)	Average pan evaporation (mm/yr)	Average daily temperature (°C)				Average radiation (MJ/m ² .day)
				January		July		
				Max.	Min.	Max.	Min.	
239	QS	709	1311	25.0	10.6	13.1	4.4	15.6
240	QS	709	1311	25.0	10.6	13.1	4.4	15.6
241	QS	709	1311	25.0	10.6	13.1	4.4	15.6
242	TS(nc)	750	1290	23.2	11.4	13.5	5.8	15.1
243	TS(nc)	752	1289	23.1	11.4	13.5	5.8	15.1
244	TS(nc)	755	1287	23.1	11.4	13.5	5.8	15.1
245	QS	733	1317	24.4	11.1	13.7	5.1	15.3
246	QS	733	1317	24.4	11.1	13.7	5.1	15.3
247	QS	733	1316	24.4	11.1	13.7	5.1	15.3
248	QS	673	1351	26.1	10.7	13.3	4.3	15.9
249	QS	667	1355	26.2	10.7	13.4	4.3	15.9
250	QS	667	1357	26.1	10.9	13.6	4.5	15.8
251	QS	674	1351	26.2	10.6	13.3	4.3	15.9
252	QS	769	1283	23.5	11.1	13.5	5.3	15.2
253	QS	770	1283	23.5	11.1	13.5	5.3	15.2
254	QS	772	1282	23.5	11.1	13.5	5.3	15.2
255	QS	676	1339	25.8	11.0	13.8	4.9	15.7
256	QS	678	1338	25.8	11.0	13.8	4.9	15.7
257	QS	680	1335	25.7	11.0	13.8	4.9	15.7
258	QS	677	1338	25.8	11.0	13.8	4.9	15.7
259	QS	636	1379	26.7	11.1	14.1	4.9	15.9
260	QS	638	1376	26.6	11.1	14.1	4.9	15.9
261	QS	640	1375	26.6	11.1	14.1	5.0	15.9
262	QS	639	1374	26.6	11.1	14.1	5.0	15.9
263	QS	637	1379	26.6	11.1	14.1	5.0	15.9
264	QS	635	1379	26.7	11.1	14.1	4.9	15.9
265	QS	644	1371	26.5	11.1	14.1	5.0	15.9
266	QS	644	1371	26.5	11.1	14.1	5.0	15.9
267	TS(nc)	735	1288	24.4	10.5	12.8	4.6	15.5
268	TS(nc)	735	1288	24.4	10.5	12.8	4.6	15.5
269	IE	757	1264	23.3	10.7	12.6	5.1	15.3
270	TS(nc)	737	1289	24.3	10.6	12.9	4.7	15.4
271	TS(nc)	746	1284	24.2	10.5	12.8	4.7	15.4
272	QS	662	1359	26.3	10.8	13.5	4.4	15.9
273	QS	656	1360	26.3	10.8	13.5	4.4	15.9
274	QS	663	1358	26.3	10.8	13.5	4.4	15.9
275	QS	661	1360	26.3	10.8	13.5	4.4	15.9
276	TS(nc)	642	1371	26.8	10.7	13.2	4.1	16.1
277	TS(nc)	647	1369	26.7	10.7	13.2	4.1	16.1
278	TS(nc)	641	1372	26.8	10.7	13.2	4.1	16.1

PSP no.	Geology ¹	Average rainfall (mm/yr)	Average pan evaporation (mm/yr)	Average daily temperature (°C)				Average radiation (MJ/m ² .day)
				January		July		
				Max.	Min.	Max.	Min.	
279	QS	641	1373	26.5	11.1	14.1	5.0	15.9
280	QS	642	1372	26.5	11.1	14.1	5.0	15.9
281	QS	644	1370	26.5	11.1	14.1	5.0	15.9
282	QS	643	1371	26.5	11.1	14.1	5.0	15.9
283	QS	749	1278	22.7	11.5	13.4	5.9	15.0
284	QS	751	1278	22.7	11.5	13.4	5.9	15.0
285	QS	752	1276	22.6	11.5	13.4	5.9	15.0
286	QS	750	1278	22.7	11.5	13.4	5.9	15.0
287	QS	749	1287	22.4	11.9	13.4	5.7	14.9
288	QS	745	1287	22.4	11.9	13.4	5.7	14.9
289	QS	640	1376	26.8	10.7	12.7	3.8	16.1
290	QS	645	1374	26.8	10.7	12.7	3.9	16.1
291	QS	640	1376	26.8	10.7	12.7	3.8	16.1
292	QS	646	1373	26.8	10.7	12.7	3.9	16.1
293	QS	775	1259	24.1	11.1	12.8	4.9	15.4
294	QS	775	1258	24.1	11.1	12.8	4.9	15.4
295	IE	704	1300	24.5	10.7	12.3	4.3	15.5
296	IE	703	1300	24.5	10.7	12.3	4.3	15.5
297	QS	681	1345	26.1	10.5	12.6	3.9	15.9
298	QS	683	1343	26.1	10.5	12.6	3.9	15.9
299	QS	684	1342	26.0	10.5	12.6	3.9	15.9
300	QS	682	1344	26.1	10.5	12.6	3.9	15.9
301	TS(c)	773	1289	23.2	11.4	13.0	5.2	15.1
302	TS(c)	771	1290	23.2	11.4	13.0	5.2	15.1

¹Geology codes are defined in Table 2

Appendix B. Tree measurements at age 1 year for PSPs of *E. globulus* and *E. nitens* planted in 1998, 1999, 2000 and 2001.

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH ² (m)
63	G	1998	891	95	2.4	2.9
64	G	1998	918	97	2.2	2.6
65	G	1998	954	98	2.3	2.8
66	G	1998	975	98	2.4	2.7
67	G	1998	969	93	2.1	2.7
68	G	1998	1014	97	2.5	2.9
69	G	1998	1001	92	2.2	2.8
70	G	1998	1115	98	2.4	2.9
71	G	1998	1005	98	2.3	2.7
72	G	1998	956	98	2.5	2.8
73	G	1998	790	95	2.2	2.6
74	G	1998	908	100	2.5	2.9
75	G	1998	951	100	2.6	3.0
76	G	1998	1056	100	2.6	3.2
77	G	1998	961	100	2.3	2.7
78	G	1998	938	95	2.1	2.5
79	G	1998	946	98	3.2	3.6
80	G	1998	939	97	2.8	3.2
81	G	1998	965	100	2.8	3.3
82	G	1998	893	90	2.7	3.2
83	G	1998	858	92	2.1	2.6
84	G	1998	880	97	2.1	3.1
85	G	1998	805	89	2.3	2.8
86	G	1998	864	97	2.1	2.7
87	G	1998	880	95	2.0	2.4
88	G	1998	922	100	2.3	2.7
89	G	1998	805	94	2.1	2.5
90	G	1998	891	97	2.5	3.0
91	G	1998	928	93	2.0	2.5
92	G	1998	980	98	2.5	2.9
93	G	1998	955	95	2.3	2.6
94	G	1998	974	95	2.1	2.7
95	G	1998	944	95	2.1	2.7
96	G	1998	893	97	2.3	2.7
97	G	1998	897	95	1.9	2.4
98	G	1998	916	100	2.0	2.6
99	G	1998	933	100	2.6	2.9
100	G	1998	946	100	2.6	3.1
101	G	1998	1000	95	2.1	2.6
102	G	1998	935	100	2.0	2.4
103	G	1998	951	100	2.1	2.6
104	G	1998	893	97	1.9	2.5
105	G	1998	944	97	2.0	2.6
106	G	1998	1000	100	2.2	2.8
107	G	1998	1043	100	1.9	2.6
108	G	1998	848	90	1.7	2.1
109	G	1998	980	100	2.2	2.6
110	G	1998	1031	95	2.1	2.6
111	G	1998	1062	100	2.6	3.1
112	G	1998	1005	98	2.2	2.6
113	G	1998	984	100	2.5	3.1
114	G	1998	898	95	2.6	3.1
115	G	1998	1175	100	2.2	2.7
116	G	1998	1150	100	2.1	2.6
117	G	1998	1000	100	2.1	2.6

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH ² (m)
118	G	1998	920	100	1.5	1.9
119	G	1998	889	91	2.0	2.5
120	G	1998	867	98	2.0	2.5
121	G	1998	1000	96	2.7	3.5
122	G	1998	867	93	2.3	3.0
123	G	1998	880	100	2.0	2.9
124	G	1998	867	91	1.9	2.4
125	G	1998	889	95	1.8	2.2
126	G	1998	911	100	2.1	2.6
127	G	1998	1022	100	1.6	2.1
128	G	1998	956	91	1.8	2.3
129	G	1998	1044	100	1.6	2.1
130	G	1998	911	98	2.4	2.9
131	G	1998	1000	100	2.5	2.9
132	G	1998	900	98	2.4	2.7
133	G	1998	950	97	2.4	2.8
134	G	1998	844	100	2.3	2.7
135	G	1998	800	97	2.5	3.1
136	G	1998	860	98	1.8	2.2
137	G	1998	1044	98	2.1	2.7
138	G	1998	956	98	2.3	3.0
139	G	1998	978	98	2.5	3.1
140	G	1998	939	100	3.0	3.6
141	G	1998	840	95	2.2	2.7
142	G	1998	933	98	1.8	2.4
143	G	1998	844	95	1.7	2.2
144	G	1998	867	95	1.4	1.8
145	G	1998	1140	94	2.7	3.5
146	G	1998	1250	94	3.2	4.2
147	G	1998	1150	98	2.7	3.6
148	G	1998	1000	100	2.1	2.6
149	G	1998	911	95	2.2	2.7
150	G	1998	1075	100	2.4	3.0
151	G	1998	956	96	2.0	2.4
152	G	1998	1000	100	1.7	2.2
153	G	1998	956	98	1.8	2.3
154	G	1998	940	98	1.7	2.1
155	G	1998	960	98	1.6	2.0
156	G	1998	1000	98	1.6	2.1
157	G	1998	1000	96	2.3	2.8
158	G	1998	999	98	1.9	2.2
159	G	1998	956	100	2.3	2.8
160	G	1998	956	98	2.4	3.1
161	G	1998	760	93	2.4	2.9
162	G	1998	900	98	2.0	2.4
163	G	1998	800	93	2.5	3.1
164	G	1998	911	95	2.2	3.1
165	G	1998	720	88	2.2	2.7
166	G	1998	1000	100	2.5	3.0
167	G	1998	933	100	2.1	2.5
168	G	1998	978	98	2.2	2.7
169	G	1998	800	98	2.5	3.0
170	G	1998	840	100	2.1	2.6
171	G	1998	980	100	1.7	2.3
172	G	1998	850	89	1.7	2.4
173	G	1998	889	98	1.9	2.4
174	G	1998	778	88	2.0	2.6
175	N	1998	956	93	2.4	3.0

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH ² (m)
176	N	1998	1100	98	2.6	3.1
177	N	1998	1050	95	1.9	2.7
178	N	1998	867	100	2.1	2.6
179	N	1998	867	98	2.7	3.2
180	N	1998	780	98	2.6	3.2
181	N	1998	1050	98	1.8	2.2
182	N	1998	933	98	1.9	2.4
183	N	1998	1044	100	1.1	1.5
184	N	1998	933	95	2.9	3.4
185	N	1998	1000	96	2.5	3.1
186	N	1998	978	100	2.5	2.9
187	N	1998	780	87	2.8	3.3
188	N	1998	857	93	3.1	3.6
189	N	1998	878	96	2.5	3.1
190	N	1998	900	96	1.5	1.9
191	N	1998	1050	95	1.6	2.1
192	N	1998	1125	98	1.9	2.4
193	N	1998	1034	100	1.5	1.8
194	N	1998	975	100	2.0	2.5
195	N	1998	978	98	1.7	2.1
196	N	1998	1067	94	1.4	1.8
197	N	1998	1044	98	1.1	1.5
198	N	1998	980	96	1.6	2.1
199	N	1998	1150	96	1.5	1.9
200	N	1998	1125	100	1.4	1.7
201	N	1998	1100	98	1.3	1.6
202	N	1998	814	93	2.1	2.5
203	N	1998	711	92	1.6	1.9
204	N	1998	818	100	1.4	1.7
211	G	1999	1125	100	1.4	1.7
212	G	1999	1125	100	1.2	1.5
213	G	1999	1125	96	1.2	1.5
214	G	1999	1022	100	2.2	2.6
215	G	1999	978	98	2.0	2.4
216	G	1999	867	98	2.1	2.4
217	G	1999	1225	98	1.6	2.0
218	G	1999	1044	100	1.9	2.4
219	G	1999	1025	98	2.0	2.6
220	G	1999	1100	100	2.1	2.6
221	G	1999	1075	100	1.8	2.3
222	G	1999	1175	96	1.9	2.3
223	G	1999	1015	91	2.6	3.2
224	G	1999	925	81	2.5	3.3
225	G	1999	1172	98	2.9	3.5
226	G	1999	1106	98	1.5	2.2
227	G	1999	957	86	1.8	2.4
228	G	1999	962	83	2.1	2.8
229	G	1999	958	96	2.0	2.8
230	G	1999	1010	98	2.1	2.6
231	G	1999	817	72	2.3	3.0
232	G	1999	718	63	2.5	3.2
233	G	1999	1119	94	2.8	3.5
234	G	1999	1050	89	2.2	2.8
235	G	1999	1075	96	2.4	3.1
236	G	1999	1128	98	1.4	2.2
237	G	1999	1241	96	2.3	3.1
238	G	1999	1119	94	1.2	1.7
239	G	1999	1166	100	2.0	2.6

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH ² (m)
240	G	1999	897	74	2.7	3.2
241	G	1999	1125	100	2.6	3.2
242	G	1999	1168	98	2.4	3.1
243	G	1999	1050	88	2.4	2.9
244	G	1999	1053	98	2.3	3.0
245	G	1999	1103	94	2.6	3.6
246	G	1999	771	67	2.5	3.0
247	G	1999	1034	91	1.8	2.5
248	G	2000	945	93	2.7	3.3
249	G	2000	854	92	2.8	3.2
250	G	2000	867	97	2.7	3.2
251	G	2000	752	86	2.2	2.8
252	G	2000	1020	95	1.9	2.6
253	G	2000	821	85	2.7	3.4
254	G	2000	989	100	1.9	2.4
255	G	2000	861	88	2.4	3.0
256	G	2000	927	95	1.6	2.3
257	G	2000	811	82	2.4	3.0
258	G	2000	595	68	2.0	2.5
259	G	2000	941	93	1.7	2.3
260	G	2000	1020	100	2.1	2.7
261	G	2000	1015	100	2.1	2.8
262	G	2000	930	97	2.3	3.0
263	G	2000	930	100	1.8	2.3
264	G	2000	893	98	2.4	3.1
265	G	2000	833	92	3.0	3.9
266	G	2000	942	100	2.0	2.6
267	G	2000	964	97	2.1	2.6
268	G	2000	863	85	2.0	2.4
269	G	2000	800	97	1.6	2.1
270	G	2000	1005	91	1.5	2.0
271	G	2000	1020	98	1.6	2.0
272	G	2000	907	95	3.0	3.5
273	G	2000	866	92	2.8	3.5
274	G	2000	925	97	3.2	3.7
275	G	2000	945	97	2.6	3.1
276	G	2000	875	95	2.5	3.3
277	G	2000	857	90	1.9	2.6
278	G	2000	865	97	1.8	2.3
279	G	2000	965	98	2.2	2.6
280	G	2000	878	90	2.0	2.5
281	G	2000	853	92	2.3	3.0
282	G	2000	862	88	2.3	2.9
283	G	2000	1005	98	2.0	2.5
284	G	2000	866	95	2.1	2.7
285	G	2000	980	93	2.2	3.0
286	G	2000	867	81	2.3	2.8
287	G	2001	1031	88	2.0	2.5
288	G	2001	1074	90	1.8	2.4
289	G	2001	1145	95	1.9	2.5
290	G	2001	1179	100	2.2	2.7
291	G	2001	1098	95	1.5	2.0
292	G	2001	1224	100	1.8	2.4
293	G	2001	1093	97	2.3	2.8
294	G	2001	975	89	2.1	2.8
295	G	2001	1152	100	2.2	2.9
296	G	2001	1164	100	2.4	3.1
297	G	2001	1170	98	1.9	2.2

PSP no.	Species¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH² (m)
298	G	2001	1233	100	1.8	2.3
299	G	2001	1226	100	2.0	2.4
300	G	2001	1132	100	1.9	2.5
301	G	2001	1211	98	1.5	2.1
302	G	2001	1323	93	1.7	2.2

¹Species: G = *E. globulus*, N = *E. nitens*

²MDH = mean dominant height (average height of the 200 tallest trees per hectare)

Appendix C. Tree measurements at age 2 years for PSPs of *E. globulus* and *E. nitens* planted in 1997, 1998, 1999 and 2000.

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH ² (m)	Basal area (m ² /ha)	Volume (m ³ /ha)
1	G	1997	906	88	*	5.5	2.1	5.1
2	G	1997	936	97	*	5.6	2.2	5.4
3	G	1997	937	97	*	6.9	4.0	11.2
4	G	1997	813	92	*	5.9	2.5	6.4
5	G	1997	902	97	*	6.1	2.2	5.7
6	G	1997	969	100	*	6.0	2.7	6.6
7	G	1997	923	92	*	5.1	1.8	4.2
8	G	1997	1005	98	*	6.1	3.7	9.4
9	G	1997	800	87	4.6	5.5	1.9	4.8
10	G	1997	920	92	5.0	6.0	2.8	7.2
11	G	1997	867	91	4.9	5.9	2.7	6.8
12	G	1997	1022	98	4.8	5.6	2.7	6.7
13	G	1997	933	95	4.7	5.6	2.5	5.9
14	G	1997	911	95	4.1	4.8	1.7	4.0
15	G	1997	911	89	5.2	5.8	3.0	7.5
16	G	1997	948	100	3.3	3.9	1.0	2.4
17	G	1997	886	91	5.6	6.4	2.9	8.1
18	G	1997	800	78	5.7	6.6	3.3	8.8
19	G	1997	1022	98	5.3	6.1	3.0	8.0
20	G	1997	1000	98	4.8	5.7	2.7	6.5
21	G	1997	857	84	4.9	5.2	2.2	5.5
22	G	1997	740	84	5.6	6.2	2.5	6.7
23	G	1997	845	89	5.1	5.8	2.7	6.8
24	G	1997	978	98	3.8	4.6	1.4	3.4
25	G	1997	867	91	3.7	4.0	1.1	2.7
26	G	1997	889	93	3.7	4.4	1.2	3.0
27	G	1997	864	95	5.6	6.2	3.6	9.5
28	G	1997	841	86	5.5	6.4	2.8	7.7
29	G	1997	867	98	4.4	4.8	2.0	4.5
30	G	1997	860	96	4.0	4.8	1.8	4.1
31	G	1997	880	100	3.8	4.5	1.5	3.3
32	G	1997	820	98	4.5	5.1	1.9	4.5
33	G	1997	750	95	4.4	5.2	2.5	5.4
34	G	1997	585	91	3.8	4.5	1.3	2.8
35	G	1997	780	93	5.0	5.6	2.4	5.9
36	G	1997	933	95	6.7	7.3	4.3	13.1
37	G	1997	911	91	6.7	7.9	4.3	13.1
38	G	1997	800	82	7.1	7.7	4.6	14.3
39	G	1997	1022	98	6.1	6.8	4.2	11.6
40	G	1997	1022	98	7.4	7.9	6.9	22.3
41	G	1997	1000	98	7.5	7.9	7.2	23.2
42	G	1997	878	93	6.9	7.4	3.7	11.4
43	G	1997	911	95	5.6	6.5	2.5	7.0
44	G	1997	1000	94	5.9	6.4	3.6	9.9
45	N	1997	1022	98	3.8	4.4	1.3	3.3
46	N	1997	933	100	5.2	5.8	3.0	7.4
47	N	1997	1000	92	4.5	4.6	3.7	7.7
48	N	1997	933	98	3.4	4.3	1.4	3.2
49	N	1997	1022	100	4.7	5.5	3.2	7.3
50	N	1997	978	100	4.2	5.0	2.8	6.1
51	N	1997	840	93	4.8	5.8	2.5	6.2
52	N	1997	673	80	5.0	6.0	2.2	5.5
53	N	1997	878	96	5.1	6.1	2.9	7.4
54	N	1997	956	100	5.0	5.4	3.7	8.7
55	N	1997	820	100	5.3	5.8	4.0	9.7

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH ² (m)	Basal area (m ² /ha)	Volume (m ³ /ha)
56	N	1997	950	100	4.8	5.2	3.9	8.7
57	N	1997	1044	94	4.7	5.6	2.0	5.1
58	N	1997	1000	94	4.0	4.8	1.6	3.7
59	N	1997	933	98	5.4	6.5	2.9	7.8
60	N	1997	956	100	5.8	6.8	3.3	9.3
61	N	1997	977	93	4.9	6.5	2.8	7.1
62	N	1997	949	95	4.9	5.9	2.2	5.7
63	G	1998	891	95	*	7.0	4.9	13.8
64	G	1998	918	97	*	6.4	3.9	10.5
65	G	1998	930	95	*	6.8	4.5	12.5
66	G	1998	950	95	*	7.0	4.9	14.5
67	G	1998	969	93	*	7.1	4.7	13.6
68	G	1998	1014	97	*	7.2	6.2	18.1
69	G	1998	1001	92	*	6.8	5.4	15.7
70	G	1998	1115	98	*	6.9	6.3	18.1
71	G	1998	1005	98	*	6.6	3.9	11.0
72	G	1998	956	98	*	6.4	4.3	11.5
73	G	1998	790	95	*	7.0	3.6	10.3
74	G	1998	908	100	*	7.4	5.0	14.8
75	G	1998	951	100	*	7.6	5.0	15.4
76	G	1998	1056	100	*	7.0	4.9	13.8
77	G	1998	961	100	*	7.3	4.4	13.1
78	G	1998	938	95	*	6.9	4.5	12.7
79	G	1998	946	98	*	7.6	6.4	19.5
80	G	1998	939	97	*	7.3	5.7	16.5
81	G	1998	941	97	*	7.3	5.4	16.1
82	G	1998	893	90	*	7.2	5.3	15.2
83	G	1998	858	92	*	7.1	4.0	11.7
84	G	1998	857	95	*	7.3	3.9	11.4
85	G	1998	805	89	*	6.8	4.2	12.2
86	G	1998	864	97	*	6.5	3.0	8.0
87	G	1998	880	95	*	7.3	4.5	13.1
88	G	1998	922	100	*	7.1	5.5	16.4
89	G	1998	805	94	*	7.0	4.3	12.5
90	G	1998	891	97	*	7.3	5.1	14.9
91	G	1998	928	93	*	6.7	3.8	10.4
92	G	1998	980	98	*	6.7	4.7	13.3
93	G	1998	930	93	*	6.2	3.6	9.1
94	G	1998	949	93	*	6.3	3.8	9.9
95	G	1998	944	95	*	6.7	4.8	13.5
96	G	1998	893	97	*	7.0	4.8	13.5
97	G	1998	897	95	*	6.6	4.7	13.1
98	G	1998	916	100	*	7.0	4.4	12.6
99	G	1998	933	100	*	7.4	6.0	18.3
100	G	1998	946	100	*	7.6	5.9	17.5
101	G	1998	975	93	*	6.7	4.9	13.2
102	G	1998	935	100	*	5.8	4.0	9.4
103	G	1998	951	100	*	7.3	5.0	15.1
104	G	1998	893	97	*	7.1	4.0	11.9
105	G	1998	944	97	*	7.2	4.9	14.6
106	G	1998	1000	100	*	7.8	5.8	18.8
107	G	1998	1043	100	*	7.4	5.6	15.7
108	G	1998	848	90	*	6.3	3.9	10.3
109	G	1998	980	100	*	6.7	5.3	14.7
110	G	1998	1031	95	*	7.2	5.6	16.2
111	G	1998	1062	100	*	7.4	6.8	21.0
112	G	1998	1005	98	*	6.7	5.7	15.9

PSP no.	Species¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH² (m)	Basal area (m²/ha)	Volume (m³/ha)
113	G	1998	984	100	*	7.8	6.3	19.8
114	G	1998	898	95	*	7.1	5.4	16.0
115	G	1998	1175	100	6.7	7.4	5.5	17.4
116	G	1998	1150	100	6.3	7.3	4.6	13.4
117	G	1998	1000	100	6.6	7.2	4.6	14.0
118	G	1998	920	100	4.6	5.3	1.9	4.7
119	G	1998	844	86	4.2	4.6	1.9	4.3
120	G	1998	867	98	5.7	6.5	2.9	8.1
121	G	1998	1000	96	6.3	7.3	3.8	11.7
122	G	1998	867	91	6.0	6.8	2.9	8.4
123	G	1998	860	98	5.5	6.6	2.8	7.5
124	G	1998	867	91	4.0	4.8	1.2	3.0
125	G	1998	889	95	4.4	4.7	1.7	3.9
126	G	1998	911	100	4.5	5.3	1.8	4.4
127	G	1998	1022	100	5.0	6.1	2.5	6.6
128	G	1998	956	91	5.2	6.3	3.1	8.1
129	G	1998	1044	100	5.0	5.6	3.1	7.6
130	G	1998	911	98	5.3	5.9	2.8	7.3
131	G	1998	1000	100	5.9	6.3	3.0	8.2
132	G	1998	900	98	5.4	5.9	2.5	6.4
133	G	1998	950	97	5.1	5.7	2.8	6.9
134	G	1998	844	100	5.1	5.6	2.6	6.4
135	G	1998	800	97	5.5	6.1	2.8	7.4
136	G	1998	860	98	5.7	6.2	2.4	6.7
137	G	1998	1044	98	5.9	6.7	3.4	9.6
138	G	1998	956	98	5.7	6.7	3.2	9.1
139	G	1998	978	98	6.6	7.3	3.5	10.8
140	G	1998	939	100	7.4	8.1	4.3	14.4
141	G	1998	840	95	6.4	7.0	2.9	8.5
142	G	1998	933	98	5.5	6.4	2.8	7.5
143	G	1998	844	95	5.3	5.7	2.4	6.2
144	G	1998	867	95	4.4	5.1	1.6	3.9
145	G	1998	1140	94	8.0	9.3	5.6	20.5
146	G	1998	1250	94	9.3	10.5	7.4	30.1
147	G	1998	1150	98	7.8	8.9	6.0	21.9
148	G	1998	1000	100	5.4	6.1	3.5	9.1
149	G	1998	911	95	5.6	6.1	3.8	10.1
150	G	1998	1075	100	6.0	7.1	4.5	12.7
151	G	1998	956	96	5.4	6.0	3.0	7.7
152	G	1998	1000	100	5.1	5.8	2.6	6.8
153	G	1998	956	98	5.1	5.8	2.7	6.8
154	G	1998	940	98	5.5	6.2	2.7	7.4
155	G	1998	960	98	5.5	6.5	2.5	6.8
156	G	1998	1000	98	5.2	6.0	2.5	6.7
157	G	1998	1000	96	6.2	6.8	4.1	11.5
158	G	1998	999	98	5.4	6.3	3.2	8.4
159	G	1998	933	98	6.7	7.2	4.3	12.8
160	G	1998	956	98	6.2	6.9	3.1	9.1
161	G	1998	780	95	6.0	6.9	2.5	7.2
162	G	1998	900	98	5.6	6.3	2.5	6.8
163	G	1998	800	93	6.3	6.9	3.1	8.8
164	G	1998	911	95	6.1	6.8	3.4	9.6
165	G	1998	720	88	6.1	6.7	3.1	8.7
166	G	1998	978	98	6.3	6.9	4.0	11.5
167	G	1998	933	100	5.8	6.5	2.9	8.2
168	G	1998	956	96	5.6	6.1	3.1	8.1
169	G	1998	800	98	6.4	7.1	3.8	11.6

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH ² (m)	Basal area (m ² /ha)	Volume (m ³ /ha)
170	G	1998	840	100	6.4	6.8	4.2	12.2
171	G	1998	980	100	5.4	6.5	3.0	8.4
172	G	1998	850	89	5.4	6.6	3.0	8.5
173	G	1998	889	98	6.6	7.4	4.3	13.2
174	G	1998	778	88	6.8	7.4	3.6	10.9
175	N	1998	956	93	8.0	8.4	6.2	21.4
176	N	1998	1100	98	8.6	8.9	7.3	26.9
177	N	1998	1050	95	6.6	8.3	4.6	14.4
178	N	1998	867	100	5.8	6.7	3.3	9.0
179	N	1998	844	95	7.2	7.7	5.1	16.1
180	N	1998	780	98	6.8	7.7	3.3	10.3
181	N	1998	1050	98	5.9	6.1	4.2	11.2
182	N	1998	933	98	6.4	7.3	4.1	11.7
183	N	1998	1044	100	4.3	5.1	1.5	3.8
184	N	1998	911	93	8.1	8.2	6.2	21.6
185	N	1998	1000	96	7.9	8.9	5.5	19.1
186	N	1998	1000	100	7.6	8.4	5.7	18.9
187	N	1998	780	87	7.0	8.1	4.2	13.6
188	N	1998	857	93	7.1	7.7	4.8	15.1
189	N	1998	878	96	6.8	7.8	3.9	11.9
190	N	1998	900	96	3.6	4.5	1.4	3.3
191	N	1998	1050	95	4.6	5.5	2.6	6.3
192	N	1998	1100	96	4.4	5.2	2.1	5.1
193	N	1998	1034	100	6.1	6.9	3.5	10.0
194	N	1998	975	100	7.5	8.6	5.2	17.2
195	N	1998	978	98	5.9	6.2	3.2	8.7
196	N	1998	1067	94	5.6	6.6	2.9	7.8
197	N	1998	1044	98	4.4	5.2	2.4	6.0
198	N	1998	980	96	6.4	7.0	3.7	11.0
199	N	1998	1150	96	4.9	5.2	3.4	8.0
200	N	1998	1125	100	5.0	5.5	3.8	9.2
201	N	1998	1100	98	4.9	5.3	3.2	7.8
202	N	1998	814	93	6.6	7.1	4.0	11.9
203	N	1998	711	92	5.4	6.5	2.0	5.4
204	N	1998	818	100	4.9	5.9	2.0	5.0
205	G	1998	1000	95	8.3	9.5	7.7	29.5
206	G	1998	911	85	8.3	8.9	6.6	24.2
207	G	1998	850	92	7.1	7.4	5.9	18.7
208	G	1998	867	91	5.4	5.8	3.0	7.9
209	G	1998	1044	100	5.3	5.9	2.9	7.6
210	G	1998	1067	100	5.0	5.5	2.9	7.2
211	G	1999	1125	100	3.9	4.7	1.9	4.3
212	G	1999	1100	98	3.5	4.4	1.4	3.2
213	G	1999	1125	96	3.7	4.7	1.8	4.1
214	G	1999	1022	100	5.0	5.5	3.5	8.2
215	G	1999	978	98	5.5	6.0	3.5	9.0
216	G	1999	889	98	5.5	6.0	3.3	8.4
217	G	1999	1225	98	5.1	5.9	3.2	8.2
218	G	1999	1044	100	5.2	5.9	3.0	7.8
219	G	1999	1025	98	5.5	6.6	3.3	8.9
220	G	1999	1100	100	6.0	6.7	4.3	12.2
221	G	1999	1075	100	5.9	7.2	3.2	9.2
222	G	1999	1175	96	5.2	6.0	4.3	10.9
223	G	1999	1025	91	*	7.2	5.5	15.8
224	G	1999	927	81	*	7.7	5.9	16.4
225	G	1999	1175	98	*	7.0	5.3	15.1
226	G	1999	1024	91	*	5.0	1.6	3.8

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH ² (m)	Basal area (m ² /ha)	Volume (m ³ /ha)
227	G	1999	925	84	*	6.3	3.2	8.2
228	G	1999	950	83	*	6.8	4.7	12.8
229	G	1999	933	93	*	6.8	4.2	11.6
230	G	1999	976	95	*	6.2	4.5	11.7
231	G	1999	825	72	*	6.6	5.4	14.0
232	G	1999	725	63	*	6.8	4.3	12.0
233	G	1999	1125	94	*	6.9	5.1	14.9
234	G	1999	1050	89	*	6.7	4.7	12.7
235	G	1999	1075	96	*	6.2	4.8	12.8
236	G	1999	1125	98	*	6.3	4.3	11.5
237	G	2000	*	*	*	*	*	*
238	G	1999	1098	92	*	5.3	2.0	4.9
239	G	1999	1150	98	*	5.8	3.3	8.4
240	G	1999	897	74	*	6.5	4.4	12.1
241	G	1999	1125	100	*	6.0	3.7	9.5
242	G	1999	1171	98	*	6.4	3.8	9.9
243	G	1999	1050	88	*	5.9	3.5	8.7
244	G	1999	1050	98	*	6.3	3.5	9.5
245	G	1999	1100	94	*	7.8	6.3	19.3
246	G	1999	775	67	*	7.0	4.2	11.8
247	G	1999	*	*	*	*	*	*
248	G	2000	1098	90	*	7.6	6.2	18.8
249	G	2000	1029	92	*	7.3	6.3	18.9
250	G	2000	1023	97	*	7.7	6.1	19.6
251	G	2000	909	86	*	6.5	3.0	7.9
252	G	2000	1201	95	*	7.2	4.3	12.4
253	G	2000	979	83	*	8.3	6.3	20.7
254	G	2000	1155	100	*	6.5	3.6	9.9
255	G	2000	1047	88	*	7.8	6.5	19.7
256	G	2000	1059	90	*	6.4	4.2	11.1
257	G	2000	945	79	*	7.7	5.4	17.8
258	G	2000	1017	92	*	6.9	3.4	9.9
259	G	2000	1124	93	*	6.7	4.1	11.1
260	G	2000	1201	100	*	7.0	4.7	13.4
261	G	2000	1201	100	*	6.6	4.2	11.4
262	G	2000	1104	97	*	7.6	6.6	20.1
263	G	2000	1104	100	*	6.4	3.3	9.2
264	G	2000	1111	98	*	7.2	5.4	15.6
265	G	2000	1003	92	*	8.0	5.6	18.2
266	G	2000	1140	98	*	6.9	3.9	11.1
267	G	2000	1111	95	*	5.8	3.0	7.5
268	G	2000	1021	87	*	5.3	3.1	7.4
269	G	2000	955	97	*	6.2	3.8	9.5
270	G	2000	1164	89	*	6.2	3.4	9.1
271	G	2000	1201	98	*	6.4	4.0	10.5
272	G	2000	1091	95	*	8.1	6.6	20.5
273	G	2000	1006	89	*	7.3	5.6	17.6
274	G	2000	1101	97	*	7.7	7.4	23.2
275	G	2000	1128	97	*	6.3	4.6	12.1
276	G	2000	1042	95	*	6.9	4.2	12.1
277	G	2000	1047	90	*	5.3	1.8	4.4
278	G	2000	1020	95	*	5.2	1.6	3.6
279	G	2000	1154	98	*	6.7	4.9	13.9
280	G	2000	1059	90	*	6.8	4.5	11.6
281	G	2000	1043	92	*	7.4	6.4	19.1
282	G	2000	1032	88	*	6.9	4.6	12.7
283	G	2000	1208	100	*	6.8	3.5	9.4

PSP no.	Species¹	Year of planting	Density (trees/ha)	Survival (%)	Mean height (m)	MDH² (m)	Basal area (m²/ha)	Volume (m³/ha)
284	G	2000	1006	92	*	7.6	5.3	16.1
285	G	2000	1045	83	*	6.3	3.0	7.8
286	G	2000	841	68	*	5.3	2.0	4.9

¹Species: G = *E. globulus*, N = *E. nitens*

²MDH = mean dominant height (average height of the 200 largest diameter, single-stemmed trees per hectare)

NB. Plots 237 and 247 were no longer being measured as flooding caused the death of the majority or all of trees in the plot.

Appendix D. Tree measurements at age 4 years for PSPs of *E. globulus* and *E. nitens* planted in 1997 and 1998.

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	MDH ² (m)	Basal area (m ² /ha)	Volume (m ³ /ha)
1	G	1997	897	88	12.5	12.1	56.3
2	G	1997	927	97	12.5	12.3	58.8
3	G	1997	947	97	12.7	13.7	67.6
4	G	1997	814	92	11.9	11.1	51.1
5	G	1997	878	95	12.0	10.7	48.6
6	G	1997	949	97	10.0	8.6	34.2
7	G	1997	923	92	10.4	9.3	37.5
8	G	1997	974	95	11.0	10.6	46.2
9	G	1997	800	87	11.9	8.6	40.6
10	G	1997	920	92	11.8	10.2	47.1
11	G	1997	867	91	11.4	9.7	44.3
12	G	1997	1000	96	11.3	11.9	51.7
13	G	1997	911	93	10.0	10.0	39.7
14	G	1997	911	95	10.5	10.0	42.0
15	G	1997	911	89	12.4	11.2	53.6
16	G	1997	926	98	9.7	7.2	28.7
17	G	1997	886	91	12.3	11.5	55.7
18	G	1997	*	*	*	*	*
19	G	1997	*	*	*	*	*
20	G	1997	*	*	*	*	*
21	G	1997	857	84	11.1	8.4	37.0
22	G	1997	740	84	12.4	8.4	40.2
23	G	1997	825	87	11.7	8.6	39.1
24	G	1997	978	98	11.1	9.1	40.4
25	G	1997	867	91	9.7	7.0	27.9
26	G	1997	889	91	10.2	8.3	35.3
27	G	1997	864	95	12.2	13.7	66.2
28	G	1997	795	81	10.8	10.5	44.4
29	G	1997	867	98	9.7	9.3	36.0
30	G	1997	860	96	10.2	8.2	33.3
31	G	1997	880	100	9.4	7.5	28.5
32	G	1997	820	98	10.0	7.9	31.4
33	G	1997	750	95	13.1	11.2	56.5
34	G	1997	585	91	12.2	8.1	39.0
35	G	1997	820	93	13.6	10.9	56.8
36	G	1997	933	95	13.3	12.3	63.9
37	G	1997	911	91	14.6	12.2	63.8
38	G	1997	778	80	13.2	10.6	55.4
39	G	1997	1022	98	14.5	14.1	75.9
40	G	1997	1000	96	17.1	21.1	138.4
41	G	1997	978	96	16.8	20.9	134.5
42	G	1997	878	93	15.1	13.3	79.0
43	G	1997	911	95	13.1	12.0	62.8
44	G	1997	1000	94	13.5	13.5	70.2
45	N	1997	*	*	*	*	*
46	N	1997	*	*	*	*	*
47	N	1997	*	*	*	*	*
48	N	1997	911	95	9.7	8.5	31.6
49	N	1997	1000	98	12.0	15.2	69.5
50	N	1997	978	100	10.9	12.9	54.1
51	N	1997	400	44	11.1	4.8	22.1
52	N	1997	653	78	11.5	8.4	37.2
53	N	1997	878	96	13.3	13.3	70.5
54	N	1997	933	98	12.9	17.6	84.0
55	N	1997	820	100	12.3	16.7	77.0

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	MDH ² (m)	Basal area (m ² /ha)	Volume (m ³ /ha)
56	N	1997	950	100	12.7	17.7	86.2
57	N	1997	1044	94	15.5	14.8	81.1
58	N	1997	1000	94	11.6	8.9	41.2
59	N	1997	911	95	16.3	14.7	90.1
60	N	1997	*	*	*	*	*
61	N	1997	*	*	*	*	*
62	N	1997	*	*	*	*	*
63	G	1998	896	95	13.4	15.0	76.9
64	G	1998	934	97	11.9	12.6	58.1
65	G	1998	951	95	14.0	14.9	78.4
66	G	1998	950	95	13.6	14.2	73.1
67	G	1998	909	88	13.3	13.7	71.7
68	G	1998	969	97	13.7	16.0	85.8
69	G	1998	936	92	13.7	14.1	74.3
70	G	1998	939	93	12.2	14.7	69.1
71	G	1998	990	95	12.3	11.0	53.6
72	G	1998	954	95	12.5	12.4	60.2
73	G	1998	820	92	12.9	12.1	60.1
74	G	1998	941	98	13.4	13.4	70.2
75	G	1998	938	97	13.3	14.0	71.3
76	G	1998	1053	100	11.8	13.6	62.1
77	G	1998	956	98	14.2	15.8	80.3
78	G	1998	944	93	13.3	16.0	81.1
79	G	1998	961	98	14.2	15.6	82.2
80	G	1998	932	97	12.6	13.3	62.5
81	G	1998	920	95	13.0	13.4	68.6
82	G	1998	885	88	12.3	12.7	60.6
83	G	1998	866	92	13.9	13.5	72.4
84	G	1998	854	92	14.2	12.4	65.7
85	G	1998	840	87	13.2	14.1	70.1
86	G	1998	894	97	12.3	11.3	52.2
87	G	1998	902	95	14.2	15.2	83.0
88	G	1998	936	100	12.9	14.8	72.8
89	G	1998	827	94	13.0	14.1	72.8
90	G	1998	920	97	14.3	16.6	91.5
91	G	1998	927	90	13.4	12.6	65.1
92	G	1998	977	98	12.9	15.6	81.9
93	G	1998	902	90	12.3	11.4	54.6
94	G	1998	886	90	12.2	12.4	58.2
95	G	1998	909	95	13.3	14.9	77.0
96	G	1998	909	97	13.4	15.0	79.1
97	G	1998	886	95	13.4	15.8	83.0
98	G	1998	896	97	14.0	14.7	78.9
99	G	1998	954	100	13.9	16.7	86.0
100	G	1998	961	100	13.4	15.4	82.0
101	G	1998	963	91	12.9	14.9	75.1
102	G	1998	905	97	12.2	13.0	58.4
103	G	1998	963	100	13.9	14.5	76.6
104	G	1998	811	87	13.2	11.6	58.2
105	G	1998	909	95	13.7	15.5	83.4
106	G	1998	975	98	13.9	16.0	86.0
107	G	1998	1034	98	13.7	16.0	80.7
108	G	1998	874	90	12.5	13.1	64.9
109	G	1998	977	100	13.4	14.3	75.9
110	G	1998	1015	95	13.0	13.9	69.7
111	G	1998	1043	100	12.9	16.4	81.9
112	G	1998	990	98	12.8	16.1	80.9
113	G	1998	981	95	13.6	16.9	85.4

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	MDH ² (m)	Basal area (m ² /ha)	Volume (m ³ /ha)
114	G	1998	862	90	12.7	13.9	68.2
115	G	1998	*	*	*	*	*
116	G	1998	*	*	*	*	*
117	G	1998	*	*	*	*	*
118	G	1998	920	100	10.3	8.9	37.4
119	G	1998	822	84	9.4	6.7	25.6
120	G	1998	740	93	12.2	9.5	46.4
121	G	1998	956	91	12.5	11.9	57.5
122	G	1998	867	91	12.7	10.0	49.0
123	G	1998	860	98	11.7	10.3	48.1
124	G	1998	867	91	8.9	5.9	21.9
125	G	1998	889	95	9.3	6.6	25.1
126	G	1998	889	98	10.2	6.8	28.7
127	G	1998	995	97	10.7	10.8	44.7
128	G	1998	955	89	11.6	12.7	56.2
129	G	1998	1044	100	10.1	10.3	42.2
130	G	1998	911	98	10.6	8.8	37.0
131	G	1998	978	98	11.3	9.1	40.1
132	G	1998	760	83	10.2	6.7	26.7
133	G	1998	950	97	10.4	11.0	47.2
134	G	1998	844	100	11.2	10.5	46.0
135	G	1998	778	95	11.4	10.9	49.5
136	G	1998	858	91	10.9	8.9	40.4
137	G	1998	998	92	11.1	9.6	42.9
138	G	1998	756	77	11.8	9.2	43.3
139	G	1998	978	98	13.2	13.1	66.5
140	G	1998	879	96	13.5	12.7	68.7
141	G	1998	820	93	13.2	11.2	59.3
142	G	1998	933	98	11.7	11.3	53.9
143	G	1998	844	95	11.9	10.4	49.4
144	G	1998	867	95	10.9	9.3	40.4
145	G	1998	1050	89	15.9	16.5	97.4
146	G	1998	1096	83	19.2	16.3	110.3
147	G	1998	1125	94	17.3	16.5	98.0
148	G	1998	978	98	12.0	13.4	61.2
149	G	1998	889	93	12.6	14.4	69.8
150	G	1998	1075	100	11.9	14.7	69.0
151	G	1998	972	97	10.1	11.9	48.0
152	G	1998	1000	100	10.8	11.9	50.5
153	G	1998	956	98	10.2	10.1	43.2
154	G	1998	900	94	10.4	9.2	39.1
155	G	1998	960	98	10.8	8.4	36.1
156	G	1998	933	91	10.7	8.6	36.4
157	G	1998	773	72	10.4	8.3	35.2
158	G	1998	976	95	12.1	13.5	64.9
159	G	1998	933	98	11.6	12.4	57.1
160	G	1998	940	96	12.3	11.7	57.1
161	G	1998	760	93	12.9	10.5	53.2
162	G	1998	880	96	11.9	10.1	47.2
163	G	1998	799	91	12.0	9.7	46.3
164	G	1998	911	95	11.6	10.8	49.7
165	G	1998	720	88	11.7	9.8	46.0
166	G	1998	978	98	12.6	14.0	68.9
167	G	1998	889	95	11.8	12.2	56.6
168	G	1998	956	96	11.1	12.1	53.1
169	G	1998	720	88	11.7	9.2	43.3
170	G	1998	720	86	13.1	9.6	48.2
171	G	1998	880	90	11.6	9.4	43.3

PSP no.	Species ¹	Year of planting	Density (trees/ha)	Survival (%)	MDH ² (m)	Basal area (m ² /ha)	Volume (m ³ /ha)
172	G	1998	*	*	*	*	*
173	G	1998	*	*	*	*	*
174	G	1998	*	*	*	*	*
175	N	1998	949	85	18.7	19.8	136.4
176	N	1998	1100	98	19.3	21.3	158.2
177	N	1998	1050	95	16.7	18.7	116.1
178	N	1998	867	100	13.3	14.6	74.1
179	N	1998	844	95	13.3	16.9	87.3
180	N	1998	780	98	13.4	12.2	61.0
181	N	1998	1049	95	13.0	15.3	76.1
182	N	1998	933	98	13.5	14.2	74.1
183	N	1998	1044	100	12.3	8.9	41.0
184	N	1998	889	91	15.1	18.0	102.8
185	N	1998	1000	96	16.1	18.7	113.3
186	N	1998	1000	98	16.1	20.2	120.1
187	N	1998	740	82	14.6	13.5	75.2
188	N	1998	820	91	13.4	13.6	69.3
189	N	1998	840	93	13.6	12.2	62.0
190	N	1998	820	87	10.2	8.9	34.7
191	N	1998	975	89	10.2	10.4	43.5
192	N	1998	1075	93	10.2	8.3	31.5
193	N	1998	1035	95	16.2	16.0	99.6
194	N	1998	950	97	19.2	22.1	157.5
195	N	1998	978	98	13.5	12.2	62.2
196	N	1998	1067	94	14.3	14.5	80.0
197	N	1998	1022	96	12.7	12.6	60.0
198	N	1998	940	92	14.8	15.2	88.0
199	N	1998	1150	96	11.1	16.4	68.8
200	N	1998	1125	100	11.4	18.2	79.6
201	N	1998	1075	96	10.5	13.7	56.6
202	N	1998	*	*	*	*	*
203	N	1998	*	*	*	*	*
204	N	1998	*	*	*	*	*
205	G	1998	925	88	16.0	18.1	109.5
206	G	1998	889	83	15.1	18.5	106.7
207	G	1998	825	89	14.1	16.0	84.9
208	G	1998	867	91	9.1	7.3	25.7
209	G	1998	1044	100	8.8	7.5	26.7
210	G	1998	1067	100	8.5	7.6	25.7

¹Species: G = *E. globulus*, N = *E. nitens*

²MDH = mean dominant height (average height of the 200 largest diameter, single-stemmed trees per hectare)

Appendix E. Foliar analysis results at age 1 year for PSPs of *E. globulus* and *E. nitens* planted in 1998, 1999, 2000 and 2001.

PSP no.	Species ¹	Year of planting	N	S	P	K	Ca	Mg	Na	Cl	Fe Mn Zn Cu B Al					
											(g/kg)					(mg/kg)
63	G	1998	20.9	1.3	1.8	9.2	4.5	1.7	2.1	2.7	50	416	24	8	14	13
64	G	1998	20.8	1.4	1.9	9.3	3.9	1.7	2.2	2.7	47	513	24	7	13	16
65	G	1998	21.1	1.3	1.8	9.6	4.7	1.8	1.6	2.6	43	536	24	6	14	10
66	G	1998	18.9	1.2	1.6	9.8	4.2	1.9	2.3	2.8	43	724	20	5	11	11
67	G	1998	22.5	1.6	2.3	11.2	4.5	2.0	1.5	2.3	52	1170	30	7	13	17
68	G	1998	26.2	1.7	2.6	11.3	4.3	2.1	1.9	2.4	53	1042	29	8	15	11
69	G	1998	22.2	1.5	2.2	9.9	3.8	2.0	1.6	1.9	49	1447	27	7	14	13
70	G	1998	23.4	1.6	2.1	10.1	4.1	1.8	1.5	1.8	46	1476	27	7	13	14
71	G	1998	20.9	1.4	2.0	9.4	4.9	2.1	2.5	2.7	50	508	30	5	13	12
72	G	1998	21.8	1.5	2.2	9.2	5.1	2.1	2.1	2.1	52	918	31	7	11	11
73	G	1998	25.3	1.8	2.7	10.9	4.1	1.9	1.8	2.5	62	913	29	4	14	15
74	G	1998	23.0	1.6	2.3	9.8	4.5	1.8	1.7	2.4	54	1328	26	5	13	19
75	G	1998	28.9	1.9	2.9	12.5	3.9	1.7	1.5	2.4	64	1442	34	3	17	16
76	G	1998	23.9	1.6	2.2	10.4	4.7	1.6	1.8	2.5	46	1302	28	3	15	14
77	G	1998	22.9	1.6	2.5	10.7	4.4	1.8	1.6	2.3	57	1591	31	5	13	16
78	G	1998	22.0	1.5	2.3	9.9	4.1	1.8	2.5	2.6	53	1113	29	7	15	12
79	G	1998	22.7	1.6	2.1	10.3	4.9	2.1	1.6	2.9	53	355	29	7	13	7
80	G	1998	16.8	1.3	1.1	5.5	11.2	2.0	1.7	3.3	54	1001	9	3	19	43
81	G	1998	16.5	1.4	1.3	7.3	7.5	1.8	1.1	2.4	45	669	13	6	14	19
82	G	1998	15.6	1.3	1.2	7.0	7.8	1.7	1.0	2.3	39	1037	12	5	16	25
83	G	1998	19.9	1.3	1.9	9.5	3.9	1.3	1.1	1.8	40	1530	21	6	14	18
84	G	1998	23.0	1.5	2.2	10.1	4.3	1.4	1.3	2.1	45	1038	22	7	15	18
85	G	1998	20.5	1.4	1.9	10.3	4.1	1.4	1.2	2.0	51	819	24	4	13	24
86	G	1998	19.4	1.3	1.8	9.6	4.5	1.5	1.2	2.0	43	751	21	4	12	12
87	G	1998	19.7	1.4	2.0	8.8	4.4	1.7	1.8	2.7	53	949	23	7	12	15
88	G	1998	21.7	1.4	2.1	8.8	4.1	1.6	1.6	2.4	47	963	24	6	12	12
89	G	1998	20.6	1.4	2.0	8.0	3.7	2.0	2.3	2.4	46	798	22	7	11	12
90	G	1998	20.4	1.4	1.9	7.9	3.9	1.7	2.1	2.6	43	689	21	7	13	13
91	G	1998	25.9	1.7	2.6	11.5	4.6	1.8	1.2	2.0	60	839	33	5	17	10
92	G	1998	22.2	1.6	2.2	10.7	4.6	1.7	1.5	2.2	49	1768	26	2	16	18
93	G	1998	23.7	1.6	2.6	10.1	4.5	1.8	1.6	2.0	52	3317	27	1	18	16
94	G	1998	25.0	1.8	3.0	10.5	4.2	1.7	1.5	2.0	50	2551	29	1	18	17
95	G	1998	21.9	1.5	2.1	9.7	3.7	1.6	2.0	2.4	47	957	25	4	12	14
96	G	1998	22.1	1.5	2.2	9.3	4.6	1.9	1.9	2.5	52	735	24	3	12	12
97	G	1998	20.2	1.4	2.0	9.1	4.5	1.8	1.7	2.4	47	368	23	6	11	18
98	G	1998	23.7	1.7	2.2	10.9	3.5	1.8	2.1	2.7	52	646	26	8	13	12
99	G	1998	21.4	1.6	2.0	10.5	3.6	1.6	1.5	2.6	44	1068	20	6	11	15
100	G	1998	23.9	1.6	2.2	10.5	3.7	1.6	1.5	2.6	48	1187	20	6	13	15

PSP no.	Species ¹	Year of planting	N	S	P	(g/kg)					(mg/kg)					
						K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
101	G	1998	22.0	1.6	2.3	10.4	3.9	1.7	1.3	2.4	47	958	20	0	20	11
102	G	1998	22.0	1.6	2.1	9.3	4.4	2.0	2.1	2.4	47	664	23	6	14	12
103	G	1998	25.0	1.8	2.5	12.5	4.8	2.5	2.2	2.9	62	588	39	11	16	10
104	G	1998	24.1	1.7	2.5	11.9	3.8	2.4	2.2	2.6	59	474	34	10	15	9
105	G	1998	23.4	1.7	2.5	12.6	4.5	2.6	1.9	2.6	52	585	33	8	14	7
106	G	1998	26.0	1.9	2.6	13.2	4.5	2.2	1.6	2.7	64	688	40	11	17	6
107	G	1998	26.1	1.8	2.9	10.6	3.5	1.5	0.9	1.5	68	2046	30	1	16	48
108	G	1998	24.6	1.6	2.4	10.6	4.2	1.3	0.9	1.9	58	2096	26	4	13	29
109	G	1998	26.0	1.9	2.6	12.7	4.8	2.0	1.9	3.1	67	292	34	3	23	11
110	G	1998	25.6	1.9	2.5	13.1	4.6	1.9	1.3	2.8	71	226	35	4	20	11
111	G	1998	22.9	1.5	2.0	8.6	4.3	1.9	1.8	2.1	44	462	22	8	12	11
112	G	1998	22.9	1.6	2.2	10.5	4.6	2.0	1.9	2.9	52	377	27	4	17	13
113	G	1998	23.3	1.6	2.3	11.3	5.1	2.0	1.8	3.0	52	553	29	5	14	11
114	G	1998	23.4	1.7	2.3	10.6	4.2	1.9	1.8	2.5	56	481	29	6	13	11
115	G	1998	20.1	1.5	1.4	8.4	8.9	1.1	0.3	1.6	39	4238	15	6	11	46
116	G	1998	21.1	1.5	1.3	7.7	7.5	1.3	0.4	1.4	46	2864	15	7	11	55
117	G	1998	23.8	1.7	1.4	7.4	8.7	1.4	0.6	1.9	46	3466	15	8	15	57
118	G	1998	19.7	1.4	1.6	6.7	4.7	1.4	0.6	1.4	45	1511	15	3	6	46
119	G	1998	20.0	1.6	1.7	8.4	5.2	1.6	0.6	1.4	53	1835	16	2	7	41
120	G	1998	18.2	1.5	1.6	6.8	6.4	1.3	1.0	1.4	46	1897	18	5	7	40
121	G	1998	21.1	1.6	1.3	9.0	9.1	1.2	0.3	1.3	49	2875	15	2	10	51
122	G	1998	19.5	1.5	1.4	8.5	6.7	1.0	0.3	1.3	34	2375	15	2	7	35
123	G	1998	22.7	1.7	1.4	8.6	8.9	1.6	1.1	1.9	50	1995	16	9	10	63
124	G	1998	16.1	1.2	1.1	6.0	7.1	1.9	1.5	1.8	34	2512	12	6	7	23
125	G	1998	17.1	1.3	1.1	5.5	7.6	1.9	1.4	1.9	36	2448	13	6	7	25
126	G	1998	16.3	1.2	1.0	5.9	8.3	2.3	1.6	2.0	37	1863	13	5	7	21
127	G	1998	19.3	1.4	1.3	6.4	8.1	1.3	1.0	1.7	48	5077	15	9	7	61
128	G	1998	19.5	1.4	1.3	8.1	7.2	0.9	0.3	1.2	44	4612	18	6	9	56
129	G	1998	22.0	1.6	1.4	7.0	7.3	1.0	0.3	1.1	49	4669	14	8	9	59
130	G	1998	18.9	1.4	1.5	6.8	6.4	2.0	0.9	1.7	49	2733	20	9	10	37
131	G	1998	17.9	1.4	1.4	6.6	7.0	1.7	1.0	1.6	41	3917	18	7	8	54
132	G	1998	17.7	1.4	1.6	6.8	6.9	1.7	0.7	1.7	45	3643	19	6	8	38
133	G	1998	22.9	1.4	1.4	9.5	7.7	2.0	0.5	1.8	52	1209	18	6	14	75
134	G	1998	20.3	1.5	1.5	9.2	6.5	1.5	0.3	1.3	37	1573	19	8	9	34
135	G	1998	21.4	1.6	1.6	9.0	6.3	1.6	0.3	1.2	41	1828	17	5	11	39
136	G	1998	18.8	1.3	1.3	7.2	5.5	1.8	1.5	1.8	42	1041	16	7	4	34
137	G	1998	18.1	1.3	1.3	6.9	5.0	1.7	1.7	2.2	40	1111	18	7	6	24
138	G	1998	19.4	1.4	1.4	8.1	6.1	1.2	0.9	1.5	31	1280	14	6	6	29
139	G	1998	24.4	1.7	1.7	8.7	6.5	1.1	1.0	1.2	38	1562	16	7	7	53
140	G	1998	20.8	1.5	1.5	8.2	7.5	1.0	0.7	0.9	35	1757	14	7	6	54

PSP no.	Species ¹	Year of planting	N	S	P	(g/kg)					(mg/kg)					
						K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
141	G	1998	22.6	1.8	1.7	8.8	7.8	1.3	0.8	1.0	41	1236	15	10	5	52
142	G	1998	18.0	1.4	1.3	7.7	7.1	1.2	0.4	1.1	28	2196	16	6	5	49
143	G	1998	20.5	1.4	1.5	8.7	7.8	1.3	0.4	1.2	27	1794	18	7	8	50
144	G	1998	22.2	1.5	1.5	9.6	7.9	1.4	0.4	1.6	30	1795	18	8	8	61
145	G	1998	15.3	1.2	1.2	8.4	6.0	1.2	0.2	1.0	29	1891	16	6	4	26
146	G	1998	17.8	1.5	1.4	7.3	7.2	0.9	0.1	0.6	33	4133	16	10	5	33
147	G	1998	17.5	1.5	1.4	9.1	6.9	1.1	0.2	0.9	31	2046	18	6	3	32
148	G	1998	19.8	1.4	1.6	10.1	5.2	1.4	0.4	1.5	39	1138	19	4	8	23
149	G	1998	19.3	1.4	1.5	9.1	5.1	1.4	0.3	1.6	36	921	18	4	8	23
150	G	1998	19.9	1.4	1.7	8.9	5.7	1.3	0.2	1.1	38	1482	19	5	11	20
151	G	1998	22.3	1.6	1.5	7.7	8.3	1.3	0.9	1.2	50	2152	16	9	8	104
152	G	1998	22.0	1.5	1.4	7.6	8.9	1.4	0.6	1.8	47	3235	12	10	9	98
153	G	1998	19.6	1.4	1.4	5.7	6.9	1.4	1.7	1.7	45	2027	11	9	5	67
154	G	1998	16.9	1.4	1.3	8.1	5.7	0.9	1.2	1.5	35	2159	12	7	5	53
155	G	1998	18.4	1.2	1.3	7.4	5.5	1.0	1.5	1.3	40	2104	11	5	5	55
156	G	1998	17.1	1.3	1.2	7.3	5.9	1.1	1.3	1.5	33	2050	11	6	6	43
157	G	1998	21.2	1.5	1.6	6.5	6.7	1.9	1.4	2.0	43	540	18	8	13	11
158	G	1998	18.0	1.3	1.2	6.3	4.9	2.5	1.5	1.6	49	560	16	10	5	20
159	G	1998	18.5	1.3	1.3	7.5	6.1	2.0	1.4	1.4	42	477	16	8	6	29
160	G	1998	21.4	1.7	1.5	7.6	8.1	1.5	0.5	1.6	38	2009	15	8	8	43
161	G	1998	22.1	2.0	1.6	7.0	7.5	1.4	0.7	1.6	47	2194	17	11	9	51
162	G	1998	22.2	1.8	1.7	7.2	8.8	1.6	0.9	1.7	46	1967	18	10	9	50
163	G	1998	20.0	1.5	1.2	7.0	8.3	2.4	1.6	1.9	45	2187	16	7	9	37
164	G	1998	19.3	1.4	1.3	6.6	7.2	1.9	1.7	1.8	46	1197	15	7	8	35
165	G	1998	21.0	1.5	1.6	6.7	5.9	1.8	1.4	1.9	39	3104	15	10	11	34
166	G	1998	17.2	1.3	1.3	8.7	6.2	1.3	0.3	0.9	34	2697	14	3	10	41
167	G	1998	18.0	1.3	1.3	8.0	7.8	1.6	0.4	1.1	36	2762	19	3	10	42
168	G	1998	15.7	1.3	1.0	8.7	7.2	1.7	0.5	1.0	33	1825	16	5	5	36
169	G	1998	18.8	1.3	1.3	7.5	5.2	1.1	1.3	1.2	33	1947	14	4	6	44
170	G	1998	17.5	1.2	1.4	8.5	4.5	1.0	1.2	1.4	30	1976	12	5	4	43
171	G	1998	16.1	1.2	1.4	7.7	3.7	1.1	1.7	1.7	37	1232	12	4	3	41
172	G	1998	16.2	1.3	1.4	8.3	4.5	1.4	0.9	1.4	27	967	18	2	2	18
173	G	1998	18.9	1.3	1.4	8.8	6.2	1.3	0.4	1.2	31	1339	15	4	3	22
174	G	1998	18.7	1.2	1.5	9.2	5.9	1.2	0.4	1.1	33	951	15	3	4	19
175	N	1998	20.0	1.2	1.4	6.0	3.0	0.6	0.0	0.5	27	1115	14	3	6	33
176	N	1998	20.7	1.3	1.6	6.1	3.0	0.6	0.0	0.4	27	1535	14	3	4	28
177	N	1998	19.6	1.2	1.2	6.6	2.9	0.6	0.0	0.6	23	850	12	4	5	40
178	N	1998	20.3	1.4	1.3	7.9	2.8	0.9	0.0	0.5	29	1254	16	3	11	24
179	N	1998	21.3	1.4	1.4	7.1	3.3	0.8	0.0	0.6	31	1621	15	1	12	33
180	N	1998	20.6	1.3	1.2	7.6	2.9	0.9	0.0	0.5	24	912	15	2	11	16

PSP no.	Species ¹	Year of planting	N	S	P	(g/kg)					(mg/kg)					
						K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
181	N	1998	21.2	1.4	1.7	7.0	2.8	0.8	0.0	0.4	27	1737	13	3	6	23
182	N	1998	20.1	1.4	1.6	7.1	2.9	0.7	0.0	0.4	26	1638	12	3	6	26
183	N	1998	21.1	1.5	1.6	5.4	4.4	1.0	0.0	0.5	28	1962	14	3	9	11
184	N	1998	19.2	1.2	1.3	6.6	2.9	0.6	0.0	0.6	33	1912	13	3	9	32
185	N	1998	21.8	1.4	1.5	7.3	3.4	0.7	0.0	0.7	38	1395	16	5	11	30
186	N	1998	20.7	1.3	1.3	6.8	3.4	0.8	0.0	0.7	36	1388	14	3	11	28
187	N	1998	19.1	1.3	1.4	6.2	3.6	0.8	0.0	0.4	30	689	12	4	5	27
188	N	1998	20.5	1.3	1.5	7.2	4.0	0.8	0.1	0.6	30	527	12	2	7	27
189	N	1998	21.5	1.4	1.4	7.0	4.3	0.9	0.1	0.6	30	314	13	2	5	36
190	N	1998	15.0	1.0	1.2	5.8	2.0	0.6	0.0	0.6	23	1043	14	2	2	17
191	N	1998	17.4	1.1	1.3	6.1	2.5	0.6	0.0	0.6	22	1687	11	1	4	22
192	N	1998	15.8	1.1	1.2	5.1	3.5	0.7	0.1	0.8	27	1285	12	1	3	23
193	N	1998	18.8	1.1	1.1	6.7	3.6	0.7	0.0	0.4	25	619	13	3	10	36
194	N	1998	19.7	1.2	1.4	7.3	3.2	0.7	0.0	0.4	26	875	16	4	9	26
195	N	1998	18.8	1.2	1.2	6.5	3.5	0.8	0.0	0.6	25	490	16	2	9	43
196	N	1998	20.8	1.3	1.5	6.5	3.9	0.7	0.0	0.5	24	1516	18	7	8	26
197	N	1998	18.7	1.3	1.1	5.3	6.7	1.1	0.0	0.7	29	1739	10	3	8	72
198	N	1998	20.9	1.4	1.4	6.6	3.7	0.8	0.0	0.4	26	1552	13	5	6	34
199	N	1998	18.2	1.1	1.1	4.9	3.2	0.6	0.0	0.5	24	1685	10	3	7	23
200	N	1998	18.5	1.1	1.1	5.4	3.3	0.6	0.0	0.6	23	1231	13	4	5	21
201	N	1998	19.5	1.2	1.1	5.3	3.8	0.6	0.0	0.5	26	1502	12	5	9	21
202	N	1998	21.5	1.4	1.6	7.9	2.8	0.9	0.0	0.8	32	719	22	3	8	25
203	N	1998	18.5	1.1	1.4	7.7	3.6	1.0	0.0	0.8	27	703	15	4	9	25
204	N	1998	20.2	1.2	1.4	7.3	3.3	0.9	0.0	0.8	26	680	17	3	5	29
211	G	1999	22.0	1.6	1.1	6.2	5.4	2.2	2.9	3.0	63	460	14	9	18	42
212	G	1999	21.0	1.6	1.2	6.0	6.1	2.4	2.8	3.2	62	539	15	9	20	40
213	G	1999	23.6	1.7	1.4	7.1	5.8	2.2	3.0	3.2	69	233	17	9	25	42
214	G	1999	25.7	1.7	1.6	8.5	5.1	1.9	2.7	3.0	58	721	15	8	15	40
215	G	1999	24.4	1.7	1.5	7.7	6.3	2.2	3.2	3.3	74	1063	19	8	19	74
216	G	1999	25.6	1.7	1.6	7.4	5.4	1.9	3.1	3.7	58	1032	16	6	17	53
217	G	1999	25.0	1.6	1.7	7.3	6.6	2.1	2.9	3.2	58	648	19	5	16	54
218	G	1999	23.5	1.6	1.2	5.7	6.0	2.2	2.3	2.6	58	436	16	9	14	52
219	G	1999	21.4	1.4	1.2	5.4	5.1	1.5	2.4	2.2	48	215	18	7	15	34
220	G	1999	23.4	1.5	1.2	7.8	7.2	2.3	2.2	3.5	50	1129	16	10	33	53
221	G	1999	23.3	1.6	1.2	7.1	7.5	2.3	2.4	3.3	53	1361	20	12	27	54
222	G	1999	23.4	1.6	1.2	8.4	7.0	2.1	2.1	3.1	65	1104	16	13	33	78
223	G	1999	21.9	1.7	1.9	8.1	6.5	1.6	2.3	*	54	369	18	3	22	50
224	G	1999	22.4	1.6	1.6	8.6	4.5	1.5	1.5	*	43	346	19	2	17	40
225	G	1999	18.9	1.4	1.4	9.3	5.2	1.6	2.0	*	43	367	17	2	16	47
226	G	1999	21.4	1.6	1.8	8.1	5.4	2.2	2.9	*	57	97	22	7	15	33

PSP no.	Species ¹	Year of planting	N	S	P	(g/kg)					(mg/kg)					
						K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
227	G	1999	23.9	1.8	2.1	9.9	4.4	1.8	2.2	*	55	938	22	8	11	26
228	G	1999	21.1	1.6	2.0	10.2	3.8	1.9	2.1	2.7	45	614	22	8	9	19
229	G	1999	22.9	1.8	1.9	9.1	5.7	2.0	2.5	*	46	468	22	7	15	34
230	G	1999	26.0	2.0	2.7	10.3	4.6	2.0	2.5	*	48	577	25	3	17	29
231	G	1999	20.6	1.5	2.2	9.7	4.3	1.5	1.0	*	39	361	22	1	21	26
232	G	1999	21.1	1.5	2.2	8.1	3.9	1.4	2.3	*	40	303	21	3	19	20
233	G	1999	20.8	1.4	1.9	6.8	4.6	1.5	2.3	2.3	36	676	20	4	19	23
234	G	1999	25.0	1.8	2.9	13.1	4.7	1.5	0.8	*	44	938	25	4	26	26
235	G	1999	21.0	1.4	1.6	9.3	4.2	1.4	2.2	3.0	34	147	24	9	18	22
236	G	1999	24.8	1.6	2.4	9.8	5.8	1.6	1.8	*	49	668	23	3	21	31
237	G	1999	21.7	1.4	1.9	9.8	4.5	1.6	2.0	*	39	245	22	2	18	22
238	G	1999	20.7	1.4	1.8	11.1	7.2	1.6	1.7	*	36	552	19	4	21	50
239	G	1999	23.0	1.9	2.6	9.1	5.2	2.2	2.3	*	47	1002	23	2	24	30
240	G	1999	23.7	1.9	2.8	11.5	4.0	1.4	1.4	1.9	51	1676	25	4	20	33
241	G	1999	18.9	1.5	1.9	6.4	4.3	1.3	2.4	3.2	34	1213	17	1	14	25
242	G	1999	19.9	1.4	1.8	9.1	3.6	1.6	1.7	*	37	573	19	7	11	25
243	G	1999	24.1	1.8	2.0	9.1	5.4	1.8	2.0	2.9	51	726	25	19	13	36
244	G	1999	18.9	1.4	1.7	8.9	4.6	1.8	1.5	*	47	354	24	13	10	38
245	G	1999	21.5	1.6	1.7	8.6	4.7	1.5	1.2	*	44	623	20	3	14	28
246	G	1999	24.0	1.9	3.5	9.8	5.1	1.5	0.9	*	46	1412	22	1	22	20
247	G	1999	21.3	1.6	2.2	7.4	4.2	1.6	1.7	*	41	483	21	3	17	30
248	G	2000	24.1	2.0	2.2	7.7	5.6	1.8	2.4	*	58	836	25	5.9	20	37
249	G	2000	23.5	1.9	2.4	7.6	7.1	1.9	3.6	*	51	293	18	1.8	35	16
250	G	2000	25.5	1.9	2.4	7.8	6.2	1.8	2.5	*	55	458	25	3.8	20	24
251	G	2000	23.8	2.1	2.3	6.7	6.3	2.0	3.4	*	65	396	25	5.0	20	38
252	G	2000	26.5	1.4	2.3	8.3	7.5	1.4	1.2	*	49	171	21	0.9	15	10
253	G	2000	23.4	1.3	1.8	8.6	6.1	1.7	1.9	*	38	126	17	1.6	22	20
254	G	2000	18.3	1.2	1.4	5.2	9.7	1.4	3.1	*	33	67	16	1.8	13	7
255	G	2000	28.4	2.2	3.0	8.1	8.6	1.7	2.3	*	62	59	30	1.5	26	14
256	G	2000	22.9	1.7	2.6	9.9	8.1	1.8	2.6	*	54	47	27	1.0	24	21
257	G	2000	20.3	1.6	2.2	10.5	5.1	1.6	2.1	*	50	180	24	3.5	16	21
258	G	2000	22.4	1.9	2.3	9.7	7.3	1.9	1.6	*	54	154	24	1.8	22	22
259	G	2000	21.8	1.7	2.0	7.3	5.1	1.7	2.9	*	47	118	18	3.5	24	23
260	G	2000	20.8	1.5	2.3	7.6	5.9	1.4	2.5	*	42	132	18	2.5	25	12
261	G	2000	19.9	1.5	1.9	8.0	7.4	2.0	1.4	*	42	146	15	1.5	16	25
262	G	2000	22.2	1.7	2.0	8.0	6.5	1.4	1.2	*	47	120	19	1.3	15	18
263	G	2000	19.8	1.8	2.1	8.5	6.5	2.0	2.1	*	48	111	22	1.3	21	22
264	G	2000	25.1	1.8	2.9	13.9	5.2	1.8	1.1	*	48	235	15	0.5	39	21
265	G	2000	21.5	1.4	2.0	8.0	6.7	1.6	3.4	*	40	64	13	1.5	28	33
266	G	2000	17.5	1.3	2.0	8.9	9.3	2.0	1.7	*	38	142	16	1.5	14	25

PSP no.	Species ¹	Year of planting	N	S	P	(g/kg)					(mg/kg)					
						K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
267	G	2000	20.1	1.5	2.5	8.6	6.1	1.7	2.4	*	55	852	23	4.6	12	47
268	G	2000	19.7	1.6	2.3	8.3	6.5	1.8	3.0	*	56	1282	28	3.9	14	55
269	G	2000	25.6	1.7	2.8	9.8	7.2	2.2	2.5	*	69	564	20	13.9	12	23
270	G	2000	20.5	1.3	2.3	12.6	7.1	1.8	1.4	*	40	1756	19	6.1	13	29
271	G	2000	17.3	1.4	2.3	8.0	4.9	1.9	4.1	*	51	479	21	11.6	11	24
272	G	2000	22.7	1.8	2.3	9.7	6.2	1.7	1.8	*	45	178	17	2.2	25	24
273	G	2000	22.1	2.2	2.6	10.8	6.4	2.3	1.2	*	50	294	21	0.5	21	23
274	G	2000	25.3	2.1	3.1	9.8	7.3	2.4	1.7	*	66	209	23	1.0	26	37
275	G	2000	23.9	1.8	2.1	7.2	5.7	1.8	2.0	*	49	250	23	3.0	19	17
276	G	2000	22.9	1.8	2.2	10.1	6.4	1.7	1.2	*	55	1940	21	2.6	14	37
277	G	2000	22.4	1.8	2.1	10.2	6.1	1.9	3.1	*	57	1512	24	5.3	20	36
278	G	2000	28.1	2.0	2.5	13.2	6.0	1.7	2.1	*	60	2112	24	8.0	22	44
279	G	2000	27.1	2.0	2.7	7.5	7.0	2.1	4.3	*	65	201	23	2.0	39	32
280	G	2000	26.9	1.9	2.7	10.1	7.6	1.6	2.0	*	48	109	20	0.7	36	26
281	G	2000	21.4	1.55	2.24	10.4	7.2	1.5	1.4	*	48	115	18	3.0	22	31
282	G	2000	23.6	1.80	2.03	10.2	7.9	1.7	1.1	*	54	133	22	1.8	15	24
283	G	2000	22.1	1.57	2.46	11.2	7.5	2.7	3.6	*	69	276	24	7.5	18	33
284	G	2000	24.0	1.71	2.66	12.6	7.8	2.1	2.6	*	65	578	26	2.5	19	29
285	G	2000	21.9	1.5	2.2	11.5	6.9	2.6	2.8	*	79	579	20	8.1	18	33
286	G	2000	26.2	1.8	2.9	14.2	6.7	2.3	3.0	*	79	549	24	7.4	21	30
287	G	2001	28.2	2.35	3.26	10.6	4.6	2.1	4.2	*	87	613	36	9.0	24	40
288	G	2001	25.1	1.87	2.75	11.1	4.2	1.7	3.9	*	61	787	27	6.4	21	33
289	G	2001	17.5	1.53	1.60	4.9	9.7	3.1	2.2	*	56	648	17	22.4	33	79
290	G	2001	15.2	1.24	1.43	5.6	8.0	2.3	2.1	*	38	1414	19	8.5	39	58
291	G	2001	17.9	1.39	1.45	6.0	7.5	1.8	2.0	*	55	778	22	11.3	25	49
292	G	2001	15.2	1.40	1.84	3.6	8.3	2.7	3.1	*	72	1502	22	14.8	54	92
293	G	2001	18.7	1.47	2.06	7.7	4.3	1.8	2.1	*	54	465	29	7.7	20	34
294	G	2001	19.2	1.45	2.16	8.5	4.2	1.6	2.0	*	52	796	28	6.4	22	32
295	G	2001	15.7	1.70	1.66	6.1	7.8	2.2	2.0	*	53	1776	24	8.0	18	70
296	G	2001	18.1	1.56	2.13	7.9	7.0	2.1	1.7	*	63	2357	27	9.4	20	72
297	G	2001	18.2	1.59	2.15	8.5	5.5	1.7	1.9	*	61	399	29	8.6	19	43
298	G	2001	19.7	1.63	2.54	9.3	6.1	1.8	2.0	*	67	351	35	7.7	22	44
299	G	2001	21.2	1.61	2.31	10.1	5.1	1.7	1.4	*	80	599	34	12.0	19	55
300	G	2001	17.5	1.63	2.34	8.0	6.5	2.0	2.1	*	62	422	30	8.0	21	50
301	G	2001	21.2	1.91	1.44	5.9	6.7	2.2	1.9	*	133	845	22	29.4	19	143
302	G	2001	21.2	1.69	2.05	6.3	5.7	2.4	2.2	*	62	1579	27	11.8	17	51

¹Species: G = *E. globulus*; N = *E. nitens*

Appendix F. Foliar analysis results at age 2 years for PSPs of *E. globulus* and *E. nitens* planted in 1997, 1998, 1999 and 2000.

PSP no.	Species ¹	Year	Foliage type ²	N	S	P	K	Ca	Mg	Na	Cl	(mg/kg)					
												Fe	Mn	Zn	Cu	B	Al
1	G	1997	J	18.1	1.3	1.1	6.2	11.6	1.9	2.2	3.7	41	1227	9	5	24	34
2	G	1997	J	19.4	1.2	1.4	7.5	8.0	1.6	1.2	2.3	32	881	12	5	17	14
3	G	1997	J	23.5	1.5	2.4	8.1	4.2	1.5	2.1	2.7	42	2244	24	2	15	18
4	G	1997	J	25.5	1.5	2.4	12.3	3.7	1.9	2.1	3.3	51	409	30	10	11	6
5	G	1997	A	15.9	1.2	1.1	5.8	10.3	1.8	1.3	3.0	46	730	10	6	17	32
6	G	1997	A	20.1	1.4	2.0	9.8	4.7	1.9	2.3	2.6	46	623	27	7	13	11
7	G	1997	A	18.2	1.3	1.8	10.1	5.5	2.1	2.8	2.9	51	819	28	6	13	14
8	G	1997	A	18.2	1.3	1.7	8.5	5.6	1.9	2.5	2.5	48	1074	24	6	13	18
9	G	1997	A	16.9	1.3	1.2	6.3	5.5	1.4	2.1	2.3	35	1190	13	4	7	28
10	G	1997	A	16.0	1.3	1.2	5.7	5.4	1.5	2.1	2.2	27	1118	14	4	10	24
11	G	1997	A	18.7	1.4	1.2	5.5	5.3	1.3	1.8	1.2	43	1043	15	3	10	30
12	G	1997	A	20.1	1.7	1.3	5.6	8.7	2.2	1.7	2.4	38	1280	13	6	12	34
13	G	1997	A	20.0	1.6	1.4	5.8	6.2	1.7	1.3	2.4	43	1332	16	9	21	48
14	G	1997	A	19.4	1.6	1.4	5.6	7.7	1.7	1.5	1.9	38	1663	15	7	14	48
15	G	1997	A	18.1	1.5	1.2	5.1	6.3	2.2	2.4	3.5	140	2336	15	5	24	62
16	G	1997	A	20.2	1.5	1.4	5.8	6.4	2.2	2.0	3.2	354	1278	15	6	23	157
17	G	1997	A	18.0	1.4	1.3	6.6	7.4	1.7	1.6	2.2	103	1384	14	6	25	55
18	G	1997	A	18.9	1.6	1.5	6.6	7.2	1.6	1.4	2.1	29	2104	17	5	9	27
19	G	1997	A	18.7	1.4	1.4	5.5	6.0	1.7	1.8	2.4	27	2757	14	5	14	23
20	G	1997	A	17.4	1.4	1.4	6.9	6.5	1.8	2.2	2.5	30	1271	15	5	12	23
21	G	1997	A	20.0	1.7	1.5	5.9	7.5	1.9	1.5	1.5	37	787	19	5	10	28
22	G	1997	A	19.0	1.6	1.8	8.7	6.3	1.8	1.6	2.1	32	627	20	3	8	18
23	G	1997	A	21.3	1.7	1.7	7.5	6.6	2.0	0.9	1.9	37	704	18	4	11	19
24	G	1997	A	17.6	1.0	1.0	4.9	5.2	0.9	0.5	1.0	18	1271	8	3	17	19
25	G	1997	A	18.1	1.6	1.5	6.3	6.7	1.6	1.6	1.9	29	2409	14	4	21	33
26	G	1997	A	18.9	1.5	1.4	6.5	5.8	1.2	0.7	1.0	26	2219	13	3	24	32
27	G	1997	A	19.6	1.7	1.7	8.5	6.7	1.7	1.0	1.9	32	1183	17	4	15	28
28	G	1997	A	19.4	1.5	1.5	8.6	8.9	1.7	1.1	1.8	40	1591	18	5	19	47
29	G	1997	A	21.8	1.7	1.8	8.3	7.3	1.7	1.6	2.5	45	1846	21	3	17	39
30	G	1997	A	17.7	1.4	1.3	6.7	6.3	1.8	2.5	3.0	26	1111	13	6	19	16
31	G	1997	A	17.2	1.5	1.3	5.2	6.9	2.2	2.1	3.0	28	1713	14	7	24	18
32	G	1997	A	18.5	1.4	1.4	6.1	6.8	1.9	2.0	2.8	28	2120	16	6	23	21
33	G	1997	A	20.2	1.6	1.6	8.9	6.8	1.8	0.6	1.8	33	1767	16	6	10	35
34	G	1997	J	19.9	1.6	1.5	9.6	7.9	1.4	0.6	1.8	40	2187	16	5	12	47
35	G	1997	A	22.0	1.5	1.4	6.2	7.5	2.0	1.1	1.1	39	1408	12	6	13	74
36	G	1997	A	17.1	1.4	1.2	5.3	6.6	1.4	1.6	2.0	32	1080	13	3	10	29
37	G	1997	A	19.8	1.6	1.4	5.8	5.8	1.5	1.4	1.7	38	1100	16	5	9	36
38	G	1997	A	18.2	1.5	1.4	6.0	5.6	1.9	1.4	1.4	33	1247	17	3	10	18

PSP no.	Species ¹	Year	Foliage type ²	N	S	P	(g/kg)					(mg/kg)					
							K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
39	G	1997	A	18.8	1.4	1.3	5.6	7.6	1.9	1.2	0.8	30	1064	15	7	17	38
40	G	1997	A	21.0	1.6	1.4	5.3	7.9	1.8	1.2	0.7	32	711	15	8	14	35
41	G	1997	A	21.2	1.5	1.4	5.8	6.8	1.5	1.3	1.3	34	703	16	6	12	36
42	G	1997	A	18.3	1.4	1.2	6.3	8.0	2.2	1.5	1.5	36	1121	14	4	23	54
43	G	1997	A	18.2	1.6	1.4	6.3	7.4	1.9	2.3	1.8	30	1747	18	5	10	30
44	G	1997	A	20.2	1.6	1.4	8.0	7.5	1.8	1.2	2.0	32	1263	18	5	19	36
45	N	1997	A	21.5	1.5	1.5	7.7	4.7	1.2	0.1	1.1	28	1926	19	6	9	35
46	N	1997	A	23.4	1.6	1.6	6.7	4.3	1.2	0.1	0.7	32	1467	17	6	14	35
47	N	1997	J	20.8	1.4	1.5	5.9	4.0	1.0	0.1	0.6	28	1356	17	5	11	21
48	N	1997	J	15.7	1.1	1.1	4.1	3.4	1.1	1.5	1.3	33	1221	15	5	6	33
49	N	1997	A	20.5	1.5	1.3	4.8	3.4	1.2	0.7	1.2	40	1164	15	6	9	25
50	N	1997	J	18.4	1.3	1.2	4.3	2.7	1.2	1.8	1.2	37	442	17	5	9	24
51	N	1997	A	27.8	1.9	1.7	7.1	4.7	1.2	0.1	0.5	40	704	20	7	28	23
52	N	1997	A	20.8	1.5	1.3	6.2	3.7	1.4	0.1	0.5	42	518	15	4	16	24
53	N	1997	A	23.8	1.6	1.4	6.2	5.6	1.3	0.0	0.7	38	1168	15	4	22	16
54	N	1997	A	23.5	1.6	1.4	6.4	4.1	1.1	0.4	1.2	44	1474	16	0	18	43
55	N	1997	A	24.1	1.6	1.4	7.0	4.5	1.2	0.3	0.8	46	452	16	1	13	43
56	N	1997	A	23.8	1.6	1.5	6.9	4.9	1.3	0.3	0.8	55	475	17	1	13	57
57	N	1997	A	20.6	1.5	1.3	6.5	4.4	1.2	0.0	0.7	32	1129	15	4	10	38
58	N	1997	A	18.2	1.2	1.2	6.0	3.5	1.2	0.0	0.4	41	709	16	5	8	49
59	N	1997	A	21.7	1.6	1.4	6.8	4.9	1.4	0.0	0.6	40	1004	14	4	12	39
60	N	1997	A	20.7	1.4	1.2	7.8	5.3	1.4	0.0	0.7	38	1250	18	7	14	52
61	N	1997	A	23.5	1.6	1.4	7.9	5.6	1.4	0.0	0.8	42	923	20	8	18	41
62	N	1997	A	25.9	1.7	1.6	8.5	4.0	1.2	0.0	0.8	39	760	17	7	18	40
63	G	1998	A	20.4	1.5	1.4	6.7	6.4	1.8	2.1	*	56	369	18	10	19	51
64	G	1998	A	21.7	1.5	1.6	7.1	5.7	2.0	2.7	3.5	52	396	19	9	17	42
65	G	1998	A	19.5	1.4	1.3	6.3	7.9	2.0	1.6	*	55	461	15	7	17	57
66	G	1998	A	21.0	1.6	1.4	6.0	7.8	2.3	2.1	*	57	539	16	9	13	56
67	G	1998	A	24.1	1.8	1.7	8.0	7.6	1.9	1.7	*	60	1299	15	9	18	66
68	G	1998	A	22.4	1.6	1.5	8.1	7.5	2.2	1.6	*	56	1209	17	11	17	53
69	G	1998	A	19.5	1.4	1.3	6.0	7.9	2.2	1.5	*	58	1545	15	9	16	75
70	G	1998	A	20.2	1.5	1.4	5.8	7.5	2.1	1.8	*	41	1422	15	8	17	48
71	G	1998	A	15.7	1.4	1.2	6.1	10.4	2.4	2.3	*	44	862	12	9	20	58
72	G	1998	A	21.6	1.5	1.5	5.9	8.0	2.2	2.3	*	53	751	18	8	19	56
73	G	1998	A	20.2	1.5	1.4	6.5	8.6	2.1	2.1	*	52	694	15	7	19	50
74	G	1998	A	20.3	1.4	1.3	6.2	8.6	2.3	2.0	*	49	477	13	6	22	45
75	G	1998	A	21.6	1.6	1.5	7.2	9.8	2.2	1.7	*	45	876	18	4	15	64
76	G	1998	A	23.4	1.6	1.7	5.7	9.9	2.2	1.8	*	55	863	18	5	22	67
77	G	1998	A	22.7	1.8	1.6	6.2	8.7	2.2	1.6	*	45	1412	18	7	15	53

PSP no.	Species ¹	Year	Foliage type ²	N	S	P	(g/kg)					(mg/kg)					
							K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
78	G	1998	A	20.7	1.6	1.5	6.5	9.0	2.0	2.3	*	57	934	18	9	18	52
79	G	1998	A	20.9	1.5	1.3	5.9	7.0	2.0	1.8	*	46	203	15	5	29	44
80	G	1998	A	20.7	1.4	1.4	7.0	8.3	2.4	1.6	*	38	197	12	3	19	49
81	G	1998	A	20.3	1.4	1.4	7.7	9.2	2.0	2.0	*	40	371	15	6	20	56
82	G	1998	A	20.9	1.5	1.6	8.5	8.7	2.0	2.0	*	45	302	18	7	24	53
83	G	1998	A	19.4	1.4	1.4	6.9	7.1	1.6	1.6	*	41	949	15	7	17	50
84	G	1998	A	21.3	1.5	1.4	6.7	8.3	1.9	1.6	*	48	692	16	7	19	57
85	G	1998	A	20.8	1.6	1.4	7.0	9.2	1.7	1.6	*	48	480	15	6	17	57
86	G	1998	A	21.2	1.6	1.5	7.0	7.9	1.9	1.5	*	44	628	17	6	17	50
87	G	1998	A	20.7	1.5	1.3	6.3	7.6	1.8	1.6	*	54	839	13	8	16	41
88	G	1998	A	20.5	1.6	1.2	5.7	8.7	2.3	1.6	*	56	1007	16	8	16	57
89	G	1998	A	20.2	1.5	1.2	5.4	8.1	2.7	2.1	*	46	733	13	9	18	46
90	G	1998	A	19.9	1.4	1.3	5.9	8.7	2.1	1.9	*	58	727	17	7	20	53
91	G	1998	A	20.6	1.6	1.3	7.3	7.1	2.5	1.3	1.8	49	592	17	19	14	41
92	G	1998	A	19.3	1.5	1.2	5.1	9.4	2.8	1.7	*	42	635	15	13	12	50
93	G	1998	A	20.4	1.5	1.5	5.5	7.2	2.4	2.1	*	41	1798	15	11	19	42
94	G	1998	A	22.2	1.7	1.7	6.3	8.5	2.4	1.5	*	43	1952	18	8	17	40
95	G	1998	A	23.2	1.7	1.5	5.8	9.8	2.2	1.8	*	54	810	18	8	19	72
96	G	1998	A	22.5	1.6	1.3	5.3	10.1	2.2	1.9	*	47	658	14	7	15	64
97	G	1998	A	24.0	1.8	1.7	6.9	8.2	1.9	1.5	*	44	755	17	7	14	54
98	G	1998	A	25.8	1.9	1.8	7.2	7.3	2.1	1.7	*	46	444	21	8	16	45
99	G	1998	A	20.5	1.6	1.4	6.7	9.8	2.3	1.9	*	43	738	15	8	18	46
100	G	1998	A	21.2	1.6	1.5	6.9	6.4	2.1	1.7	*	48	411	13	7	11	53
101	G	1998	A	23.5	1.6	1.7	7.6	8.2	1.9	1.7	*	49	1014	16	7	19	49
102	G	1998	A	22.5	1.7	2.0	8.8	6.9	2.0	1.6	*	41	647	15	1	18	43
103	G	1998	A	19.5	1.4	1.3	8.5	7.4	2.4	1.8	*	64	592	15	9	18	57
104	G	1998	A	21.8	1.6	1.4	6.2	8.3	2.5	2.1	*	53	626	17	10	20	49
105	G	1998	A	21.1	1.6	1.4	7.5	7.8	2.5	2.0	*	53	668	16	8	21	48
106	G	1998	A	20.2	1.5	1.3	7.6	9.2	2.3	1.6	*	50	626	18	9	17	49
107	G	1998	A	21.9	1.6	1.5	7.5	7.8	2.0	1.8	*	44	679	15	4	16	50
108	G	1998	A	20.5	1.5	1.4	7.9	7.4	1.7	1.6	*	43	924	15	5	16	52
109	G	1998	A	22.4	1.6	1.5	7.7	8.2	2.0	2.1	*	48	774	13	7	13	56
110	G	1998	A	21.5	1.9	1.4	7.2	10.1	2.2	2.3	*	44	740	16	9	15	54
111	G	1998	A	22.1	1.6	1.4	6.5	9.0	2.5	1.7	*	63	456	17	8	18	54
112	G	1998	A	22.2	1.7	1.7	7.5	7.5	2.1	2.1	*	48	881	17	4	18	47
113	G	1998	A	20.8	1.6	1.3	7.0	8.1	2.2	1.5	*	53	470	18	7	12	67
114	G	1998	A	21.7	1.7	1.6	6.3	7.0	2.5	2.0	*	52	563	17	8	18	48
115	G	1998	A	20.5	1.4	1.4	8.9	7.1	1.6	0.6	2.6	37	1609	15	7	11	12
116	G	1998	A	21.5	1.6	1.5	9.6	6.4	1.8	0.7	2.6	45	1141	16	8	9	27

PSP no.	Species ¹	Year	Foliage type ²	N	S	P	(g/kg)					(mg/kg)					
							K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
117	G	1998	A	23.8	1.8	1.6	8.5	6.7	1.7	1.2	2.7	48	1332	16	9	10	18
118	G	1998	J	22.1	1.6	1.6	7.4	9.8	2.7	0.7	2.5	83	1433	20	9	34	95
119	G	1998	J	20.5	1.4	1.5	7.8	6.6	2.4	0.7	2.2	73	885	19	6	33	80
120	G	1998	A	19.9	1.5	1.3	6.2	7.3	2.1	1.4	2.2	48	702	16	13	26	39
121	G	1998	A	20.8	1.6	1.4	8.2	6.5	1.7	0.4	1.6	60	804	18	7	12	42
122	G	1998	A	20.1	1.8	1.5	8.2	6.1	1.6	0.4	1.5	66	1250	19	8	8	45
123	G	1998	A	17.7	1.5	1.1	6.9	6.1	1.9	1.2	2.4	46	538	16	9	10	35
124	G	1998	J	16.8	1.3	1.0	5.6	10.1	2.3	1.4	2.9	75	711	10	3	46	73
125	G	1998	J	17.0	1.3	1.0	5.5	9.5	2.0	1.8	4.1	67	2300	12	5	48	57
126	G	1998	J	16.7	1.2	1.0	5.7	11.8	2.7	1.9	3.1	52	186	120	6	20	50
127	G	1998	A	18.0	1.2	1.3	8.7	4.9	1.5	0.9	2.5	34	299	28	4	23	27
128	G	1998	A	19.0	1.4	1.2	7.9	5.0	1.4	0.4	2.1	31	2226	16	7	11	19
129	G	1998	A	20.1	1.4	1.3	7.3	6.9	1.5	0.4	0.9	47	2201	15	6	11	53
130	G	1998	A	17.6	1.4	1.1	6.8	6.1	2.4	1.5	2.9	59	773	20	12	15	49
131	G	1998	A	17.5	1.3	1.0	5.7	6.7	2.1	1.7	2.8	48	1212	16	9	15	51
132	G	1998	A	19.7	1.5	1.1	7.2	6.7	2.1	1.9	3.2	64	998	19	9	16	60
133	G	1998	J	17.7	1.2	1.2	7.6	9.2	2.6	0.6	2.3	59	766	13	7	12	68
134	G	1998	J	16.6	1.2	1.0	8.4	11.4	2.1	0.7	1.9	58	830	13	8	16	74
135	G	1998	J	16.2	1.2	1.0	8.0	13.0	2.5	0.5	1.9	64	1196	11	6	17	94
136	G	1998	A	18.7	1.4	1.2	8.2	5.4	2.2	1.1	3.0	37	417	13	7	7	9
137	G	1998	A	21.1	1.6	1.2	7.3	4.2	2.0	1.4	3.2	53	471	15	10	10	26
138	G	1998	A	19.7	1.4	1.2	6.7	4.3	1.5	1.3	1.7	46	421	11	6	10	46
139	G	1998	A	19.5	1.3	1.3	6.9	6.2	2.0	0.9	2.2	39	516	15	7	22	31
140	G	1998	A	18.8	1.4	1.2	6.4	7.2	1.9	0.9	1.4	40	466	14	7	33	42
141	G	1998	A	20.6	1.4	1.4	6.7	7.2	2.2	1.1	1.9	47	392	15	9	30	45
142	G	1998	A	18.5	1.3	1.3	7.5	7.4	2.1	0.6	1.8	45	708	17	8	25	31
143	G	1998	A	18.5	1.4	1.3	8.0	8.9	2.3	0.6	2.1	41	932	16	9	33	30
144	G	1998	A	16.5	1.4	1.3	8.8	7.2	2.1	0.5	1.8	39	1195	15	8	21	24
145	G	1998	A	21.2	1.3	1.3	9.7	6.6	1.6	0.3	1.0	41	2397	17	9	16	33
146	G	1998	A	22.2	1.4	1.4	10.1	7.2	1.4	0.4	0.7	40	172	15	6	19	34
147	G	1998	A	20.8	1.3	1.3	10.3	6.9	1.5	0.4	1.1	43	1351	16	9	10	41
148	G	1998	A	21.1	1.4	1.5	8.9	8.4	2.0	0.8	2.3	45	807	17	9	14	35
149	G	1998	A	18.6	1.2	1.2	8.8	7.3	2.0	0.7	2.1	49	626	14	24	14	33
150	G	1998	A	19.8	1.3	1.3	8.7	8.8	1.9	0.6	1.9	47	1043	17	15	13	37
151	G	1998	A	18.9	1.6	1.2	7.0	7.1	2.4	1.0	2.4	49	680	16	10	23	35
152	G	1998	A	18.7	1.1	1.3	7.5	7.2	2.2	0.7	2.3	38	876	14	7	22	26
153	G	1998	A	17.3	1.4	1.1	6.2	6.7	2.2	1.8	3.1	46	588	11	8	26	27
154	G	1998	A	20.6	1.5	1.3	9.4	4.7	1.6	1.3	2.6	39	612	13	10	20	14
155	G	1998	A	19.6	1.6	1.2	7.8	4.4	1.6	1.4	2.2	46	717	12	8	38	18

PSP no.	Species ¹	Year	Foliage type ²	N	S	P	(g/kg)					(mg/kg)					
							K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
156	G	1998	A	18.9	1.6	1.3	8.2	6.2	1.6	1.1	2.5	44	791	12	9	34	16
157	G	1998	A	22.6	1.6	1.4	6.1	6.5	1.8	2.0	2.8	54	214	17	8	32	33
158	G	1998	A	19.8	1.3	1.2	6.2	6.2	2.4	1.5	2.3	40	339	18	12	16	18
159	G	1998	A	20.9	1.4	1.3	7.2	5.5	2.1	1.5	2.5	51	204	16	25	26	32
160	G	1998	A	20.8	1.3	1.3	6.3	5.9	2.2	0.9	1.9	49	564	14	9	11	55
161	G	1998	A	18.7	1.3	1.1	5.7	7.6	2.2	1.4	2.1	44	725	13	12	9	46
162	G	1998	A	17.2	1.5	1.1	6.3	8.6	2.5	1.1	2.1	41	712	15	10	10	31
163	G	1998	A	20.6	1.5	1.2	6.6	5.9	1.9	2.4	2.7	51	695	13	9	15	43
164	G	1998	A	17.7	1.3	1.1	6.7	6.3	1.6	2.6	3.0	50	485	11	9	17	45
165	G	1998	A	19.9	1.5	1.2	5.9	6.5	2.2	2.1	2.7	47	850	14	12	16	36
166	G	1998	A	20.0	1.3	1.3	8.9	8.0	1.9	0.4	1.6	39	869	14	5	29	40
167	G	1998	A	19.3	1.3	1.3	9.0	6.7	2.0	0.7	2.4	37	899	15	5	33	24
168	G	1998	A	18.5	1.2	1.3	8.0	7.7	2.1	0.7	2.4	41	766	17	6	27	29
169	G	1998	A	20.3	1.6	1.3	7.7	4.8	1.5	1.2	2.1	53	952	13	6	52	28
170	G	1998	A	21.6	1.5	1.4	8.2	5.6	1.6	1.0	2.3	46	1612	16	6	22	26
171	G	1998	A	19.9	1.5	1.4	7.6	4.7	1.5	1.4	2.3	44	854	13	3	36	22
172	G	1998	A	18.9	1.4	1.4	10.0	5.5	1.7	1.3	1.6	45	730	14	5	24	28
173	G	1998	A	20.3	1.4	1.4	9.9	6.6	1.7	0.6	1.6	46	172	109	5	18	24
174	G	1998	A	16.9	1.2	1.3	9.1	6.4	1.5	0.5	1.2	33	726	16	4	47	19
175	N	1998	J	21.8	1.5	1.3	7.1	4.1	1.1	0.1	0.8	44	932	12	6	13	46
176	N	1998	J	22.0	1.4	1.2	8.0	5.8	1.2	0.0	0.9	43	718	14	4	54	50
177	N	1998	J	15.1	1.0	1.0	7.9	7.5	1.6	0.1	1.3	38	942	13	4	39	60
178	N	1998	J	18.7	1.3	1.0	7.3	6.9	1.7	0.2	1.4	43	978	15	6	20	59
179	N	1998	J	20.1	1.3	1.1	6.7	5.2	1.3	0.0	1.2	49	821	16	4	20	50
180	N	1998	J	20.2	1.4	1.1	8.0	6.7	1.4	0.0	0.9	39	1031	17	3	25	31
181	N	1998	J	22.3	1.3	1.9	7.7	5.9	1.6	0.0	0.8	43	749	15	3	119	45
182	N	1998	J	21.1	1.3	1.4	7.1	6.0	1.6	0.1	0.8	43	751	12	3	101	41
183	N	1998	J	23.2	1.9	1.6	5.6	6.4	1.7	0.2	0.7	41	1061	15	3	112	0
184	N	1998	J	22.6	1.4	1.3	7.2	5.9	1.4	0.1	1.6	85	834	18	4	19	83
185	N	1998	J	20.7	1.4	1.2	6.4	6.1	1.5	0.1	1.7	51	697	12	5	16	55
186	N	1998	J	20.4	1.2	1.3	6.5	7.4	1.7	0.2	1.4	59	601	13	4	11	61
187	N	1998	J	19.7	1.4	1.4	7.1	6.5	1.5	0.1	1.0	46	478	15	2	70	48
188	N	1998	J	18.5	1.3	1.2	7.2	7.4	1.6	0.2	1.5	48	435	12	2	45	53
189	N	1998	J	18.5	1.3	1.1	6.4	7.0	1.4	0.1	0.8	41	205	13	3	47	49
190	N	1998	J	18.0	1.2	1.0	5.6	6.6	1.6	0.2	0.7	38	556	16	5	13	43
191	N	1998	J	17.2	1.2	1.0	6.5	6.9	1.5	0.2	0.9	37	1349	13	3	126	60
192	N	1998	J	14.4	1.1	1.0	3.7	8.2	1.7	0.9	0.6	50	1217	12	3	160	48
193	N	1998	J	18.0	1.2	1.1	8.2	5.6	1.1	0.1	1.1	47	970	10	9	7	63
194	N	1998	J	23.2	1.4	1.2	8.3	5.6	1.1	0.0	1.1	39	651	11	4	14	38

PSP no.	Species ¹	Year	Foliage type ²	N	S	P	(g/kg)					(mg/kg)					
							K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
195	N	1998	J	21.2	1.5	1.4	8.3	5.3	1.3	0.0	1.1	57	986	13	4	15	77
196	N	1998	A	26.9	1.8	1.6	6.3	4.9	1.4	0.0	0.6	55	901	19	7	49	23
197	N	1998	J	20.6	1.4	1.3	5.8	6.7	1.6	0.0	0.5	47	836	11	3	31	48
198	N	1998	J	23.5	1.6	1.4	7.4	5.5	1.4	0.0	0.7	42	755	13	3	105	46
199	N	1998	J	21.5	1.4	1.3	6.1	3.9	1.1	0.0	0.6	45	295	21	6	17	32
200	N	1998	J	20.5	1.3	1.3	5.9	4.1	1.1	0.0	0.7	35	981	16	4	51	25
201	N	1998	J	21.4	1.4	1.2	6.5	4.0	1.1	0.0	0.6	50	1044	16	4	25	38
202	N	1998	A	23.6	1.5	1.4	7.2	2.6	1.1	0.1	0.9	50	462	15	5	36	39
203	N	1998	A	19.1	1.4	1.2	7.6	4.5	1.3	0.1	0.6	51	418	15	4	17	44
204	N	1998	A	19.7	1.5	1.3	7.0	4.9	1.4	0.1	0.7	75	671	13	5	21	45
205	G	1998	A	17.6	1.2	1.2	8.5	8.1	1.8	1.7	2.8	45	1020	14	9	20	51
206	G	1998	A	19.0	1.3	1.3	7.9	8.7	1.7	1.6	2.4	38	1407	13	9	17	50
207	G	1998	A	19.7	1.2	1.2	7.4	7.6	1.5	1.3	1.9	44	1050	12	9	15	53
208	G	1998	A	20.1	1.4	1.1	4.5	4.1	1.9	1.9	2.6	58	420	15	7	22	48
209	G	1998	A	18.4	1.4	1.0	4.9	3.2	1.9	2.1	2.9	50	317	19	9	22	36
210	G	1998	A	18.9	1.4	1.1	4.9	3.5	2.2	2.2	3.7	51	454	18	11	29	37
211	G	1999	A	22.5	1.7	1.6	6.8	6.9	2.5	2.4	*	59	1180	22	13	21	24
212	G	1999	A	22.2	1.6	1.6	7.5	6.9	2.4	2.9	*	58	1088	19	15	25	21
213	G	1999	A	24.7	1.9	2.0	8.9	4.8	2.0	3.0	*	64	561	25	14	20	11
214	G	1999	A	22.8	1.7	1.7	6.6	5.5	2.1	2.0	*	65	948	17	10	30	52
215	G	1999	A	20.3	1.6	1.4	5.9	6.0	2.1	2.7	*	49	1014	17	10	24	29
216	G	1999	A	22.8	1.7	1.5	6.2	6.2	2.1	2.3	*	47	1538	17	10	19	25
217	G	1999	A	21.4	1.6	1.4	8.2	8.9	2.4	2.8	*	48	1197	19	8	18	30
218	G	1999	A	19.2	1.5	1.1	6.0	7.2	2.0	2.6	*	48	445	11	17	17	39
219	G	1999	A	17.9	1.3	1.2	7.1	8.4	2.2	2.8	*	46	302	15	13	14	33
220	G	1999	A	20.4	1.7	1.3	5.9	8.4	2.3	1.9	*	55	868	17	15	15	26
221	G	1999	A	20.8	1.6	1.2	5.4	10.6	2.4	1.7	*	52	1374	16	17	17	29
222	G	1999	A	23.0	1.9	1.6	8.3	7.7	2.3	2.9	*	50	1104	20	18	12	24
223	G	1999	A	24.8	1.8	2.2	8.7	11.0	2.4	2.2	*	58	229	19	7.6	18	45
224	G	1999	A	25.6	1.8	2.2	8.4	9.1	2.1	2.3	*	68	151	17	4.9	22	57
225	G	1999	A	20.8	1.9	1.6	7.0	4.9	1.7	2.6	*	56	182	21	6.4	20	37
226	G	1999	J	18.6	1.3	1.2	5.5	11.6	2.6	2.7	*	62	142	15	6.2	20	57
227	G	1999	J	20.4	1.2	1.3	6.8	8.0	2.0	2.5	*	55	324	11	5.1	50	44
228	G	1999	A	22.6	1.7	1.8	6.7	6.8	2.1	3.0	*	53	167	20	8.1	24	25
229	G	1999	A	21.6	1.7	1.8	7.0	7.1	2.1	3.1	*	53	101	20	7.4	28	29
231	G	1999	A	20.7	1.5	2.0	9.8	6.5	1.5	2.6	*	45	94	13	0.6	35	28
232	G	1999	A	20.2	1.3	1.6	6.1	7.6	1.4	3.2	*	46	64	13	1.8	29	16
233	G	1999	A	23.8	1.6	1.9	6.0	7.2	1.6	3.0	*	56	235	17	4.6	24	16
234	G	1999	A	21.5	1.4	2.0	12.9	7.8	1.5	1.1	*	41	217	14	0.8	20	11

PSP no.	Species ¹	Year	Foliage type ²	N	S	P	(g/kg)					(mg/kg)					
							K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
235	G	1999	A	19.7	1.3	1.7	5.9	11.0	1.8	3.6	*	43	86	26	7.0	26	24
236	G	1999	A	21.1	1.4	2.1	11.5	7.5	1.7	2.1	*	41	136	17	0.9	26	14
238	G	1999	A	18.4	1.2	1.8	10.5	8.7	1.7	1.6	*	39	108	17	1.6	20	16
239	G	1999	A	20.1	1.5	1.8	7.1	8.5	2.0	2.8	*	49	276	21	3.5	20	23
240	G	1999	A	29.6	1.9	3.2	13.3	7.3	1.8	2.1	*	53	844	46	5.9	30	21
241	G	1999	A	22.3	1.8	2.6	9.0	12.4	2.4	5.7	*	51	1132	30	4.2	32	31
242	G	1999	A	22.5	1.7	1.7	7.0	10.0	2.5	2.3	*	52	765	25	8.7	23	42
243	G	1999	A	22.1	1.4	1.8	7.6	10.3	2.5	2.2	*	42	375	20	9.1	18	27
244	G	1999	A	20.4	1.5	1.6	6.7	10.7	2.8	1.8	*	39	279	19	5.5	19	36
245	G	1999	A	21.3	1.6	2.4	13.9	12.1	2.2	2.2	*	53	124	26	5.5	23	18
246	G	1999	A	25.0	1.7	2.9	10.6	7.7	1.9	2.2	*	72	390	21	1.6	34	30
248	G	2000	A	22.2	1.91	1.43	6.3	8.6	2.8	2.1	*	41	311	18	6.7	27	25
249	G	2000	A	21.2	1.90	1.71	6.1	12.8	2.5	2.0	*	41	156	22	4.4	24	31
250	G	2000	A	22.4	1.82	1.67	6.6	9.5	2.7	2.3	*	41	159	22	4.5	26	20
251	G	2000	A	20.1	1.78	1.68	6.3	10.5	3.0	2.8	*	49	166	23	4.6	25	30
252	G	2000	A	21.7	1.85	1.54	6.8	9.8	2.3	2.2	*	38	270	21	5.5	16	24
253	G	2000	A	21.9	1.92	1.70	8.2	9.2	2.4	1.8	*	43	95	24	3.5	17	25
254	G	2000	A	22.3	2.10	1.52	6.1	16.9	2.8	2.8	*	40	587	24	7.1	24	37
255	G	2000	A	26.4	2.34	2.28	8.1	12.7	2.6	3.0	*	56	57	31	4.5	26	27
256	G	2000	A	25.1	2.09	2.21	7.2	8.7	2.2	2.5	*	51	67	26	2.4	30	19
257	G	2000	A	23.1	2.40	1.98	9.3	8.9	2.6	3.3	*	51	147	30	5.6	22	17
258	G	2000	A	24.3	2.49	1.92	7.8	11.2	2.7	2.5	*	50	154	24	3.5	23	25
259	G	2000	A	22.6	1.90	1.78	8.4	7.2	2.8	3.4	*	42	104	23	2.8	33	11
260	G	2000	A	21.3	1.60	1.59	7.4	7.2	2.4	3.4	*	35	69	18	1.6	29	13
261	G	2000	A	19.8	1.54	1.36	6.4	8.4	2.8	2.7	*	38	54	22	4.1	33	23
262	G	2000	A	23.4	1.93	1.71	7.6	9.7	2.2	1.7	*	38	76	21	3.3	22	20
263	G	2000	A	21.4	1.85	1.54	7.9	10.0	2.9	2.6	*	42	83	26	5.6	24	22
264	G	2000	A	22.9	1.86	1.65	7.4	6.7	2.5	2.2	*	45	171	19	1.4	36	18
265	G	2000	A	20.0	1.66	1.23	6.1	13.8	3.0	1.7	*	46	178	21	4.6	18	40
266	G	2000	A	17.5	1.57	1.33	6.9	9.6	2.3	2.0	*	37	88	27	5.1	14	25
267	G	2000	A	24.7	2.21	2.24	7.2	11.1	2.4	2.7	*	59	1223	33	4.1	18	34
268	G	2000	A	26.9	2.49	2.85	9.2	11.2	2.7	2.6	*	63	1649	31	1.9	24	36
269	G	2000	A	28.2	2.52	2.31	8.5	10.3	3.2	2.9	*	62	497	33	9.4	19	32
270	G	2000	A	23.6	2.29	2.05	8.7	10.6	2.8	2.0	*	50	726	22	6.5	17	42
271	G	2000	A	22.3	2.04	1.88	7.7	11.0	3.0	2.1	*	45	1062	23	8.7	18	28
272	G	2000	A	19.1	1.62	1.38	6.8	10.5	2.5	1.8	*	44	101	19	7.5	21	33
273	G	2000	A	19.2	1.79	1.88	6.7	11.0	3.3	2.4	*	79	107	25	4.6	22	37
274	G	2000	A	19.2	1.55	1.31	6.7	14.3	3.0	1.5	*	39	240	20	2.3	16	40
275	G	2000	A	23.4	2.01	1.58	5.4	8.5	2.1	2.2	*	53	243	24	6.4	29	35

PSP no.	Species ¹	Year	Foliage type ²	N	S	P	(g/kg)					(mg/kg)					
							K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
276	G	2000	A	21.5	1.90	1.55	6.6	11.0	2.6	1.6	*	51	769	19	3.4	22	44
277	G	2000	A	21.3	1.89	1.55	6.7	10.4	2.9	3.5	*	48	988	23	4.7	28	40
278	G	2000	A	22.1	2.03	1.22	6.0	7.3	2.1	2.3	*	50	650	19	4.7	25	59
279	G	2000	A	21.1	1.76	1.79	6.8	7.9	2.8	3.0	*	39	110	20	2.5	38	19
280	G	2000	A	21.7	1.82	1.68	7.0	7.3	2.1	2.4	*	38	84	18	1.2	33	16
281	G	2000	A	20.0	1.75	1.56	7.4	9.7	1.9	1.7	*	37	62	19	2.0	20	25
282	G	2000	A	22.7	2.03	1.63	7.3	9.7	2.2	1.8	*	41	89	22	4.5	20	31
283	G	2000	A	21.3	1.93	1.71	7.5	11.1	3.1	2.7	*	48	940	23	6.8	24	32
284	G	2000	A	24.8	2.19	2.10	8.6	10.1	2.5	2.7	*	55	392	27	3.1	29	31
285	G	2000	A	22.5	2.14	1.80	7.5	10.0	2.5	2.3	*	47	1066	24	7.1	22	27
286	G	2000	A	23.3	2.02	1.95	8.0	8.8	2.3	2.9	*	53	897	22	4.3	24	24

¹Species: G = *E. globulus*; N = *E. nitens*

²Type of foliage sampled: A = adult; J = juvenile

NB. Samples were not collected from plots 230, 237 and 247.

Appendix G. Foliar analysis results at age 4 years for PSPs of *E. globulus* and *E. nitens* planted in 1997 and 1998.

PSP no.	Species ¹	Year	N	S	P	K	Ca	Mg	Na	Cl	mg/kg					
											Fe	Mn	Zn	Cu	B	Al
1	G	1997	15.7	1.1	1.1	5.3	8.4	1.7	1.6	*	45	352	12	7	16	42
2	G	1997	17.2	1.1	1.1	6.0	8.4	1.6	1.7	*	46	297	14	6	17	37
3	G	1997	14.1	0.9	1.0	5.9	9.1	1.5	2.3	*	37	374	13	6	18	38
4	G	1997	16.8	1.1	1.2	6.0	9.4	1.8	1.7	*	43	227	13	7	21	32
5	G	1997	17.4	1.2	1.1	6.3	9.9	1.6	1.8	*	50	415	19	6	18	40
6	G	1997	15.7	1.1	1.1	5.8	11.8	2.1	2.1	*	47	376	18	6	23	55
7	G	1997	17.5	1.2	1.2	5.6	11.0	1.9	1.3	*	47	240	14	9	21	37
8	G	1997	16.5	1.1	1.1	6.2	12.6	1.8	1.9	*	64	245	16	8	26	51
9	G	1997	18.5	1.4	1.0	7.0	7.2	1.7	2.1	3.8	49	1268	15	8	18	45
10	G	1997	15.3	1.2	0.8	7.1	7.4	1.5	3.2	4.2	29	651	11	8	19	33
11	G	1997	16.7	1.3	0.9	6.0	6.8	1.5	2.5	3.5	75	963	11	12	18	48
12	G	1997	17.0	1.2	1.0	6.0	9.1	1.5	1.4	2.1	36	989	14	5	38	62
13	G	1997	18.7	1.4	1.1	5.3	7.7	1.3	1.2	1.7	35	1223	15	5	46	61
14	G	1997	18.5	1.3	1.0	5.7	8.6	1.3	1.2	1.5	41	851	14	5	39	77
15	G	1997	16.3	1.1	0.8	5.2	6.5	1.6	1.5	2.5	212	1309	16	5	26	80
16	G	1997	17.8	1.3	0.9	4.9	6.1	1.9	1.5	2.1	216	534	15	5	30	75
17	G	1997	15.3	1.1	0.8	6.3	15.2	2.2	1.6	2.6	116	1274	15	5	26	69
18	G	1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19	G	1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20	G	1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21	G	1997	16.4	1.2	0.9	7.0	7.9	1.6	1.4	2.5	39	523	12	7	16	48
22	G	1997	16.4	1.2	0.9	6.5	8.1	1.7	1.7	2.8	30	380	12	7	17	38
23	G	1997	16.4	1.2	0.9	6.9	8.0	1.9	1.0	2.6	31	471	11	7	17	37
24	G	1997	19.4	1.4	1.1	5.8	9.8	1.7	1.0	1.3	36	1705	18	5	34	39
25	G	1997	18.8	1.4	1.1	6.7	8.2	1.5	1.6	2.1	40	2152	15	5	38	41
26	G	1997	19.4	1.4	1.1	6.9	9.0	1.6	0.9	1.2	38	2085	15	4	41	38
27	G	1997	17.2	1.2	1.0	6.0	8.4	1.6	1.0	2.0	31	785	14	6	21	41
28	G	1997	18.0	1.3	1.1	6.1	9.0	1.2	0.8	1.2	34	723	12	3	28	60
29	G	1997	17.1	1.2	1.0	6.0	5.5	1.5	1.4	2.1	31	466	12	5	15	33
30	G	1997	17.4	1.3	0.9	6.9	5.8	1.8	2.5	4.4	62	939	13	5	32	37
31	G	1997	18.1	1.4	1.0	6.6	5.6	1.9	3.0	4.3	165	919	11	5	29	42
32	G	1997	18.6	1.4	1.0	6.3	5.0	1.7	2.6	4.0	45	1104	15	6	30	42
33	G	1997	17.8	1.3	1.1	7.8	5.9	1.3	1.0	*	39	524	14	7	17	59
34	G	1997	16.1	1.2	1.0	8.2	7.5	1.1	0.9	*	35	690	12	4	18	47
35	G	1997	17.2	1.3	1.1	8.3	6.5	1.4	1.3	*	30	834	15	5	14	36
36	G	1997	16.0	1.2	0.8	6.1	6.3	1.5	1.8	2.7	32	486	11	3	15	33
37	G	1997	17.3	1.3	0.8	5.6	5.7	1.4	1.6	3.0	34	760	13	4	17	30
38	G	1997	17.4	1.3	0.9	6.6	5.2	1.3	1.4	1.8	34	641	11	4	21	28

PSP no.	Species ¹	Year	N	S	P	(g/kg)					mg/kg					
						K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
41	G	1997	18.4	1.3	1.1	5.6	4.5	1.4	1.4	1.9	31	320	13	5	16	22
42	G	1997	15.7	1.1	0.9	6.0	7.8	1.5	1.4	2.3	26	604	11	3	15	43
43	G	1997	17.9	1.3	1.0	4.9	7.7	1.3	1.6	1.4	31	913	12	3	13	47
44	G	1997	18.4	1.2	1.0	6.8	7.5	1.2	1.1	2.0	35	878	13	3	19	59
45	N	1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*
46	N	1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*
47	N	1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*
48	N	1997	14.4	1.1	1.0	3.9	5.3	1.4	1.2	1.4	88	2133	10	3	50	57
49	N	1997	16.3	1.2	1.1	4.1	4.8	1.1	1.4	1.0	87	1685	10	5	33	50
50	N	1997	16.5	1.3	1.0	3.9	4.4	1.5	1.1	1.2	82	1148	12	3	48	54
51	N	1997	17.9	1.2	1.2	5.9	7.1	1.3	0.0	*	43	724	13	3	22	40
52	N	1997	14.8	1.1	0.9	4.6	4.8	1.4	0.1	*	39	980	10	3	17	34
53	N	1997	15.2	1.0	1.1	5.6	5.8	1.5	0.1	*	34	893	11	3	17	25
54	N	1997	18.1	1.2	1.0	4.6	5.6	1.4	0.2	1.0	43	748	12	2	15	60
55	N	1997	18.3	1.3	1.0	4.8	5.3	1.4	0.2	0.8	55	433	14	3	15	65
56	N	1997	20.1	1.3	1.0	4.9	5.1	1.4	0.3	0.9	53	383	12	3	14	54
57	N	1997	17.2	1.2	1.1	7.5	5.1	1.4	0.1	*	36	544	10	4	15	64
58	N	1997	17.2	1.2	1.1	5.2	4.6	1.2	0.0	*	46	967	12	3	12	59
59	N	1997	15.1	1.0	1.0	6.8	5.6	1.5	0.1	*	29	508	9	4	13	57
60	N	1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*
61	N	1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*
62	N	1997	*	*	*	*	*	*	*	*	*	*	*	*	*	*
63	G	1998	15.4	1.3	1.0	5.9	12.9	2.3	2.5	*	41	275	17	4	30	56
64	G	1998	15.9	1.4	1.1	5.8	15.2	2.6	2.7	*	43	324	16	5	33	62
65	G	1998	16.9	1.4	1.2	7.3	11.8	2.0	2.1	*	40	351	17	5	36	47
66	G	1998	15.9	1.5	1.0	6.1	14.6	2.6	2.4	*	47	568	15	5	33	58
67	G	1998	17.2	1.5	1.2	6.8	11.6	2.5	2.5	*	46	414	13	3	26	67
68	G	1998	17.5	1.5	1.3	7.4	12.5	2.6	2.4	*	48	329	15	4	29	65
69	G	1998	18.3	1.6	1.1	7.1	14.6	2.3	1.9	*	44	596	15	5	23	70
70	G	1998	17.7	1.5	1.1	6.2	11.1	2.4	1.5	*	42	385	15	5	23	67
71	G	1998	17.3	1.7	1.2	6.2	16.8	2.3	2.6	*	57	800	17	6	38	80
72	G	1998	19.1	1.7	1.2	5.3	14.3	2.0	2.8	*	54	657	19	5	36	77
73	G	1998	19.0	1.5	1.1	5.3	14.1	2.0	2.9	*	47	603	14	5	35	74
74	G	1998	17.1	1.6	1.1	5.8	15.1	2.3	2.7	*	50	739	16	5	41	78
75	G	1998	19.8	1.6	1.4	6.4	12.3	2.2	2.2	*	45	363	15	5	21	71
76	G	1998	16.9	1.6	1.1	5.3	14.7	2.1	3.4	*	45	475	17	3	31	73
77	G	1998	18.5	1.5	1.3	5.2	12.1	2.1	2.5	*	50	427	16	4	26	83
78	G	1998	16.5	1.5	1.2	7.5	14.1	2.5	3.2	*	46	464	18	5	33	65
79	G	1998	14.0	1.2	1.0	6.4	13.5	2.5	2.6	*	37	134	12	3	27	58

PSP no.	Species ¹	Year	N	S	P	(g/kg)					mg/kg					
						K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
80	G	1998	18.1	1.2	1.0	5.7	12.5	2.9	1.8	*	32	104	12	3	23	49
81	G	1998	15.3	1.5	1.0	6.4	16.8	3.0	2.2	*	41	167	13	3	28	71
82	G	1998	18.1	1.6	1.2	5.9	17.4	3.0	2.2	*	46	149	17	4	26	74
83	G	1998	18.0	1.5	1.2	6.8	12.1	2.5	2.3	*	47	468	14	4	30	65
84	G	1998	17.7	1.5	1.3	7.1	14.2	2.5	2.4	*	48	270	19	5	29	69
85	G	1998	16.2	1.5	1.2	6.6	14.2	2.3	2.1	*	41	228	17	4	25	70
86	G	1998	18.4	1.5	1.2	5.8	12.5	2.2	1.8	*	45	229	18	4	29	52
87	G	1998	18.4	1.4	1.1	7.6	13.7	1.9	2.3	*	46	519	15	6	30	62
88	G	1998	18.1	1.7	1.3	7.0	15.1	2.5	2.5	*	52	399	20	6	35	58
89	G	1998	16.0	1.4	1.2	5.9	11.9	3.1	2.6	*	85	887	15	7	33	44
90	G	1998	17.0	1.4	1.1	7.0	14.5	2.2	2.6	*	43	715	13	4	34	65
91	G	1998	21.5	1.7	1.6	7.0	7.7	2.0	1.5	*	55	459	15	5	25	57
92	G	1998	18.5	1.6	1.4	6.0	9.8	2.2	3.1	*	45	546	16	4	24	67
93	G	1998	18.2	1.5	1.2	5.2	8.4	2.1	2.4	*	51	514	14	4	19	75
94	G	1998	19.2	1.6	1.4	5.6	9.2	2.3	2.0	*	40	466	16	4	20	56
95	G	1998	19.0	1.5	1.2	5.9	12.9	2.0	2.3	*	44	525	13	4	26	71
96	G	1998	17.4	1.5	1.2	6.1	12.8	2.3	2.9	*	43	326	18	5	31	61
97	G	1998	16.3	1.5	1.2	6.0	14.5	2.4	2.7	*	43	432	17	5	20	76
98	G	1998	18.9	1.5	1.3	7.2	13.3	2.2	1.7	*	42	301	14	5	24	62
99	G	1998	16.3	1.5	1.1	6.7	14.6	2.2	3.9	*	57	655	16	5	32	80
100	G	1998	16.7	1.4	1.1	6.3	10.3	2.0	2.9	*	46	250	15	4	26	68
101	G	1998	19.2	1.8	1.3	6.0	13.1	2.1	2.6	*	60	404	19	5	22	91
102	G	1998	19.3	1.5	1.3	6.6	9.4	2.3	2.3	*	50	547	14	3	21	52
103	G	1998	17.8	1.5	1.1	6.8	13.1	2.5	2.3	*	47	264	15	5	28	62
104	G	1998	15.9	1.6	1.1	6.8	14.4	2.5	2.4	*	44	312	15	6	28	46
105	G	1998	17.7	1.5	1.2	6.9	14.1	2.2	2.6	*	49	305	17	5	31	66
106	G	1998	16.0	1.3	1.0	6.4	14.3	2.2	2.1	*	45	598	14	4	25	59
107	G	1998	16.5	1.6	1.1	6.1	13.4	2.7	2.7	*	41	274	15	3	23	77
108	G	1998	17.7	1.5	1.3	7.9	11.1	1.8	1.9	*	46	644	15	4	18	73
109	G	1998	17.5	1.5	1.2	6.8	15.5	2.7	2.2	*	46	325	15	5	22	69
110	G	1998	18.2	1.6	1.2	7.3	16.5	2.5	2.6	*	49	316	17	6	28	74
111	G	1998	17.2	1.4	1.2	5.6	10.9	2.2	3.1	*	45	252	15	4	31	57
112	G	1998	17.4	1.4	1.3	5.8	10.2	2.0	2.9	*	44	331	15	4	24	63
113	G	1998	19.0	1.6	1.4	7.2	10.6	2.2	2.2	*	53	482	14	4	19	78
114	G	1998	18.2	1.5	1.2	5.2	12.2	2.1	3.0	*	42	328	14	5	30	52
115	G	1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*
116	G	1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*
117	G	1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*
118	G	1998	15.8	1.1	0.9	5.9	10.7	1.9	0.6	*	53	895	13	5	24	66

PSP no.	Species ¹	Year	N	S	P	(g/kg)					mg/kg					
						K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
119	G	1998	17.6	1.3	1.1	5.2	5.9	1.5	0.8	*	57	857	12	3	34	73
120	G	1998	14.9	1.0	0.8	6.7	9.2	1.8	1.5	*	45	611	13	4	26	56
121	G	1998	16.5	1.1	1.0	6.9	10.1	1.5	0.4	*	35	1081	13	5	24	37
122	G	1998	17.6	1.2	1.1	5.9	11.4	1.7	0.5	*	39	524	13	4	23	40
123	G	1998	15.1	1.0	0.9	5.1	8.6	1.5	0.8	*	34	572	10	5	22	35
124	G	1998	13.8	1.0	0.8	5.4	9.1	1.7	1.3	*	31	2038	7	2	22	34
125	G	1998	15.1	1.0	0.8	5.4	6.4	1.5	1.4	*	35	1356	11	4	14	37
126	G	1998	13.5	0.9	0.7	5.5	7.9	1.6	1.4	*	33	1448	9	3	24	29
127	G	1998	18.1	1.2	1.0	5.8	5.9	1.5	1.2	*	41	1732	36	9	29	44
128	G	1998	17.6	1.1	1.1	6.9	5.9	1.4	1.0	*	35	1943	12	4	21	52
129	G	1998	18.6	1.3	1.1	5.6	9.1	1.8	0.5	*	35	2609	18	6	50	46
130	G	1998	15.6	1.1	0.8	5.3	8.7	1.8	1.2	*	58	964	11	4	15	63
131	G	1998	15.5	1.1	0.9	5.5	11.3	1.6	1.6	*	51	1330	11	5	15	65
132	G	1998	17.2	1.1	0.9	5.5	11.5	1.7	1.0	*	52	1291	10	4	18	67
133	G	1998	13.9	1.0	0.9	6.6	6.8	2.5	1.4	*	27	299	8	6	10	27
134	G	1998	14.2	1.0	0.9	6.7	9.8	1.7	0.6	*	32	588	8	7	18	46
135	G	1998	13.8	1.0	0.8	6.4	12.1	1.9	0.5	*	36	1093	9	5	17	53
136	G	1998	16.0	1.2	0.9	5.2	7.9	1.6	1.2	*	51	793	12	4	13	62
137	G	1998	15.9	1.2	0.9	6.2	7.4	1.7	1.6	*	48	806	15	6	16	52
138	G	1998	16.3	1.2	1.0	6.6	7.5	1.4	1.0	*	40	606	12	6	17	70
139	G	1998	16.8	1.1	1.0	6.0	8.8	1.5	1.0	*	35	501	11	4	23	76
140	G	1998	15.7	1.0	1.0	5.9	9.1	1.5	1.0	*	36	305	10	5	23	71
141	G	1998	16.7	1.1	1.0	4.9	8.7	1.8	1.1	*	37	289	10	4	19	56
142	G	1998	15.8	1.0	0.8	5.0	9.3	1.7	0.7	*	34	851	10	5	15	49
143	G	1998	15.4	1.0	0.8	6.5	11.2	1.8	0.7	*	35	977	11	5	22	50
144	G	1998	15.1	1.0	0.8	5.7	9.5	1.5	0.5	*	35	869	10	6	17	52
145	G	1998	14.8	1.0	1.0	9.2	10.5	1.6	0.4	*	30	936	9	6	10	56
146	G	1998	15.3	1.1	1.0	8.0	8.4	1.1	0.3	*	30	1168	11	4	9	46
147	G	1998	17.2	1.1	1.0	8.8	8.0	1.4	0.4	*	32	582	11	5	9	40
148	G	1998	16.6	1.1	0.9	6.7	10.6	1.5	0.8	*	45	313	10	4	16	62
149	G	1998	15.1	1.0	0.8	6.6	10.5	1.6	0.7	*	41	438	11	5	16	55
150	G	1998	14.7	1.0	0.8	6.1	10.7	1.6	0.7	*	38	550	9	4	16	51
151	G	1998	15.1	1.0	0.8	6.2	7.0	1.6	1.0	*	37	535	10	6	18	56
152	G	1998	16.1	1.2	1.0	6.0	9.2	1.9	1.1	*	41	718	12	6	18	65
153	G	1998	14.8	1.1	0.8	5.1	8.7	1.9	1.6	*	42	762	9	6	22	58
154	G	1998	15.8	1.2	0.8	6.1	9.1	1.0	2.1	*	43	1587	13	5	44	83
155	G	1998	16.1	1.2	0.9	6.8	7.5	1.2	1.8	*	44	1416	13	4	44	72
156	G	1998	15.7	1.2	0.8	5.6	9.4	1.0	1.3	*	45	1325	23	5	45	73
157	G	1998	15.1	1.1	0.7	3.8	12.1	2.0	0.9	*	50	254	10	4	22	38

PSP no.	Species ¹	Year	N	S	P	(g/kg)					mg/kg					
						K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
158	G	1998	15.6	1.0	0.8	4.4	9.0	2.4	1.0	*	47	320	10	4	11	43
159	G	1998	14.7	0.9	0.7	4.8	9.1	1.8	1.1	*	41	146	8	4	18	59
160	G	1998	14.5	1.0	0.8	6.2	8.3	1.5	1.3	*	31	601	10	6	12	60
163	G	1998	15.9	1.1	0.7	5.0	8.5	1.5	1.3	*	55	845	9	5	22	65
164	G	1998	15.7	1.1	0.8	5.5	10.6	1.7	1.8	*	57	608	11	5	34	70
165	G	1998	13.7	0.9	0.7	4.9	7.6	1.7	1.4	*	46	770	10	6	35	51
166	G	1998	14.3	0.9	0.8	6.1	7.6	2.0	0.5	*	36	545	9	4	16	50
167	G	1998	15.4	1.0	0.9	5.9	8.8	1.8	0.7	*	41	708	11	4	29	73
168	G	1998	14.5	0.9	0.8	5.6	8.8	1.7	1.1	*	38	491	10	4	17	59
169	G	1998	15.1	1.3	0.9	6.1	9.6	1.2	1.7	*	54	2421	9	4	44	92
170	G	1998	17.3	1.3	1.0	5.9	6.3	1.5	1.3	*	49	1162	13	4	31	57
171	G	1998	16.0	1.1	0.9	5.3	5.2	1.1	1.6	*	48	808	12	3	24	64
172	G	1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*
173	G	1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*
174	G	1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*
175	N	1998	16.3	1.0	1.0	7.1	6.2	1.3	0.0	*	30	783	12	3	21	51
176	N	1998	17.3	1.1	1.0	6.3	5.7	1.4	0.0	*	30	762	12	3	15	43
177	N	1998	15.5	1.0	0.9	6.5	5.2	1.1	0.0	*	31	469	13	2	8	61
178	N	1998	16.7	1.1	0.8	4.5	5.8	1.4	0.1	*	42	1053	10	3	17	47
179	N	1998	14.2	0.9	0.7	4.4	5.8	1.4	0.1	*	40	959	10	3	27	50
180	N	1998	15.0	1.0	0.7	4.4	5.8	1.4	0.1	*	34	810	9	3	18	33
181	N	1998	15.1	0.9	0.8	4.7	3.8	1.1	0.0	*	35	550	9	2	19	47
182	N	1998	15.8	1.0	0.9	4.2	4.4	1.4	0.0	*	42	786	12	3	26	58
183	N	1998	15.9	1.0	0.8	3.4	4.3	1.2	0.0	*	36	781	13	3	28	24
184	N	1998	18.5	1.2	1.0	5.1	5.2	1.3	0.1	*	57	519	11	3	12	76
185	N	1998	18.5	1.2	1.0	4.5	5.7	1.5	0.1	*	46	471	11	3	14	66
186	N	1998	16.8	1.1	0.9	4.9	5.6	1.4	0.1	*	41	370	11	3	12	53
187	N	1998	14.9	1.0	0.9	4.4	5.1	1.2	0.1	*	34	305	10	2	21	42
188	N	1998	14.3	0.9	0.8	4.7	5.7	1.3	0.1	*	36	283	9	2	19	53
189	N	1998	15.7	1.0	0.9	4.5	5.6	1.3	0.1	*	34	173	11	3	23	47
190	N	1998	16.3	1.1	1.0	4.7	5.7	1.3	0.0	*	44	1001	9	4	19	40
191	N	1998	16.4	1.1	1.0	5.6	4.6	1.3	0.0	*	36	1055	9	2	20	38
192	N	1998	15.6	1.1	1.0	5.4	4.7	1.2	0.0	*	55	948	9	3	24	36
193	N	1998	17.0	1.1	1.0	6.2	4.2	1.4	0.0	*	33	348	11	2	6	44
194	N	1998	17.5	1.1	0.9	6.3	4.1	1.1	0.0	*	31	318	12	3	13	34
195	N	1998	15.2	1.0	1.0	8.2	5.3	1.3	0.0	*	29	381	10	3	14	55
196	N	1998	17.7	1.0	0.9	5.6	4.1	1.2	0.0	*	32	490	11	3	22	35
197	N	1998	17.2	1.1	1.0	5.8	5.3	1.2	0.0	*	44	553	11	3	27	56
198	N	1998	16.6	1.1	1.0	6.2	4.3	1.1	0.0	*	34	474	11	3	25	48

PSP no.	Species ¹	Year	N	S	P	(g/kg)					mg/kg					
						K	Ca	Mg	Na	Cl	Fe	Mn	Zn	Cu	B	Al
199	N	1998	19.4	1.2	1.1	5.4	4.5	1.3	0.0	*	43	549	11	4	10	37
200	N	1998	19.3	1.1	1.1	5.5	4.9	1.2	0.0	*	36	653	12	3	12	45
201	N	1998	16.0	1.0	1.0	6.3	5.9	1.2	0.0	*	38	1056	12	3	18	40
202	N	1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*
203	N	1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*
204	N	1998	*	*	*	*	*	*	*	*	*	*	*	*	*	*
205	G	1998	16.4	1.1	1.0	6.6	6.7	1.8	1.7	*	26	519	12	7	20	21
206	G	1998	15.6	1.0	0.9	6.8	7.2	1.9	1.8	*	26	638	13	6	20	24
207	G	1998	16.2	1.1	0.9	6.0	8.2	1.7	1.3	*	26	887	14	6	17	24
208	G	1998	15.2	1.1	0.9	4.5	7.1	1.9	1.5	*	39	461	12	4	31	46
209	G	1998	15.8	1.1	0.8	4.4	11.0	2.1	1.1	*	43	876	13	4	39	53
210	G	1998	16.2	1.2	0.9	4.4	12.0	2.0	1.3	*	53	945	11	4	39	75

¹Species: G = *E. globulus*; N = *E. nitens*

Appendix H. Chemical analysis of surface soil samples (0-10 cm depth) from a subset of PSPs in north-eastern and central Victoria.

PSP no.	EC (mS/m)	pH	Total C (g/kg)	Total N (g/kg)	Avail-P (mg/kg)	Ca	Mg (cmol(+)/kg)	K	Na
9	0.104	4.8	23.2	1.8	11.9	1.6	1.5	0.3	0.1
12	0.056	5.1	43.7	3.5	11.4	1.8	1.1	0.4	0.0
15	0.101	5.8	13.9	1.3	5.2	4.8	4.0	0.2	0.3
18	0.050	5.0	39.1	2.8	18.6	2.4	0.6	0.3	0.0
21	0.059	4.9	62.0	4.4	40.0	4.1	1.1	0.3	0.0
24	0.050	5.4	13.9	1.3	25.8	1.4	0.3	0.5	0.0
27	0.061	5.1	33.1	2.6	8.9	2.4	0.8	0.4	0.0
30	0.058	5.6	20.8	2.0	10.8	5.0	4.2	0.5	0.2
33	0.066	4.9	45.3	3.3	20.5	2.8	0.5	0.5	0.0
36	0.045	4.8	20.6	1.5	7.6	0.8	0.3	0.2	0.0
39	0.052	5.0	33.6	3.0	40.3	4.3	1.8	0.3	0.0
42	0.052	4.9	40.3	2.5	7.5	2.3	1.3	0.4	0.0
45	0.063	5.3	43.5	3.7	7.1	4.7	1.3	0.6	0.0
48	0.044	5.0	25.7	2.2	7.8	1.0	0.6	0.1	0.0
51	0.064	5.3	55.8	5.0	83.9	10.6	2.9	1.7	0.0
54	0.065	5.0	36.6	2.8	12.0	2.1	0.6	0.4	0.0
57	0.053	5.1	38.2	2.5	11.7	1.9	0.8	0.4	0.0
60	0.034	5.3	38.9	1.7	9.1	2.0	1.3	0.6	0.0
115	0.046	4.9	22.4	2.1	7.6	1.1	0.3	0.4	0.0
118	0.064	5.2	46.4	4.3	10.2	5.5	1.2	0.4	0.0
121	0.130	5.3	48.8	4.9	26.9	6.7	1.5	0.7	0.0
124	0.053	5.8	19.4	1.7	8.0	4.8	6.5	0.6	0.6
127	0.053	4.8	22.3	2.0	12.4	0.6	0.3	0.3	0.0
130	0.083	4.9	44.0	3.4	10.0	2.0	1.4	0.5	0.1
133	0.060	5.4	43.1	2.9	7.4	4.0	1.6	0.5	0.0
136	0.058	5.1	28.0	2.2	12.1	0.9	0.6	0.2	0.1
139	0.062	5.0	33.5	2.3	24.0	2.6	0.4	0.2	0.0
142	0.061	4.9	44.3	3.0	8.0	2.2	0.7	0.4	0.0
145	0.050	5.0	30.9	2.4	13.4	2.6	0.5	0.4	0.0
148	0.067	5.4	35.6	2.5	8.8	4.5	1.1	0.5	0.0
151	0.088	4.7	52.6	3.9	11.0	1.9	0.7	0.3	0.0
154	0.044	5.3	24.3	1.8	6.9	1.2	0.4	0.4	0.0
157	0.092	5.9	44.0	4.1	99.2	12.5	5.1	0.4	0.2
160	0.056	4.7	38.7	2.6	8.6	1.2	0.4	0.2	0.0
163	0.049	5.3	38.9	3.0	7.9	2.1	1.4	0.3	0.1
166	0.039	5.0	29.4	2.1	12.2	1.7	0.5	0.2	0.0
169	0.062	5.1	27.4	2.4	24.1	1.8	0.4	0.3	0.1
172	0.038	5.3	24.9	2.0	13.7	2.3	0.8	0.2	0.0
175	0.067	5.4	41.3	3.3	22.1	4.6	1.2	0.5	0.0
178	0.081	5.2	56.0	4.0	10.9	4.0	1.7	0.8	0.0
181	0.059	5.2	46.4	3.2	16.7	4.7	1.4	0.5	0.0
184	0.062	5.3	31.7	2.4	7.7	2.5	0.7	0.3	0.0
187	0.036	5.3	35.3	1.9	25.0	3.3	0.8	0.2	0.0
190	0.065	5.1	33.3	2.9	26.2	2.5	0.7	0.3	0.0
193	0.046	5.7	36.9	2.3	9.1	5.3	1.3	0.6	0.0
196	0.099	5.4	59.6	4.8	22.6	8.0	1.6	0.7	0.0
199	0.048	5.3	23.8	2.2	6.7	2.8	0.6	0.5	0.0
202	0.111	5.3	50.5	3.7	28.7	5.1	1.5	1.2	0.0
205	0.133	5.3	64.2	5.9	9.0	6.0	4.1	0.9	0.1
208	0.120	5.2	39.4	3.4	12.6	3.9	6.5	0.4	0.3
211	0.101	5.5	37.3	3.0	6.4	4.0	3.3	0.4	0.4
214	0.170	5.1	73.1	6.5	38.6	6.7	2.8	0.6	0.2
217	0.067	5.0	45.7	3.3	21.2	2.8	1.2	0.2	0.1
220	0.039	5.4	24.0	1.9	6.1	1.4	0.6	0.1	0.0

Appendix I: An example of a completed soil profile morphology description for a PSP.

Aust. Soil Class.: Vertic, Mottled-Subnatric, Brown, SODOSOL (deep profile)

Site Description: 3 year old *Eucalyptus globulus* plantation on ex-agricultural land

Slope: 1° **Aspect:** SE **Elevation:** 442 m

Rainfall: 680 mm/yr **Pan Evaporation:** 1060 mm/yr

Geology: Quaternary basalt (Qvn)



Soil Profile Morphology:

Surface Soil

A1 0-20 cm Brown (10YR4/3); *clay loam*; weak coarse granular, parting to weak medium granular structure; weak consistence (dry); no segregations; medium roots common; pH 5.0; gradual and smooth change to:

A2 20-40 cm Brown (10YR5/3) with very few fine faint yellowish brown (10YR5/8) mottles; conspicuously bleached; *clay loam*; dry consistence; very many manganiferous and ferruginous nodules (2-6 mm); medium roots common; pH 6.1; clear and broken change to:

Subsoil

B21 40-100 cm Brown (10YR5/3) with many medium faint yellowish brown (10YR5/8) mottles; *medium heavy clay*; weak very coarse polyhedral structure; very firm consistence (moderately moist); many manganiferous and ferruginous nodules (2-6 mm); fine roots common; pH 6.4; diffuse and smooth change to:

B22 100-150 cm Light yellowish brown (10YR6/4) with many medium faint yellowish brown (10YR5/8) mottles; *medium heavy clay*; very coarse lenticular structure; very firm consistence (moderately moist); few manganiferous and ferruginous nodules (2-6 mm); many rounded boulders; fine roots common; pH 6.4:

C 150+ cm Basalt rock at base of pit; unable to dig further.



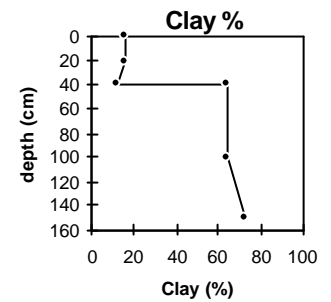
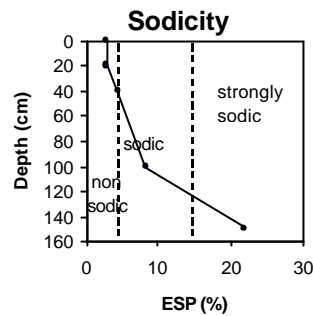
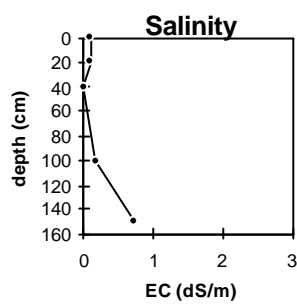
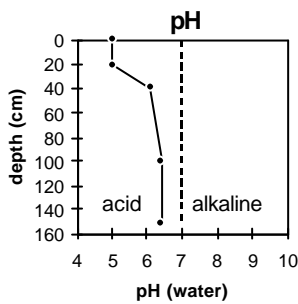
Key Profile Features

- Conspicuously bleached subsurface (A2) horizon.
- Strong texture contrast between surface (A) horizons and subsoil (B21) horizon.

Key Profile Characteristics

	pH	Salinity Rating	Sodicity	Dispersion
Surface (A1 horizon)	Strongly Acid	Very Low	Non-Sodic	None
Subsoil (B21 horizon)	Slightly Acid	Very Low	Sodic	None ¹
Deeper subsoil (at 100-150 cm)	Slightly Acid	Low-Medium	Strongly Sodic	None

¹ complete dispersion after remoulding



Horizon	Horizon Depth	pH (water)	pH CaCl ₂	EC dS/m	NaCl %	Exchangeable Cations				Ex Al mg/ka	Ex Ac meq/100g	Field pF2.5	Wilting Point pF4.2	Coarse Sand (0.2-2.0mm)	Fine Sand (0.02-0.2mm)	Silt (0.002-0.02mm)	Clay (<0.002mm)
						Ca	Mg	K	Na								
A1	0-20	5.0	4.4	0.10		2.5	1.3	0.15	0.45	54	12	31.1	8.1	15.8	38.2	23.0	15.5
A2	20-40	6.1	5.1	<0.05		1.2	1.3	0.07	0.31	<10	4.1	24.2	4.7	11.3	45.1	27.5	12.0
B21	40-100	6.4	5.4	0.17		3.9	11	0.21	2.4	<10	11	42.5	23.8	6.1	18.0	9.0	63.5
B22	100-150	6.4	5.9	0.74		3.7	16	<0.1	5.3	<10	8.7	53.5	28.1	6.1	12.4	8.0	72.5

Management Considerations:

- The deeper subsoil is vertic (i.e. lenticular structure) which indicates that significant shrinking and swelling can occur during wetting and drying cycles. This may disrupt the roots of some species.

Notes:

- Sampled by: Ian Sargeant and Paul Feikema (May 2002).
- Edited by: Mark Imhof and Angela Murphy (December 2002).