Gumeracha Farm Forestry

Research and Trial Areas

Gumeracha Farm Forestry Management Area (2008).

Background

In March 1990, a deliberately lit fire burnt through pine plantations on part of Mt Crawford Forest Reserve, west of the township of Gumeracha. Considerable thought was given to the future management objectives of this area. Revegetation with trees and using the area for demonstration purposes was considered the most appropriate management action.

A management plan was developed which took into account a full range of land management issues including fire protection, water catchment requirements and land capability. The plan included establishment of different types of forests, including a range of farm forestry options to demonstrate their value to the community. Assessment of the performance of a range of eucalypts for farm forestry was also intended.

The demonstration area has many features in common with much of the Southern Mount Lofty Ranges, including undulating to steep terrain, 700mm + rainfall, high water catchment values and fertile soils. It is well suited to demonstrate various land management techniques as well as commercial and alternative forestry regimes available to private landowners in the Mount Lofty Ranges.

The Farm Forestry Demonstration Area is located NW of the Gumeracha township and covers over 100 hectares and is designed to demonstrate a variety of farm forestry management regimes. Both hardwood and softwood species were planted and have been grown for both sawlogs, and firewood production. Specialty timber trees were also planted in the area, which includes Acacias, Casuarinas and Grevillia's. Planting began in 1992 and continued until 1999.

This area includes research projects such as the Gumeracha Climate Change Trials EM112 and a number of trial plots from the South Australia Farm Tree Improvement Project along with Kersbrook *Eucalyptus cladocalyx* seed production area and the Kersbrook Farm Forestry Arboretum.

The purpose of this document is to summarise those trials.

Samson Flat Fire

In January 2015 the Samson Flat Fire impacted heavily on the trials listed below with many being destroyed. Data collected up to the time of the fire once summarised and analysed will generate reports allowing growth of the various species and provenances to be compared.

Kersbrook *Eucalyptus cladocalyx* Seed Production Area (SPA)

The Kersbrook Seed Production Area was established in 1992 for the purpose of producing improved seed. However only provenances were recorded when collecting seed for the area and not parent tree locations, so this area can only be used as a seed production area and not as a seed orchard. From recently established (2003) genetic gains trials through the Australian Low Rainfall Tree Improvement Group (ALRTIG). It has been proven that seed from this seed production area produces trees with better form and growth compared to other currently available seed sources.

The Kersbrook Seed Production Area is comprised of 5 natural South Australian provenances from Wirrabara, Wilmington, Wanilla, Flinders Chase National Park – Kangaroo Island and Wirrabara Forest Reserve. The Seed Production area is 0.28 ha in size. Provenances were replicated 91 times and were planted 2.5m apart in 2.5m wide rows. The design of the planting was used to avoid planting the same provenance next to one another. The seed production area is currently standing at 37 trees down from 455. The remaining trees will be cut to promote vigorous branching through coppice and to increase seed quantity even pollination and seed collection efficiency.

Species:	*Eucalyptus cladocalyx*
Spacing:	2.5 x 2.5m
Provenances:	5
Design:	Polycross – planted as a block of 13 rows by 35 trees, 91 representations totalling 455 trees.
Planted:	1992

Provenance No.	Provenance Location
32	Wirrabara, SA
33	Wilmington, SA
34	Wanilla, SA
35	Flinders Chase NP. KI, SA
36	Wirrabara FR., SA

Kersbrook Farm Forestry Arboretum

The Kersbrook Farm Forestry Arboretum was planted in 1997 and contains a collection of 40 different tree species and provenances within 100 plots. The trees were chosen for their growth potential and timber qualities in the Mount Lofty Ranges region.

The sizes of individual plots are 7.5m x 12.5m. Each plot is 2 rows wide, spaced 2.5m apart. 4 trees are planted on each row, spaced 2.5m apart. Each plot is separated by 5m, or one blank row. Where more than one provenance of a species is involved, 3 plots of each provenance were planted.

A timber-belt was also established to demonstrate the use of farm forestry species as a shelter belt design.

In 2006 to 2008 the Kersbrook Arboretum walking trail was established, it includes boardwalks and bridges over water courses, interpretive signage, plot markers, and trail headers at the start of the walking trail.

Species:	Mixed species Arboretum
Spacing:	2.5m x 2.5m
Provenances:	Various (see below)
Design:	Plots consist of 2 rows, 8 tree plot design
Planted:	1997

Provenance	**Species**	**Provenance**
Timberbelt	*Pinus radiata*	Unknown
Timberbelt	*Cupressus macrocarpa*	Unknown
Timberbelt	*Acacia melanoxylon*	Scottsdale Tas.

Provenance No	**Species**	**Provenance**
1	*Acacia dealbata*	Bathurst, NSW
2	*Acacia mearnsii*	Bodalla, NSW
3	*Acacia melanoxylon*	Scottsdale, TAS
4	*Acacia melanoxylon*	Lenswood, SA
5	*Casuarina cunninghamiana*	Singleton, NSW
6	*Casuarina cunninghamiana*	Nowra, NSW
7	*Casuarina cunninghamiana*	Bega, NSW
8	*Casuarina cunninghamiana*	Kangaroo Valley, NSW
9	*Casuarina cunninghamiana*	Glenn Innes, NSW

10	*Casuarina cunninghamiana*	Uriara Crossing, ACT
12	*Casuarina glauca*	Bodalla, NSW
15	*Cupressus lusitanica*	Lismore Seed Stand, NZ
16	*Cupressus macrocarpa*	Longwood Seed Stand, NZ
17	*Eucalyptus botryoides*	Termeil SF, NSW
18	*Eucalyptus cladocalyx*	Unknown
19	*Eucalyptus cypellocarpa*	Unknown
20	*Eucalyptus globulus*	Flinders Island, TAS
21	*Eucalyptus globulus*	Otways Range, VIC
22	*Eucalyptus grandis*	Bulahdelah, NSW
23	*Eucalyptus leucoxylon*	Williamstown, SA
24	*Corymbia maculata*	Warwick, QLD
25	*Corymbia maculata*	Ewingar SF, NSW
26	*Corymbia maculata*	Kioloa SF, NSW
27	*Corymbia maculata*	Richmond Range SF, NSW
28	*Corymbia maculata*	Nelligen, NSW
29	*Corymbia maculata*	Mount Moffat NP, QLD
31	*Eucalyptus nitens*	Erica, VIC
32	*Eucalyptus obliqua*	Mount Compass, SA
33	*Eucalyptus oreades*	Meadlow Bath, NSW
34	*Eucalyptus punctata*	Raymond Terrace, NSW
35	*Eucalyptus regnans*	Traralgon, VIC
36	*Eucalyptus rubida*	Glendale Crossing, ACT
37	*Eucalyptus robusta*	Bulahdelah SF, NSW
38	*Eucalyptus saligna*	Kyogle, NSW
39	*Eucalyptus saligna*	Kenilworth SF, NSW
40	*Eucalyptus saligna*	Mount Boss SF, NSW
41	*Eucalyptus saligna*	Urbenville, NSW
42	*Eucalyptus saligna*	Paddys Land SF, NSW
43	*Eucalyptus saligna*	Consuelo Tablelands, QLD

44	*Eucalyptus saligna x botryoides*	Batemans Bay, NSW
45	*Eucalyptus sideroxylon*	Gilgandra, NSW
46	*Eucalyptus smithii*	Unknown
47	*Eucalyptus viminalis ssp viminalis*	Apollo Bay, VIC
48	*Grevillea robusta*	Mann, NSW
49	*Robinia pseudoacacia*	Unknown
50	*Pinus brutia*	Happy Valley, SA
51	*Pinus canariensis*	Mt Crawford FR, SA
52	*Pinus muricata*	Second Valley FR, SA
53	*Pinus pinaster*	Myponga, SA
55	*Cupressus x leylandii*	Unknown
57	*Paulownia tomentosa*	Unknown
59	*Platanus acerifolia*	Unknown
61	*Populus x euramericana*	Unknown
62	*Quercus ilex*	Unknown
63	*Quercus palustris*	Unknown
65	*Quercus robur*	Unknown
66	*Quercus suber*	Unknown

Gumeracha Climate Change Trials EM112A, B and C

The Gumeracha climate change trials were established in 1992 and were established over 3 sites within the Gumeracha Farm Forestry area. These trials are aimed at observing changes in yield, vigor and fecundity with respect to climate change. Species and seed sources that have originated from climates that South Australia is expected to change to are anticipated to perform better over time.

EM112A tests 39 different seed sources collected from across Australia. The design of this trial employs a group system with 13 trees per plot The aim is to retain 1 or 2 final crop trees per group for a final stocking of 80 - 160 trees/ha. Plots are 11m X 11m, and were generally replicated 8 times for each seed source. This trial spans over 3.6 hectares within compartments 171 and 172.

EM112B trial tests 46 different seed sources from across Australia. The seedlings were planted at close spacing, 1.5m X 1.5m in 30m X 30m (0.09ha) plots of 400 trees. This trial spans over 4.22 hectares within compartment 180.

EM112C includes the same seed sources as EM112B however half of this was planted at 1.5m X 1.5m spacing’s and the remaining half at 3.0m X 3.0m spacing’s. This trial area covers 5.7 hectares over 2 compartments 208 and 209.

South Australian Farm Tree Improvement Project

The South Australian Farm Tree Improvement Project was established in 1992 to assess the suitability of various seed sources for a number of tree species and site types. A number of trials were set up across South Australia; these sites include the Mid North, Murray Mallee, South East and the Mount Lofty Ranges.

Gumeracha has 7 species and provenance trials which are part of the South Australian Farm Tree Improvement Project. These Trials consist of mixed eucalypt plantings along with provenance trials of Eucalyptus cladocalyx, Eucalyptus globulus, Grevillia robusta, Acacia melanoxylon and Robinia pseudoacacia.

Acacia melanoxylon **Trial**

Species: *Acacia melanoxylon*

Provenances: 12

Spacing: 2.5m between rows and 2.5m between trees

Design: Plots are of 8 trees each (two rows of four trees)

Planted: 1992

Provenance No	**Species**	**Provenance**
206	*Acacia melanoxylon*	Silver Creek VIC
207	*Acacia melanoxylon*	Burnie TAS
208	*Acacia melanoxylon*	Blackwood Park Lileam TAS
209	*Acacia melanoxylon*	Mount Gambier SA
212	*Acacia melanoxylon*	Sassafrass TAS
502	*Acacia melanoxylon*	Frankford TAS
503	*Acacia melanoxylon*	Welshpool Cntrl Gippsland VIC
504	*Acacia melanoxylon*	Red Creek TAS
505	*Acacia melanoxylon*	Central Highlands VIC
506	*Acacia melanoxylon*	Lancefield VIC
507	*Acacia melanoxylon*	Lenswood SA
508	*Acacia melanoxylon*	Fingal TAS
509	*Acacia melanoxylon*	Scottsdale TAS

Eucalyptus cladocalyx Trial

Species: *Eucalyptus cladocalyx*

Provenances: 5

Spacing: 2.5m between rows and 2.5m between trees

Design: Plots are of 8 trees each (two rows of four trees)

Planted: 1992

Provenance No	Species	Provenance
235	*Eucalyptus cladocalyx*	Flinders Chase NP KI SA
232	*Eucalyptus cladocalyx*	Wirrabara SA
233	*Eucalyptus cladocalyx*	Wilmington SA
236	*Eucalyptus cladocalyx*	Wirrabara FR SA
234	*Eucalyptus cladocalyx*	Wanilla SA

Mixed Species Trial – Red Gum Site

Species: Various

Provenances: 24

Compartment: 196 and 197 (Refer to Figure 1.2 and Figure 1.10)

Spacing: 2.5m between rows and 2.5m between trees

Design: Plots are of 8 trees each (two rows of four trees)

Planted: 1992

Provenance No	**Species**	**Provenance**
265	*Eucalyptus globulus globulus*	Huonville TAS
282	*Eucalyptus camaldulensis*	Lake Albacutya VIC
287	*Eucalyptus camaldulensis*	Lowan Valley VIC
284	*Eucalyptus camaldulensis*	Lake Hindmarsh VIC
318	*Corymbia maculata*	Batemans Bay NSW
275	*Eucalyptus camaldulensis*	Wimmera River VIC
286	*Eucalyptus camaldulensis*	Lake Coorong VIC
279	*Eucalyptus camaldulensis*	Murray Bridge SA
285	*Eucalyptus camaldulensis*	Lake Agnes VIC
219	*Eucalyptus leucoxylon*	Naracoorte SA
281	*Eucalyptus camaldulensis*	Kalangadoo SA
288	*Eucalyptus sideroxylon sideroxylon*	Gilgandra NSW
278	*Eucalyptus camaldulensis*	Silverton NSW
274	*Eucalyptus camaldulensis*	Pt Augusta SA
324	*Robinia pseudoacacia*	Tree 2 Nyirsegi Hungary
103	*Acacia melanoxylon*	Unknown
280	*Eucalyptus camaldulensis*	Minlaton SA
325	*Robinia pseudoacacia*	Tree 3 Nyirsegi Hungary

321	*Eucalyptus camaldulensis*	Callana Flinders Ranges SA
277	*Eucalyptus camaldulensis*	Petford Qld
326	*Robinia pseudoacacia*	Tree 4 Nyirsegi Hungary
323	*Robinia pseudoacacia*	Tree 1 Nyirsegi Hungary
276	*Eucalyptus camaldulensis*	Lake Indoon NSW
311	*Allocasuarina torulosa*	Woolgoolga NSW
312	*Allocasuarina leuhmannii*	Unknown
327	*Allocasuarina torulosa*	NE of Sydney NSW

Robinia pseudoacacia Site

Species: *Robinia pseudoacacia*

Provenances: 4

Spacing: 2.5m between rows and 2.5m between trees

Design: Plots are of 8 trees each (two rows of four trees)

Planted: 1992

Provenance No	Species	Provenance
323	*Robinia pseudoacacia*	Tree 1 Nyirsegi Hungary
324	*Robinia pseudoacacia*	Tree 2 Nyirsegi Hungary
325	*Robinia pseudoacacia*	Tree 3 Nyirsegi Hungary
326	*Robinia pseudoacacia*	Tree 4 Nyirsegi Hungary

Grevillia robusta Trial

Species: *Grevillia robusta*

Provenances: 5

Spacing: 2.5m between rows and 3.0m between trees

Design: Plots are of 12 trees, three rows of four trees

Planted: 1992

Provenance No	Species	Provenance
261	*Grevillia robusta*	Guy Fawkes NSW
264	*Grevillia robusta*	Nimbin NSW
260	*Grevillia robusta*	Boyd River NSW
263	*Grevillia robusta*	Samford QLD
259	*Grevillia robusta*	Mann River NSW

Eucalyptus globulus Trial

Species:	*Eucalyptus globulus*
Provenances:	9
Spacing:	2.5m between rows and 2.5m between trees
Design:	Plots are of 8 trees, two rows of four trees
Planted:	1992

Provenance No	Species	Provenance
271	*Eucalyptus globulus*	Police Point TAS
267	*Eucalyptus globulus*	Dover TAS
272	*Eucalyptus globulus*	Denison Valley TAS
266	*Eucalyptus globulus*	Lorne VIC
265	*Eucalyptus globulus*	Huonvill TAS
268	*Eucalyptus globulus*	Lake Leake TAS
269	*Eucalyptus globulus ssp bicostata*	Bruthen VIC
270	*Eucalyptus globulus spp bicostata*	Rylstone NSW
273	*Eucalyptus globulus ssp maidenii*	Cann Valley VIC

Mixed Species Trial – Blue Gum Site

Species: Various

Provenances: 24

Spacing: 2.5m between rows and 3.0m between trees

Design: Plots are of 12 trees, three rows of four trees

Planted: 1992

Provenance No	Species	Provenance
232	*Eucalyptus cladocalyx*	Wirrabara SA
233	*Eucalyptus cladocalyx*	Wilmington SA
236	*Eucalyptus cladocalyx*	Wirrabara FR SA
217	*Eucalyptus leucoxylon*	Wirrabara SA
235	*Eucalyptus cladocalyx*	Flinders Chase NP KI SA
216	*Eucalyptus leucoxylon*	Kangaroo Island SA
215	*Eucalyptus leucoxylon*	Rushworth VIC
234	*Eucalyptus cladocalyx*	Wanilla SA
288	*Eucalyptus sideroxylon ssp sideroxylon*	Gilgandra NSW
290	*Eucalyptus sideroxylon ssp tricarpa*	Bermagui NSW
219	*Eucalyptus leucoxylon*	Naracoorte SA
221	*Eucalyptus leucoxylon*	Merrimu Res VIC
218	*Eucalyptus leucoxylon*	Digby VIC
289	*Eucalyptus sideroxylon ssp sideroxylon*	Wangaratta VIC
220	*Eucalyptus leucoxylon*	Studley Park VIC
316	*Melaleuca uncinata*	Kangaroo Island SA
317	*Melaleuca uncinata*	Lameroo SA
312	*Allocasuarina luehmanii*	Unknown
311	*Allocasuarina torulosa*	Woolgoolga NSW

327	*Allocasuarina torulosa*	NE Sydney NSW
222	*Allocasuarina fraserana*	Norman Beach WA
223	*Allocasuarina fraserana*	Darling Plateau WA
315	*Acacia salicina*	Near Yacka SA
318	*Corymbia maculata*	Batemans Bay NSW