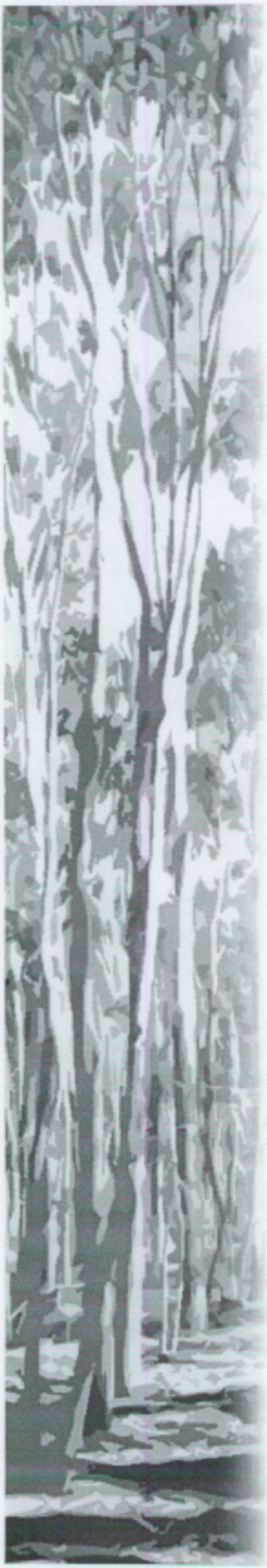

Rural and Regional Affairs and Transport Reference Committee

Submission to

Plantation Forestry Enquiry

from the

Joint Venture Agroforestry Program

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Rural Industries Research & Development Corporation

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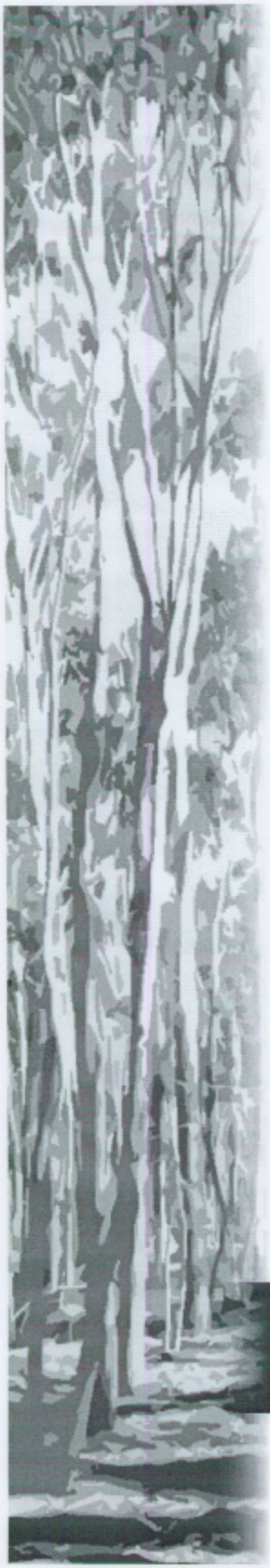
Land & Water Australia

Murray-Darling Basin Commission



Terms of Reference

This submission specifically addresses TOR (c)

(c) whether there are further opportunities to maximise the benefits from plantations in respect of their potential to contribute environmental benefits, including whether there are opportunities to:

(i) better integrate plantations into achieving salinity and water quality objectives and targets,

(ii) optimise the environmental benefits of plantations in low rainfall areas, and

(iii) address the provision of public good services (environmental benefits) at the cost of private plantation growers;

Introduction

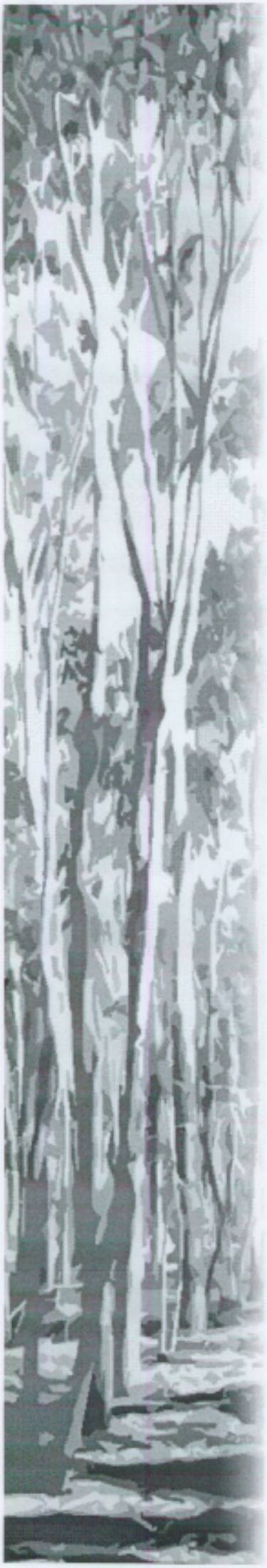
The Joint Venture Agroforestry Program (JVAP) comprises several agencies working together to provide research and development which will underpin a sustainable and innovative farm forestry sector in Australia.

We are actively supporting research which directly addresses TOR (c) of the Australian Plantation Enquiry – although our brief is a lot broader than this. We have been exploring for several years now the range of opportunities to maximise the benefits from plantations with respect to their potential environmental benefits. The JVAP therefore has a direct and important contribution to make to the Australian Plantations Enquiry.

We would be pleased to appear before the Senate Committee to expand further on the opportunities outlined in this submission.

The Joint Venture Agroforestry Program has the following guiding objective:

To integrate sustainable and productive farm forestry within Australian farming systems



The JVAP has a broad view of farm forestry and agroforestry. It includes trees on farms which are planted or managed by farmers for one or more purposes, with products and services that may or may not be commercial. The JVAP supports R&D which will underpin the quantification and commercialisation of these products and services so that they will be more attractive and feasible options for farmers to incorporate into existing farming systems.

The ways in which farm forestry can be incorporated into existing agriculture include block plantings which are analogous to plantations. These can be in long rotations but we are also investigating mosaic farm forests, short-rotation farm forestry, and phase farming with trees.

We have a clear focus on obtaining multiple benefits – in terms of

- commercial products including wood and non-wood (including bio-based) products
- achieving water quality and salinity targets
- public good or environmental services

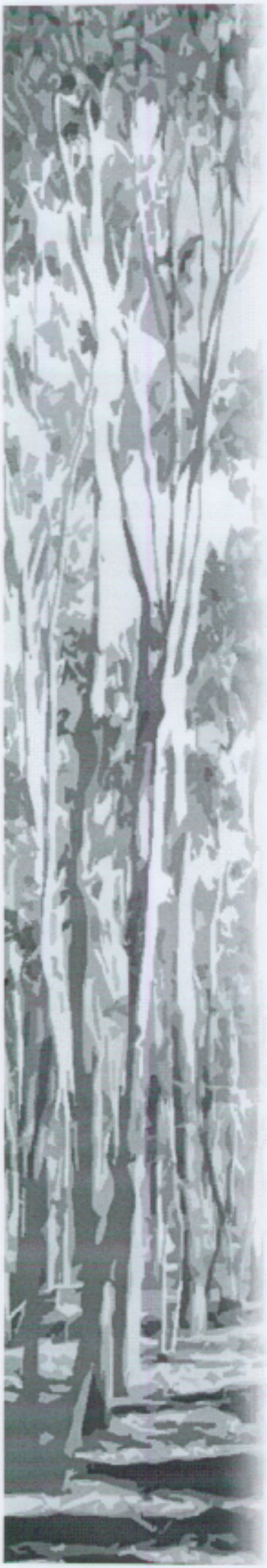
We have a strong emphasis on providing R&D to underpin design of multiple benefit farm forestry systems in low – medium rainfall areas.

Background to the Joint Venture Agroforestry R&D Program

The Joint Venture Agroforestry Program was established in 1993. It is a collaborative undertaking by Rural Industries Research and Development Corporation (RIRDC), Land & Water Australia (L&WA; formerly Land and Water Resources Research and Development Corporation), Forest and Wood Products Research and Development Corporation (FWPRDC) and the Murray Darling Basin Commission. Additional funding has been provided for some activities by the Grains R&D Corporation, the Department of Agriculture, Fisheries and Forestry Australia, the Natural Heritage Trust, the Australian Greenhouse Office (AGO), and private investors. The JVAP also leads Bioenergy Australia, a consortium of 50 private and government investors formed to facilitate the development of bioenergy and related bio-products in Australia.

Many farmers now recognise the benefits of planting trees on their farms, including:

- new product diversification: tree products such as wood, pulp or oils provide opportunities to generate new income;
- enhancement of existing enterprises: agroforestry can increase the productivity of a traditional pasture-based enterprise through, for example, the provision of shelter for animals and crops;
- natural resource protection: trees can help protect the quality of soil and water resources. For example, trees may help limit wind and water erosion. Depending on the scale and configuration of



The role of the JVAP

The JVAP has a key role in initiating, coordinating, managing and communicating research into farm forestry and agroforestry. Where commercial agroforestry is already well advanced, the JVAP should assist the removal of remaining policy and institutional impediments and help rectify market failures. In the lower rainfall zones, where agroforestry is less advanced, the JVAP is becoming increasingly active with a very diverse but targeted range of research topics. The strategies being used by JVAP to address these issues are:

1. Targeted strategies for implementation of farm forestry
2. More sustainable management of natural resources eg soil, water, biodiversity
3. Optimised productivity of crops and pastures
4. Optimised direct returns from tree products
5. Cost effective multi-purpose agroforestry systems to meet commercial and environmental objectives
6. Effective communications

plantings and their position in the landscape, they can also help in salinity management;

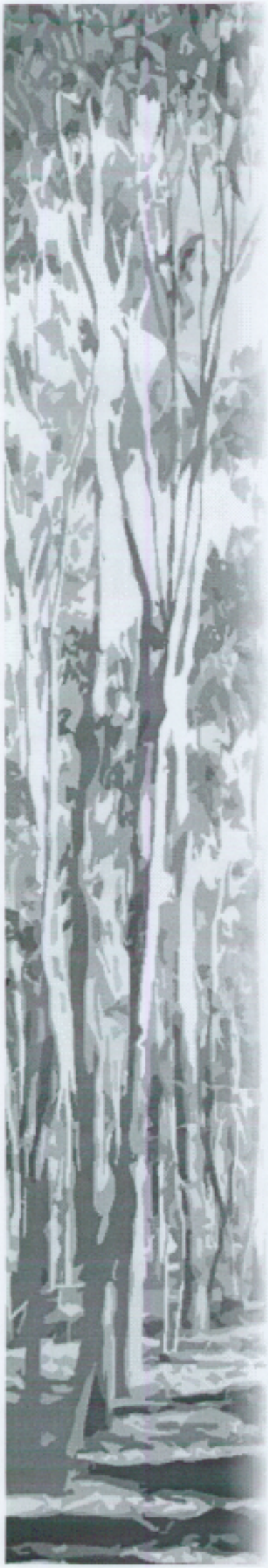
- nature conservation and biodiversity protection: trees add horizontal and vertical structure to the landscape and provide new niches for other plants and animals. Trees can be planted to buffer remnant vegetation and to provide wildlife corridors;
- beauty and landscape improvement.

Farmers often plant trees for a combination of reasons: trees, it is hoped, will provide farm income, while simultaneously solving land degradation problems and enhancing the productivity of other enterprises. The JVAP aims to provide land managers with quality research which provides understanding of biophysical systems, good agroforestry designs which can optimise multiple benefits, and distillation of the science into practical guidelines which can be implemented with confidence.

A new approach

Agroforestry has the capacity to deliver both private and public benefits. Private benefits can accrue to landholders in the form of income from wood and non-wood products and environmental services. Agroforestry has the potential to provide farmers with an alternative crop that can supplement farm income.

Australian agroforestry is most developed in regions of relatively high rainfall that are close to timber markets or wood processing facilities. Established tree crops in Australia have traditionally used long rotations and produced timber-based products in areas with rainfall >700mm. There may be ready products and markets in these areas, but there are nevertheless some outstanding design issues which must be addressed in order to achieve desired water quality, salinity, social and economic outcomes. The JVAP supports research into these areas, although there is a major focus in the



program on lower rainfall areas where the information gaps are even more profound.

The JVAP has recognised that the agroforestry systems of the future will need to be in lower rainfall areas in order to address land degradation and enterprise diversification issues in these areas. The focus of JVAP research is therefore on redefining the range of possible farming and agroforestry systems in these lower rainfall areas (400 – 650 mm). This requires a new and innovative approach to the design of agroforestry systems – starting new industries requires vertical integration of activities and products in the system, from biophysical systems through to the manufacture of novel products, the definition of new markets, and industry or regional capacity.

New agroforestry systems will need to integrate with established agriculture. Block plantings can be implemented in a range of ways. With targetted R&D, integrated planning and a measure of goodwill, block plantings can enhance and complement existing agricultural and other industries (rather than displacing them), as well as maximise environmental benefits.

New Products and Processing Options

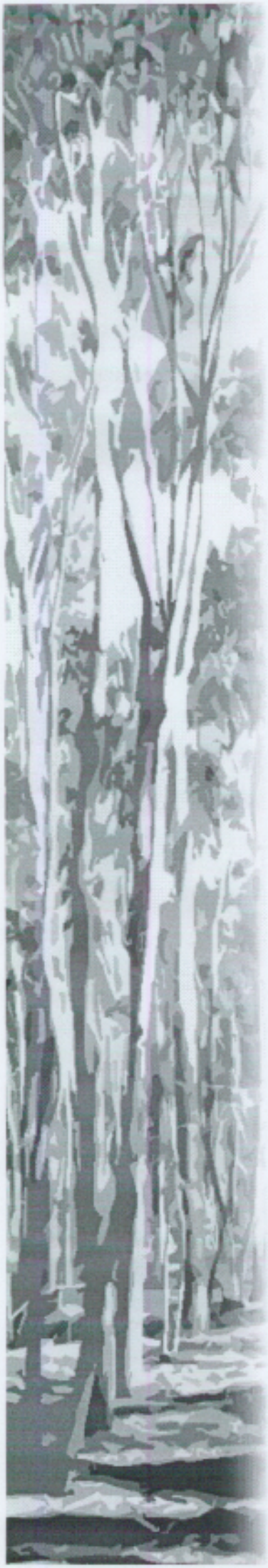
The TOR for the Reference Committee is focussed the 'design' element of farm forestry – how the plantations can be integrated to optimise environmental benefits. It is equally important to find potential products from the new range of woody species. Australia has a wealth of native plant species which have never been systematically investigated for their potential products or suitability for cultivation. The JVAP has developed a new project in southern Australia called 'FloraSearch'. This research will systematically screen woody perennials native to low rainfall farming areas which have potential for novel products and are suitable for integration into agriculture at a broad scale. It builds on the WA 'Search' project.

The JVAP is also investigating new products from non-traditional species, including:

- composite wood products such as medium density fibreboard, oriented strandboard, wood-fibre plastic composites
- high value specialty timbers
- electricity production
- ethanol production and potential markets
- thermochemical pulping and kraft pulping technologies
- bio-based products (including adhesives, preservatives, degreasing agents, anti-fouling agents and herbicides which can be derived from native species).

As well as optimising biophysical designs in landscape, there is a pressing need to optimise processing and product options. For example, a JVAP feasibility study entitled 'Integrated Tree Processing of Mallee Eucalypts' showed that it was not economically viable to rely on individual product streams from mallees. An integrated processing system which can produce three products - activated carbon, electricity and cineole - from a single tree feedstock is, however, a much more viable option. A pilot plant is currently being constructed in Narrogin, WA, on the basis of this feasibility study.

There is a great deal of potential for R&D into developing alternative product streams and processing systems.



Two new systems of tree cropping show great potential:

- short-rotation tree crops which can be grown in rows or blocks within existing farming systems. The trees can be harvested in short cycles (ranging 5 – 10 years) and regrow from coppice (eg mallee systems)
- 'phase farming' with deep-rooted perennials. This system has been tested with lucerne but also shows potential with trees. The trees are planted in blocks and harvested after 5 – 10 years. They will dewater the soil profile or lower the water table while they grow. The tree crop phase is followed by a conventional crop phase for 5 – 10 years. During this phase the water tables may rise again, ready for the next phase of trees to dewater.

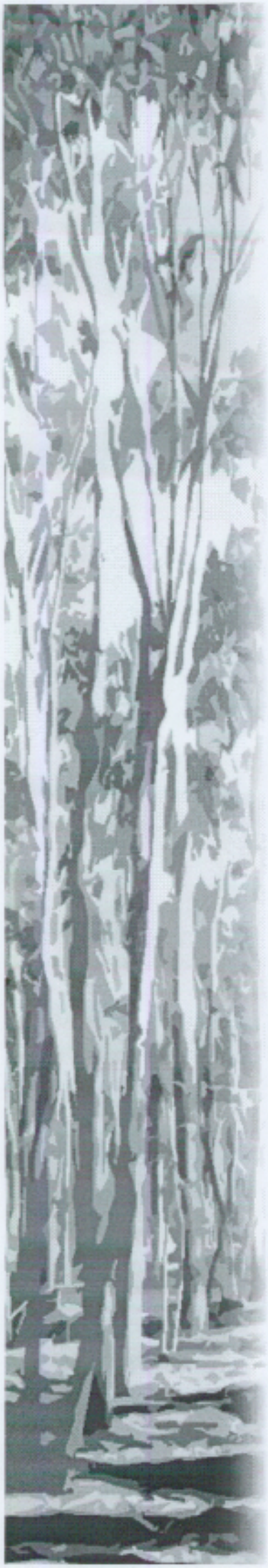
The JVAP is supporting several research projects covering various aspects of these farming systems with a major focus on developing these design principles. The book *Design Principles for Farm Forestry* uses the best available scientific knowledge to evaluate tradeoffs in designing for a range of outcomes. This line of research has since been further developed with a series of Agroforestry Design Principles books including *Trees, Water and Salt*; and a further two in this series entitled *Trees for Shelter*, and *Trees and Biodiversity* which are forthcoming.

The public benefit of integrating agroforestry into farming systems is potentially substantial, and is of national significance. The widespread adoption of agroforestry in critical regions will address a range of natural resource management and environmental issues such as:

- the loss of productive land to salinity and other types of soil degradation – it is in the national interest to maintain and enhance the capacity of the land to grow food and other products;
- biodiversity conservation (both on-site and off-site, such as downstream wetlands);
- the loss of water quality (such as that caused by rising salinity levels and siltation);
- sequestration of carbon to offset greenhouse gas emissions; and
- damage to public infrastructure such as roads and buildings.

Breeding trees for low rainfall regions of southern Australia

Investment in tree planting in southern Australia's low rainfall areas will be maximised if planting stock is adapted to the low rainfall environments and yet able to yield marketable forest products. The JVAP supports the Australian Low Rainfall Tree Improvement Group to develop improved breeds of trees that meet these requirements. A number of 'key' species have been selected to improve tree performance in low rainfall areas, and the economic and environmental returns from plantations.



Environmental and Commercial Outcomes through Agroforestry

Policy and Investment Options

Which policies will encourage private investment in agroforestry to maximise environmental benefit? This question was addressed in a report commissioned by the JVAP. Key findings:

- There are many measures available which will, if modified to meet environmental requirements and used in appropriate combinations, achieve the desired policy outcomes
- Existing measures do not encourage private investment into farm forestry to meet strategic goals
- Investors need information about where agroforestry will be environmentally beneficial. This process has been started and details for accrediting catchment plans are being finalised by the National Action Plan for Salinity and Water Quality. Providing pre-approved measures and instruments to regional catchment bodies will help them to develop approved catchment plans more quickly
- Allowing tax concessions for investors in agroforestry ventures which have environmental benefits could be beneficial (using mechanisms similar to pooled development funds)
- Governments need to ensure that any incentives are actually used to purchase desired environmental outcomes.

Any ameliorating influence of the trees on these important resources could provide an income stream to farmers if the environmental services could be quantified and commercialised. The JVAP is supporting active research in this area. So far, the indications are that provision of environmental services alone will not make farm forestry in low rainfall areas a commercial option for farmers; however, it may provide sufficient income to help make viable an otherwise unprofitable enterprise. We have recently commenced a project which will initiate and test markets for ecosystem services in three trial catchments.

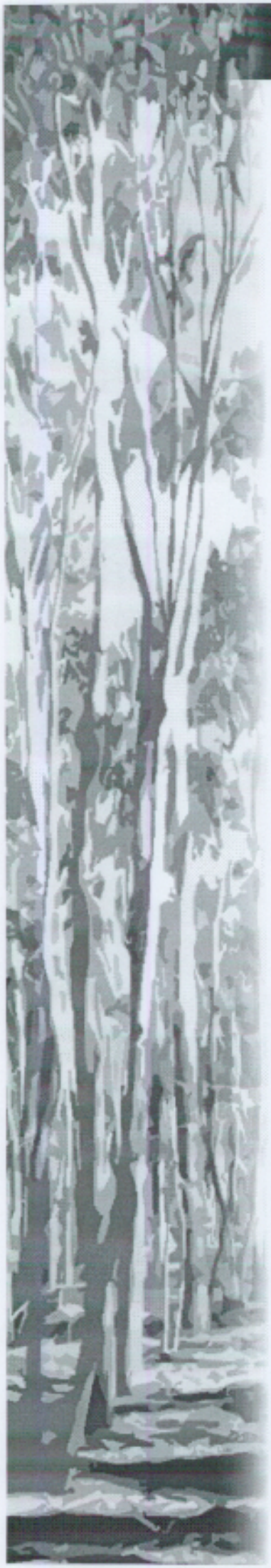
Conclusion

The Joint Venture Agroforestry Program has funded and provided a co-ordinated framework for a wide range of research topics into agroforestry in the last ten years. This research is helping to provide the knowledge that land managers need to invest with confidence in agroforestry. We will continue to invest in quality research to underpin the development of this important and exciting emerging industry.

We invite you to read our research reports, which are listed as part of this submission. Most of these have been provided to the Committee Secretary. We would be pleased to support your enquiry by supplying additional copies, or directly consulting with the Committee if required.

Signed

Dr Simon Hearn



New Publications

The Cost Benefits of Small Log Processing: Laminated Three-ply Flooring – A Case Study in WA
2002, 138 pp, Pub. No. 02/120: $20

Development of a FloraSearch project for Southern Australia
2002, 40pp, Pub. No. 02/121: $10

Managing Riparian Land and Trees for Multiple Uses
Pub. No. 02/105 (in press)

Improved Species Climatic Profiles
2002, 74pp, Pub. No. 02/095 : $15

Australian Low Rainfall Tree Improvement Group: Mallee Genotype/ Environment Interaction
2002, 27pp ,Pub. No. 02/084 : $10

Environmental and Commercial Outcomes through Agroforestry - Policy and Investment Options
2002, 90pp, Pub. No. 02/057: $15

Biodiversity in Agriculture and Agroforestry
2002, 29pp, Pub. No. 02/051: $10

Measurement and integration of fauna biodiversity values in Queensland agroforestry systems
2002, 120pp, Pub. No. 02/044: $20

Innovative use of farm trees: Australian marketing experiences
2002, 46pp, Pub. No. 02/022: $15

Forage trees and shrubs in Australia- their current use and future potential
2002, 77 pp, Pub. No. 02/039: $10

Australian Low Rainfall Tree Improvement Group: Compendium of Softwood Tree Improvement Strategies
2002, 62 pp, Pub. No. 02/028: $10

Tree Root Morphology in Alley Systems
2002,31 pp, Pub. No. 02/024: $10

Plantation Design and Biodiversity Conservation
2002, 64 pp, Pub. No. 02/019: $15

Vineyard Posts from Eucalypts Grown on Effluent Water
2002, 46pp, Pub. No. 02/014: $10

Trees water and salt: An Australian guide to using trees for healthy catchments and productive farms
2002, 168pp, Pub. No. 01/086: $27

Making Farm Forestry Pay - Markets for Ecosystem Services
2002,74pp, Pub. No. 02/005: $10

Silvicultural Management of Blackwood
2001,70pp, Pub. No. 01/176: $10

Pulpwood Quality of 13 Eucalypt Species – with potential for farm forestry
2001, 44pp, Pub. No. 01/164: $10

Emerging markets for environmental services - Implications and opportunities for resource management in Australia
2001, 33pp, Pub. No. 01/162: $10

Defining the Product – Log Grades Used in Australia
2001, 37pp, Pub. No. 01/161: $10

Integrated Tree Processing of Mallee Eucalypts
2001, 92pp, Pub. No. 01/160: $10

Conifers in the dry country
2001, 69pp, Pub. No. 01/146: $10

Agroforestry R&D priorities for northern Australia
2001, 104pp, Pub. No. 01/142: $15

The JVAP *Research Update* Series

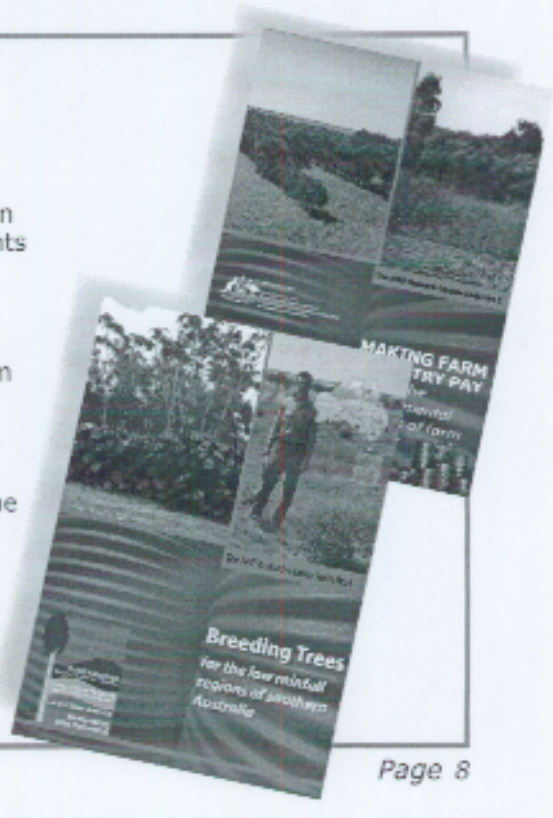
Free concise summaries of some of our groundbreaking research

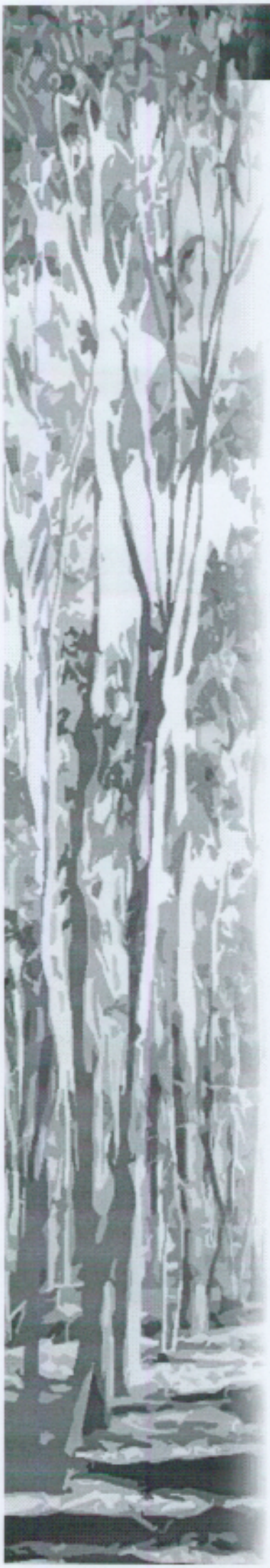
No.1: Trees,Water and Salt – An Australian Guide to using trees for healthy catchmernts and productive farm
2000, 22 pp, Pub.No. 00/170
free

No.2: Emerging products and services from trees in low rainfall areas
2000, 22pp, Pub. No. 00/171
free

No. 3: Making farm forestry pay- selling the environmental services of farm forestry
2002, 28pp, Pub No 02/018
free

No. 4: Breeding trees for the low-rainfall regions of southern Australia
2002, 24pp, Pub No 02/031
free





Agriculture as a Mimic of Natural Ecosystems
1998, 24 pp, Pub. No. 98/066 : $10

Agroforestry Calculator User Manual
2000, 20 pp, Pub. No. 99/154: $10

Agroforestry from Existing Timber Resources
1999, 83 pp, Pub. No. 99/151: $15

Agroforestry & Hydrology — What do we need to know?
1997, 16 pp, Pub. No. 96/012: $10

Agroforestry Over Shallow Water Tables
1999, 60 pp, Pub. No. 99/036: $15

Agroforestry Water Use in Mediterranean Regions of Australia
1998, 71pp, Pub. No. 98/063: $10

Agroforestry with High Value Trees
1998, 51pp, Pub. No. 98/142: $10

Alleppo Pine for Low Rainfall Farm Forestry
1999, 70pp, Pub. No. 99/016: $10

Alley Farming in Australia — Current Research & Future Directions
1997, 71pp, Pub. No. 97/029: $25

Biological Control of Scarabs causing Eucalyptus Dieback
1998, 89pp, Pub. No. 98/003: $10

Black Wattle and its Utilisation
1997, 167pp, Pub. No. 97/077: $25

Blue Gum Timberbelt Design Farming for Alley Farming
2000, 100pp, Pub. No. 00/154: $15

Carob Agroforestry in the Low Rainfall Murray Valley
1998, 28pp, Pub. No. 98/008: $10

Commercial Farm Forestry in Australia (3 Book Kit)
1996, Pub. No. 96/026: $40

Commercial Prospects for Low Rainfall Agroforestry
1999, 104pp, Pub. No. 99/152: $20

Compendium of Hardwood Breeding Strategies
2001, 140pp, Pub. No.01/100: $15

Creating a Viable Farm Forestry Industry in Australia
1998, 134pp, Pub. No. 98/074: $10

Design Principles for Farm Forestry
1997, 102pp, Pub. No. 97/048: $16

Determining the Effectiveness of Vegetation Management Programs
2000, 109pp, Pub. No. 99/130: $20

Effects of Trees on Native Pasture Production
1999, 82pp, Pub. No. 99/165: $10

Effect of Salt on Wood & Fibre Formation in Eucalypts
2000, 55pp, Pub. No. 00/169: $10

Extension and advisory strategies for Agroforestry
2001, 116pp, Pub. No. 00/184: $15

Farm Forestry in Australia: A Research Update
1998, 34pp, Pub. No. 98/103: $10

Forecasting Growth of Key Agroforestry Species
2000, 59pp, Pub. No. 00/068: $10

Genetic Pollution from Farm Forestry
2001, 109pp, Pub. No. 01/114: $15

Growing Neem Trees in Australia
2001, 14pp, Pub. No. 01/061: $10

Growing Trees on Cotton Farms
1999, 76pp, Pub. No. 99/065: $10

Hardwood Species for Scrimber Production
1998, 23pp, Pub. No. 98/004: $10

Harvesting Trees on Farms
2000, 57pp, Pub. No. 00/046: $10

How Trees Affect Soils
1998, 124pp, Pub. No. 98/016: $15

Identifying Pest Resistant Eucalypts
2001, 110pp, Pub. No. 01/112: $15

Integrating Farm Forestry & Biodiversity
2000, 35pp, Pub. No. 99/166: $15

Integrating Trees with Livestock Grazing
1997, 30pp, Pub. No. 97/047: $10

Links Between Farm Forestry Growers & the Wood Processing Industry
1998, 61pp, Pub. No. 98/041: $10

National Classification of Catchments– For Land & River Salinity Control
1998, -60pp, Pub. No. 98/078: $10

National Low Rainfall Tree Improvement
1999, 88pp, Pub. No. 99/066: $15

Native Forests on Farms
1999, 50pp, Pub. No. 99/021: $15

Native Regrowth — A Farmers Guide to Maintaining Biodiversity
2000, 24pp, Pub. No. 00/012: $10

On-Site Processing for Farm Forestry
1998, 184 pp, Pub. No. 98/079: $20

Phase Farming with Trees
2001, 53 pp, Pub. No. 00/048: $10

Plantations, Farm Forestry & Water – Proceedings of Workshop
2001, 62pp, Pub. No. 01/020:$15

Practical Farm Forestry
1999, 134 pp, Pub. No. 99/099: $20

Potential for Tropical Agroforestry in Wood & Animal Feed Production
1997, 85pp, Pub. No. 97/073: $20

Sustainable Hardwood Production in Shallow Watertable Areas
2000, 105pp, Pub. No. 00/163: $15

Sustaining the Productivity of Tree Crops on Agricultural Land
2001, 69pp, Pub. No. 01/009: $10

Socio-Economic Research to Support Successful Farm Forestry
2001, 89pp, Pub. No. 01/013:$15

Socio-Economic Impacts of Farm Forestry
2001, 74pp, Pub. No. 01/045: $10

The Carbon Farmer Model
2001, 18pp, Pub. No. 01/059: $10

The Carbon Farmer Model User
201, 70pp+CD, Pub. No. 01/060: $30

The Ways Trees Use Water
1999, 104pp, Pub. No.99/037: $20

The Farmer's Log
1999, 128pp, Pub. No. 99/081: $10

Trees for South Eastern Australia
1996, 75pp, Pub. No. 96/005: $10

Tropical Cabinet Timber Trees
2000, 46pp, Pub. No. 00/119: $10

Wattle Seed Production in Low Rainfall Areas
2001, 34pp, Pub. No. 01/008: $10

Short Reports

(all short reports are free)

Alley Farming in Australia
SR 8

Creating a Viable Farm Forestry Industry
SR 35

Designing Blue Gum Alley Farms
SR 99

Farm Forestry in Australian Rural Communities
SR 103

Guidelines for biodiversity conservation in new and existing softwood plantations
SR 77

Groundwater Uptake & Salt Accumulation by Trees
SR 40

How Trees Affect Soils
SR 29

Integrating Farm Forestry & Biodiversity
SR 68

Interim Guidelines for Revegetating Areas with Shallow, Saline Watertables
SR 46

Links Between Small-Scale Growers & Industry
SR 36

On-Site Processing for Farm Forestry – Does it Stack up?
SR 38

Progress towards commercial farm forestry in Australia
SR 34

Sustaining Productive Tree Crops in South Western Australia
SR 93

Trees for Profit – Integrated Economic Model
SR 21

Trees Face the Acid Test
SR 59

Water Use by Trees
SR 39

What's happening in the Farm Forestry market?
SR 65

Windbreaks Increasing Crop Growth on the Atherton Tablelands
SR 67