Design Principles for Farm Forestry

A Guide to assist farmers to decide where to place trees and farm plantations on farms

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RIRDC/LWRRDC/FWPRDC Joint Venture Agroforestry Program

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The production of this book was facilitated by two meetings of all authors, many of whom are experts in particular aspects of agroforestry. Each chapter has been edited by most of the authors. Chapters have also been professionally edited by Deborah O'Connell and Alastair Sarre.

What this book is about

Agroforestry – the productive use of trees on farms – is a new concept to most Australian farmers. This book has been written because agroforestry differs from traditional annual forms of production in two main ways.

First, trees are a long-term investment. They deserve extra planning and management to maximise their benefits to the farm. Because of their long-term nature, they can be used for many purposes including financial risk management, retirement planning and transferring wealth between generations. You will need good advice on taxation and investment to optimise these aspects of agroforestry.

Second, trees give indirect benefits to other farm enterprises. Trees can make conditions more favourable for the growth of plants and animals and play a role in keeping farm ecosystems healthy. You may plant trees with one purpose in mind but get other benefits as well. In fact, the indirect benefits of trees can add up to be more important than the original reason for planting them in the first place. Careful design is needed to capture multiple benefits from trees. This is what the book is about.

Trees are deep-rooted and therefore access water-tables and recycle nutrients that are unavailable to most other forms of production. Trees also have an important influence on natural systems and biodiversity which, with good planning, can benefit the farm and region.

Special consideration should be given first to the best places to plant trees in a catchment and second to the best layout of trees in the paddock, in order to improve the productivity of the farm, protect the soil and water resources and enhance the beauty and conservation value of the land.

It is important to be aware that changes to some environmental aspects, such as rising water-tables, will take as long to reverse as they did to emerge. This is not to say we should not take remedial action, but rather we should give careful consideration to design and planning. In human terms, these effects often span generations!

In compiling this book, it is recognised that Australia has widely differing climatic regions. For this reason, we have concentrated on design principles that hold true across all regions. Some regional examples are given to help demonstrate a point, but you will need to take local advice on regionally specific issues such as establishment techniques and species selection.

It may help most farmers to think of trees as just another crop! The same care in paddock preparation, weed and insect control and species selection will be equally rewarding as for any other crop. Be warned that multiple uses of trees on the farm will increase management demands – but it will be worth the effort.

The contributors to this book are involved in on-going research to further improve our knowledge of tree productivity and their effects on the wider environment. However, they believe the design principles outlined here should enable farmers and their advisers to undertake planning with reasonable confidence to improve the financial and environmental aspects of the farm business.

The principles outlined in this short book will be supported by a second volume which is now being

compiled. It will cover more of the theory and detail used in arriving at the design principles. It is therefore recommended to those readers who want a more in-depth understanding of the issues.

I commend this book to you, and suggest you move straight to the chapter you think is most likely to benefit your farm.

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How to use this book

The book identifies seven reasons why you may want to start planting trees. These are:

- to produce timber or other wood products;
- to combat salinity and waterlogging problems;
- to protect or rehabilitate degraded land (soil conservation);
- to provide shade and shelter for plants and animals;
- to provide fodder;
- to conserve and encourage the abundance and diversity of native plants and animals; and
- to improve the scenic beauty of the landscape.

We call the reasons for planting trees 'triggers' and have written a chapter to cover each one. You can start by moving straight to the trigger of most interest. Each trigger chapter gives basic design principles to achieve that particular objective for growing trees. At the end of each of the trigger chapters there is a table which gives you hints as to how you can alter a design to capture other benefits. Use this table to lead you to the next trigger chapter of most interest to you. Sometimes other benefits can be achieved with relatively little modification, while others will be more difficult to accommodate.

After the seven trigger chapters there is a section called 'Capturing multiple benefits from agroforestry'. This chapter explains how to maximise the positive interactions trees have on the farm and how to minimise the negative ones. The concepts are illustrated with case studies.

The final two chapters give general principles for the establishment of trees and steps you can take to work out the economic viability of the agroforestry design that you have developed for your farm. Depending on the economics, you may need to modify your design.

So pick the trigger chapter that most interests you and start reading!