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Leucaena Establishment and Management Book

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Abstract

A user-friendly manual entitled *Leucaena: A Guide to Establishment and Management* has been published by MLA to assist graziers in northern Australia establish and manage this valuable forage resource. Historically graziers have found establishing leucaena pastures to be complex and difficult. At present, it is estimated that 2/3 plantings fail at a cost of \$3-5M/yr to the beef industry. Establishing leucaena is technically demanding when soil crusting, weed competition and predation by insect pests are problematic; thus a comprehensive up-to-date manual covering all aspects of growing and grazing leucaena was required.

The book was developed from course notes used in the highly successful *Leucaena for Profit and Sustainability* training courses run by The University of Queensland with support from The Leucaena Network. Detailed technical information is presented using straightforward language, colour photographs, diagrams and case studies. Topics covered include: background information about leucaena; establishing leucaena (rainfall/soil types, varieties, seed treatment, planting, weed control, insect control, companion grasses & early grazing management); managing the plant (mineral nutrition, height control, insect pests & irrigation); grazing management (carrying capacity, grazing strategies, diet selection & leucaena toxicity prevention); economics (costs of establishment & returns); and leucaena and the environment (its weed potential, the Code of Practice, how to control weed leucaena, leucaena for salinity prevention & greenhouse gas offset).

This book is essential reading for all beef producers considering planting leucaena and for natural resource managers (Catchment groups, govt. personnel & policy makers) engaged with the northern Australian beef industry. The 70-page book is available from MLA Publications (phone 1800 675 717, option 3) at a cost of \$30/copy to MLA members.

Executive Summary

Leucaena-grass pastures are the most productive and sustainable forage resource available to northern Australian cattlemen. Leucaena plants are deep rooted & drought tolerant, highly palatable & produce forage of excellent quality, and long-lived and tolerant of heavy grazing. Unfortunately, leucaena pastures are difficult to establish and they require significant post-establishment management of both the plants and cattle to ensure graziers extract maximum benefit from the system. Rates of establishment failure were estimated to be 66% in the early 1980's (Lesleighter and Shelton 1986) and similar levels of failure persist today. An estimated 20,000 ha of leucaena pastures was planted in 2006. If 2/3 of plantings fail, graziers are wasting \$3-6M/yr based on typical establishment costs of \$250-450/ha. The most significant factor leading to the failure of leucaena establishment has been a lack of technical knowledge about how best to germinate seed and nurture young leucaena seedlings.

Many new farming practices, seed treatments and agrochemicals have been developed over the last decade and more is now known about the agronomy of leucaena. A 'recipe' for successful establishment has been developed and has been delivered to graziers in Queensland via The University of Queensland's *Leucaena for Profit and Sustainability* (LPS) training courses that are delivered in conjunction with The Leucaena Network. The LPS courses were designed for cattle producers interested in growing leucaena for sustainable cattle production, but with limited farming experience and understanding of how to manage leucaena systems. These 2-day QRAA FarmBis accredited on-farm training courses have been very successful with 16 courses training >320 graziers, consultants and extension staff over the last 3 years.

A comprehensive set of up-to-date LPS course notes were developed and these complemented PowerPoint presentations containing colour photographs and diagrams. The concept of this project was to combine these 2 resources to produce an attractive, user-friendly, full-colour, leucaena technical manual that would provide beef producers in northern Australia with all the information they need to successfully establish and integrate leucaena pastures into their grazing businesses.

The manual *Leucaena: A Guide to Establishment and Management* has been published by MLA. An initial print-run of 1500 books was launched for sale in October 2006 by the Chairman of the MLA Board, Mr Don Heatley, at The Leucaena Network AGM. The 70-page book contains detailed technical information presented using straightforward language, colour photographs, diagrams and case studies. Topics covered include: background information about leucaena; establishing leucaena (rainfall/soil types, varieties, seed treatment, planting, weed control, insect control, companion grasses & early grazing management); managing the plant (mineral nutrition, height control, insect pests & irrigation); grazing management (carrying capacity, grazing strategies, diet selection & leucaena toxicity prevention); economics (costs of establishment & returns); and leucaena and the environment (its weed potential, the Code of Practice, leucaena for salinity prevention & greenhouse gas offset). This book is essential reading for all beef producers considering planting leucaena and for natural resource managers (Catchment groups, govt. personnel & policy makers) engaged with the northern beef industry. It is available from MLA Publications (phone 1800 675 717, option 3) at a cost of \$30/copy to MLA members.

Graziers interested in establishing leucaena will directly benefit from the book by avoiding mistakes and pitfalls that cause establishment failure. Fewer failures will encourage more graziers to

adopt the technology. The book will also lead to improved post-establishment management of leucaena and grazing management (e.g. preventing leucaena toxicity) and enhanced productivity of new and existing plantings of >150,000 ha. These benefits will scale-up with the burgeoning interest in leucaena in northern Australia over the next decade.

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1 Background

MLA accepted our proposal to fund the publication of a book based on The University of Queensland's (UQ) *Leucaena for Profit and Sustainability* (LPS) courses that would become a graziers' guide to the establishment and management of leucaena-grass pastures in Northern Australia in 2005.

The University of Queensland, in conjunction with The Leucaena Network, has developed and delivered 16 LPS training courses throughout Queensland during 2004-2006 and has trained over 320 people. The 2-day courses were designed for cattle producers interested in leucaena for sustainable cattle production, but with limited experience and understanding of leucaena systems. The LPS courses are supported by a set of notes developed primarily by UQ staff, Dr Scott Dalzell, Assoc. Prof. Max Shelton and Dr Ben Mullen. The LPS course notes, together with the case studies compiled during the delivery of the courses formed the basis of the book.

Significant technological advances in leucaena establishment and management have occurred since the publication of the initial text, *Leucaena - the Shrub Legume for Cattle Feed*, written by Ian Partridge and G. Adams in 1989. Staff from UQ are in a unique position to produce a contemporary guide to the topic due to their research interests in cultivar development, leucaena toxicity management, farming systems research, water-use-efficiency of tree legumes, salinity management and the leucaena weed issue. In addition, their long-term interaction with leucaena growers/graziers through The Leucaena Network and more recently through the LPS courses has brought UQ staff into contact with the practical aspects of leucaena development across the major production regions.

2 Project Objectives

The project objective was, by September 30 2006, to produce a "printer-ready" advanced draft of a grazier-friendly book on leucaena establishment and management (*Leucaena: A Guide to Establishment and Management*) for general sale and for use in conjunction with the LPS courses.

3 Methodology

The following tasks were undertaken:

1. A format and style for the book was decided in consultation with MLA Publications, UQ staff, leading graziers from The Leucaena Network, and Mr Ian Partridge (design and graphics consultant).
2. Content of the book was determined by UQ. The LPS course notes were upgraded, additional material prepared and case-studies written. This was done through personal communication with agricultural scientists and consultants, extension specialists and expert farmers, and through literature review as necessary.

3. Case studies were finalised during short tours of central and north Queensland leucaena production areas. Specific photographs were taken to meet the photographic requirements for the book. Photographs were also collected from scientists and graziers and were included in the book with full recognition of the owners.
4. The design and graphics consultant, Mr Ian Partridge (DPI&F) supplied graphics and typesetting to produce a "printer-ready" final version of the book on CD.
5. Final editing and style review was undertaken prior to publication by MLA.
6. Mr Ian Partridge (DPI&F) provided MLA with three quotes for the printing of an initial print-run of 1500 copies.
7. MLA and The Leucaena Network launched the book *Leucaena: A Guide to Establishment and Management* through various media outlets in October 2006 and then successively at meetings, field days and other extension opportunities.

4 Results and Discussion

No experimental work was undertaken in this project.

5 Success in Achieving Objectives

The book *Leucaena: A Guide to Establishment and Management* was successfully produced to MLA's satisfaction and was officially launched by Chairman of the MLA Board, Mr Don Heatley, at The Leucaena Network Annual General Meeting held at Carnarvon Gorge in October 2006.

6 Impact on Meat and Livestock Industry – now & in 5 years time

Anecdotal information gathered through The Leucaena Network and the LPS courses indicates that the failure rate for leucaena plantings has changed little from the 66% failure rate reported by Lesleighter and Shelton (1986) in the 1980s. Plantings generally fail due to a combination of unfavourable seasonal conditions and incorrect establishment procedures. However, for experienced leucaena producers, the failure rate is generally low. The leucaena book, in conjunction with the LPS courses, will reduce the current rate of establishment failures. Given that at least 20,000 ha of leucaena is sown each year at a cost of \$250-450/ha, the industry currently loses around \$3.3-5.9M/year to establishment failures. A reduction in establishment failure of 20 percentage points would save approximately \$1-2M/yr in direct costs to graziers. Additional financial benefits will accrue through better cattle and plant management. These benefits will scale-up substantially over the next 5-10 yrs as the area of leucaena planted in Northern Australia grows from 150,000 ha towards 500,000 ha.

The LPS courses have already delivered significant financial benefits to those who have attended through a greater understanding of successful establishment procedures and management systems. For example, after attending a LPS course, a northern leucaena grower has decided to use a leader-follower system for leucaena height management rather than spend \$15,000 on a slasher. This will result in an increase in annual liveweight production as well as a reduction in unnecessary expenditure. The leucaena book will greatly increase the dissemination of important information to graziers, reducing establishment failures and improving the profitability of leucaena under grazing. Most large-scale leucaena plantings have been established by farmers experienced in, and equipped for precision farming practices. However, the greatest benefit will be to cattle producers with limited farming experience and equipment.

Indirectly, leucaena systems improve the consistency of supply of cattle to feedlots and meatworks throughout the year. Leucaena graziers have greater flexibility in selling cattle because they have the ability to fatten year-round. This has significant positive implications for the northern beef industry. Leucaena also has significant environmental benefits, most notably in reduction of pressure on extensive grazing lands through provision of an extended green feed season, but also through dryland salinity mitigation, carbon sequestration and animal methane emission reductions. Used effectively, it can also be an excellent drought mitigation strategy.

7 Conclusions and Recommendations

The book *Leucaena: A Guide to Establishment and Management* is an excellent publication that directly meets an industry need. It fills an important void in the provision of accurate, detailed technical information to graziers that was formerly available from govt. extension services. We envisage that most of the 1500 copies produced will be distributed to levy-paying beef producers over the next 5 years. The book will be a tangible R&D outcome that graziers will be able to attribute directly to MLA and its activities.

The book has additional significance to the global beef industry, as it is directly relevant to other parts of the world interested in broadacre leucaena pasture development. This is particularly the case with graziers in Central (Mexico) and South America (Brazil, Bolivia, Paraguay & Argentina). A translation of the book into Spanish (Latin American style) and Brazilian Portuguese would benefit graziers in these countries and raise the profile of MLA in the region.

8 Bibliography

Lesleighter, L.C. and Shelton, H.M. 1986. Adoption of the shrub legume *Leucaena leucocephala* in central and southeast Queensland. *Tropical Grasslands*, 20: 97-106.