



The New Rural Industries

Volume II

Financial Analysis

by Hassall & Associates Pty Ltd

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Foreword

In March 1999, the Corporation released ‘The New Rural Industries Financial Indicators’. This report covered eight case studies and set out a methodology, which sought to address the question – does it make sense to get involved?

There is no one answer to that question – it depends on too many factors which are specific to the investor and the particular enterprise, farm and region. But, as a generality, the report did provide a useful framework for investors considering their options. It provided information on the cost profile and possible returns. Obviously the input-output mix was based on a host of assumptions but it was a start to the question – does it make sense to get involved?

Because of the demand for the earlier publication, the Corporation again commissioned Hassall and Associates to widen its coverage to other ‘new industries’. In this publication, eleven enterprise options are analysed and benchmarked against two other options – wine grapes and Treasury Bonds. The software package that you can use to help make site-specific analyses for an actual investment is located on our website at www.rirdc.gov.au.

This project was funded from RIRDC Core Funds which are provided by the Federal Government.

This report is a new addition to RIRDC’s diverse range of over 500 research publications. Most of our publications are available for viewing, downloading or purchasing online through our website:

- Downloads at www.rirdc.gov.au/reports/Index.htm
- Purchases at www.rirdc.gov.au/eshop

Peter Core
Managing Director
Rural Industries Research and Development Corporation

Acknowledgments

Many producers and government and private agency officers have provided their time and data willingly to assist Hassall & Associates to prepare these analyses. This report could not have been possible without their assistance, for which Hassall & Associates is very grateful. A list of these people is provided as Appendix B.

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Executive Summary

This report is a stage II investigation following on from Financial Analyses of New Rural Industries, completed by Hassall & Associates for the Rural Industries Research & Development Corporation (RIRDC) in November 1998 and published in March 1999. This study, Financial Analyses of New Rural Industries Stage II, examined 11 new industries and two benchmark industries utilising a two stage model developed for the Stage I report. The first stage of the model provides preliminary static state analysis of financial viability. The second stage of the model is a 20 year discounted cash flow that analyses the industries in terms of Net Present Value (NPV), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR) and the break even year. The table below outlines the results for the thirteen industries examined.

Industry	NPV	BCR	IRR (%)	Break Even Point (years)
Wine Grapes	\$814,072	1.56	13	13
Treasury Bonds	\$9,596	1.13	7	20
Red Deer	\$673	0.97	7	20
Alpaca	\$357,235	1.30	12	13
Dairy Goats	\$258,249	1.41	28	6
Emu	\$1,216,217	1.37	27	6
Culinary Herb	\$892,406	1.57	46	4
Medicinal Herb	\$240,723	1.25	23	7
Persimmon	\$12,722	0.99	8	20
Durian	\$2,791,349	2.46	25	11
Jojoba	\$858,047	1.63	16	11
Sesame	\$234,048	1.40	16	9
South African Proteaceae	\$211,861	1.08	10	17

All results are indicative of how the analysed new industries may perform in circumstances similar in size, variety, location, farming practices and price. For individual enterprise opportunities the parameters used in the analysis should be varied to suit the particular circumstances. This report also addresses the issues to be considered for the third stage of the model which involves site specific considerations for an actual investment.

1. Introduction

1.1 Purpose

The following report is the Stage II investigation of Financial Analysis of New Rural Industries. The Stage I investigation was completed by Hassall & Associates in November 1998. Stage I involved the formulation of a three part financial evaluation model and analysis of ten new rural industries. This study builds on that work and analyses a further set of 11 new rural industries and contrasts them against two investment benchmarks.

1.2 Background

The New Rural Industries Financial Indicators was released by RIRDC at the ABARE OUTLOOK 99 conference. Subsequent interest in both the method of analysis and the industries used as case studies has resulted in RIRDC commissioning a second series of case studies.

In addition, it was recognised that the value of the financial indicators provided could be enhanced by applying the analysis method developed for new industries to an established enterprise. The resultant financial indicators would act as a benchmark for evaluations.

1.3 Study Approach

This study was divided into 5 key stages:

- Consultation with RIRDC with regard to selection of new and emerging enterprises and benchmark enterprises to be analysed;
- Data collection from past studies completed by both Hassall & Associates and RIRDC, industry associations, representatives and government agencies such as NSW Agriculture;
- Analysis of the enterprises using the financial evaluation model developed in the Stage I investigation;
- Review of analyses by relevant industry authorities; and
- Provision of conclusions and discussion.

1.4 Method of Analysis

This study uses the method of analysis as developed in The New Rural Industries Financial Indicators study. As with the first investigation, allowance in the model is made for both crop and livestock enterprises.

The method comprises three stages. Stage One uses a static analytical framework, which facilitates data collection and acts as a first round approval hurdle: should adverse indicators be produced in the first stage, the second stage of analysis becomes unnecessary. Stage Two requires a more thorough set of data and models the timing of investment in a more realistic manner. In this stage, the analysis is structured around a horizontal cash flow layout, with annual time steps and a maximum evaluation period of 20 years. The third stage involves site specific considerations for an actual investment and this stage is triggered by positive second round findings and an actual investors interest in proceeding.

An explanation of the stage three approach is provided below. In order to develop the most applicable methodology for financial analysis, other industries were studied.

2. Methodologies Used in Other Industries

Financial evaluation methodologies used in other industries were sought from various rural and non-rural investors for the Stage I report in 1998. This chapter reports the findings of that process for each of research and development corporations, government agencies and corporations, commercial organisations and agribusiness.

2.1 Research and Development Corporations

Information was sought from a range of research and development corporations to include both plant and animal products. Information was sought from Australian Wool Research and Development Corporation (now The Woolmark Company), Grains Research and Development Corporation and Meat and Livestock Australia (formally Meat Research Corporation and Australian Meat & Livestock Corporation).

Only Meat and Livestock Australia (MLA) prepared financial evaluations that are targeted towards potential industry investors. MLA was at the time in the process of developing a financial analysis spreadsheet model and guideline broadly consistent with Commonwealth Department of Finance procedures. They utilised discounted cash flows over a 20 year analysis period with discount rates reflected in the long term Commonwealth Government bond rate. Residual values are incorporated into the cash flow analysis. Both sensitivity and scenario analysis are described in procedures and risk assessment is handled qualitatively. When finalised, the model will be made available to potential commercial adopters of MLA research.

2.2 Government Agencies and Corporations

Rather than complete an exhaustive review of public sector agency and corporation methodologies for completing financial evaluation, two case studies with differing perspectives were selected. The then Commonwealth Department of Primary Industries and Energy was selected for its relevance to rural and emerging industries and the Sydney Water Corporation was selected for its rigorous use of financial evaluation as a capital rationing tool. Results are presented below.

2.2.1 Commonwealth Department of Primary Industries and Energy

Information on project and investment evaluation completed by the Commonwealth Department of Primary Industries and Energy (DPIE – now Agriculture, Fisheries and Forestry Australia) was provided by Vanessa Elwell-Gavins, former Director Plantations and Farm Forestry.

Information was provided for a DPIE program evaluation as a case study. A program evaluation does not include a numerical analysis, but rather it relies on a series of qualitative assessments. These might include multi criteria analysis, evaluation matrices or peer review. Evaluation factors are generated by the goals of the program and weighted in the evaluation in terms of criteria set by both the program review steering committee and the review contractor.

Minor reviews are completed internally by DPIE, while major reviews are externally contracted. The review steering committee consists of the branch director, program manger and industry representatives.

Evaluations are intended for DPIE, external stakeholders and other government agencies.

2.2.2 Sydney Water Corporation

Information on internal project and investment evaluation at Sydney Water Corporation (SWC) was provided by Coral Robinson, Senior Economist, Commercial and Economic Services.

Sydney Water has a corporate policy of conducting financial evaluations for all projects over \$100,000. The approach is standardised with written guidelines, training and compulsory use of a spreadsheet model made available to Corporation officers completing financial evaluations. Quantitative analysis is based on discounted cash flow, using an evaluation period of up to 30 years, and a central discount rate of 9% reflecting weighted average cost of capital, with sensitivities at 6% and 12%. Residual values are incorporated into the analysis and an analysis of capital sources, including impacts on the customer rate base, is made.

Qualitative analysis is used by the Corporation as a shortlisting tool; that is, identification of options for financial analysis. Both Multi Criteria Analysis and Value Management are employed. Criteria for qualitative analysis are generated by stakeholders including the local community being served by the potential project.

Financial evaluations are intended for internal decision making and resource allocation. Results are made available to interested stakeholders.

2.3 Agribusiness

Information on procedures employed in agribusiness for assessing the financial worth of an investment were sought from both a successful private family company (the Buster Farming Partnership) and a listed multinational (Clyde Agriculture, part of the Hong Kong based Swire Group).

2.3.1 Buster Farming Partnership

Information on decision criteria for investment in a new agricultural enterprise was supplied on behalf of Buster Farming Partnership by Daniel Buster, a partner.

Buster Farming Partnership employs both quantitative and qualitative decision making techniques. Discounted cash flow analysis is completed on a 5 year basis for annual crops and a 15 year analysis period for perennial species. The discount rate applied is the relevant commercial bill rate and returns must exceed 15% before interest and taxation.

Other criteria for consideration include impact on total borrowing position and a series of benchmarks such as a comparison of returns against their core business enterprise (cotton) and returns per megalitre of water (the limiting resource for cotton).

Qualitative techniques include Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis and a subjective analysis of risk. Other decision criteria include project management requirements, social costs, level of commitment to the project's success, partners' time requirements and whether the investment can be incorporated into the existing farm activity. Financial evaluations are completed by the initiating partner, their advisor or researcher. Investment decisions are made collectively by all active partners.

Analyses are completed for the capital providers (banks, financiers) and stakeholders (the partners and their wives).

2.3.2 Clyde Agriculture

Information on decision criteria for new rural investment was supplied on behalf of Clyde Agriculture by Tim de Mestre, who is Clyde's Commercial Manager.

Clyde Agriculture employs both quantitative and qualitative decision making techniques. Decisions are made to invest on a long term strategic basis, in response to market opportunity and, on a smaller scale, on an as needs requirement. A discounted cash flow analysis is completed and reviewed by the financial accountant. Capital is sourced internally. Qualitative analysis includes multi criteria analysis and evaluation factors are identified by research and weighted by dollar importance by the managing director. These qualitative analyses are completed by the commercial manager and the managing director, and final say on investment is made by the managing director and board of directors.

Evaluations are intended for private internal interests.

2.4 Banking and Finance Industry

The way the banking and finance industry approaches financial evaluation of projects was canvassed through three interviews, two with representatives of different aspects of the investment banking sector and one with a consultant that undertakes project evaluations on behalf of clients in the industry. Following are summaries of these interviews.

2.4.1 Bankers Trust Australia Limited, Project & Structured Finance

The project financing arm of BT evaluates projects brought to it for funding and/or underwriting. Projects are therefore at the conceptual planning stage. The following information was provided by David Carland, Executive Vice President and Head of Project Finance.

BT Project Finance uses a standard discounted cash flow approach to project evaluation. This is based on a specific discount rate that reflects the proponent's cost of capital or required rate of return, or alternatively the internal rate of return is computed. The evaluation term is usually 20 years, but this is influenced by the length of any underlying contracts, debt payback term and other specific requirements. The analysis is normally built around a capital profile that reflects the project parameters, and is carried forward through taxation and financing computations to provide an evaluation of the debt or equity position depending on the proponent's interest in the project.

There is normally no need for qualitative evaluation as projects are already well defined by the time BT is involved.

Evaluations are largely produced for internal purposes, as BT is required to underwrite the project debt and/or equity positions. Otherwise, evaluations are made available to potential investors or equity partners.

2.4.2 Bankers Trust Australia Limited, Structured Products Group (prev.)

Paul van Bergen was previously involved in BT's Structured Products Group that evaluated projects for R&D syndication before the tax incentives for R&D syndicates were discontinued in July 1996. He responded to our survey generally from the point of view of this prior experience.

Evaluations are carried out according to the specific needs of the proposal, but are based on discounted cash flow techniques incorporating sensitivity analysis. The evaluation period depends on the project context; for example, for the life of the patent for a technology based project, or five years for computer equipment. The discount rate is based on the project's debt carrying capacity.

A risk assessment matrix technique is also applied where project risk is a major concern. The project components are unbundled into specific risks, which are then allocated in the most cost efficient manner to third parties; for example, by forward selling. Typical risk types are ore reserve (for mining projects), product price and environmental factors. These risks are often mitigated by involving specialist advisors, conducting market appraisals and insisting on an environmental monitoring strategy, respectively.

The evaluations are intended for the respective R&D syndicates.

2.4.3 Invetech Operations Pty Ltd

Invetech is a Melbourne based project evaluation consultancy that services the needs of clients from large fund managers to proponents of individual projects. Peter Pick, the Managing Director, responded to our survey.

For its funds management clients, Invetech uses a project portfolio appraisal process that combines discounted cash flow analysis with a more qualitative risk analysis.

The evaluation period of the DCF analysis is based on the expected lifecycle of the intellectual property behind the project, and is usually only 5 to 10 years. The discount rate is based on a weighted cost of capital, with a premium added for industry (beta) risk as well as specific project risks such as technical, market and construction risks. The perspective of the analysis depends on the need of the client, whether debt or equity proponent.

Invetech's risk assessment methodology is based on six standard risk factors, each attributed a standard weighting or importance. A panel comprising four to six client and Invetech personnel evaluates projects by scoring them against each of the risk factors. This methodology can be applied iteratively, and even used in an ongoing monitoring role.

Invetech employs a charting method to combine the parallel quantitative (DCF) and qualitative (risk assessment) sides of the appraisal. A "foresight team" comprising senior client and Invetech officers and selected outside specialists where appropriate has the final say on how the charted results are to be interpreted.

2.5 Venture Capital Industry

The venture capital industry is one that evaluates a wide range of projects as its core function. Most of these projects are innovative and, sadly, many are of dubious commercial value. Selected for our survey were Hambro-Grantham, an Australian independent with \$140 million under management, and Axiom Funds Management, a division of Deutsche Morgan Grenfell with \$18 billion under management worldwide.

2.5.1 Hambro-Grantham Management Ltd

One of the most enduring of venture capital companies, Hambro-Grantham is well known for its thorough and professional approach to investment evaluation. The following information on project evaluation was provided by Guy Manson, Associate Director and Marketing Manager.

The approach to project evaluations is decided on a case by case basis according to the proposal and the detail of its presentation to Hambro-Grantham. Wherever possible, the proponent's own business case is first dissected.

The following three aspects are particularly evaluated, in the following order of importance:

- The proponent's people first:
Track record, reference checks and commitment to the project are the most important criteria.
- The project's industry next:
Industry growth record and potential, stability and endemic risk are considered most important.
- The business case numbers last:
Either have to rework the business case or more often start afresh with discounted cash flow approach.

The objective of the evaluation is to establish a value for the business or venture, often based on earnings multiples, comparables or closest comparisons.

The evaluations are intended for internal use only, or more accurately for the directors of the various funds managed by Hambro-Grantham.

2.5.2 Axiom Funds Management Corporation

Besides its core funds management function, Axiom operates a well respected venture capital function that has a portfolio of \$660 million. Peter Dowding, an Account Executive, responded to our survey.

Axiom uses several methodologies to evaluate new venture capital proposals, both quantitative and qualitative.

The quantitative tools used include long-term (20 to 25 years) discounted cash flow analysis, scenario analysis, and occasionally monte carlo simulation techniques that use a random number generator to simulate risk events for risk-based projects. Discount rates are predicated on a benchmark rate of 10% p.a. real plus a risk premium. Residual values are calculated several ways: for property, using cap rates (a variation of the price/earnings multiple); for businesses, EBIT multipliers; and for resource projects, breakup value. The initial objective of the DCF analysis is to optimise the debt/equity ratio, and ultimately to maximise the return on equity.

Some issues are handled qualitatively, such as the assessment of the proponents' management capabilities. This is largely done through extensive reference checking. Other venture capital companies are understood to use aptitude and psychological testing for this purpose. Regular internal peer review meetings are the fora for these qualitative decisions, sometimes necessitating the participation of outside expertise.

An investment paper is produced on every proposal that successfully passes the internal review. An investment committee representing the company's board of directors has the final word on which investments to support. Occasionally, project reviews are carried out for third parties. Recently, Axiom reviewed the entire portfolio of a major institutional investor.

2.6 Summary Findings

The above data covers a wide range of uses and users of prospect and project evaluation techniques. In order to focus the survey results on new rural industry needs so that the best approach, methodology and outcome can be identified, the results were summarised in terms of the following differentiating characteristics:

- Stage of the venture or project at which the analysis is applied (concept, feasibility or investment stage);
- Intended "client" audience of the analysis report (internal or external);
- Main methodology used (qualitative or quantitative); and
- Secondary methodology used (qualitative or quantitative) if any.

These characteristics are deliberately expressed somewhat simplistically in Table 2.1 below, so that any pattern can be easily visually identified. A single-word descriptor of each evaluation approach is also listed for easy recognition and recall.

The most evident and relevant differentiating feature from the table below is the stage of prospect evaluation at which each respondent group is involved. The groups are arranged in the table according to the stage of greatest interest to them, with MLA most concerned with the first (concept) stage, followed by

Government Agencies and Agribusiness mostly interested in the second (feasibility) stage, and the Banking and Finance and Venture Capital groups concentrating mostly on the third (investment) stage.

Successful projects normally have to pass through each of the three evaluation stages before being implemented, or in the case of some agribusiness and government sponsored projects the first two stages at least. Major private sector projects are the most likely to require the third stage evaluation in order to optimise debt/equity ratios and refine tax efficiency, for instance, and for this to be meaningful a project needs to be well defined and quantified.

A notable conclusion that can be drawn from the table below is the overwhelming preference for some form of discounted cash flow (DCF) analysis as the quantitative methodology of choice. Even the business case approach has a heavy reliance on DCF calculations.

Table 2.1 Summary of Findings - Methodologies Used in Other Industries

Ref	Organisation	Stage	Audience	Qual.	Quant.	Descriptor
3.1	R&D CORPORATIONS					
3.1.1	MLA	C, F	E		M-dcf	DCF
3.2	GOVT. AGENCIES					
3.2.1	DPIE	I	I/E	M-mca		Developing
3.2.2	Sydney Water	F, I	I	S-mca	M-dcf	Internal
3.3	AGRIBUSINESS					
3.3.1	Buster	F	I	S-swot	M-dcf	Internal
3.3.2	Clyde	F	I	S-mca	M-dcf	Internal
3.4	BANKING & FINANCE					
3.4.1	BT Projects	I	I		M-dcf	DCF
3.4.2	BT R&D	F, I	E		M-dcf	Risk
3.4.3	Invetech	I	E	M-risk	M-dcf	Portfolio
3.5	VENTURE CAPITAL					
3.5.1	Hambro-G	F, I	I	M-people	S-bus	Subjective
3.5.2	Axiom	I	I	S-people	M-dcf	Comprehensive

KEY:

Stage:	C =	Conceptual Stage
	F =	Feasibility Stage
	I =	Investment Stage
Audience	I =	Internal audience for appraisal
	E =	External audience for appraisal
Qualitative Assessment	M =	Whether used as main methodology
	S =	Whether used as secondary methodology
	-mca	Multi Criteria Analysis favoured
	-swot	SWOT Analysis favoured
	-risk	Risk Analysis favoured
	-people	Analysis of proponent's people favoured
Quantitative Assessment	M =	Whether used as main methodology
	S =	Whether used as secondary methodology
	-dcf	Discounted Cash Flow Analysis favoured
	-bus	Business Case Analysis favoured

3. Selection & Documentation of Preferred Methodology

Based on a literature search conducted for Stage I, interviews with financial analysts in other industries and Hassall & Associates' experience, a recommended methodology was developed for evaluating the financial integrity and viability of new and emerging rural enterprises.

Part of this evaluation process is aimed at ensuring that sufficient reliable information on the subject enterprise is to hand, and part on using this information to determine the enterprise's likelihood of commercial viability.

3.1 Rationale

As one of RIRDC's three core areas of business, prospective and emerging rural industries need to be handled in a coordinated and consistent fashion. RIRDC's need for financial evaluations of these industries is seen as being an essential component in this function, as part of its mission of making objective information available to the public to support informed investment decision making.

It is understood that there is exchange of emerging information between RIRDC and its stakeholders during the development of new industries. RIRDC sees its role in this exchange as being able to respond to new industry ideas and provide objective information at various junctures, so as to encourage and assist the development process in an impartial and objective manner.

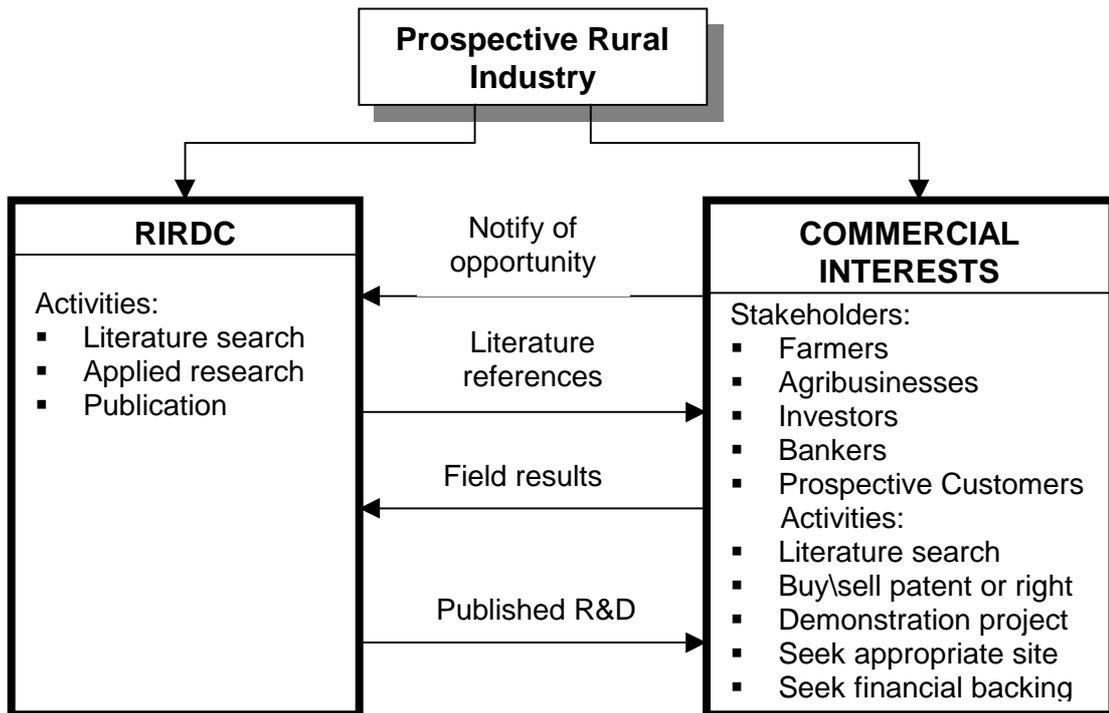
Following in Figure 3.1 is a schematic illustration of how the current information exchange process occurs.

The body of stakeholders that RIRDC serves in this instance will include investors, banks, researchers, academics, students, agribusiness and family farmers, all with their specific interests in the process. Each makes its specialised contribution to the process, and one of RIRDC's functions is to keep abreast of these developments and play its role in the process as well.

Significantly, the ultimate development and implementation of a new industry depends entirely on the private sector stakeholders embracing the concept and interpreting it into a commercial proposition. The acid test of the enterprise being commercially viable is the Stage Three evaluation, which brings together the various component contributions, including an operator/farmer, the financial backing, market contracts, and others.

A characteristic of the Stage Three evaluation is that the project is site-specific. This requires that a location be determined and that the project be fully scoped in terms of land area and enterprise size. This precludes RIRDC involvement in this stage of development as the Corporation's objectivity could be compromised if public money is considered to be directed to the benefit of a specific commercial venture. However, feedback on Stage Three evaluations undertaken by individual and corporate investors is most important to the Corporation in making R&D investment decisions.

Figure 3.1 Development of New Rural Industries



RIRDC’s role in the process of developing new and emerging rural industries can be illustrated as shown in Figure 3.2.

The **Stage One** evaluation serves two purposes:

1. To ensure that the concept’s fundamental components and criteria are in place; and
2. To identify any data gaps or inadequacies.

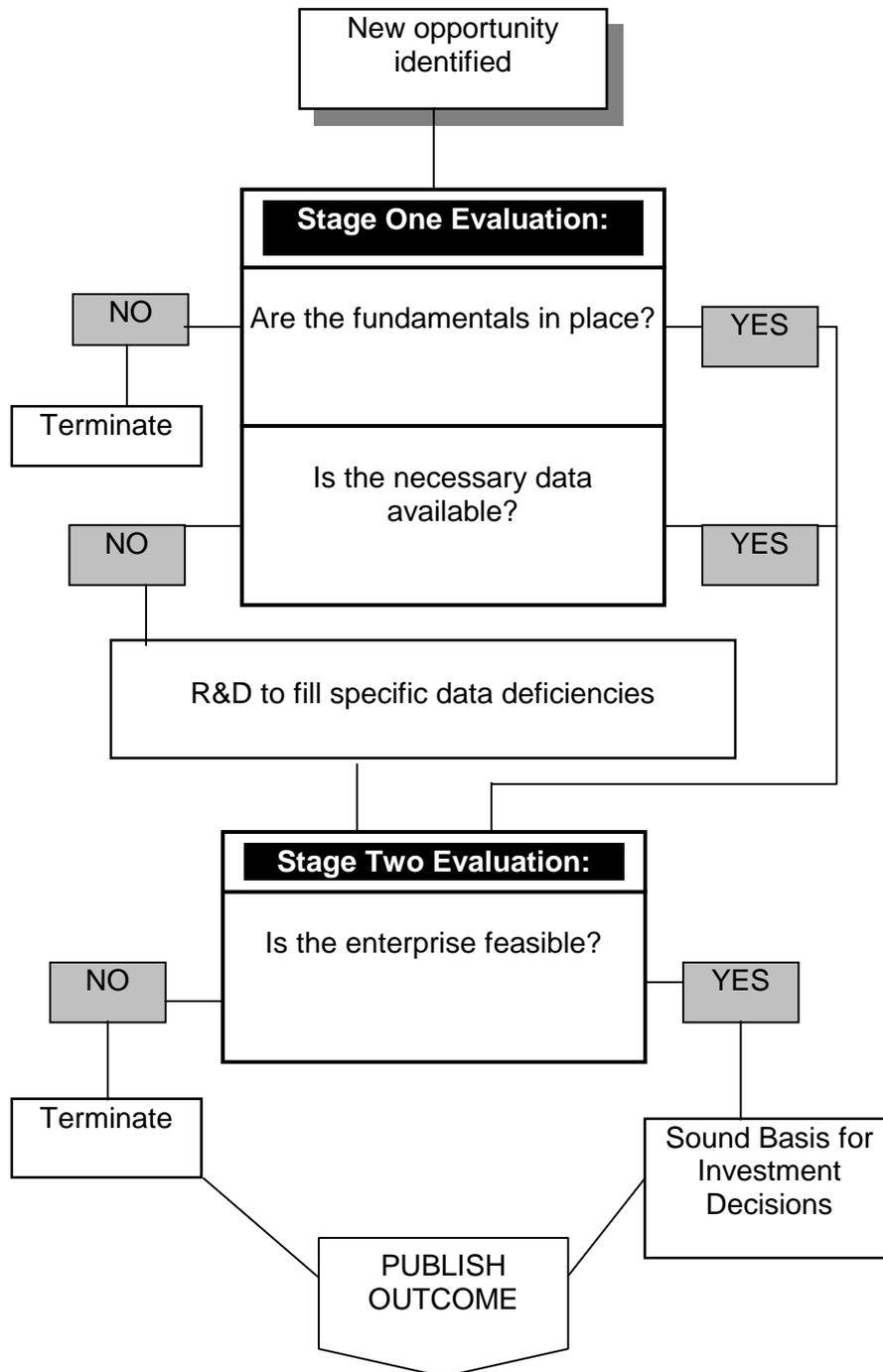
These two objectives for Stage One, although shown separately in Figure 3.2 with different negative outcomes, are likely to be interdependent. For instance, a prospect might require further research in order to determine whether the fundamentals are in place, or the fundamentals might be so positive that the absence of certain data is irrelevant. Although a fair degree of judgement is therefore still necessary to the process, the proposed methodology can nevertheless act validly as a decision support tool to improve the quality of these subjective decisions. Financial analysis, it should be remembered, is only a component of this process, but an important one.

The Stage One analysis, as a preliminary screening device, needs to be simple and easy to apply; at least, simpler and easier than the Stage Two analysis which follows. This will ensure a more economical use of the resources of RIRDC and the stakeholder community in segregating out unattractive prospects and identifying the need for further research of the marginal prospects.

The possible outcomes of the Stage One analysis, then, are:

- Termination of the opportunity if the fundamentals are judged to be lacking;
- Identification of data gaps and inadequacies for further research; and
- Promotion to Stage Two evaluation.

Figure 3.2 RIRDC New Enterprise Evaluation Process



The **Stage Two** analysis is more straightforward, but also more comprehensive. The single objective of the Stage Two analysis is to identify prospects that are worthy of commercial advancement. Prospects therefore either gain a green light or are terminated. In reality, however, “terminated” prospects seldom die. Frequently, other stakeholders will re-evaluate a prospect based on new information, advanced technology, market shifts, changes in assumptions or sheer determination to make it commercial.

As this is a critical decision point, the Stage Two analysis that supports it must take a wider and more thorough view of the prospect than is appropriate in the Stage One evaluation. The financial analysis that forms part of this stage of prospect evaluation, therefore, will likewise be more detailed and comprehensive.

Although it is possible to set definitive threshold values above which the financial performance of a prospect is considered acceptable, there remain other less quantifiable aspects of the evaluation process that will require judgement to support the ultimate decision of whether the prospect has the potential to be commercially successful. These include views on the capabilities and integrity of the proponents, for instance, which clearly require subjective consideration, even if techniques such as psychological testing and reference checking are used.

The possible outcomes of the Stage Two analysis are:

- Termination of the opportunity if its feasibility is judged to be inferior; and
- Documentation of the opportunity for others to investigate for investment and implementation.

As mentioned above and confirmed in the survey of other users of financial evaluations reported in Section 2 of this report, there is a subsequent more detailed stage of project evaluation. This **Stage Three** evaluation applies to what can generally be described as the “investment stage”.

In this level of evaluation, the proponent is generally the end investor and the investment opportunity is generally advanced to the level of detail at which the specific site, the enterprise scope and the expected minimum return on the investment is already established. The objective of this third level analysis is often to maximise commercial return of an already proven concept by finessing such parameters as the exact size and timing of the enterprise, the financial and tax structuring aspects, and the management structuring.

As these parameters are unique to a specific context, they cannot usefully be explored in a generic financial analysis methodology appropriate to RIRDC’s role in the development process.

3.2 The Proposed Methodology

In order to meet RIRDC’s needs for the financial analyses that belong in Stage One and Two evaluations, Hassall & Associates developed available financial appraisal methodologies into two evaluation models that are considered appropriate for both community and RIRDC use.

The models were constructed in Microsoft Excel 97, which is considered to be accessible to most potential users. The model structure and computations are protected to preserve their integrity, and user input is guided by a number of in-context instructions. A trade-off between “user-friendliness” and structural flexibility was sought, in the sense that a reasonable level of user capability to modify the models to suit project specifics is assumed.

True to the concept described above and illustrated in Figure 3.2, the Stage One model is simpler and easier to apply than the Stage Two model, and concentrates both on ensuring the fundamentals are in place and on identifying data gaps and inadequacies for further investigation. The Stage Two model makes use of this investigative data in more detailed cash flow analyses and thus explores the time dimension further.

In developing these financial evaluation models, it became clear that the diversity of enterprises would pose a problem to the objective of providing a uniform appraisal format. After consideration of alternatives, it was decided that prospects could generally be divided into two types of enterprise requiring different templates, these being:

- Crop enterprises; and
- Livestock enterprises.

This should provide for coverage of at least 85% of prospective new and emerging industries, based on an analysis of the industries contained in RIRDC's 1996/97 research portfolio as a rough guide. The enterprises that do not fit neatly into one or other of these categories can generally be described as harvesting (seaweed, bush tucker) and processing (hemp products). The former can generally be "shoe-horned" into one of the two templates, while the latter requires specific analysis that is beyond the scope of a standard template while still generally being along the same methodological lines.

Following are descriptions of the financial evaluation models developed for RIRDC use and the methodologies used.

3.2.1 Stage One Analysis

The Stage One financial model uses a static analytical framework to collect and collate the data necessary to making a determination on the concept feasibility of an enterprise. It serves in a way as a checklist of the necessary data, but at the same time requires the user to state the source and confidence limits of each line item of data. This makes it possible to evaluate both the existence and the quality of data as it is assembled and placed in context.

Following is a summary of the line items included in the crop and livestock templates of the model (Tables 3.1 and 3.2). Most of the line items are generic, and should be expanded wherever appropriate. For instance, "maintenance" under "recurrent inputs" might have several components, each requiring a separate line-item calculation. Many of the items that appear to be site-specific, for example the availability of suitable land, require the analyst to make assumptions as to what is "suitable" and to make a provisional estimate for same.

Table 3.1 Checklist of Fundamentals - Crop Enterprises

Investment inputs

Field Investigations	Survey, soils, agronomic investigations; farm planning
Land	Assumes suitable area of land; soils; topography; access
Buildings	Suitable sheds, storage (if appropriate)
Stock	Seed stock
Machinery	Tractor; plough; harvester; irrigation equipment, etc.
Establishment	Fencing; landforming; banks; channels & drains; trellises; access structures.
Processing	Drying; oil extraction (eg. tea-tree, jojoba); winemaking.
Distribution	Packing facilities; bulk silos; bulk transporters; reefer trucks.
Markets	Established or prospective markets
Permits, etc.	Permits; licenses; industry association memberships
Working capital	Normally, value of one season's recurrent inputs

Recurrent inputs

Seed / Stock	Seed; rootstock; cuttings
Irrigation / water	Irrigation if necessary
Soil preparation	Tilling; stubble burning;
Fertilisers	Phosphates; urea; etc.
Chemicals	Herbicides; pesticides;
Crop protection	Trellises; covers for table grapes; etc.
Harvesting	Crop harvesting
Maintenance	Fencing; banks; structures
Disposal	Disposal of unused products (eg. grapeskins, grain husks)
Permits, etc.	Annual permit, licence, industry levy renewals

Yield

Primary yield	Unit yield of primary crop
By-product yield	Unit yield of each by-product

Demand

Demand value	Unit farm-gate price, or market price minus transport & handling
Quantified demand	Size of accessible market
Price elasticity	Impact of new supply on market prices
Projected demand	Market outlook

Table 3.2 Checklist of Fundamentals - Livestock Enterprises

Investment inputs

Field Investigations	Survey, vegetation investigations; farm planning
Land	Assumes suitable area of land; fencing; soils (if grazing); access; suitable buildings (if appropriate)
Buildings	Suitable buildings, protection (if appropriate)
Stock	Suitable and sufficient breeding pairs.
Machinery	As required (eg. milking, feeding)
Establishment	Fencing; protection; watering; feeding; access structures; drains & lagoons.
Processing	eg. alpaca shearing, leather tanning
Distribution	Packing facilities; stock transporters; reefer trucks.
Markets	Established or prospective markets
Permits, etc.	Permits; licenses; industry association memberships
Working capital	Normally value of one season's recurrent inputs, but could be more or less.

Recurrent inputs

Seed / Stock	Access to replenishment stock.
Irrigation / water	Watering; habitat for some
Soil preparation	(Only for grazing)
Fertilisers	(Only for grazing)
Chemicals	Pesticides
Feed	Silage; grains; many others
Vet	Make allowance
Harvesting	Shearing; milking; etc.
Maintenance	Fencing; pens; structures
Disposal	Disposal of unused products (eg. offal, manure, effluents)
Permits, etc.	Annual permit, licence, industry levy renewals

Yield

Primary yield	Unit yield of primary product
By-product yield	Unit yield of each by-product

Demand

Demand value	Unit farm-gate price, or market price minus transport & handling
Quantified demand	Size of accessible market
Price elasticity	Impact of new supply on market prices
Projected demand	Market outlook

The input portion of the model is divided into the four parameter sections, namely: investment inputs, recurrent inputs, yield, and demand. Each section commences with the basic user instructions and provides unprotected cells for the input data. Input is also sought for recording the source of the numerical data and a subjective comment on its confidence limits.

The analysis is predicated on a convenient unit of production selected by the user; for instance a hectare of crop or a dry sheep equivalent (DSE) or head of livestock. The investment input is, however, more complex as estimation of investment costs is best based on a reasonably sized enterprise, considering machinery capacities and economies of scale. The investment inputs section, therefore, supports this by allowing as the estimating unit the “reasonably sized enterprise” and by ultimately converting the total annualised investment cost to a compatible unit number by dividing by the number of production units that the reasonably sized enterprise can sustain.

The “annualisation” of the investment costs is computed on an annuity basis. The interest rate input by the user is taken as a surrogate discount rate for this calculation. Unlike the Stage Two analysis, the static analysis is not very sensitive to this assumption.

In the results portion, the model calculates the unit gross margin and net margin for the enterprise for a typical steady-state year. It also computes an approximation of the enterprise’s net return on recurrent inputs alone as well as on investment and recurrent inputs, the latter of which approximates the internal rate of return (IRR) of the venture, computed in the Stage Two analysis. These computations are more important for identifying the sensitivity of the enterprise’s viability to the various data categories than for establishing its financial viability, as the preliminary nature of the static analysis might lead to spurious results.

The sensitivity of the enterprise’s gross margin and net margin to changes in the main parameters is automatically computed by threshold analysis, each of which triggers a descriptor of the relative sensitivity of the enterprise’s viability to that parameter.

This analysis of data sensitivity provides a guide to the relative importance of the various data categories that make up the parameters, so that a rational plan for data augmentation can be developed. For instance, it would be counter-productive to spend much time and resources improving the confidence limits on the investment cost of common machinery, if the farm-gate price or market strength have similar confidence limits, as the viability of most enterprises is more sensitive to market demand than to investment inputs.

With this in mind, a special “demand sensitivity” checklist has been included at the end of the “results” section of the model, designed to provide appropriate prompts depending on the yes/no answers entered by the user.

3.2.2 Stage Two Analysis

The Stage Two financial model assumes a more thorough set of input data, especially with respect to implementation timing and scope. This model uses a cash flow analysis framework to more realistically model the anticipated implementation and ongoing operation of the enterprise, especially in the time dimension.

As far as possible, the data structure used for the Stage One financial analysis (as shown in Tables 3.1 and 3.2 above) is preserved in the Stage Two model so that relevant data can be compared and contrasted between the two. Again, the generic line items should be expanded wherever appropriate, and it is anticipated that more detailed user computations in this regard will be appropriate.

Separate templates for crop enterprises and livestock enterprises have also been carried forward for much the same rationale as that for the Stage One analyses.

The Stage Two model is structured around a horizontal cash flow layout, with annual time steps and a maximum evaluation period of 20 years. The analyst needs to decide on the most appropriate evaluation period for the enterprise, but 20 years is commonly considered to be the maximum period over which a new enterprise can be evaluated.

At the top of the spreadsheet is a list of user instructions, including prompts for the entry of the selected unit of production on which the analysis is to be based, and the required real annual rate of return. This latter input value can equally be defined as the weighted average cost of capital (WACC) of the proponent of the enterprise. However, as the proponent is not known at Stage Two, a realistic threshold rate of return needs to be determined for all new enterprises, given that their risk profiles are likely to be similar.

Following these instructions is a user workspace for inputting and computing physical parameters against the annual timeframe. This space is for discretionary use to model the physical attributes of the enterprise, which are often complex during the implementation years, especially where livestock breeding programs are involved. The information entered and computed in this section can be predicated on whatever units of measure are most appropriate. Although no embedded formulae derive from data in this space, users may want to link subsequent cash flow lines to this data.

The cash flow analysis portion of the model is the formal input section. As with the Stage One model, it is based on the same four parameter types, namely: investment inputs, recurrent inputs, yield and demand, although yield and demand are jointly expressed as revenue and an additional section for the entry for the residual values of assets is provided. Although it is assumed for Stage Two analysis that all data are to hand and meet some uniform standard of confidence, space is provided to the extreme right of all cash flow lines for recording the source and confidence limits of the numerical data.

There are many decisions the user needs to make regarding the enterprise that cannot be built into the model. These include the following:

- Whether to purchase machinery, or contract out soil preparation, spraying and harvesting;
- Whether to breed stock within the enterprise, have females sired externally, or purchase replacement stock as required; and
- Whether to sell the raw produce at the farm gate, or include in the enterprise some level of value-adding processing such as slaughtering, tanning, oil extraction and even packaging.

The model may be used to seek the commercially optimal solution to such decision ranges, as long as the necessary technical information is available to support such a use.

In the financial analysis results portion, the model computes such well known financial performance indicators as net present value (NPV), internal rate of return (IRR), and benefit cost ratio (BCR). The NPV and BCR are computed using the required rate of return that is input by the user as the discount rate. As there is perennial debate as to which indicator is best, the model provides them all. Alongside each indicator is an embedded comment that provides a subjective prompt on the result, according to the following table:

Performance Indicator	Condition	Embedded Comment
NPV	> 10% of investment inputs	Very Favourable Outcome
	0 – 10% of investment inputs	Favourable Outcome
	< 0	Unfavourable Outcome
IRR	> 1.5 x req'd rate of return	Very Favourable Outcome
	1 – 1.5 x req'd rate of return	Favourable Outcome
	< Req'd rate of return	Unfavourable Outcome
BCR	> 1.5	Very Favourable Outcome
	1 – 1.5	Favourable Outcome
	< 1	Unfavourable Outcome

These prompts can be modified as RIRDC or the user sees fit.

Following the performance results is a block showing the embedded results of selected sensitivity analyses. These include the NPV of the enterprise if the discount rate is changed to be 2 percentage points higher and lower than that entered by the user, and the IRR with revenues, investment inputs and seasonal recurrent inputs each adjusted by 10%. Embedded comments appropriate to the results are shown to the right of the sensitivity results.

Next, threshold analysis results are presented, showing by how much each of the main parameter groups needs to change, either increase or decrease, to derive an NPV of zero. Threshold analysis is useful in assessing whether an unviable enterprise is reasonably likely to reach viability with further research and development, or whether the change in a key assumption necessary to convert a viable enterprise to becoming unviable is a reasonable expectation. Again, embedded comments appropriate to the results are shown to the right of the threshold analysis results.

Finally, the breakeven point along the time scale set out in the analysis period is computed on a cumulative discounted basis. This means that the enterprise would likely begin to generate retained earnings at the breakeven point, assuming equity financing. The interpretation of the breakeven point is subjective, and perhaps has greater value for Stage Three evaluations where enterprise site and scale are established.

3.2.3 Stage Three Analysis

A third stage of analysis is the essential part of investment decision making. Use of Stages one and two provides a framework and indicators for the likely outcomes of a new industry investment proposal. However, stage three however requires the establishment of site and scale and the incorporation of confirmed data. A Stage Three analysis may also incorporate the proposed enterprise within a whole farm plan.

Stage one and two analyses can be, and for the purposes of the analyses presented in this report have been, completed under a number of assumptions. Assumptions can not be relied upon for the purposes of a stage three analysis. Careful consideration must be made with regard to a number of factors including:

- The target market for the produce. This could include making a decision as to whether a livestock operation would be run to produce stud stock, or for crops, whether export quality would be produced; and
- Type of production. In some instances it might be necessary to consider whether organic, genetically modified or conventional production would be pursued.

Stage three requires realistic consideration of such factors and should be conducted iteratively with other forms of appraisal necessary for investment selection.

3.3 The Broader Context of Enterprise Appraisal

The financial analysis described above is only a component, albeit an important one, of the overall process of new and emerging enterprise appraisal appropriate to RIRDC and community needs. Other forms of appraisal need to be considered in screening new prospects. In this section, some of the considerations other than financial viability are identified and discussed.

➤ Agronomic Analysis:

The agronomy or husbandry of the enterprise is central to its performance, and a full analysis is likely to be the core of most prospects. The capability and reputation of the party that authored the agronomic analysis are as important in assessing its soundness as any peer review. The agronomic

analysis is an essential input into the financial analysis. Enterprise set up planning may be appropriate when analyses reach stage three and the enterprise site/location is fully specified.

⇒ **Market Analysis:**

The demand side of the commercial equation is frequently a weak link in the financial appraisal of new and emerging projects of all types. This is perhaps because the excitement of technological discovery consumes most of the interest and resources available to the emerging enterprise. A thorough and well constructed market analysis is therefore an essential ingredient for new and emerging enterprises, especially where the enterprise depends on a weak or untested market, or, worse, on one that currently does not exist. Where target markets are small or immature, price elasticities must be investigated to explore the impact that the new enterprise's product will have on demand and prices, and both impacts are likely to be unfavourable.

As with the agronomic analysis, the capability and reputation of the market researcher in that specific market field are essential to assessing the soundness of the market plan. The market analysis is also an essential input into the financial analysis and in the event of a stage three analyses would be an important consideration for subsequent business planning.

⇒ **Risk Assessment:**

In our ever more competitive and litigious economy, risk plays an increasingly important role in the prospects of new enterprises. While quantitative methodologies based on probability theory and economic optimisation abound in the commercial marketplace, at the stage of enterprise development in which RIRDC is involved, a more fundamental view of risk is more appropriate. This is largely due to these methodologies requiring much context-specific data for meaningful results to be possible.

For the purposes of generic analysis, it should be sufficient to identify the major areas of risk to an emerging enterprise, and then to make a subjective assessment of whether these risks impose intolerable pressures on the enterprise. These risks might range from political change to export market exposure, access to a scarce source for a key input such as seed, and over-reliance on unskilled labour, among many others.

To some extent, generic risk assessment can be input into the financial analysis through the use of probability-reduced values, where appropriate. Only once a Stage Three analysis is appropriate can specific risks be identified and analysed to any degree of precision.

⇒ **Personal Assessment of Proponents:**

The confidence with which new and emerging enterprises can be evaluated will to some degree depend on the personal reputation and past performance of the proponents, over and above all other less subjective considerations.

Even an informal but systematic method of making an assessment of the personalities behind the prospect will aid decision making relating to new ventures. A more formal checklist approach to ensuring that all aspects of such personal assessments are recorded for consideration will further improve the quality of decision making.

Where little or nothing is known of the proponent, for instance if the initial information is from outside Australia, a personal assessment might not be feasible at Stage One and Two of development. In most cases, personal assessment, such as psychological testing, is more appropriate for Stage Three assessment, where the identity of the promoter, developer or investor is known.

4. Enterprise Selection

In consultation with RIRDC, eleven new and emerging enterprises were chosen. The industries were selected from among those documented in The New Rural Industries Handbook for Farmers and Investors. The enterprises chosen reflect a desire to achieve diversity in the analysis in terms of geographical location, livestock versus crops and the degree to which the enterprises are developed.

Recognition of the value of providing indicators for established industry, as benchmarks, led to the selection of Wine Grapes and Investment Indices. Wine Grapes were chosen on the basis that the industry is established and currently a popular investment. Investment indices were chosen as an additional benchmark in order to link the analyses to non-primary industries. Capital Indexed Treasury Bonds were chosen because they have a 20 year life (appropriate to a 20 year cash flow analysis) and they are easily accessible to the general public.

5. Presentation of Findings

Findings are presented as per Stage I investigations. Summary sheets and comment for each investigation are included in Section 6. An annotated summary sheet to aid interpretation is attached below. The full cash flow analyses are provided as Appendix C.

Description: Prospective industry Y Analyst: Date:			
Key Assumptions: Enterprise scale Geographic location Initial investment Typical recurrent input costs Key yield factors Farm gate (or other) prices Discount rate Inflation rate (if any) Analysis period		100 hectares Aust. \$ 1,717,300 \$ 282,780 \$ 4.00 per unit 7% n/a 20 yrs	<i>Outlay required to get into business</i> <i>Annual cost of labour, materials, equipment, etc</i> <i>Present values allow for the time value of money</i> <i>Can be considered as the cost of capital minus inflation</i>
Present Value @ 7% over 20 years: Investment inputs Recurrent inputs Revenues Residual values Net Present Value of Enterprise @ 7% over 20 years		\$ 1,790,480 \$ 2,170,885 \$ 5,888,888 \$ 219,070 \$ 1,810,020	
Financial Analysis Results: Return on recurrent inputs Return on investment and recurrent inputs Internal Rate of Return Benefit Cost Ratio @ 7%		223% static state 70% static state 14% 1.57	<i>For a typical year only - usually an optimistic result</i> <i>Should be greater than discount rate (above)</i> <i>Greater than one if benefits exceed costs</i>
Breakeven on cumulative discounted basis after		13 years	
Threshold Analysis Results: Net Present Value of Enterprise equals ZERO when... Yield / Prices decreases by (%) Investment Expenditure increases by (%)		31% 101%	<i>No 'dividend' from the business up to this point</i> <i>i.e. long-term breakeven</i>
Major Risks to Financial Viability: Loss of crop due to climate variations International prices and volume of domestic supply			

6. Summary of Financial Analyses

6.1 Benchmark - Wine Grapes

Description: Wine Grapes - Chardonnay			
Analyst: Hassall & Associates			
Date: April 2000			
Key Assumptions:			
Enterprise scale	20	hectares	
Geographic location	Riverland South Australia		
Initial investment	\$ 1,020,145		
Typical recurrent input costs	\$ 71,550		
Key yield factors	a number of vine diseases can threaten yield		
Farm gate (or other) prices	\$ 700.00	per tonne	
Discount rate	7%		
Inflation rate (if any)	n/a		
Analysis period	20	years	
Present Value @ 7% over 20 years:			
Investment inputs	\$ 1,008,280		
Recurrent inputs	\$ 650,333		
Revenues	\$ 2,275,224		
Residual values	\$ 196,879		
Net Present Value of Enterprise @ 7% over 20 years	\$ 814,072		
Financial Analysis Results:			
Return on recurrent inputs	340%	static state	
Return on investment and recurrent inputs	99%	static state	
Internal Rate of Return	13%		
Benefit Cost Ratio @ 7%	1.56		
Breakeven on cumulative discounted basis after	13	years	
Threshold Analysis Results:			
Net Present Value of Enterprise equals ZERO when.....			
Yield / Prices	decreased by	36%	
Investment Expenditure	increased by	81%	
Recurrent Inputs	increased by	125%	
Major Risks to Financial Viability:			
Possible over supply of wine grapes in future years may put downward pressure on price if new international markets for Australian wines are not established.			

Chardonnay Wine grapes achieved a significant NPV and BCR of 1.56. The enterprise breaks even in Year 13.

Dr Phillip Taylor of Primary Industries South Australia, examined this analysis and found the results to be accurate for Chardonnay wine grape production conducted in the manner assumed.

6.2 Benchmark – Treasury Bonds

Description: Capital Indexed Treasury Bonds		
Analyst:	Hassall & Associates	
Date:	April 2000	
Key Assumptions:		
Enterprise scale	150	\$1000 bonds
Geographic location	Australia	
Initial investment	\$ 150,944	
Typical recurrent input costs	\$ 194	
Key yield factors		
Farm gate (or other) prices	as per inflation over the term	
Discount rate	6.5%	
Inflation rate (if any)	variable & 2.5% in long run	
Analysis period	20 years	
Present Value @ 6.5% over 20 years:		
Investment inputs	\$	141,731
Recurrent inputs	\$	2,133
Revenues	\$	83,524
Residual values	\$	69,937
Net Present Value of Enterprise @ 6.5% over 20 years	\$	9,596
Financial Analysis Results:		
Return on recurrent inputs	n/a	static state
Return on investment and recurrent inputs	n/a	static state
Internal Rate of Return	7.0%	
Benefit Cost Ratio @ 6.5%	1.13	
Breakeven on cumulative discounted basis after	20	years
Threshold Analysis Results:		
Net Present Value of Enterprise equals ZERO when.....		
Yield / Prices	decreased by	11%
Investment Expenditure	increased by	7%
Recurrent Inputs	increased by	450%
Major Risks to Financial Viability:		
Capital Indexed Treasury Bonds are more profitable in periods of bouyant inflation.		
The viability of this enterprise is dependent on the discount rate and should be chosen carefully.		

The nature of Capital Indexed Treasury Bonds insures that a positive NPV would be achieved in this analysis and also that the investment will breakeven in Year 20. Capital Index Treasury Bonds achieve an IRR of 7% and a BCR 1.13%.

NB. 6.5% is used as the discount rate in this analysis, due to the sensitivity of the bond price to the prevailing interest rate. 6.5% better reflects the prevailing market interest rate at the time the bond prices were established for this analysis.

These outcomes were found to be accurate by Jonathon Rice of Grange Securities.

6.3 Red Deer

Description:	Red Deer, Velvet & Venison		
Analyst:	Hassall & Associates		
Date:	April 2000		
Key Assumptions:			
Enterprise scale	50	head	
Geographic location	Gippsland, Victoria		
Initial investment	\$	160,804	
Typical recurrent input costs	\$	7,167	
Key yield factors			
Farm gate (or other) prices	\$	95.00	per kg Velvet
Discount rate	7%		
Inflation rate (if any)	n/a		
Analysis period	20	years	
Present Value @ 7% over 20 years:			
Investment inputs	\$	168,153	
Recurrent inputs	\$	71,267	
Revenues	\$	205,222	
Residual values	\$	28,900	
Net Present Value of Enterprise @ 7% over 20 years	\$	673	
Financial Analysis Results:			
Return on recurrent inputs	349%	static state	
Return on investment and recurrent inputs	6%	static state	
Internal Rate of Return	7%		
Benefit Cost Ratio @ 7%	0.97		
Breakeven on cumulative discounted basis after	20	years	
Threshold Analysis Results:			
Net Present Value of Enterprise equals ZERO when.....			
Yield / Prices	decreased by	0%	
Investment Expenditure	increased by	0%	
Recurrent Inputs	increased by	1%	
Major Risks to Financial Viability:			
<p>Red Deer viability is reliant on velvet price. The major market for velvet is Asia, particularly Korea. Velvet prices fell to as low as \$47/kg and remained low throughout the Asian economic crisis of 1997. The price for top grade velvet has just recovered to \$120/kg, a level which is expected to be at least maintained in the next 3-4 years. The average industry price is currently around \$95/kg. Prices prior to 1997 were around \$130/kg</p>			

Financial analysis of the Red Deer production case study indicates a positive net present value of \$673 and an internal rate of return of 7%.

The results from the Red Deer production analysis were analysed by Bruce McKay of NSW Agriculture, and Andrew Hansen, Veterinarian with Deer Expertise, Orange and found to be reasonable.

6.4 Alpaca

Description: Alpaca - Progeny & Fibre		
Analyst:	Hassall & Associates	
Date:	April 2000	
Key Assumptions:		
Enterprise scale	50	breeding females
Geographic location	Southern NSW	
Initial investment	\$	898,056
Typical recurrent input costs	\$	34,931
Key yield factors		
Farm gate (or other) prices	\$25/kg fibre, various stock prices	
Discount rate	7%	
Inflation rate (if any)	n/a	
Analysis period	20	years
Present Value @ 7% over 20 years:		
Investment inputs	\$	902,609
Recurrent inputs	\$	303,448
Revenues	\$	1,530,289
Residual values	\$	33,004
Net Present Value of Enterprise @ 7% over 20 years	\$	357,235
Financial Analysis Results:		
Return on recurrent inputs	687%	static state
Return on investment and recurrent inputs	77%	static state
Internal Rate of Return	12%	
Benefit Cost Ratio @ 7%	1.30	
Breakeven on cumulative discounted basis after	13	years
Threshold Analysis Results:		
Net Present Value of Enterprise equals ZERO when.....		
Yield / Prices	decreased by	23%
Investment Expenditure	increased by	40%
Recurrent Inputs	increased by	118%
Major Risks to Financial Viability:		
These results are reliant on persistent marketing and the establishment of a good reputation in the industry. Quality bloodlines and appropriate breeding must be used.		

An Huacayu Alpaca herd of 50 breeding females, based in Southern NSW breaks even in year 13 given appropriate marketing and bloodline selection. The Financial analysis of Alpaca production indicates a strong NPV, an IRR of 12% and a BCR greater than 1.

Results from the Huacayu Alpaca production analysis have been analysed by Colin Langford of NSW Agriculture and found to be reasonable.

6.5 Dairy Goats

Description:	Dairy Goats	
Analyst:	Hassall & Associates	
Date:	April 2000	
Key Assumptions:		
Enterprise scale		200 milking does
Geographic location		Tasmania
Initial investment		\$ 133,675
Typical recurrent input costs		\$ 44,220
Key yield factors	600 litres of milk per doe per annum	
Farm gate (or other) prices	\$ 0.70	per litre
Discount rate	7%	
Inflation rate (if any)	n/a	
Analysis period	20 years	
Present Value @ 7% over 20 years:		
Investment inputs	\$ 184,557	(includes working capital)
Recurrent inputs	\$ 468,467	
Revenues	\$ 889,897	
Residual values	\$ 21,376	
Net Present Value of Enterprise @ 7% over 20 years	\$ 258,249	
Financial Analysis Results:		
Return on recurrent inputs - Stage One	90%	static state
Return on investment and recurrent inputs - Stage One	40%	static state
Internal Rate of Return	28%	
Benefit Cost Ratio @ 7%	1.41	
Breakeven on cumulative discounted basis after	6 years	
Threshold Analysis Results:		
Net Present Value of Enterprise equals ZERO when.....		
Yield / Prices	decreased by	29.02%
Investment Expenditure	increased by	139.93%
Recurrent Inputs	increased by	55.13%
Major Risks to Financial Viability:		
The price received per litre of milk is highly volatile and prices are expected to fall as supply increases.		
This analysis is based on basic production with minimal capital expenditure, however it does assume the land has no existing infrastructure.		

A dairy goat herd of 200 milkers based in Tasmania breaks even in year 6 given continued strong milk prices. The financial analysis indicates a strong NPV, an IRR of 28% and a BCR of 1.41.

The results from the production analysis were analysed by Arthur Stubbs of DNRE Victoria and found to be reasonable.

6.6 Emu

Description: Emus for meat, hides, oil and skins		
Analyst: Hassall & Associates		
Date: April 2000		
Key Assumptions:		
Enterprise scale		100 breeding pairs
Geographic location		Northern NSW
Initial investment	\$	316,000
Typical recurrent input costs	\$	296,475
Key yield factors		oil @ 7.2 kg/bird
Farm gate (or other) prices		oil @\$20/kg
Discount rate		7%
Inflation rate (if any)		n/a
Analysis period		20 years
Present Value @ 7% over 20 years:		
Investment inputs	\$	569,802 (includes working capital)
Recurrent inputs	\$	2,810,568
Revenues	\$	4,507,955
Residual values	\$	88,631
Net Present Value of Enterprise @ 7% over 20 years	\$	1,216,217
Financial Analysis Results:		
Return on recurrent inputs - Stage One		66% static state
Return on investment and recurrent inputs - Stage One		42% static state
Internal Rate of Return		27%
Benefit Cost Ratio @ 7%		1.37
Breakeven on cumulative discounted basis after (years)		6
Threshold Analysis Results:		
Net Present Value of Enterprise equals ZERO when.....		
Yield / Prices	decreased by	27%
Investment Expenditure	increased by	213%
Recurrent Inputs	increased by	43%
Major Risks to Financial Viability:		
Fluctuating oil and meat prices.		
Quarantine issues such as those currently faced by NSW producers (avian flu).		
Competition from international producers.		

An emu enterprise of 100 breeding pairs in northern NSW could break even in year 6 given current high oil prices. The financial analysis indicates a very strong NPV, an IRR of 27% and a BCR of 1.37.

These results were verified by NSW growers and Peter McGuinness of RIRDC.

6.7 Fresh culinary herb production

Description:	Culinary Herb Production	Dill
Analyst:	Hassall & Associates	
Date:	April 2000	
Key Assumptions:		
Enterprise scale		1 hectare
Geographic location		NSW
Initial investment		\$ 248,150
Typical recurrent input costs		\$ 117,035
Key yield factors		Yield averaged at 27,300 kg/ha
Farm gate (or other) prices		\$ 0.85 per bunch
Discount rate		7%
Inflation rate (if any)		n/a
Analysis period		20 years
Present Value @ 7% over 20 years:		
Investment inputs		\$ 377,890
Recurrent inputs		\$1,239,870
Revenues		\$2,458,341
Residual values		\$ 51,825
Net Present Value of Enterprise @ 7% over 20 years		\$ 892,406
Financial Analysis Results:		
Return on recurrent inputs - Stage One		98% static state
Return on investment and recurrent inputs - Stage One		55% static state
Internal Rate of Return		46%
Benefit Cost Ratio @ 7%		1.57
Breakeven on cumulative discounted basis after		4 years
Threshold Analysis Results:		
Net Present Value of Enterprise equals ZERO when.....		
Yield / Prices	decreased by	36%
Investment Expenditure	increased by	236%
Recurrent Inputs	increased by	72%
Major Risks to Financial Viability:		
1 hectare of Dill production is impractical and this model is for demonstration purposes only.		
This volume of fresh Dill on the market would impact on price.		

A culinary herb enterprise of 1 ha based in northern NSW/southern QLD was found to break even in year 4. As noted above the production of one hectare of a single herb is impractical and does not reflect genuine production patterns. The results of this analysis are for demonstration purposes only. The financial analysis indicates a very strong NPV, an IRR of 46% and a BCR of 1.57.

6.8 Medicinal Herb Production

Description:	Medicinal Herb Production	Broad-leaf Echinacea
Analyst:	Hassall & Associates	
Date:	April 2000	
Key Assumptions:		
Enterprise scale		1 hectare
Geographic location		Victoria
Initial investment	\$	167,500
Typical recurrent input costs	\$	65,525
Key yield factors		Yield roots at 2000 kg/ha
Farm gate (or other) prices	\$	32.50 per kg
Discount rate		7%
Inflation rate (if any)		n/a
Analysis period		20 years
Present Value @ 7% over 20 years:		
Investment inputs	\$	308,850 (includes working capital)
Recurrent inputs	\$	694,173
Revenues	\$	1,218,312
Residual values	\$	25,435
Net Present Value of Enterprise @ 7% over 20 years	\$	240,723
Financial Analysis Results:		
Return on recurrent inputs - Stage One		76% static state
Return on investment and recurrent inputs - Stage One		23% static state
Internal Rate of Return		23%
Benefit Cost Ratio @ 7%		1.25
Breakeven on cumulative discounted basis after		7 years
Threshold Analysis Results:		
Net Present Value of Enterprise equals ZERO when.....		
Yield / Prices	decreased by	20%
Investment Expenditure	increased by	78%
Recurrent Inputs	increased by	35%
Major Risks to Financial Viability:		
1 hectare of Broad-leaf Echinacea production is impractical and this model is for demonstration purposes only.		
This volume of dried Echinacea on the market would impact severely on price.		

A medicinal herb enterprise of 1 ha based in Victoria was found to break even in year 7. As noted above the production of one hectare of a single herb is impractical and does not reflect genuine production patterns. The results of this analysis are for demonstration purposes only. The financial analysis indicates a very strong NPV, an IRR of 23% and a BCR of 1.25.

6.9 Persimmon

Description:	Fuyu Persimmon	
Analyst:	Hassall & Associates	
Date:	April 2000	
Key Assumptions:		
Enterprise scale	2	hectares
Geographic location	Southern Qld	
Initial investment	\$	145,005
Typical recurrent input costs	\$	65,233
Key yield factors		
Farm gate (or other) prices	\$	3.00 per kg
Discount rate	7%	
Inflation rate (if any)	n/a	
Analysis period	20	years
Present Value @ 7% over 20 years:		
Investment inputs	\$	313,578
Recurrent inputs	\$	541,204
Revenues	\$	823,145
Residual values	\$	21,827
Net Present Value of Enterprise @ 7% over 20 years	\$	12,722
Financial Analysis Results:		
Return on recurrent inputs	54%	static state
Return on investment and recurrent inputs	2%	static state
Internal Rate of Return	8%	
Benefit Cost Ratio @ 7%	0.99	
Breakeven on cumulative discounted basis after	20	years
Threshold Analysis Results:		
Net Present Value of Enterprise equals ZERO when.....		
Yield / Prices decreases by (%)	2%	
Investment Expenditure increases by (%)	4%	
Recurrent Inputs increases by (%)	2%	
Major Risks to Financial Viability:		
Labour contributes a large cost to the operation.		
Bruised/blemished fruit is downgraded receiving lower \$/kg		

An internal rate of return of 8% is achieved in this analysis of Persimmon. An enterprise such as this breaks even in year 20 with a net present value of \$12,722.

The analysis has been reviewed by Ben Jeffers and Jeff Patterson of the Sunshine Coast Tropical Fruits Association and found to be consistent with persimmon production in North Queensland.

6.10 Durian

Description:	Durian		
Analyst:	Hassall & Associates		
Date:	April 2000		
Key Assumptions:			
Enterprise scale	10	hectares	
Geographic location	North Queensland		
Initial investment	\$	329,368	
Typical recurrent input costs	\$	231,847	
Key yield factors			
Farm gate (or other) prices	\$	7,000.00	per tonne
Discount rate	7%		
Inflation rate (if any)	n/a		
Analysis period	20	years	
Present Value @ 7% over 20 years:			
Investment inputs	\$	440,610	
Recurrent inputs	\$	1,498,532	
Revenues	\$	4,688,033	
Residual values	\$	30,030	
Net Present Value of Enterprise @ 7% over 20 years	\$	2,791,349	
Financial Analysis Results:			
Return on recurrent inputs	108%	static state	
Return on investment and recurrent inputs	47%	static state	
Internal Rate of Return	25%		
Benefit Cost Ratio @ 7%	2.46		
Breakeven on cumulative discounted basis after	11	years	
Threshold Analysis Results:			
Net Present Value of Enterprise equals ZERO when.....			
Yield / Prices	decreased by	60%	
Investment Expenditure	increased by	634%	
Recurrent Inputs	increased by	186%	
Major Risks to Financial Viability:			
<p>The analysis is completed on the assumption that the current application by Thailand to import fresh Durian to Australia is successfully appealed. Jack fruit are produced in conjunction with Durian in this analysis (The 10 ha comprises 8 ha of Durian and 2 ha of jack fruit). Jack fruit act as a wind break and also boost cash flow in the early years. Cut Flowers, may be used as another option which increases cash flow in early years.</p> <p>In areas with lower rainfall, irrigation costs would be significantly higher.</p>			

Financial analysis of Durian production in North Queensland indicates a significant NPV, a high IRR of 25% and a BCR of 2.46.

The results from the Durian production analysis were reviewed by Alan Zappala of the Zappala Tropicals, and found to be reasonable.

6.11 Jojoba

Description: **Jojoba**

Analyst: **Hassall & Associates**

Date: **April 2000**

Key Assumptions:

Enterprise scale	20 hectares
Geographic location	Nth NSW/Sth QLD
Initial investment	\$ 469,123
Typical recurrent input costs	\$ 105,980
Key yield factors	
Farm gate (or other) prices	\$ 23.00 per kg oil
Discount rate	7%
Inflation rate (if any)	n/a
Analysis period	20 years

Present Value @ 7% over 20 years:

Investment inputs	\$ 535,007	(includes working capital)
Recurrent inputs	\$ 870,577	
Revenues	\$ 2,220,971	
Residual values	\$ 42,659	
Net Present Value of Enterprise @ 7% over 20 years	\$ 858,047	

Financial Analysis Results:

Return on recurrent inputs - Stage One	251% static state
Return on investment and recurrent inputs - Stage One	135% static state
Internal Rate of Return	16%
Benefit Cost Ratio @ 7%	1.63

Breakeven on cumulative discounted basis after 11 years

Threshold Analysis Results:

Net Present Value of Enterprise equals ZERO when.....

Yield / Prices	decreased by	39%
Investment Expenditure	increased by	160%
Recurrent Inputs	increased by	99%

Major Risks to Financial Viability:

- Plant losses can be greater than 5% if in a frost prone area.
- Levys are currently voluntary (they are included in this analysis).
- Estimated costs for Irrigation and Fertiliser are higher than average.
- Yield is based on irrigated production.
- Industry needs to achieve critical mass to secure markets.
- The cost of machinery is based on new prices.

A jojoba plantation of 20 hectares in northern NSW/southern QLD could break even in year 11 given current prices. The financial analysis indicates a strong NPV, an IRR of 16% and a BCR greater than 1.

The results from the production analysis were verified by growers and Peter Milthorpe of NSW Agriculture.

6.12 Sesame

Description:	Sesame Seed		
Analyst:	Hassall & Associates		
Date:	April 2000		
Key Assumptions:			
Enterprise scale	100	hectares	
Geographic location	Katherine, NT		
Initial investment	\$	263,100	
Typical recurrent input costs	\$	37,019	
Key yield factors			
Farm gate (or other) prices	\$	1,000.00	per tonne
Discount rate	7%		
Inflation rate (if any)	n/a		
Analysis period	20	years	
Present Value @ 7% over 20 years:			
Investment inputs	\$	332,964	
Recurrent inputs	\$	373,191	
Revenues	\$	936,862	
Residual values	\$	36,695	
Net Present Value of Enterprise @ 7% over 20 years	\$	234,048	
Financial Analysis Results:			
Return on recurrent inputs	170%	static state	
Return on investment and recurrent inputs	5%	static state	
Internal Rate of Return	16%		
Benefit Cost Ratio @ 7%	1.40		
Breakeven on cumulative discounted basis after	9	years	
Threshold Analysis Results:			
Net Present Value of Enterprise equals ZERO when.....			
Yield / Prices decreases by (%)	25%		
Investment Expenditure increases by (%)	70%		
Recurrent Inputs increases by (%)	63%		
Major Risks to Financial Viability:			
A minimum of 3 year rotations would be necessary to ensure yield is maintained throughout the 20 year analysis period.			

Sesame seed production in the Northern Territory was found to achieve good financial performance over the 20 year analysis. The 100 hectare enterprise breaks even in Year 9, achieves an IRR of 16% and return of 170% on recurrent inputs.

This analysis was scrutinised by Mal Bennett of the Department of Primary Industries and Fisheries of the Northern Territory and found to reflect the performance of the enterprises currently in operation in the Katherine region.

6.13 South African Proteaceae

Description: South African Proteaceae (Leucadendron)	
Analyst:	Hassall & Associates
Date:	April 2000
Key Assumptions:	
Enterprise scale	10 hectares
Geographic location	Western Australia
Initial investment	\$ 581,160
Typical recurrent input costs	\$ 151,760
Key yield factors	
Farm gate (or other) prices	\$ 2.25 per bunch
Discount rate	7%
Inflation rate (if any)	n/a
Analysis period	20 years
Present Value @ 7% over 20 years:	
Investment inputs	\$ 807,851 (includes working capital)
Recurrent inputs	\$ 2,076,311
Revenues	\$ 2,961,190
Residual values	\$ 134,833
Net Present Value of Enterprise @ 7% over 20 years	\$ 211,861
Financial Analysis Results:	
Return on recurrent inputs - Stage One	73% static state
Return on investment and recurrent inputs - Stage One	41% static state
Internal Rate of Return	10%
Benefit Cost Ratio @ 7%	1.08
Breakeven on cumulative discounted basis after	17 years
Threshold Analysis Results:	
Net Present Value of Enterprise equals ZERO when.....	
Yield / Prices decreased by	7%
Investment Expenditure increased by	26%
Recurrent Inputs increased by	10%
Major Risks to Financial Viability:	
Price risk.	
Distance to markets.	
The cost of freight (both domestic and international).	
Soil type.	

A leucadendron enterprise of 10 hectares in Western Australia breaks even in year 17 given current prices. The financial analysis indicates a moderate NPV, an IRR of 10% and a BCR greater than 1.

The results from the production analysis were verified Mark Heap of Agriculture WA and found to be reasonable.

7. Appendices

Appendix A: References

ACIL Economics and Policy in association with McIntyre Management and Marketing (1992). *A Development Strategy for the Emu Industry*.

American Dairy Goat Association Website
Dairy Goat Facts

Australian Farm Journal, Australian Landcare June 1999.

Australian Farm Journal, Jeffrey Jones, *Quality, marketing skills vital in wildflower trade*, June 1999

Boon, K., Taylor, P., Panagiotopoulos, R., and Radford, R. (1999), *Seasons of Change-A guide to successful vineyard investment in a changing world*: South Australia: Primary Industries and Resources South Australia.

Cahill, G., (1995). *160 alternative farming enterprises & ideas: suitable for large and small farms*. Agmedia, East Melbourne.

Davies, L and Murray, G. (1997a) *The Economics of a Commercial Cashmere Goat Enterprise*, RIRDC Research Paper Series no 97/10, RIRDC, Canberra

Davies, L and Murray, G. (1997b) *The Economics of a Commercial Angora Goat Enterprise*, RIRDC Research Paper Series no 97/11, RIRDC, Canberra

DNRE, Victoria – Agriculture Notes

Dairy Goats	AG0665 February 1998
Fresh Herbs	AG0672 February 1998
Dried Herbs	AG0671 February 1998
Dill Oil	AG0651 February 1998
Medicinal Herbs	AG0673 February 1998
Echinacea	AG0654 February 1998
Ginseng	AG0668 February 1998
Garlic Growing for Profit in Victoria	AG0355 September 1995

DPI Queensland, (1994), *A Recipe for Growing Persimmons*, Agrilink.

Graham, C and Hart, D (1997) *Prospects for the Australian Native Bushfoods Industry*, RIRDC Research paper No 97/22, RIRDC, Canberra

Grange Securities Ltd, (1999), *Inflation Indexed Bonds*

Hyde, K (1998) eds. *The New Rural Industries - A Handbook for Farmers and Investors*, RIRDC, Canberra.

Hassall & Associates (1995a) *ACD - EMU Feasibility Study*.

Hassall & Associates (1990a) *ACD - Financial Feasibility, APPM Forest Products*.

Karingal Consultants (1997) *A Review of the Australian Wildflower Industry*, RIRDC Research Paper No 97/64, RIRDC, Canberra

NSW Agriculture Agfacts

Mint growing H8.1.33

Persimmon Growing H3.1.17

NSW Agriculture Website

Notes on Dairy Goats

Angora Mohair Enterprise Gross Margin

Cashmere Enterprise Gross Margin

Meat Goat Enterprise Gross Margin

Phelps D. G. (1997) *Feasibility of a Sustainable Bush Food Industry in Western Queensland; A pre-feasibility study for the RIRDC*, RIRDC Research Paper Series No 97/37, RIRDC, Canberra

RIRDC (1997a). *Sustainable Economic Use of Native Australian Birds and Reptiles, A Summary Report*, Research Paper Series No. 97/26a

Stuart, R.D., Cowan, M. and Griffiths, H.D., (1995). *Emu Farming – An Industry Assessment* (revised), Department of Primary Industry and Fisheries, Tasmania.

Smetana, P. (1994). *Emu Farming – Background Information*. Department of Agriculture, Western Australia.

Tasmanian Department of Primary Industry and Fisheries (1995) *Emu Farming: An Industry Assessment*

The Land, (1999) *Farm Costs Guide*: Rural Press.

Tuckwell, C (1997) *Australian Deer Industry Manual - Part 1 Investment and Economics*, RIRDC Publication 97/71, RIRDC, Canberra

University of Florida Website

Dairy Goat Production Guide

University of Queensland Website

The Australian New Crops Newsletter Issue No. 8, July 1997.

The Australian New Crops Newsletter Issue No. 11, January 1999.

Ward, M.S., (1995). Thesis - An economic analysis of the Australian ostrich industry, Department of Agricultural Economics, University of Sydney.

Whitten, Greg, (1997). *Herbal harvest: commercial organic production of quality dried herbs*. Bloomings Books, Victoria.

Miscellaneous Websites

Australis Flowers Pty Ltd

West Wimmera Herb Growers

Yorke Regional Development Board

Appendix B: Persons Contacted

Wine Grapes	
Dr Phillip Taylor	PIRSA, Lenswood
Richard Hall	Richard Hall Engineering, Waikerie
Bill Mitchell	First National, Waikerie
Government Bonds	
Jonathon Rice	Grange Securities
Red Deer	
Lionel Campion	Key Stone Stud Blood, Yarragon
Merv Nicholas	Producer – Gippsland Victoria
Andrew Hansen	Producer – Central Tablelands, NSW
Bruce McKay	NSW Department of Agriculture, Orange
Charlie Gatt Romsey	Australian Deer Services
David Walker	Australian Deer Horn & Co
Alpaca	
Wendy Billington	Cedar House Alpaca Stud, Yass
Colin Langford	NSW Department of Agriculture, Goulburn
Dairy Goats	
Glenys Keays	Victorian Dairy Goat Association
Gail Abud	Dairy Goat Representative – VFF
Michael Rocca	Producer – Gunns Plains, Tasmania
Malcolm Barton	Producer – Wodonga, Victoria
Arthur Stubbs	DNRE, Victoria
Emu	
Anthony Phelps	Producer – NSW
Peter Thompson	Producer – QLD
Rob Evans	Producer - NSW
Peter O’Malley	Agriculture WA
Suzanne Robinson	NSW Agriculture
Fresh Culinary Herbs	
Clarrie Beckingham	NSW Agriculture
Peter Purbrick	Mediherb, Queensland
John Penninger	Producer – Northern NSW
David Hine	Producer – Kyogle, NSW
Jeff Lindstrom	Producer – Rochedale, Queensland
Robert Hayes	Producer – Leongatha South, Victoria
Jill Stone	Producer – Melrose Park, South Australia
Leigh James	NSW Agriculture
David Fuller	NSW Agriculture
Medical Herbs	
Peter Purbrick	Mediherb, Queensland
Kim Grant	Producer – Niangala, NSW
Robert Down	Producer – Wodonga, Victoria
Michael & Natalie Brouwer	Producers – Victoria
Lindsay Trapnell	DNRE, Victoria
Persimmon	
Ray Collins	University of Queensland, Gatton
Ben Jeffers	Sunshine Coast Tropical Fruits Association
Jeff Patterson	Sunshine Coast Tropical Fruits Association
Durian	
Alan Zappala	Zappala Tropicals, Babinda
Shoo Siah	Lambell’s Lagoon

Jojoba	
Kim & Judy Felton-Taylor	Producers – Goondiwindi, QLD
Bob Dunstone	Producer – Condobolin, NSW
Daniel Buster	Producer – Bourke, NSW
Peter Milthorpe	NSW Agriculture
Sesame	
Michael Shannon	Producer – Mid-North, Northern Territory
Malcolm Bennett	DPIF – Katherine
South African Proteaceae	
Grace Sedgley	Producer – WA
James Wood	Producer – WA
Dawn Lewis	Producer – WA
John Daykin	Producer – WA
Mark Heap	Agriculture WA
Gillie Brown	Agriculture WA
Tom & Joan Anthione	Producers – WA
Franz & Ann Vernig	Producers – WA
Peter Gartrell	Agriculture WA

TREASURY BONDS (STAGE 2 ONLY)

Stage Two (Cash Flow) Analysis																						
Crop Enterprise		Capital Intended Treasury Bonds																				
1. Decide on an appropriate unit of production (eg. hectare of growing area) - may be different from unit used in Stage One Analysis. Unit of production used: 1,000 dollars																						
2. Estimate all costs and revenues for this unit of production, on an annual cash flow basis.																						
3. Use the "physical parameters" worksheet if required.																						
4. All costs are negative values, and all revenues are positive values.																						
5. All costs and revenues are to be estimated in real terms, that is, with no allowance for inflation.																						
6. Decide on an appropriate analysis period that matches the expected life of the enterprise, if applicable, but not longer than 20 years.																						
7. For investment assets with useful lives less than the analysis period, estimate typical renewal costs under "investment".																						
8. Estimate the residual value of each investment asset at the end of the analysis period.																						
9. Decide on an appropriate real interest rate or required annual rate of return, and enter here: 8.5% pa																						
Physical Parameter Workspace																						
Units		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	
For \$1000		1000																				
CPI (%)		1.2	3.5	3	3.5	2.5	2.8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Indexed Value		101.2	1047.63	1078.843	1109.81	1123.46	1161.795	1180.84	1220.613	1251.137	1282.405	1314.465	1347.327	1381.01	1415.526	1450.923	1487.196	1524.378	1562.488	1601.549	1641.587	
Coupon Rate (k%)		8.00	percent																			
Yield per annum		41.0873	42.5253	42.99101	44.896	46.8184	47.1899	48.34912	49.55882	50.79574	52.06184	53.34726	54.73146	56.069	57.47072	58.90749	60.38019	61.89969	63.42692	65.02284	66.64842	
Total Income		8163.98	8378.79	8570.151	8734.41	8902.77	9075.334	9252.218	9432.523	9616.361	9803.845	10005.092	10205.219	10410.349	10620.609	10835.123	11057.026	11283.452	11515.538	11753.427	11997.262	
Investment Inputs		Units	Number	Price	Cost	Useful Life																
Consultancy			1	\$750	750	20																
20 year bonds			150	\$1,000.00	150,000	20																
Other					0																	
Recurrent Inputs		Units	Amount	Price/Unit	Cost																	
Fm Review			52	\$2.00	104																	
Yearly Consult			1	\$100	100																	
Other					0																	
Demand/Revenues		Crop	Crop Unit	Unit Yield	Farmgate Price	Income																
Primary crop				as per inflation		0																
By-product #1						0																
By-product #2						0																
CASH FLOW ANALYSIS																						
for enterprise of 1,000																						
Total		Present Value @ 8%	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Investment Inputs																						
Consultancy		-\$750	-\$704	-\$750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Year Indexed bond		-\$150,000	-\$140,045	-\$150,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other		\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Working capital		-\$104	-\$102	-\$184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL:		-\$150,844	-\$141,731																			
Recurrent Inputs																						
Fm Review		\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yearly Consult		-\$1,000	-\$1,031	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94	-\$94
Other		\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL:		-\$1,072	-\$1,137																			

Revenues																						
Primary crop	\$199,624	\$83,524	8,163	8,379	8,578	8,734	8,883	7,075	7,252	7,434	7,619	7,810	8,024	8,255	8,410	8,521	8,636	8,857	9,283	9,516	9,753	9,997
By-product #1	\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
By-product #2	\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL	\$199,624	\$83,524																				
Residual Values																						
Mature Bonds	\$246,238	\$88,082	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	246,238	28
Buildings	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
Other	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Working capital	\$194	\$55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	184	
SUB-TOTAL	\$246,432	\$88,937																				
NET CASH FLOW	\$251,240	\$8,598	-144,874	6,106	6,377	6,541	6,788	8,882	7,099	7,240	7,426	7,619	7,811	8,012	8,217	8,427	8,643	8,863	9,090	9,322	9,560	258,235
FINANCIAL ANALYSIS RESULTS																						
Cash Flow Analysis:																						
Net Present Value @ 5.5%	\$8,598																					
Internal Rate of Return	7.8%																					
Benefit Cost Ratio @ 5.5%	1.13																					
Sensitivity Analysis:																						
Net Present Value with																						
> discount rate of 4.5% pa	\$55,138																					
> discount rate of 6.5% pa	-\$22,037																					
Internal Rate of Return with																						
> yield / prices decreased by 10%	7.0%																					
> investment expenditure increased by 10%	8.3%																					
> seasonal inputs increased by 10%	7.0%																					
Threshold Analysis:																						
Net Present Value equals ZERO with																						
> yield / prices decreased by 11.5%																						
> investment expenditure increased by 4.8%																						
> seasonal inputs increased by 449.8%																						
Breakdown Analysis:																						
The Enterprise breaks even on a cumulative discounted basis in Year 20																						

RED DEER

Stage One (Static) Analysis									
Livestock Enterprise		Red Deer, Velvet & Venison							
1 Decide on an appropriate unit of production (eg. dry sheep equivalent; head; etc.).									
Unit of production used:		Breeding female							
2 For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.									
Investment Input									
1 Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.									
Reasonable size of enterprise:		50			Year 7				
2 For the reasonably sized enterprise, estimate the first-time cost of all investment items.									
Use extra lines if necessary for other or multiple items; for instance, different items of machinery.									
3 Then estimate the expected useful life of each in years.									
4 Calculate the approximate annualised cost of each, using the embedded formulae.									
5 Note the information source of each line item, and estimate its confidence limits.									
6 Total both the cost and annualised cost columns using the embedded formulae.									
Assumed real interest rate:		7% pa							
		Units	Number	Price	Cost	Useful Life (yrs)	Annualised Cost	Source	Confidence limits(%)
					0		0		
Land	\$/ha	22	\$ 4,500	99,000	20	9,345	H&A	-/+10	
Fences	metres	3,900	\$ 4.05	15,795	20	1,491	H&A	-/+15	
Deer Yards		1	\$ 3,500	3,500	20	330	H&A	-/+15	
Stock Crush	(Optional)	1	\$ 4,000	4,000	20	378	H&A	-/+5	
Stock Shelter	shade house & tree establishment	1	\$ 1,000	1,000	5	244	H&A	-/+10	
Stock	Stags	1	\$ 2,000	2,000	10	285	H&A	-/+5	
	Breeding Hinds	50	\$ 400	20,000	10	2,848	H&A	-/+5	
Pasture Est.	ha	22	\$ 78	1,716	7	318	H&A	-/+25	
Velvetting Equipment		1	\$ 20	20	5	5	H&A	-/+5	
Velvetting Accreditation		1	\$ 200	200	20	19	H&A	-/+5	
Water troughs		3	\$ 500	1,500	20	142	H&A	-/+15	
Machinery	motorbike	1	\$ 5,890	5,890	6	1,236	H&A	-/+10	
	trailer	1	\$ 400	400	8	67	H&A	-/+10	
Working capital	Years	6	\$ 5,901	35,408	7%	2,479	based on interest rate		
TOTAL:				\$190,429		\$19,185			
7 Calculate the total investment cost and total annualised capital cost per production unit using the embedded formulae.									
Total investment cost per unit:		\$ 3,809			per Breeding female				
Total annualised investment cost per unit:		\$ 384			per Breeding female				
Recurrent Inputs									
1 For the selected unit of production (eg. hectare of growing area), estimate all input costs.									
Use extra lines if necessary for other or multiple items; for instance, different chemicals.									
2 Note the information source of each line item, and estimate its confidence limits.									
3 Total the cost column using the embedded formula.									
		Costs calculated per: Breeding female							
		Units	No.	Price	Cost	Source	Confidence limits(%)		
Chemicals	Cydectin	3	\$ 1.05	3.11		H&A	+/-10%		
	Panicure	3	\$ 0.85	2.55		H&A	-/+15		
	5 in 1	3	\$ 0.60	1.80		H&A	-/+10		
Supplementary Feed	days	150	\$ 0.25	37.50		H&A	-/+25		
Pasture Improvement	per ha	0.14	\$ 48	6.72		H&A	-/+25		
Velvetting	per stag (inc. anaesthetic)	1.32	\$ 5.50	7.26		H&A	-/+25		
Vet Costs	general allowance	0.02	\$ 1,000.00	20.00		H&A	-/+25		
Transport	per animal sold	0.88	\$ 12.00	10.56		H&A	-/+25		
Maintenance	general	0.02	\$ 1,000	20.00		H&A	-/+25		
Slaughter Levy	c/kg	30.72	\$ 0.18	5.53		H&A	-/+0		
Memberships	DIAA	0.02	\$ 150.00	3.00		H&A	-/+25		
TOTAL:				\$118.03	per	Breeding female			

Yield									
1 For the selected unit of production, estimate the anticipated yield for the primary product.									
2 For the selected unit of production, estimate the anticipated yield for all by-products.									
Use extra lines if necessary for multiple by-products; for instance stubble, husk, degrade product.									
Demand/Revenues									
1 For the selected unit of production, estimate the anticipated farmgate price for the primary crop.									
2 For the selected unit of production, estimate the anticipated farmgate prices for all by-products.									
Yields estimated per: Breeding female									
Prices estimated per: Product Unit									
		Product	Unit	Yield	Farmgate Price	Income	Source	Confidence limits(%)	
Primary product		velvet	kg	4.22	\$ 95.00	401	H&A	-/+25	
By-product #1		venison	kg	30.72	\$ 3.00	92	H&A	-/+25	
By-product#2		cull stock	head	0.30	\$ 120.00	36	H&A	-/+20	
TOTAL:						\$529	per	Breeding female	
For a typical year or season of production, once the enterprise has been established:									
		Revenue		529		per	Breeding female		
	Less	Recurrent Inputs		-118		per	Breeding female		
	=	Gross Margin		\$ 411		per	Breeding female		
				=	348.6%	return on recurrent inputs only			
	Less	Investment Input	annualise	-364		per	Breeding female		
	=	Net Margin		\$ 31		per	Breeding female		
				=	6.2%	return on investment & recurrent inputs			
Sensitivity Analysis:									
Gross Margin = 0 when:		Revenue is reduced by				78%		Not sensitive	
		Recurrent Inputs are increased by				349%		Not sensitive	
Net Margin = 0 when:		Revenue is reduced by				6%		Very sensitive	
		Recurrent Inputs are increased by				26%		Not sensitive	
		Investment Input is increased by				8%		Very sensitive	
Demand Sensitivity:									
					Y / N			Recommendation	
		Is there an established market for the product?			y			(Good - go to next question)	
		Is this market readily accessible?			y			(Good - go to next question)	
		Will the produce volume upset market stability?			n			(Good - go to next question)	
		Will the produce volume affect market price?			n			(Good - go to next question)	
		Is the market likely to strengthen with time?			y			(Good - robust solution)	
		Are new markets likely to emerge with time?			y			Investigate development of these markets	
Sources: H&A-Hassall & Associates									

Stage Two (Cash Flow) Analysis

Livestock Enterprise

Red Deer, Velvet & Venison

1. Decide on an appropriate unit of production (eg. dry sheep equivalent, etc.) - may be different from unit used in Stage One Analysis.
Unit of production used: **50 head**
2. Estimate all costs and revenues for the unit of production, on an annual cash flow basis.
3. Use the "physical parameters" workspace if required.
4. All costs are negative values, and all revenues are positive values.
5. All costs and revenues are to be estimated in real terms, that is, with no allowance for inflation.
6. Decide on an appropriate analysis period that matches the expected life of the enterprise, if applicable, but not longer than 20 years.
7. For capital assets with useful lives less than the analysis period, estimate cyclical renewal costs under "capital".
8. Estimate the residual value of each capital asset at the end of the analysis period.
9. Decide on an appropriate real interest rate or required annual rate of return, and enter here: **7% pa**

Physical Parameter Workspace:

	Units	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Herd Size																					
Breeding Females	head	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Velvet Stags		22	44	66	88	110	132	154	176	198	220	242	264	286	308	330	352	374	396	418	440
Young Hinds		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Young Stags		22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Enterprise size		94	138	138	160	180	180	180	200	200	180	180	180	180	180	180	180	180	180	180	180
Stock Sold																					
Breeding Females	ewe	0	0	0	0	10	10	10	10	5	5	5	5	5	5	10	10	10	10	5	5
Velvet Stags		0	0	0	0	0	0	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Young Hinds		0	22	22	22	12	12	12	12	17	17	17	17	17	17	12	12	12	12	17	17
Young Stags		0	0	0	22	22	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Total Stock Sold		0	22	22	22	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
Velvet produced																					
per head as stag matures	kg	0	1	2.1	2.5	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
total as flock develops		0	22	66.2	128.2	145.2	158.4	167.44	201.96	211.2	211.2	211.2	211.2	211.2	211.2	211.2	211.2	211.2	211.2	211.2	211.2

Investment Input

	Units	Number	Price	Cost	Useful Life
Land	ha	22	\$ 4,500	99,000	20
Fences	meters	3,900	\$4.05	15,795	20
Deer yards (climbing eqn)		1	\$3,500	3,500	20
Stock Churn (cateral)		1	\$4,000	4,000	20
Shed	sheds house & pens	1	\$1,000	1,000	5
Stock	ewe (tag)	1	\$ 2,000	2,000	10
	Breeding Hinds	50	\$ 400	20,000	10
Pasture Establishment	ha	22	\$ 78	1,716	7
Velvet Accreditation		1	\$ 200	200	20
Velvet equipment		1	\$ 20	20	5
Water trough		3	\$500	1,500	20
Motorbike (4x4)		1	\$5,000	5,000	5
Trailer		1	\$400	400	10

Recurrent Inputs

	Units	Number	Price	Cost
Chemicals	Cyberin	1	\$ 1.05	1.05
	Paracet	1	\$ 0.85	0.85
	S & I	1	\$ 0.80	0.80
Supplementary Feed	kg	150	\$ 0.25	37.50
Pasture Improvement	per ha	7	\$ 45	315
Velveting	(inc. anaesthetic)	1	\$ 5.50	5.50
Transport		1	\$ 12.00	12.00
Maintenance	general	1	\$ 500	500
Slaughter fee	o/kg	1	\$ 0.18	0.18 per head slaughtered
Memberships	DMK	1	\$ 150	150
Slaughter weight	kg			
Hinds	48			
Stags	60			

ALPACA

Stage One (Static) Analysis								
Livestock Enterprise		Alpaca - Progeny & Fibre						
1 Decide on an appropriate unit of production (eg. dry sheep equivalent, head, etc.).								
Unit of production used:		breeding female						
2 For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.								
Investment Input								
1 Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.								
Reasonable size of enterprise:		50 breeding females		Year 11				
2 For the reasonably sized enterprise, estimate the first-time cost of all investment items.								
Use extra lines if necessary for other or multiple items; for instance, different items of machinery.								
3 Then estimate the expected useful life of each in years.								
4 Calculate the approximate annualised cost of each, using the embedded formulae.								
5 Note the information source of each line item, and estimate its confidence limits.								
6 Total both the cost and annualised cost columns using the embedded formulae.								
Assumed real interest rate:		7% pa						
	Units	Number	Price	Cost	Useful Life (yrs)	Annualised Cost	Source	Confidence limits(%)
Field Investigations/Consultation	0	3	\$ 500	1,500	20	142	H&A	-/+25
Land	hectares	82	\$ 1,500	123,000	20	11,610	H&A	-/+10
Fences	metres	6,258	\$ 5	31,290	20	2,954	H&A	-/+15
Buildings	yard and shed	1	\$ 20,000	20,000	20	1,898	H&A	-/+15
Stock-sires	head	2	\$ 45,000	90,000	10	12,814	H&A	-/+5
Stock-breeding females	head	50	\$ 12,000	600,000	20	56,636	H&A	-/+5
Machinery-trailer		1	\$ 5,000	5,000	10	712	H&A	-/+15
Shearing Equipment		1	\$ 500	500	15	55	H&A	-/+5
Information Seminars		1	\$ 1,000	1,000	20	94	H&A	-/+5
Pasture Establishment	hectares	82	\$ 148	12,136	7	2,252	H&A	-/+10
Working capital	Years	2	\$ 26,815	53,630	7%	3,754	based on interest rate	
TOTAL:				\$938,056		\$92,910		
7 Calculate the total investment cost and total annualised capital cost per production unit using the embedded formulae.								
Total investment cost per unit:				\$ 18,761	per breeding female			
Total annualised investment cost per unit:				\$ 1,858	per breeding female			
Recurrent Inputs								
1 For the selected unit of production (eg. hectare of growing area), estimate all input costs.								
Use extra lines if necessary for other or multiple items; for instance, different chemicals.								
2 Note the information source of each line item, and estimate its confidence limits.								
3 Total the cost column using the embedded formula.								
	Units	Number	Price	Cost	Source	Confidence limits(%)		
Chemicals-Drench	per head			0.30	H&A	-/+15		
Chemicals-vaccination	per head	2	\$0.50	1.00	H&A	-/+15		
Vet	per head			100.00	H&A	-/+15		
AAA membership	per head			4.00	H&A	-/+15		
Pasture maintenance	per head	10	\$ 1.50	15.00	H&A	-/+20		
Annual Shearing costs	per head			10.00	H&A	-/+15		
Maintenance & overheads	per head			246.00	H&A	-/+15		
Marketing	per head			160.00	H&A	-/+15		
TOTAL:				\$536.30	per	breeding female		

Yield							
1 For the selected unit of production, estimate the anticipated yield for the primary product.							
2 For the selected unit of production, estimate the anticipated yield for all by-products. Use extra lines if necessary for multiple by-products; for instance stubble, husk, degrade product.							
Demand/Revenues							
1 For the selected unit of production, estimate the anticipated farmgate price for the primary crop.							
2 For the selected unit of production, estimate the anticipated farmgate prices for all by-products.							
				Yields estimated per breeding female			
				Prices estimated per Product Unit			
	Product	Product Unit	Unit Yield*	Farmgate Price	Income	Source	Confidence limits(%)
Primary product	Fibre	kg	8.88	\$ 25.00	222	Co-op	+/-10
By-product #1	Male Progeny	head	0.00	\$ 5,000	0	H&A	+/-15
	High Qual Male	head	0.08	\$14,000	1,120	H&A	+/-15
	Highest Qual Male	head	0.02	\$25,000	500	H&A	+/-15
By-product #2	Female Progeny	head	0.34	\$ 7,000	2,380	H&A	+/-15
TOTAL:					\$4,222	per	breeding female
<small>*Unit yields for the whole herd are calculated and reported on a per breeding female basis</small>							
Static Analysis Summary:							
For a typical year or season of production, once the enterprise has been established:							
	Revenue		4,222		per breeding female		
	Less Recurrent Inputs		-536		per breeding female		
	= Gross Margin		\$ 3,686		per breeding female		
			= 88.7%		return on recurrent inputs only		
	Less Investment Input annualised		-1,858		per breeding female		
	= Net Margin		\$ 1,834		per breeding female		Very Favourable Outcome
			= 76.6%		return on investment & recurrent inputs		
Sensitivity Analysis:							
Gross Margin = 0 when:		Revenue	is reduced by	87%		Not sensitive	
		Recurrent Inputs	are increased by	687%		Not sensitive	
Net Margin = 0 when:		Revenue	is reduced by	43%		Not sensitive	
		Recurrent Inputs	are increased by	342%		Not sensitive	
		Investment Input	is increased by	99%		Not sensitive	
Demand Sensitivity:				Y / N	Recommendation		
Is there an established market for the product?				n	Investigate demand potential further		
Is this market readily accessible?				y	(Good - go to next question)		
Will the produce volume upset market stability?				y	Investigate market stability further		
Will the produce volume affect market price?				y	Check sensitivity to income (above)		
Is the market likely to strengthen with time?				y	(Good - robust solution)		
Are new markets likely to emerge with time?				n	Be sure of reliance on existing market		
Sources: H&A-Hassall & Associates, Co-op- Alpaca Fibre Coop							

Stage Two (Cash Flow) Analysis																					
Livestock Enterprise		Alpacas - Progeny & Fibre																			
Decide on an appropriate unit of production (eg. dry sheep equivalent, etc.) - may be different from unit used in Stage One Analysis																					
Unit of production used		50 breeding females																			
Use the "physical parameters" workspace if required.																					
All costs are negative values, and all revenues are positive values.																					
All costs and revenues are to be estimated in real terms, that is, with no allowance for inflation.																					
Decide on an appropriate analysis period that matches the expected life of the enterprise, if applicable, but not longer than 20 years.																					
For capital assets with useful lives less than the analysis period, estimate cyclical renewal costs under "capital".																					
Estimate the residual value of each capital asset at the end of the analysis period.																					
Decide on an appropriate real interest rate or required annual rate of return, and enter here: 7% pa																					
Physical Parameter Workspace:																					
Units	Number	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Hard Structure																					
Breeding Females	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Wethers	0	0	12	24	36	48	64	76	88	99	99	99	99	99	99	99	99	99	99	99	99
Male Progeny		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Female Progeny		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Total Enterprise size		50	62	94	108	119	130	140	156	170	170	170	170	170	170	170	170	170	170	170	170
*Progeny are calculated on an 80% weaning rate and on the basis of breeding females having 4 cubs in 3 years (11 months gestation period)																					
Stock sold																					
High quality Male Progeny (Sold as stud)		0	4	4	3	4	0	3	4	4	3	0	4	3	4	4	0	3	4	4	3
Higher quality Male Progeny (Sold as stud) 1 in 3 years					1		1		1		1		1		1		1		1		1
Male Progeny*		0	0	0	0	0	0	0	0	12	12	16	0	0	0	0	0	0	0	0	0
Female Progeny**		0	16	16	16	16	16	1	5	5	1	16	14	14	14	14	16	16	16	16	16
*from year 11, male progeny are used to replace cull wethers																					
**female progeny are used to replace culled breeding females thus in some years the number of females sold is less than produced.																					
Cull stock are not entered as stock sold since assumed value is \$0																					
Investment Input																					
Units	Number	Price	Cost	Useful Life (yrs)																	
Field Investigations/Consultation	3	\$ 500	1,500	20																	
Land	80	\$ 1,500	120,000	20																	
Fences	metres	0,258	\$ 20,580	20																	
Buildings	yards + shed	1	\$ 20,000	20																	
Stock - Sires	head	2	\$ 40,000	10																	
Stock - breeding females	head	50	\$ 12,000	20	Self replacing flock																
Machinery/trailer	1	\$ 5,000	5,000	10																	
Shearing Equipment	1	\$ 500	500	15																	
Information/Manuals	1	\$ 1,000	1,000	20																	
Pasture Establishment	hectares	80	\$ 148	12,196	7																
Recurrent Inputs																					
Units	Number	Price	Cost																		
Chemicals - drench	per head	170	\$ 0.39	51.0																	
Chemicals - vaccination	per head	170	\$ 1.00	170																	
Vet	p.a.	1	\$ 5,000	5,000																	
AAA Membership	p.a.	1	\$ 200	200																	
Pasture maintenance	hectares	10	\$ 75	750																	
Annual Shearing Costs	head	170	\$ 10	1,700																	
Maintenance	ha	80	\$ 150	12,000																	
Marketing costs	per annum	1	\$ 6,000	6,000																	
Demand/Revenues (in mature year 11)																					
Product	Product Unit	Unit Yield	Price	Income																	
Primary product	Fibre	kg	414	\$ 25.00	10,350																
By-product #1	Male Progeny	head	0	\$ 5,000	0																
	High Qual Male	head	4	\$ 14,000	56,000																
	Highest Qual Male	head	1	\$ 25,000	25,000																
By-product #2	Female progeny	head	17	\$ 7,000	119,000																

CASH FLOW ANALYSIS																						
for enterprise of 50																						
	Total	Present Value @ 7%	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Investment Inputs																						
Land	-\$125,000	-\$114,953	-\$125,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fences	-\$31,288	-\$29,343	-\$31,288	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Buildings	-\$20,000	-\$19,492	-\$20,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock-Sires	-\$180,000	-\$129,894	-\$80,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock-breeding females	-\$800,000	-\$593,748	-\$500,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moisture-trailer	-\$10,000	-\$7,315	-\$5,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shearing Equipment	-\$1,000	-\$949	-\$500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Information/seminars	-\$1,000	-\$938	-\$1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pasture Establishment	-\$26,428	-\$22,904	-\$12,138	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Working capital	-\$18,987	-\$17,539	-\$15,138	-\$3,957	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL	-\$1,021,689	-\$802,808																				
Recurrent Inputs																						
Chemicals -drench	-\$811	-\$426	-78	-78	-78	-78	-78	-78	-44	-47	-81	-81	-81	-81	-81	-81	-81	-81	-81	-81	-81	-81
Chemis - vaccination	-\$2,504	-\$1,415	-83	-82	-84	-108	-118	-130	-148	-158	-170	-170	-170	-170	-170	-170	-170	-170	-170	-170	-170	-170
Vet	-\$200,408	-\$141,548	-1,880	-8,288	-8,490	-10,000	-11,000	-13,000	-14,880	-16,800	-17,880	-17,880	-17,880	-17,880	-17,880	-17,880	-17,880	-17,880	-17,880	-17,880	-17,880	-17,880
AAA Memberships	-\$4,000	-\$2,119	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200
Pasture-maintenance	-\$18,000	-\$17,945	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750
Annual Shearing Costs	-\$23,168	-\$11,893	-820	-508	-820	-740	-960	-960	-1,140	-1,380	-1,380	-1,380	-1,380	-1,380	-1,380	-1,380	-1,380	-1,380	-1,380	-1,380	-1,380	-1,380
Maintenance	-\$128,158	-\$54,163	-815	-1,225	-1,845	-2,460	-3,075	-3,690	-4,305	-4,920	-5,535	-6,150	-6,765	-7,380	-7,995	-8,610	-9,225	-9,840	-10,455	-11,070	-11,685	-12,300
Marketing	-\$180,000	-\$84,752	-8,880	-8,000	-8,880	-9,000	-9,000	-9,000	-8,880	-8,880	-8,880	-8,880	-8,880	-8,880	-8,880	-8,880	-8,880	-8,880	-8,880	-8,880	-8,880	-8,880
TOTAL	-\$627,511	-\$323,489																				
Revenue																						
Fibre	\$119,708	\$82,976	3,750	3,750	4,950	5,550	6,458	7,366	8,550	9,460	10,350	10,350	10,350	10,350	10,350	10,350	10,350	10,350	10,350	10,350	10,350	10,350
High-Qual Male Property	\$912,000	\$417,894	-	\$5,800	\$5,800	42,000	\$8,000	-	42,000	\$6,000	\$6,000	42,000	-	\$6,000	\$6,000	\$6,000	\$6,000	-	42,000	\$6,000	\$6,000	42,000
High-Qual Male Prop	\$150,000	\$72,000	-	-	-	25,000	-	-	25,000	-	-	25,000	-	25,000	-	25,000	-	25,000	-	25,000	-	25,000
Male Property	\$108,000	\$103,890	-	-	-	-	-	-	-	-	60,000	\$8,880	\$8,880	-	-	-	-	-	-	-	-	-
Female Property	\$1,708,000	\$853,954	-	112,800	152,000	112,000	112,000	112,000	7,900	35,000	35,000	7,200	112,000	98,000	89,800	88,000	89,000	112,000	112,000	112,000	112,000	112,000
SUB-TOTAL	\$3,048,708	\$1,530,288																				
Residual Values																						
Land	\$110,708	\$28,907	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110,708
Buildings	\$2,000	\$917	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,000
Stock	\$34,000	\$6,708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34,000
Working capital	-\$18,987	-\$9,339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18,987
TOTAL	\$127,713	\$33,994																				
NET CASH FLOW:	\$1,527,218	\$357,235	-\$68,439	148,667	151,713	181,680	149,812	92,961	83,883	57,170	128,284	20,648	188,034	129,419	136,804	128,188	114,838	84,850	151,344	139,720	138,114	277,212
FINANCIAL ANALYSIS RESULTS																						
Cash Flow Analysis:																						
Net Present Value @ 7%		\$357,235	Very Favourable Outcome																			
Internal Rate of Return		12.2%	Very Favourable Outcome																			
Benefit Cost Ratio @ 7%		1.38	Favourable Outcome																			
Sensitivity Analysis:																						
Net Present Value with																						
= discount rate of	5% pa	\$578,260	Sensitive																			
= discount rate of	9% pa	\$188,917	Not sensitive																			
Internal Rate of Return with																						
= yield / prices decreased by	10%	10.8%	Sensitive																			
= capital expenditure increased by	10%	10.8%	Sensitive																			
= seasonal inputs increased by	10%	11.8%	Sensitive																			
Threshold Analysis:																						
Net Present Value equals ZERO with																						
= yield / prices decreased by		23.3%	Outcome not sensitive to yield / price assumptions																			
= capital expenditure increased by		33.8%	Outcome not sensitive to investment expenditure assumptions																			
= seasonal inputs increased by		117.7%	Outcome not sensitive to seasonal input assumptions																			
Break-even Analysis:																						
The Enterprise breaks even on a cumulative discounted basis in Year 13																						

DAIRY GOATS

Stage One (Static) Analysis

Livestock Enterprise Dairy Goats Tasmania

- 1 Decide on an appropriate unit of production (eg. dry sheep equivalent; head; etc.).
Unit of production used: milking doe
- 2 For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.

Investment Input

- 1 Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.
Reasonable size of enterp 200 milking does Year 10
- 2 For the reasonably sized enterprise, estimate the 668 litres of milk per doe per annum
Use extra lines if necessary for other or multiple items; for instance, different items of machinery.
- 3 Then estimate the expected useful life of each in years.
- 4 Calculate the approximate annualised cost of each, using the embedded formulae.
- 5 Note the information source of each line item, and estimate its confidence limits.
- 6 Total both the cost and annualised cost columns using the embedded formulae.
Assumed real interest rate 7% pa

	Units	Number	Price	Cost	Useful Life (yrs)	Annualised Cost	Source	Confidence limits
Field Investigations		1	\$ 250	250	20	24	H&A	+/-20%
Land	hectares	10	\$ 2,500	25,000	100	1,752	H&A	+/-35%
Buildings	Shed/Dairy	1	\$ 30,000	30,000	30	2,418	H&A	+/-35%
Stock	Does	200	\$ 130	26,000	20	2,454	H&A	+/-35%
	Bucks	8	\$ 300	2,400	20	227	H&A	+/-35%
Machinery	bath/troughs	1	\$ 40,000	40,000	15	4,392	H&A	+/-35%
Establishment	fences/equip	1	\$ 10,000	10,000	10	1,424	H&A	+/-35%
Processing				0		0		
Distribution				0		0		H&A=Hassall & Associates data
Markets				0		0		
Permits, etc.				25	20	2	MB	+/-35%
Other				0		0		
Working capi	Season	1	\$ 44,220	44,220	7%	3,095		based on interest rate
TOTAL:				\$177,895		\$15,787		

- 7 Calculate the total investment cost and total annualised capital cost per production unit using the embedded formulae.
Total investment cost per unit: \$ 889 per milking doe
Total annualised investment cost per \$ 79 per milking doe

Recurrent Inputs

- 1 For the selected unit of production (eg. hectare of growing area), estimate all input costs.
Use extra lines if necessary for other or multiple items; for instance, different chemicals.
- 2 Note the information source of each line item, and estimate its confidence limits.
- 3 Total the cost column using the embedded formula.

	Units	Number	Price	Cost		Source	Confidence limits
Costs calculated per: milking doe							
Raising doe kids				0.00			
Health	per doe	1	\$ 12.50	12.50		H&A	+/-35%
Feed	per doe	1	\$ 80	80.00		RIRDC	+/-35%
Grazing	per doe	1	\$ 27.50	27.50	tractor/plant/fert	H&A	+/-35%
Water	per doe	1	\$ 5.00	5.00		H&A	+/-35%
Dairy costs	per doe	1	\$ 21.50	21.50		H&A	+/-35%
Stock cartage	per doe	1	\$ 0.68	0.68		H&A	+/-35%
Maintenance	per doe	1	\$ 0.42	0.42		H&A	+/-35%
Wages	casual	1	\$ 40.00	40.00		H&A	+/-35%
Permits, etc.	unpaid labour	1	\$ -	0.00		DPIF	+/-35%
Other - insur:	per doe	1	\$ 33.50	33.50	herd recording/rates	H&A	+/-35%
TOTAL:				\$221	per milking doe		

Yield

- 1 For the selected unit of production, estimate the anticipated yield for the primary product.
- 2 For the selected unit of production, estimate the anticipated yield for all by-products.
Use extra lines if necessary for multiple by-products; for instance stubble, husk, degrade product.

Demand/Revenues

- 1 For the selected unit of production, estimate the anticipated farmgate price for the primary crop.
- 2 For the selected unit of production, estimate the anticipated farmgate prices for all by-products.

			Yields estimated per: milking doe					
			Prices estimated per: Product Unit					
		Product	Unit	Unit Yield	Price	Income	Source	Confidence limits
Milk	Unit	does litres		600	\$ 0.70	420	H&A	+/-35%
TOTAL:						\$420	per milking doe	

Static Analysis Summary:

For a typical year or season of production, once the enterprise has been established:

Revenue	420	per milking doe	
Less Recurrent Inputs	-221	per milking doe	
= Gross Margin	<u>\$ 199</u>	per milking doe	
	= 90.0%	return on recurrent inputs only	
Less Investment I annualise	-79	per milking doe	
= Net Margin	<u><u>\$ 121</u></u>	per milking doe	Very Favourable Outcome
	= 40.3%	return on investment & recurrent inputs	

Sensitivity Analysis:

Gross Margin = 0 when:	Revenue is reduced by	47%	Not sensitive
	Recurrent Inputs are increased by	90%	Not sensitive
Net Margin = 0 when:	Revenue is reduced by	29%	Not sensitive
	Recurrent Inputs are increased by	55%	Not sensitive
	Investment Input is increased by	153%	Not sensitive

Demand Sensitivity:

	<u>Y / N</u>	<u>Recommendation</u>
Is there an established market for the product?	y	(Good - go to next question)
Is this market readily accessible?	y	(Good - go to next question)
Will the produce volume upset market stability?	y	Investigate market stability further
Will the produce volume affect market price?	y	Check sensitivity to income (above)
Is the market likely to strengthen with time?	y	(Good - robust solution)
Are new markets likely to emerge with time?	y	Investigate development of these markets

Stage Two (Cash Flow) Analysis

Livestock Enterprise Dairy Goals Tasmania

Decide on an appropriate unit of production (eg. dry sheep equivalent, etc.) - may be different from unit used in Stage One Analysis.

Unit of production used: 200 milking does

Estimate all costs and revenues for this unit of production, on an annual cash flow basis.

Use the "physical parameters" workspace if required.

All costs are negative values, and all revenues are positive values.

All costs and revenues are to be estimated in real terms, that is, with no allowance for inflation.

Decide on an appropriate analysis period that matches the expected life of the enterprise, if applicable, but not longer than 20.

For capital assets with useful lives less than the analysis period, estimate cyclical renewal costs under.

Estimate the residual value of each capital asset at the end of the analysis period.

Decide on an appropriate real interest rate or required annual rate of return, and 7% pa

Physical Parameter Workspace:

	Units	Number	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Does	ha	10	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
ewe weaners			0	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70

Investment Input

	Units	Number	Life in years
Field investigations		1	250
Land	hectares	10	2,500
Buildings	Sheds/Dairy	1	33,000
Stock	Does	200	130
	Bulls	6	300
Machinery	Wheeled tractor	1	48,000
Establishment	fences etc	1	18,000
Permits			25

Recurrent inputs

Raising ewe kids	per doe		\$ -
Health	per doe	1	12.50
Feed	per doe	1	88.00
Grazing	per doe	1	27.50
Water	per doe	1	5.00
Dairy costs	per doe	1	21.50
Stock cullage	per doe	1	8.68
Maintenance	per doe	1	8.42
Wages	casual	1	48.00
Permits, etc	input/labour	1	-
Other - insurance/undry		1	33.50

Revenue

Wool	lbs	600 per lactation	\$/lbs	\$ 0.70
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CASH FLOW ANALYSIS

for enterprise of 200

	Total	Present Value @ 7%	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Investment Inputs																						
Field investigation	-\$250	-\$234	-\$ 250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land	-\$25,000	-\$23,364	-\$25,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Buildings	-\$30,000	-\$28,037	-\$30,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock	-\$28,400	-\$26,542	-\$28,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Machinery	-\$80,000	-\$69,933	-\$40,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Establishment	-\$20,000	-\$14,097	-\$10,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Processing	\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution	\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Markets	\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Permits, etc.	-\$25	-\$23	-\$ 25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Working capital	-\$44,220	-\$41,327	-\$44,220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	-\$27,886	-\$184,557																				

Recurrent Inputs																					
Raising doe kids	\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Health	-\$60,000	-\$36,495	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	
Feed	-\$330,000	-\$169,504	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	-16,000	
Grading	-\$110,000	-\$58,267	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	-5,500	
Water	-\$20,000	-\$10,594	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	
Dairy costs	-\$86,000	-\$45,554	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	-4,300	
Stock cartage	-\$2,720	-\$1,441	-136	-136	-136	-136	-136	-136	-136	-136	-136	-136	-136	-136	-136	-136	-136	-136	-136	-136	
Maintenance	-\$1,680	-\$850	-84	-84	-84	-84	-84	-84	-84	-84	-84	-84	-84	-84	-84	-84	-84	-84	-84	-84	
Wages	-\$160,000	-\$84,752	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000	
Permits, etc.	\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other - insurance/cost	-\$134,000	-\$70,960	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	-6,700	
TOTAL	-\$884,400	-\$468,467																			
Revenue																					
Milk	\$1,680,000	\$889,897	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	84,000	
SUB-TOTAL	\$1,680,000	\$889,897																			
Residual Values																					
Field Investigation	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	Life
Land	\$25,000	\$6,480	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25,000	100
Buildings	\$7,500	\$1,938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,500	25
Stock	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20
Machinery	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20
Establishment	\$6,000	\$1,551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000	15
Processing	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	10
Distribution	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Markets	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20
Permits, etc.	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Other	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Working capital	\$44,220	\$11,427	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44,220	
TOTAL	\$82,720	\$21,376																			
NET CASH FLOW:	\$660,425	\$258,249	-138,115	39,780	122,500																
FINANCIAL ANALYSIS RESULTS																					
Cash Flow Analysis:																					
Net Present Value 7%	\$258,249																				
Internal Rate of Return	26.3%																				
Benefit Cost Ratio 7%	1.41																				
Sensitivity Analysis:																					
Net Present Value with																					
> discount rate of 5% pa	\$333,328																				
> discount rate of 9% pa	\$200,737																				
Internal Rate of Return with																					
> yield / prices decreased 10%	20.6%																				
> investment expenditure increased 10%	24.9%																				
> recurrent inputs increased 10%	24.2%																				
Threshold Analysis:																					
Net Present Value equals ZERO with																					
> yield / prices decreased by	29.0%																				
> investment expenditure increased by	139.9%																				
> recurrent inputs increased by	55.1%																				
Breakeven Analysis:																					
The Enterprise breaks even on a cumulative discounted basis in Year 5																					

EMU

Stage One (Static) Analysis									
Livestock Enterprise		Emus for meat, hides, oil and skins							
1 Decide on an appropriate unit of production (eg. dry sheep equivalent; head, etc.).									
Unit of production used:		breeding pair							
2 For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.									
Investment Input									
1 Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.									
Reasonable size of enterprise:		100 breeding pair							
2 For the reasonably sized enterprise, estimate the first-time cost of all investment items.									
Use extra lines if necessary for other or multiple items; for instance, different items of machinery.									
3 Then estimate the expected useful life of each in years.									
4 Calculate the approximate annualised cost of each, using the embedded formulae.									
5 Note the information source of each line item, and estimate its confidence limits.									
6 Total both the cost and annualised cost columns using the embedded formulae.									
Assumed real interest rate:		7% pa							
		Units	Number	Price	Cost	Useful Life (yrs)	Annualised Cost	Source	Confidence limits
Field Investigations			1	\$ 2,000	2,000	20	189	H&A	+/- 50%
Land	Farm		100	\$ 240	24,000	100	1,682	EFFA	+/- 20%
Buildings	Sheds		1	\$ 90,000	90,000	25	7,723	EFFA	+/- 20%
Stock	head		200	\$ 200	40,000	20	3,776	EFFA	+/- 20%
Machinery			1	\$ 40,000	40,000	10	5,695	EFFA	+/- 20%
Establishment	Paddocks		1	\$ 120,000	120,000	20	11,327	EFFA	+/- 20%
Processing					0		0		
Distribution					0		0	H&A=Hassall & Associates	
Markets					0		0	EFFA=Emu Farmers Federation of Australia	
Permits, etc.					0		0		
Other					0		0		
Working capital	Season		1	\$ 296,475	296,475	7%	20,753	based on interest rate	
TOTAL:					\$612,475		\$51,145		
7 Calculate the total investment cost and total annualised capital cost per production unit using the embedded formulae.									
Total investment cost per unit:		\$ 6,125 per breeding pair							
Total annualised investment cost per unit:		\$ 511 per breeding pair							
Recurrent Inputs									
1 For the selected unit of production (eg. hectare of growing area), estimate all input costs.									
Use extra lines if necessary for other or multiple items; for instance, different chemicals.									
2 Note the information source of each line item, and estimate its confidence limits.									
3 Total the cost column using the embedded formula.									
		Costs calculated per: breeding pair							
		Units	Number	Price	Cost			Source	Confidence limits
Stock					0				
Water					0				
Chemicals	doses		20	\$ 1.50	29			EFFA	+/- 20%
Feed	per head		20	\$ 40	780			EFFA	+/- 20%
Grazing					0				
Vet			2	\$ 1.00	2			EFFA	+/- 20%
Slaughtering	head		15	\$ 100	1,545			EFFA	+/- 20%
Maintenance	annual		1	\$ 150	150			EFFA	+/- 20%
Wages			1	\$ 250	250			EFFA	+/- 20%
Permits, etc.			1	\$ 8.50	9	permit & EPA		EFFA	+/- 20%
Other	power, phone		1	\$ 200	200			EFFA	+/- 20%
TOTAL:					\$2,965	per		breeding pair	

Yield							
1 For the selected unit of production, estimate the anticipated yield for the primary product.							
2 For the selected unit of production, estimate the anticipated yield for all by-products.							
Use extra lines if necessary for multiple by-products; for instance stubble, husk, degrade product.							
Demand/Revenues							
1 For the selected unit of production, estimate the anticipated farmgate price for the primary crop.							
2 For the selected unit of production, estimate the anticipated farmgate prices for all by-products.							
Yields estimated per: breeding pair							
Prices estimated per: Product Unit							
	Unit	Product Unit	Unit Yield (kg)	Farmgate Price	Income	Source	Confidence limits
oil	kg per bird	7.2	111	\$ 20	2,225	RIRDC	+/- 20%
meat	kg per bird	9	139	\$ 15	2,086	EFFA	+/- 20%
leg skins	per bird	2	31	\$ 5	155	EFFA	+/- 20%
hides	sq m per bird	0.6	9	\$ 40	371	EFFA	+/- 20%
trim	kg per bird	2.0	31	\$ 3	93	WA A	+/- 20%
adults	head		0	\$ -	0	EFFA	+/- 20%
TOTAL:					\$4,929	per	breeding pair
Static Analysis Summary:							
For a typical year or season of production, once the enterprise has been established:							
	Revenue		4,929		per breeding pair		
	Less Recurrent Inputs		-2,965		per breeding pair		
	= Gross Margin		\$ 1,964		per breeding pair		
		=	66.2%		return on recurrent inputs only		
	Less Investment Inp annualise		-511		per breeding pair		
	= Net Margin		\$ 1,453		per breeding pair		Very Favourable Outcome
		=	41.8%		return on investment & recurrent inputs		
Sensitivity Analysis:							
Gross Margin = 0 when:		Revenue is reduced by		40%			
		Recurrent Inputs are increased by		66%			
Net Margin = 0 when:		Revenue is reduced by		29%			
		Recurrent Inputs are increased by		49%			
		Investment Input is increased by		284%			
Demand Sensitivity:							
				Y / N		Recommendation	
	Is there an established market for the product?			y		(Good - go to next question)	
	Is this market readily accessible?			n		Investigate market access further	
	Will the produce volume upset market stability?			n		(Good - go to next question)	
	Will the produce volume affect market price?			n		(Good - go to next question)	
	Is the market likely to strengthen with time?			y		Investigate access to existing market further	
	Are new markets likely to emerge with time?			y		Investigate development of these markets	

Stage Two (Cash Flow) Analysis

Livestock Enterprise Errors for meat, hides, or odd skins

1. Decide on an appropriate unit of production (eg. dry sheep equivalent, etc.) - may be different from unit used in Stage One Analysis.
2. Unit of production used: **100 liveborn pigs**
3. Estimate all costs and revenues for this unit of production, on an annual cash flow basis.
4. Use the "physical parameters" worksheet if required.
5. All costs are negative values, and all revenues are positive values.
6. All costs and revenues are to be estimated in real terms, that is, with no allowance for inflation.
7. Decide on an appropriate analysis period that matches the expected life of the enterprise, if applicable, but not longer than 25 years.
8. For capital assets with useful lives less than the analysis period, estimate cyclical renewal costs under "capital".
9. Estimate the residual value of each capital asset at the end of the analysis period.
10. Decide on an appropriate real interest rate or required annual rate of return, and enter here: **7% pa**

Physical Parameter Worksheet:

		Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	
Livestock numbers	Units adults	100	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	
	yearlings			600	570	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	
	sales			690	1403	1404	1404	1404	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	
Investment inputs	Field investigations	2,000	14																									
	Land	24,000	0																									
	Buildings	90,000	0																									
Recurrent inputs	Stock	40,000	0																									
	Machinery	40,000	0																									
	Establishment	120,000	0																									
	Chemicals	\$ 1.00																										
	Feed	\$ 40																										
	Vet	\$ 1.00																										
	Slaughtering	\$ 100																										
	Maintenance	\$ 15,000																										
	Wages	\$ 25,000																										
	Permits, etc.	\$ 500																										
Other	\$ 20,000																											
Revenue	all	kg per herd	7.2	\$ 648	1012	1085	1054	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	
	meat	\$/kg	\$20.00	\$ 144	2024	2170	2108	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248	
kg skins	per herd	2	1780	2006	2060	2030	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	
	\$/kg	\$5.00	\$ 89	1003	1030	1030	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	
hides	per herd	2	1780	2006	2060	2030	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	
	\$/kg	\$40.00	\$ 71	802	824	824	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	
wool	per herd	2	1780	2006	2060	2030	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	2090	
	\$/kg	\$2.00	\$ 36	401	412	412	418	418	418	418	418	418	418	418	418	418	418	418	418	418	418	418	418	418	418	418	418	
adults	skins	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	\$/head	\$0.00	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0		

CASH FLOW ANALYSIS

for enterprise of 100

	Total	Present Value @ 7%	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25
Investment inputs																											
Field investigations	-\$2,000	-\$1,869	-\$2,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land	-\$24,000	-\$20,438	-\$24,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Buildings	-\$90,000	-\$64,112	-\$90,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock	-\$40,000	-\$37,355	-\$40,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Machinery	-\$40,000	-\$37,357	-\$40,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Establishment	-\$120,000	-\$112,552	-\$120,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Processing	\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution	\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Markets	\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Permits, etc.	\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Working capital	-\$29,475	-\$25,471	-\$9,350	-\$130,508	-\$74,955	-\$11,835	2,000	-\$11,835	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	-\$192,475	-\$169,800																									

FRESH CULINARY HERBS

Stage One (Static) Analysis

Crop Enterprise Culinary Herb Production NSW
Dill - Annual

Decide on an appropriate unit of production (eg. hectare of growing area, sheds of 20 rows).

Unit of production used: hectare

For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.

Investment Inputs

Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.

Reasonable size of enterprise: 1 hectare Year 1

For the reasonably sized enterprise, estimate the first-time cost of all investment items.

Use extra lines if necessary for other or multiple items; for instance, different items of machinery.

Then estimate the expected useful life of each in years.

Calculate the approximate annualised cost of each, using the embedded formulae.

Note the information source of each line item, and estimate its confidence limits.

Total both the cost and annualised cost columns using the embedded formulae.

Assumed real interest rate: 7% pa

	Units	Number	Price	Cost	Useful Life (yrs)	Annualised Cost	Source	Confidence limits
Field Investigations		1	\$0	0	20	0		
Land	per ha	2	\$10,000	20,000	100	1,402	H&A	+/-50%
Buildings		1	\$78,000	78,000	20	7,363	H&A	+/-50%
Seed stock	annual cost			0		0		
Machinery		1	\$105,850	105,850	15	11,622	H&A	+/-50%
		1	\$500	500	5	122	H&A	+/-50%
Establishment	per ha	1	\$43,800	43,800	20	4,134	H&A	+/-50%
Processing				0		0		
Distribution				0		0		
Markets				0		0		
Permits, etc.				0		0		
Other				0		0		
Working capital	Years	1	\$117,035	117,035	7%	8,192	based on interest rate	
TOTAL:				\$365,185		\$32,835		

Calculate the total investment cost and total annualised investment cost per production unit using the embedded formulae.

Total investment cost per unit: \$365,185 per hectare

Total annualised investment cost per unit: \$32,835 per hectare

Recurrent Inputs

For the selected unit of production (eg. hectare of growing area), estimate all input costs.

Use extra lines if necessary for other or multiple items; for instance, different chemicals.

Note the information source of each line item, and estimate its confidence limits.

Total the cost column using the embedded formula.

Costs calculated per: hectare

	Units	Amount	Price/Unit	Cost		Source	Confidence limits
Soil preparatic	6	1	\$1,500	9,000	soil prep/cult/fert	H&A	+/-50%
Seed/Stock	6	2	\$40	480		H&A	+/-50%
Irrigation/Water	6	1	\$750	4,500		H&A	+/-50%
Fertilisers	6	1	\$500	3,000		H&A	+/-50%
Crop protectic	6	1	\$500	3,000		H&A	+/-50%
Harvesting	6	4,550	\$0.90	24,570	100 g bunches	H&A	+/-50%
Pack/Process	6	4,550	\$0.45	12,285	100 g bunches	H&A	+/-50%
Transport	6	1	\$2,000	12,000	local market	H&A	+/-50%
Marketing		1	\$2,500	2,500		H&A	+/-50%
Permits, etc.				0			
Maintenance	QA	1	\$15,000	15,000		H&A	+/-50%
Other	fuel/insur/labour	1	\$30,700	30,700	season	H&A	+/-50%
TOTAL:				\$117,035	per hectare		

Yield

For the selected unit of production, estimate the anticipated yield for the primary crop.
 For the selected unit of production, estimate the anticipated yield for all by-products.
 Use extra lines if necessary for multiple by-products; for instance stubble, husk, degrade product.

Demand/Revenues

For the selected unit of production, estimate the anticipated farmgate price for the primary crop.
 For the selected unit of production, estimate the anticipated farmgate prices for all by-products.

	Yields estimated per: hectare					
	Prices estimated per: \$/bunch					
			Yield	Farmgate		
	Crop	\$/bunch	bunches/ha	Price/ha	Income	Source Confidence limits
Fresh Herbs	6	0.85	45,500	232,050	232,050	H&A +/-50%
Dried Herbs		0.0	0	0	0	
TOTAL:					\$232,050	per hectare

FINANCIAL ANALYSIS RESULTS

Static Analysis:

For a typical year or season of production, once the enterprise has been established:

Revenue	232,050	per	hectare	
Less Recurrent Inputs	-117,035	per	hectare	
= Gross Margin	\$115,015	per	hectare	
	=	98.3%	return on recurrent inputs only	
Less Investment Inp annualis	-32,835	per	hectare	
= Net Margin	<u>\$82,180</u>	per	hectare	Very Favourable Outcome
	=	54.8%	return on investment & recurrent inputs	

Sensitivity Analysis:

Gross Margin = 0 when:	Revenue is reduced by	50%	Not sensitive
	Recurrent Inputs are increased by	98%	Not sensitive
Net Margin = 0 when:	Revenue is reduced by	35%	Not sensitive
	Recurrent Inputs are increased by	70%	Not sensitive
	Investment Inputs is increased by	250%	Not sensitive

Demand Sensitivity:

	<u>Y / N</u>	<u>Recommendation</u>
Is there an established market for the product?	y	(Good - go to next question)
Is this market readily accessible?	n	Investigate market access further
Will the produce volume upset market stability?	y	Investigate market stability further
Will the produce volume affect market price?	y	Check sensitivity to income (above)
Is the market likely to strengthen with time?	n	Investigate access to existing market further
Are new markets likely to emerge with time?	y	Investigate development of these markets

MEDICINAL HERBS

Stage One (Static) Analysis									
Crop Enterprise		Medicinal Herb Production			Victoria				
		Broad-leaf Echinacea			<i>(Echinacea purpurea)</i>				
Decide on an appropriate unit of production (eg. hectare of growing area, sheds of 20 rows).									
Unit of production used:		hectare							
For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.									
Investment Inputs									
Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.									
Reasonable size of enterprise:		1 hectare							
For the reasonably sized enterprise, estimate the first-time cost of all investment items.									
Use extra lines if necessary for other or multiple items; for instance, different items of machinery.									
Then estimate the expected useful life of each in years.									
Calculate the approximate annualised cost of each, using the embedded formulae.									
Note the information source of each line item, and estimate its confidence limits.									
Total both the cost and annualised cost columns using the embedded formulae.									
Assumed real interest rate:		7% pa							
		Units	Number	Price	Cost	Useful Life (yrs)	Annualised Cost	Source	Confidence limits
Field Investigati		soil tests	1	\$400	400	20	39	H&A	+/-20%
Land		hectares	1.2	\$2,000	2,400	100	168	H&A	+/-20%
Buildings		sheds/workshop	1	\$61,000	61,000	40	4,576	H&A	+/-20%
Seed stock					0		0		
Machinery		tractor/plough/fox	1	\$63,000	63,000	10	8,970	H&A	+/-20%
Establishment		Soil prep/irrig	1	\$35,500	35,500	5	8,658	H&A	+/-20%
Processing			1	\$2,000	2,000	3	762	H&A	+/-20%
Distribution			1	\$500	500	3	191	H&A	+/-20%
Markets					0		0		
Permits, etc.		organic	1	\$2,700	2,700	10	384	H&A	+/-20%
Other					0		0		
Working capital		Years	1	\$65,525	65,525	7%	4,597	based on interest rate	
TOTAL:					\$233,025		\$28,333		
Calculate the total investment cost and total annualised investment cost per production unit using the embedded formulae.									
Total investment cost per unit:		\$233,025 per hectare							
Total annualised investment cost per unit:		\$28,333 per hectare							
Recurrent Inputs									
For the selected unit of production (eg. hectare of growing area), estimate all input costs.									
Use extra lines if necessary for other or multiple items; for instance, different chemicals.									
Note the information source of each line item, and estimate its confidence limits.									
Total the cost column using the embedded formula.									
		Units	Amount	Price/Unit	Cost			Source	Confidence limits
Soil preparation		pre planting	0.5	\$1,300	650			H&A	+/-25%
Seed/Stock		plants/planting	0.5	\$1,100	550			H&A	+/-25%
Irrigation/Water			1	\$2,000	2,000			H&A	+/-25%
Fertilisers		compost	1	\$2,000	2,000			H&A	+/-25%
Crop protection			1	\$500	500			H&A	+/-25%
Harvesting			1	\$2,500	2,500			H&A	+/-25%
Pack/Processing			1	\$5,000	5,000			H&A	+/-25%
Transport			1	\$500	500			H&A	+/-25%
Marketing			1	\$2,500	2,500			H&A	+/-25%
Permits, etc.			1	\$500	500			H&A	+/-25%
Maintenance		inter row	1	\$1,500	1,500			H&A	+/-25%
Other		janic testing etc.	1	\$47,325	47,325			H&A	+/-25%
TOTAL:					\$65,525	per	hectare		

Recurrent Inputs																					
Soil preparation	-873,000	-88,888	-890	-890	-890	-890	-890	-890	-890	-890	-890	-890	-890	-890	-890	-890	-890	-890	-890	-890	-890
Seed/Stock	-815,000	-85,827	-550	-550	-550	-550	-550	-550	-550	-550	-550	-550	-550	-550	-550	-550	-550	-550	-550	-550	-550
Irrigation/Water	-848,000	-871,168	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000
Fertilizers	-848,000	-871,168	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000
Crop protection	-818,000	-85,287	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500
Harvesting	-858,000	-878,888	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500
Pack/Processing	-818,000	-852,873	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000
Transport	-818,000	-85,287	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500
Marketing	-858,000	-878,888	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500	-2500
Permits, etc.	-818,000	-85,287	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500
Maintenance	-818,000	-875,888	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500
Other	-884,500	-893,382	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325	-47325
TOTAL	-81,318,500	-8884,173																			
Revenue																					
Primary crop	\$1,388,000	\$888,811	\$ 65,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000
Secondary crop	\$1,888,000	\$528,781	\$2,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
QUP-TOTAL	\$2,288,000	\$1,218,312																			
Residual Values																					
Field Investigations	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Land	\$1,400	\$620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
Buildings	\$38,500	\$7,882	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
Seed stock	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Machinery	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Establishment	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Processing/Grain	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Permits	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Other	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Working capital	\$85,525	\$18,833	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
QUP-TOTAL	\$85,425	\$25,435																			
NET CASH FLOW:	\$887,700	\$248,723	-183,550	49,475	49,475	49,475	49,475	13,975	48,975	49,475	49,475	49,475	49,475	-51,725	49,475	49,975	49,475	49,475	49,475	11,475	49,475
FINANCIAL ANALYSIS RESULTS																					
Cash Flow Analysis:																					
Net Present Value @ 7%	\$248,723																				
Internal Rate of Return	22.9%																				
Benefit-Cost Ratio @ 7%	1.28																				
Sensitivity Analysis:																					
Net Present Value with:																					
- discount rate at 7% p.a.		\$220,883																			
- discount rate at 9% p.a.		\$178,959																			
Internal Rate of Return with:																					
- yield / prices: decreased by 10%		18.1%																			
- investment expenditure: increased by 10%		18.5%																			
- recurrent inputs: increased by 10%		18.1%																			
Threshold Analysis:																					
Net Present Value equals ZERO with:																					
- yield / prices: decreased by		18.8%																			
- investment expenditure: increased by		77.8%																			
- recurrent inputs: increased by		34.7%																			
Breakdown Analysis:																					
The Enterprise breaks even on a cumulative discounted basis in Year								7													

Unit
20
100
48
8
10
5
3
10
0
8

PERSIMMON

Stage One (Static) Analysis								
Crop Enterprise		Fuyu Persimmon						
1 Decide on an appropriate unit of production (eg. hectare of growing area, sheds of 20 rows).								
Unit of production used:		Hectare						
2 For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.								
Investment Inputs								
1 Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.								
Reasonable size of enterprise:		2	Hectare	units of production (above)			Year 5	
2 For the reasonably sized enterprise, estimate the first-time cost of all investment items.								
Use extra lines if necessary for other or multiple items; for instance, different items of machinery.								
3 Then estimate the expected useful life of each in years.								
4 Calculate the approximate annualised cost of each, using the embedded formulae.								
5 Note the information source of each line item, and estimate its confidence limits.								
6 Total both the cost and annualised cost columns using the embedded formulae.								
Assumed real interest rate:		7% pa						
	Units	Number	Price	Cost	Useful Life (yrs)	Annualised Cost	Source	Confidence limits (%)
Field Investigation	-	1	\$1,000	1,000	20	94	H&A	+/-25
Land	hectares	2.5	\$7,000	17,500	20	1,652	H&A	-/+25
	preparation	2	\$1,000	2,000	20	189	H&A	-/+15
Buildings	packing shed	1	\$30,000	30,000	20	2,832	H&A	-/+10
	cool room	1	\$10,000	10,000	12	1,259	H&A	-/+10
Persimmon Stock	Grafted Fuyu	1,700	\$10.00	17,000	20	1,605	H&A	-/+5
	Grafted Gallej	200	\$10.00	2,000	20	189	H&A	-/+5
Trellising	hectare	2	\$10,000.00	20,000	20	1,868	RRDC	-/+10
Irrigation System	connection to existin	1,900	\$5.00	9,500	15	1,043	RRDC	-/+5
	pump	1	\$1,000.00	1,000	15	110	H&A	-/+15
Netting	hectares	2	\$25,000.00	50,000	8	8,373	RRDC	-/+10 purchased in year 3
Machinery	tractor	1	\$30,000	30,000	10	4,271	H&A	-/+25
	trailer	1	\$2,000	2,000	20	189	H&A	-/+15
	padded harvest bins	3	\$600	1,800	15	190	H&A	-/+25
	ladders	10	\$75	750	20	71	H&A	-/+20
	refractometer	1	\$250	250	15	27	H&A	-/+5
Establishment	covercrop (ha)	2	\$215	430	10	61	H&A	-/+10
Processing				0		0		
Distribution				0		0		
Markets				0		0		
Permits, etc.				0		0		
Working capital	Years	2	\$64,350	128,700	7%	9,009	based on interest rate	
TOTAL:				\$323,930		\$33,060		
7 Calculate the total investment cost and total annualised investment cost per production unit using the embedded formulae.								
Total investment cost per unit:			\$161,965	per	Hectare			
Total annualised investment cost per unit:			\$16,530	per	Hectare			
Recurrent Inputs								
1 For the selected unit of production (eg. hectare of growing area), estimate all input costs.								
Use extra lines if necessary for other or multiple items; for instance, different chemicals.								
2 Note the information source of each line item, and estimate its confidence limits.								
3 Total the cost column using the embedded formula.								
				Costs calculated per:	Hectare			

	Units	Amount	Price/Unit	Cost		Source	Confidence limits(%)
Irrigation/water	ML	7	\$18.00	126		H&A	-/+5
Irrigation/power	ML	7	\$7.00	49.00		H&A	-/+25
Fertilizers	kgs	125	\$0.60	75		H&A	-/+15
Fungicides	litres	10	\$7.50	75		H&A	-/+25
Harvesting/ packing	kgs	16,500	\$0.90	14,850		H&A	-/+10
Pruning/thinning labour	tree	825	\$8.00	6,600		H&A	-/+10
Packaging	packing trays	5,000	\$2.00	10,000		H&A	-/+10
Electricity	coolroom/grader	1	\$100.00	100		H&A	-/+25
Pruning snips/shears		1	\$100	100		H&A	-/+5
Maintenance	general/irrigation	1	\$200	200		H&A	-/+10
Other				0			
TOTAL:				\$32,175	per Hectare		

Yield

1 For the selected unit of production, estimate the anticipated yield for the primary crop.

2 For the selected unit of production, estimate the anticipated yield for all by-products.

Use extra lines if necessary for multiple by-products; for instance stubble, husk, degrade product.

Demand/Revenues

1 For the selected unit of production, estimate the anticipated farmgate price for the primary crop.

2 For the selected unit of production, estimate the anticipated farmgate prices for all by-products.

		Yields estimated per:	Hectare				
		Prices estimated per:	kg				
				Farmgate			
	Crop	Crop Unit	Unit Yield	Price	Income		
Primary crop	Fuyu Persimmo	kg	16,500	\$3.00	49,500	H&A	-/+10
By-product #1					0		
TOTAL:					\$49,500	per Hectare	

FINANCIAL ANALYSIS RESULTS

Static Analysis:

For a typical year or season of production, once the enterprise has been established:

Revenue	49,500	per Hectare	
Less Recurrent Inputs	-32,175	per Hectare	
= Gross Margin	\$17,325	per Hectare	
	= 53.8%	return on recurrent inputs only	
Less Investment Input/annualise	-16,530	per Hectare	
= Net Margin	\$795	per Hectare	Favourable Outcome
	= 1.6%	return on investment & recurrent inputs	

Sensitivity Analysis:

Gross Margin = 0 when:	Revenue is reduced by	35%	Not sensitive
	Recurrent Inputs are increased by	54%	Not sensitive
Net Margin = 0 when:	Revenue is reduced by	2%	Very sensitive
	Recurrent Inputs are increased by	2%	Very sensitive
	Investment Inputs is increased by	5%	Very sensitive

Demand Sensitivity:

	Y / N	Recommendation
Is there an established market for the product?	y	(Good - go to next question)
Is this market readily accessible?	n	Investigate market access further
Will the produce volume upset market stability?	n	(Good - go to next question)
Will the produce volume affect market price?	n	(Good - go to next question)
Is the market likely to strengthen with time?	n	Investigate access to existing market further
Are new markets likely to emerge with time?	y	Investigate development of these markets

Source: H&A-Hessell & Associates

Stage Two (Cash Flow) Analysis

Crop Enterprise Fruit Production

1. Decide on an appropriate unit of production (eg. sectors of growing area) - may be different from unit used in Stage One Analysis.
2. Estimate all costs and revenues for this unit of production, on an annual cash flow basis.
3. Use the "physical parameter" workspace if required.
4. All costs are negative values, and all revenues are positive values.
5. All costs and revenues are to be estimated in real terms, that is, with no allowance for inflation.
6. Decide on an appropriate analysis period that matches the expected life of the enterprise, if applicable, but not longer than 20 years.
7. For investment assets with useful lives less than the analysis period, estimate cyclical renewal costs under "investment".
8. Estimate the residual value of each investment asset at the end of the analysis period.
9. Decide on an appropriate real interest rate or required annual rate of return, and enter here.

7% pa

Physical Parameter Workspace

			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Tree per ha	Units		825	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825
Yield per Tree			8	8	18	18	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Yield per Ha			8	8	8258	12375	9258	16583	18508	18508	18508	18508	18508	18508	18508	18508	18508	18508	18508	18508	18508	18508
Total field			8	8	18508	24758	33008	33008	33008	33008	33008	33008	33008	33008	33008	33008	33008	33008	33008	33008	33008	33008
Price per kg			2.5	2.5	2.8	3.2	3.2	3.3	3	3	3	3	3	3	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Investment Inputs	Units	Number	Price	Cost	Useful Life																	
Field Investigations		1	\$1,000.00	1,000	20																	
Land	hectares	3	\$7,000.00	21,000	20																	
Land Preparation	hectares	2	\$1,000.00	2,000	20																	
Grafted Fruit (inc. loss rejects)		1,700	\$10.00	17,000	20																	
Grafted Gully (inc. loss rejects)		200	\$10.00	2,000	20																	
Trellis		2	\$10,000.00	20,000	20																	
Trellis	per ha	2	\$25,000	50,000	20																	
Cover crop cuttings	per ha	2	\$2.50	5.00	20																	
Irrigation system	sections per tree	1,000	\$5	5,000	20																	
Buildings	packing shed	1	\$20,000	20,000	20																	
	cool room	1	\$10,000	10,000	12																	
Tractor		1	\$30,000	30,000	10																	
Trailer		1	\$2,000	2,000	20																	
Loaders		10	\$75	750	20																	
refractometer		1	\$250	250	15																	
padding bins for harvest		3	\$600	1,800	15																	
Recurrent Inputs	Units	Amount	Price/Unit	Cost																		
Irrigation / water	Ml	7	\$18.00	126																		
Irrigation/power	Ml	7	\$7.00	49																		
Fertilisers	hectares	2	\$150.00	300																		
Fungicides	hectares	2	\$150.00	300																		
Harvest/packing labor	per kilogram	1	\$0.95	0.95																		
packing bin labor	per tray	1	\$8.00	8.00																		
packing bins	per tray	5,000	\$2.00	10,000																		
electricity		2	\$100.00	200																		
packing shed/fields		1	\$100.00	100																		
maintenance	per hectare	2	\$200.00	400																		
Revenues/Revenues																						
Primary crop	Crop	Crop Unit	Unit Yield	Price	Income																	
	Fruit Production	kg	14,000	\$3.00	42,000																	

CASH FLOW ANALYSIS

	Total	Present Value @ 7%	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Investment Inputs																						
Soil Sample Kit & Air	\$1,000	-\$975	-\$1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land	\$17,500	-\$16,365	-\$17,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land Preparation	\$2,000	-\$1,868	-\$2,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grafted Pearmaine	\$17,000	-\$15,589	-\$17,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gully Prolinators	\$2,000	-\$1,868	-\$2,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trellising	\$20,000	-\$18,642	-\$20,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trellis	\$10,000	-\$9,321	-	-	-	-	-	-	-	-\$8,800	-	-	-	-	-	-	-	-	-	-	-	-
cover crop cut & cart	\$430	-\$402	-\$430	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Irrigation system	\$5,000	-\$4,679	-\$5,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
packing shed	\$20,000	-\$18,657	-\$20,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cool room	\$10,000	-\$9,099	-\$10,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tractor	\$30,000	-\$24,245	-\$30,000	-	-	-	-	-	-	-	-\$6,890	-	-	-	-	-	-	-	-	-	-	-
Trailer	\$2,000	-\$1,868	-\$2,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
loaders	\$750	-\$709	-\$750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
refractometer	\$250	-\$240	-\$250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
padding bins	\$1,800	-\$1,264	-\$1,800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Working capital	-\$65,222	-\$61,168	-\$775	-	-\$6,628	-\$13,914	-\$13,884	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.46-6.07M	-\$401,812	-\$393,578																				

Recurrent Inputs																						
Irrigation / water	-\$2,520	-\$1,235	-128	-128	-128	-128	-128	-128	-128	-128	-128	-128	-128	-128	-128	-128	-128	-128	-128	-128	-128	
Irrigation/power	-\$980	-\$519	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49	
Fertilizers	-\$8,000	-\$3,178	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	
Fungicides	-\$8,000	-\$3,178	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	-388	
Harvest/hacking labo	-\$148,788	-\$258,988	0	0	-15075	-23513	-31250	-31250	-31250	-31250	-31250	-31250	-31250	-31250	-31250	-31250	-31250	-31250	-31250	-31250	-31250	
pruning/shear labo	-\$118,000	-\$57,938	0	0	-6600	-8888	-6600	-6600	-6600	-6600	-6600	-6600	-6600	-6600	-6600	-6600	-6600	-6600	-6600	-6600	-6600	
packing trays	-\$358,308	-\$166,252	0	0	-10154	-15231	-20308	-20308	-20308	-20308	-20308	-20308	-20308	-20308	-20308	-20308	-20308	-20308	-20308	-20308	-20308	
electricity	-\$2,600	-\$1,757	0	0	-200	-288	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	
pruning traps/shears	-\$88,000	-\$32,748	0	0	-2000	-3888	-4000	-4000	-4000	-4000	-4000	-4000	-4000	-4000	-4000	-4000	-4000	-4000	-4000	-4000	-4000	
maintenance	-\$38,000	-\$17,572	0	0	-2000	-2888	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	
Other	\$0	\$0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL	-\$1,132,988	-\$541,204	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Revenue																						
Primary crop	\$1,788,008	\$823,145	0	0	\$7,250	\$0,438	107,288	107,288	\$6,038	\$8,000	\$6,000	\$6,038	\$6,000	\$5,700	\$5,700	\$5,700	\$5,700	\$5,700	\$5,700	\$5,700	\$5,700	
SUB-TOTAL	\$1,788,008	\$823,145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Residual Values																						
Field Investigations	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Land	\$15,750	\$4,070	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15,750	
Buildings	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Machinery	\$3,400	\$999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,400	
Markets	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Permits, etc.	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Working capital	\$85,233	\$21,827	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85,233	
SUB-TOTAL	\$84,463	\$21,827	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NET CASH FLOW	\$257,942	\$12,722	-145,700	-775	-88,283	15,205	20,183	42,817	35,787	35,767	-16,233	3,787	33,767	38,467	20,467	30,487	28,417	-18,633	20,467	30,467	30,487	114,830
FINANCIAL ANALYSIS RESULTS																						
Cash Flow Analysis:																						
Net Present Value @ 7%	\$12,722																					
Internal Rate of Return	7.7%																					
Benefit Cost Ratio @ 7%	0.99																					
Sensitivity Analysis:																						
Net Present Value with:																						
+ discount rate of 5% pa	\$50,743																					
+ discount rate of 9% pa	\$19,427																					
Internal Rate of Return with:																						
+ yield / prices decreased by 10%	2.8%																					
+ investment expenditure increased by 10%	0.1%																					
+ seasonal inputs increased by 10%	4.8%																					
Threshold Analysis:																						
Net Present Value equals ZERO with:																						
+ yield / prices decreased by 1.5%																						
+ investment expenditure increased by 4.1%																						
+ seasonal inputs increased by 2.4%																						
Breakdown Analysis:																						
The Enterprise breaks even on a cumulative discounted basis in Year 28																						

DURIAN

Stage One (Static) Analysis							
Crop Enterprise		Durian					
1 Decide on an appropriate unit of production (eg. hectare of growing area, sheds of 20 rows).							
Unit of production used:		Hectare					
2 For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.							
Investment Inputs							
1 Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.							
Reasonable size of enterprise:		10	Hectare	units of production (above)			
2 For the reasonably sized enterprise, estimate the first-time cost of all investment items.							
Use extra lines if necessary for other or multiple items; for instance, different items of machinery.							
3 Then estimate the expected useful life of each in years.							
4 Calculate the approximate annualised cost of each, using the embedded formulae.							
5 Note the information source of each line item, and estimate its confidence limits.							
6 Total both the cost and annualised cost columns using the embedded formulae.							
Assumed real interest rate:		7% pa					
					Useful Life	Annualised	
	Units	Number	Price	Cost	(yrs)	Cost	Source Confidence limits(%)
Land	ha	10	\$12,000	120,000	20	11,327	HSA -/+10
Shed		1	\$80,000	80,000	20	7,551	HSA -/+10
Chiller		1	\$10,000.00	10,000	15	1,098	HSA -/+10
Site Preparation	ha	10	\$1,427	14,270	20	1,347	HSA -/+10
Grafted Durian Trees	trees	1,160	\$40	46,400	20	4,360	HSA -/+10
Grafted Jfruit	trees	420	\$15	6,300	20	595	HSA -/+10
Cover Crop	ha	8	\$10	80	20	8	HSA -/+10
Shading	trees	1,160	\$3	3,364	20	318	HSA -/+10
Preplanting Fert	ha	8	\$66.40	531	20	50	HSA -/+10
Preplanting herbici	ha	8	\$110	880	20	83	HSA -/+10
4WD motorbike		1	\$5,000	5,000	10	712	HSA -/+10
Tractor (70hp)		1	\$50,000	50,000	10	7,119	HSA -/+10
Trailer		1	\$2,000	2,000	10	265	HSA -/+10
Spot Sprayer (200L)		1	\$1,800	1,800	1	1,826	HSA -/+10
Air Buzzer(1000L)		1	\$6,000	6,000	17	615	HSA -/+10
Slasher		1	\$4,000	4,000	10	570	HSA -/+10
Tree Planting Auger		1	\$2,000	2,000	20	189	HSA -/+10
Boom Spray		1	\$2,000	2,000	20	189	HSA -/+10
Irrigation System		1	\$5,000	5,000	20	472	HSA -/+10
Pump, pipes, establishment		1	\$26,500	26,500	20	2,501	HSA -/+10
Working capital	Years	5	\$643,626	3,218,130	7%	225,269	based on interest rate
TOTAL:				\$3,604,255		\$266,602	
7 Calculate the total investment cost and total annualised investment cost per production unit using the embedded formulae.							
Total investment cost per unit:		\$360,426		per Hectare			
Total annualised investment cost per unit:		\$26,660		per Hectare			
Recurrent Inputs							
1 For the selected unit of production (eg. hectare of growing area), estimate all input costs.							
Use extra lines if necessary for other or multiple items; for instance, different chemicals.							
2 Note the information source of each line item, and estimate its confidence limits.							
3 Total the cost column using the embedded formula.							
		Costs calculated per:		Hectare			
	Units	Amount	Price/Unit	Cost		Source	Confidence limits(%)
Irrigation costs	p.a.	1	\$2,000	2,000		HSA	-/+10
Chemicals	see workspace	1	\$12,745	12,745		HSA	-/+10
Harvesting/ Packaging	per tonne	34	\$760	25,658		HSA	-/+10
Air Freight (to Sydne	per tonne	34	\$700	23,632		HSA	-/+10
Slashing	as per annum	6	\$13	78		HSA	-/+10 * only years 1-5
Mulching	bales per annum*			0		HSA	-/+10
Maintenance - gene	per annum	1	\$200.00	200		HSA	-/+10
Maintenance - iriga	per annum	1	\$50.00	50		HSA	-/+10
Permits, etc.				0		HSA	-/+10
Other				0		HSA	-/+10
TOTAL:				\$64,363	per	Hectare	

Yield							
1 For the selected unit of production, estimate the anticipated yield for the primary crop.							
2 For the selected unit of production, estimate the anticipated yield for all by-products.							
Use extra lines if necessary for multiple by-products; for instance stubble, husk, degrade product.							
Demand/Revenues							
1 For the selected unit of production, estimate the anticipated farmgate price for the primary crop.							
2 For the selected unit of production, estimate the anticipated farmgate prices for all by-products.							
			Yields estimated per:	Hectare			
			Prices estimated per:	Crop Unit			
				Farmgate	Income		
	Crop	Crop Unit	Unit Yield	Price			
Primary crop	Durian	ha	12.76	\$8,000	102,080	H&A	-/+10
By-product #1	Jack fruit	ha	21	\$1,500	31,500	H&A	-/+10
TOTAL:					\$133,580	per	Hectare
FINANCIAL ANALYSIS RESULTS							
Static Analysis:							
For a typical year or season of production, once the enterprise has been established:							
	Revenue		133,580	per	Hectare		
	Less Recurrent Inputs		-64,363	per	Hectare		
	= Gross Margin		\$69,217	per	Hectare		
		=	107.5%	return on recurrent inputs only			
	Less Investment Inprannualise		-26,660	per	Hectare		
	= Net Margin		\$42,557	per	Hectare		Very Favourable Outcome
		=	46.8%	return on investment & recurrent inputs			
Sensitivity Analysis:							
Gross Margin = 0 when:	Revenue	is reduced by		52%			Not sensitive
	Recurrent Inputs	are increased by		108%			Not sensitive
Net Margin = 0 when:	Revenue	is reduced by		32%			Not sensitive
	Recurrent Inputs	are increased by		66%			Not sensitive
	Investment Inputs	is increased by		160%			Not sensitive
Demand Sensitivity:							
				Y / N			Recommendation
	Is there an established market for the product?			y			(Good - go to next question)
	Is this market readily accessible?			y			(Good - go to next question)
	Will the produce volume upset market stability?			n			(Good - go to next question)
	Will the produce volume affect market price?			n			(Good - go to next question)
	Is the market likely to strengthen with time?			y			(Good - robust solution)
	Are new markets likely to emerge with time?			y			Investigate development of these markets
Sources: H&A-Hassall & Associates							

Stage Two Cash Flow Analysis																					
Crop Enterprise		Duration																			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
1. Decide on an appropriate unit of production (eg. tonnes of growing area) - may be different from unit used in Stage One Analysis.																					
Unit of production used		10 hectares																			
2. Estimate all costs and revenues for this unit of production, on an annual cash flow basis.																					
3. Use the "physical parameters" worksheet if required.																					
4. All costs are negative values, and all revenues are positive values.																					
5. All costs and revenues are to be estimated in real terms, that is, with no allowance for inflation.																					
6. Decide on an appropriate analysis period that matches the expected life of the enterprise, if applicable, but not longer than 20 years.																					
7. For investment assets with useful lives less than the analysis period, estimate residual renewal costs under "Investment".																					
8. Estimate the residual value of each investment asset at the end of the analysis period.																					
9. Decide on an appropriate real interest rate or required annual rate of return, and enter here.																					
		r%, pa																			
Physical Parameter Worksheet:																					
		US\$/ha																			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Duration Time Yield (kg/Tree)		0	0	0	0	0	0.0	2.5	12.5	25	50	75	87.5	100.0	112.5	125	138	150	160	200	200
Duration Yield (Tonnes from 1100 trees)		180	0	0	0	0	0	2.0	14.5	29	58	87	101.5	116	130.5	145	160.5	174	200.5	220	220
Jackfruit Yield (kg/tree)		0	0	5	25	50	75	100	100	100	100	100	120	120	140	140	160	160	180	180	180
Jackfruit Yield (Tonnes) from 420 trees		0	0	2.1	10.5	21	31.5	42	42	42	42	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4
Estimated Market price per kg		10	10	10	9	9	9	8.5	8	8	7.5	7	7	7	7	7	7	7	7	7	7
Estimated Jackfruit price per kg		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Fertiliser & Chemical costs		constant																			
Duration FFR		174	174	174	140	140	140	130	130	130	130	130	130	130	130	130	130	130	130	130	130
8 spp/ha Total cost/ha		1.2	208.8	208.8	208.8	177.6	177.6	177.6	165.6	165.6	165.6	165.6	165.6	165.6	165.6	165.6	165.6	165.6	165.6	165.6	165.6
Duration - Dynamic tiller		30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
12 spp/ha Total cost/ha		0.6	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Duration - lime		73	73	73	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145
1 sp/ha Total cost/ha		0.4	29.2	29.2	29.2	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
Duration - trace elements		0	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
12 spp/ha Total cost/ha		0.27	0	0	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24
Total Insecticide Costs (eg. Diphos, Rogreaster) g/ha		180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Diphosene		0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 spp/ha Total cost/ha		18	0	0	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Rogreaster		0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 spp/ha Total cost/ha		18	0	0	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Total Fungicide Costs (eg. Copper Oxide/oxide and/or)		0	0	0	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4
Copper Oxide/oxide		0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 spp/ha Total cost/ha		4.2	0	0	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Phosol		0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 spp/ha Total cost/ha		6	0	0	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Total Herbicide Costs (eg. Roundup) g/ha		28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Roundup		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
4 spp/ha Total cost/ha		7	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
TOTAL DURIAN CHEMICALS		284	284	284	687.64	687.64	687.64	750.28	750.28	750.28	750.28	750.28	750.28	750.28	750.28	750.28	750.28	750.28	750.28	750.28	750.28
JFruit NPK		210	210	210	420	420	420	884	884	884	884	884	884	884	884	884	884	884	884	884	884
8 spp/ha Total cost/ha		1.2	252	252	504	504	504	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8
TOTAL JFruit CHEMICALS		252	252	252	504	504	504	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8	884.8
Investment (Input/Output)		Units	Number	Price	Cost	Useful Life															
Land			10	\$12,000	120,000	20															
Seed (Year 1) (inc. power)			1	\$25,000	25,000	20															
Seed Extension (year 1) (inc. power)			1	\$55,000	55,000	15															
Chiller			1	\$10,000	10,000	15															
Site preparation (clearing, grading, etc)			10	\$1,427	14,267	20															
Grafted Durian Trees (inc. less replant)			1,160	\$40	46,400	20															
Grafted Jackfruit - wedbreak/Inc. less replant			420	\$15	6,300	20															
Power (100)			8	\$10	80	20															
Shedding			1,160	\$2.90	3,364	20															
Preplanting fertilizer			8	\$65.40	523	20															
Preplanting herbicide			8	\$110.00	880	20															
4WD Motorbike			1	\$5,000	5,000	10															
Tractor (2700)			1	\$50,000	50,000	10															
Trailer			1	\$2,000	2,000	10															
Boat Sprayer (200L)			1	\$1,000	1,000	10															
Air Blower (7000L)			1	\$6,000	6,000	20															
Blasher (60)			1	\$4,000	4,000	10															
Tree Planting Ager			1	\$2,000	2,000	20															
Boat Gully			1	\$2,000	2,000	20															
Mopnet Sucker			1	\$5,000	5,000	20															
Pump, water electric			10	\$2,000	20,000	20															

JOJOBA

Stage One (Static) Analysis									
Crop Enterprise		Jojoba			Nth NSW/Sth QLD				
1 Decide on an appropriate unit of production (eg. hectare of growing area, sheds of 20 rows).									
Unit of production used:		hectare							
2 For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.									
Investment Inputs									
1 Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.									
Reasonable size of enterprise:		20 hectare			Year 10				
2 For the reasonably sized enterprise, estimate the first-time cost of all investment items.									
Use extra lines if necessary for other or multiple items; for instance, different items of machinery.									
3 Then estimate the expected useful life of each in years.									
4 Calculate the approximate annualised cost of each, using the embedded formulae.									
5 Note the information source of each line item, and estimate its confidence limits.									
6 Total both the cost and annualised cost columns using the embedded formulae.									
Assumed real interest rate:		7% pa							
					Useful				
		Units	Number	Price	Cost	Life	Annualised	Source	Confidence limits
						(yrs)	Cost		
Field Investigations			1	\$2,600	2,600	20	245	H&A	+/-20%
Land			24	\$350	8,400	100	589	H&A	+/-20%
Buildings			1	\$32,000	32,000	30	2,579	H&A	+/-20%
Seed stock	plant replacement @ 5% and voluntary loss @ \$0.05/plant		26,250	\$3.05	80,063	40	6,005	H&A	+/-20%
Machinery			1	\$126,700	126,700	10	18,039	H&A	+/-20%
Establishment			20	\$3,643	72,860	20	6,877	H&A	+/-20%
Irrigation			20	\$4,000	80,000	15	8,784	H&A	+/-20%
Distribution					2,000	20	189	H&A	+/-20%
Markets					2,000	3	762	H&A	+/-20%
Permits, etc.					1,000	20	94	H&A	+/-20%
Other					10,000	20	944	H&A	+/-20%
Working capital	Years		1	\$105,980	105,980	7%	7,419	based on interest rate	
TOTAL:					\$523,603		\$52,526		
7 Calculate the total investment cost and total annualised investment cost per production unit using the embedded formulae.									
Total investment cost per unit:		\$26,180 per hectare							
Total annualised investment cost per unit:		\$2,526 per hectare							
Recurrent Inputs									
1 For the selected unit of production (eg. hectare of growing area), estimate all input costs.									
Use extra lines if necessary for other or multiple items; for instance, different chemicals.									
2 Note the information source of each line item, and estimate its confidence limits.									
3 Total the cost column using the embedded formula.									
		Costs calculated per hectare							
		Units	Amount	Price/Unit	Cost			Source	Confidence limits
Seed / Stock					0				
Irrigation / water			1	\$600	600			H&A	+/-20%
Fertilisers			1	\$500	500			H&A	+/-20%
Crop protection			1	\$50	50			H&A	+/-20%
Harvesting	& cleaning		1	\$1,000	1,000			H&A	+/-20%
Maintenance	hoe/bed shaping		1	\$150.00	150			H&A	+/-20%
Transport	per tonne seed		2.0	\$120.00	240			H&A	+/-20%
Processing	per tonne seed		2.0	\$600.00	1,200			H&A	+/-20%
Permits, etc.			1	\$25	25			H&A	+/-20%
Levys	per tonne seed		2	\$90	180			H&A	+/-20%
Commission			6%	\$18,400	1,104			H&A	+/-20%
Other	casual labour		1	\$250	250			H&A	+/-20%
TOTAL:					\$5,299	per	hectare		

Yield							
1 For the selected unit of production, estimate the anticipated yield for the primary crop.							
2 For the selected unit of production, estimate the anticipated yield for all by-products.							
Use extra lines if necessary for multiple by-products; for instance stubble, husk, degrade product.							
Demand/Revenues							
1 For the selected unit of production, estimate the anticipated farmgate price for the primary crop.							
2 For the selected unit of production, estimate the anticipated farmgate prices for all by-products.							
			Yields estimated per:	hectare			
			Prices estimated per:	Crop Unit			
	Crop	Crop Unit	Unit Yield	Farmgate	Income	Source	Confidence limits
		tonnes	t/ha	Price/tonne			
	Oil		0.80	\$23,000	18,400	H&A	+/-20%
	Meal	tonnes	1.20	\$180	216	H&A	+/-20%
	By-product #2				0		
	TOTAL:				\$18,616	per	hectare
FINANCIAL ANALYSIS RESULTS							
Static Analysis:							
For a typical year or season of production, once the enterprise has been established:							
	Revenue		18,616		per	hectare	
	Less Recurrent Inputs		-5,299		per	hectare	
	= Gross Margin		\$13,317		per	hectare	
		=	251.3%		return on recurrent inputs only		
	Less Investment In/annualise		-2,626		per	hectare	
	= Net Margin		\$10,691		per	hectare	Very Favourable Outcome
		=	134.9%		return on investment & recurrent inputs		
Sensitivity Analysis:							
Gross Margin = 0 when:		Revenue	is reduced by	72%	Not sensitive		
		Recurrent Inputs	are increased by	251%	Not sensitive		
Net Margin = 0 when:		Revenue	is reduced by	57%	Not sensitive		
		Recurrent Inputs	are increased by	202%	Not sensitive		
		Investment Inputs	is increased by	407%	Not sensitive		
Demand Sensitivity:				Y / N	Recommendation		
Is there an established market for the product?				y	(Good - go to next question)		
Is this market readily accessible?				y	(Good - go to next question)		
Will the produce volume upset market stability?				y	Investigate market stability further		
Will the produce volume affect market price?				y	Check sensitivity to income (above)		
Is the market likely to strengthen with time?				y	(Good - robust solution)		
Are new markets likely to emerge with time?				y	Investigate development of these markets		

SESAME

Stage One (Static) Analysis									
Crop Enterprise	Sesame Seed		Northern Territory						
1 Decide on an appropriate unit of production (eg. hectare of growing area, sheds of 20 rows).									
Unit of production used: Hectare									
2 For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.									
Investment Inputs									
1 Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.									
Reasonable size of enterprise: 100 Hectare units of production (above)									
2 For the reasonably sized enterprise, estimate the first-time cost of all investment items.									
Use extra lines if necessary for other or multiple items; for instance, different items of machinery.									
3 Then estimate the expected useful life of each in years.									
4 Calculate the approximate annualised cost of each, using the embedded formulae.									
5 Note the information source of each line item, and estimate its confidence limits.									
6 Total both the cost and annualised cost columns using the embedded formulae.									
Assumed real interest rate: 7% pa									
	Units	Number	Price	Cost	Useful Life (yrs)	Annualised Cost	Source	Confidence limits(%)	
Field Investigations		1	\$100	100	20	9	H&A	-/+5	
Land		100	\$600	60,000	20	5,664	H&A	-/+5	
Harvester(2nd hand)		1	\$150,000	150,000	10	21,357	DPF	-/+15	
Tractor(2nd hand)		1	\$50,000	50,000	10	7,119	DPF	-/+15	
Cultivator (2nd hand)		1	\$30,000	30,000	12	3,777	DPF	-/+15	
Combine/planter(2nd hand)		1	\$100,000	100,000	10	14,238	DPF	-/+15	
spray plant		1	\$3,000	3,000	7	557	H&A	-/+10	
Other				0		0			
Working capital	Years	2	\$37,019	74,037	7%	5,183	based on interest rate		
TOTAL:				\$467,137		\$67,903			
7 Calculate the total investment cost and total annualised investment cost per production unit using the embedded formulae.									
Total investment cost per unit:			\$4,671	per	Hectare				
Total annualised investment cost per unit:			\$579	per	Hectare				
Recurrent Inputs									
1 For the selected unit of production (eg. hectare of growing area), estimate all input costs.									
Use extra lines if necessary for other or multiple items; for instance, different chemicals.									
2 Note the information source of each line item, and estimate its confidence limits.									
3 Total the cost column using the embedded formula.									
Costs calculated per: Hectare									
	Units	Amount	Price/Unit	Cost		Source	Confidence limits(%)		
Seed	kg	4.00	\$2.20	8.8		H&A	-/+10		
Fertilisers -NPKS	kg	100	\$0.60	60.0		H&A	-/+10		
Fertilisers -Urea	kg	100	\$0.45	45.0		H&A	-/+10		
Fertilisers - MOP	kg	100	\$0.50	50.0		H&A	-/+10		
Tractor/application/	hours	0.75	\$17.00	12.8		H&A	-/+15		
Insecticides(inc. aerial application)	L	1	\$30.00	30.0		H&A	-/+15		
Harvesting	hours	0.50	\$82.07	41.0		H&A	-/+15		
Header Maintenance	p.a.	1	\$7.60	7.6		H&A	-/+20		
General Maintenance	p.a.	1	\$5.00	5.0		H&A	-/+20		
Clean & Grading	tonne	1.00	\$50	50.0		H&A	-/+10		
Bags	tonne	1.00	\$25	25.0		H&A	-/+5		
Freight	tonne	1.00	\$30	30.0		H&A	-/+5		
Research Levy	tonne	1.00	\$5	5.0		H&A	-/+0		
TOTAL:				\$370	per	Hectare			

Yield								
1 For the selected unit of production, estimate the anticipated yield for the primary crop.								
2 For the selected unit of production, estimate the anticipated yield for all by-products.								
Use extra lines if necessary for multiple by-products; for instance stubble, husk, degrade product.								
Demand/Revenues								
1 For the selected unit of production, estimate the anticipated farmgate price for the primary crop.								
2 For the selected unit of production, estimate the anticipated farmgate prices for all by-products.								
			Yields estimated per:	Hectare				
			Prices estimated per:	Crop Unit				
				Farmgate				
	Crop	Crop Unit	Unit Yield	Price	Income			
Primary crop	Sesame	tonne	1.0	\$1,000	1,000	H&A	-/+20	
	TOTAL:				\$1,000	per	Hectare	
FINANCIAL ANALYSIS RESULTS								
Static Analysis:								
For a typical year or season of production, once the enterprise has been established:								
	Revenue		1,000	per Hectare				
	Less Recurrent Inputs		-370	per Hectare				
	= Gross Margin		\$630	per Hectare				
		=	170.1%	return on recurrent inputs only				
	Less Investment In annualise		-579	per Hectare				
	= Net Margin		\$51	per Hectare			Favourable Outcome	
		=	5.4%	return on investment & recurrent inputs				
Sensitivity Analysis:								
Gross Margin = 0 when:								
	Revenue is reduced by			63%			Not sensitive	
	Recurrent Inputs are increased by			170%			Not sensitive	
Net Margin = 0 when:								
	Revenue is reduced by			5%			Very sensitive	
	Recurrent Inputs are increased by			14%			Sensitive	
	Investment Inputs is increased by			9%			Very sensitive	
Demand Sensitivity:								
				Y / N			Recommendation	
	Is there an established market for the product?			y			(Good - go to next question)	
	Is this market readily accessible?			y			(Good - go to next question)	
	Will the produce volume upset market stability?			n			(Good - go to next question)	
	Will the produce volume affect market price?			n			(Good - go to next question)	
	Is the market likely to strengthen with time?			y			(Good - robust solution)	
	Are new markets likely to emerge with time?			y			Investigate development of these markets	
Source: DPIF-Dept of Primary Industries and Fisheries, H&A-Hassall & Associates								

Recurrent Inputs																						
Sewer	-\$17,180	-\$8,912	-440	-880	-880	-880	-880	-880	-880	-880	-880	-880	-880	-880	-880	-880	-880	-880	-880	-880	-880	-880
Fertilizers -NPKS	-\$117,000	-\$68,700	-3000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000	-6000
Fertilizers -Urea	-\$97,750	-\$45,570	-2250	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500	-4500
Fertilizers -MCP	-\$97,500	-\$50,634	-2500	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000
Tractor/applications/insecticides/pesticides	-\$24,863	-\$12,913	-638	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275	-1275
airal applicator(s)	-\$59,500	-\$30,389	-1500	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000
Harvesting	-\$88,010	-\$41,555	-2052	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104	-4104
Header Maintenance	-\$15,200	-\$8,091	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760	-760
General Maintenance	-\$12,000	-\$6,287	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500	-500
Clean & Grading	-\$97,500	-\$50,634	-2500	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000	-5000
Bags	-\$48,625	-\$23,622	-375	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750	-750
Freight	-\$59,500	-\$30,389	-1500	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000	-3000
Research Levy	-\$3,225	-\$1,684	-75	-150	-150	-150	-150	-150	-150	-150	-150	-150	-150	-150	-150	-150	-150	-150	-150	-150	-150	-150
TOTAL:	-\$719,941	-\$373,191																				
Revenue																						
Primary crop	\$1,985,000	\$936,982	15,880	80,000	80,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000
SUB-TOTAL:	\$1,985,000	\$936,982																				
Residual Values																						
Land	\$72,000	\$18,800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72,000
Machinery	\$78,000	\$18,099	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70,000
Working capital	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUB-TOTAL:	\$142,000	\$36,899																				
NET CASH FLOW	\$939,941	\$234,048	-284,279	6,452	52,382	62,682	62,682	62,982	284,982													
FINANCIAL ANALYSIS RESULTS																						
Cash Flow Analysis:																						
Net Present Value @ 7%	\$234,048																					
Internal Rate of Return	15.9%																					
Benefit Cost Ratio @ 7%	1.40																					
Sensitivity Analysis:																						
Net Present Value with																						
+ discount rate of 5%	\$339,446																					
+ discount rate of 9%	\$154,912																					
Internal Rate of Return with																						
+ yield prices decreased by 10%	12.4%																					
+ investment expenditure increased by 10%	14.1%																					
+ seasonal inputs increased by 10%	14.4%																					
Threshold Analysis:																						
Net Present Value equals ZERO with																						
+ yield prices decreased by 25.9%																						
+ investment expenditure increased by 70.3%																						
+ seasonal inputs increased by 62.7%																						
Breakdown Analysis:																						
The Enterprise breaks even on a cumulative (discounted) basis in Year 8																						

SOUTH AFRICAN PROTEACEAE

Stage One (Static) Analysis									
Crop Enterprise		South African Proteaceae (Leucadendron)				Western Australia			
Species - <i>Safari, Flordum, Pisa, Laureolum, Maw</i>									
1 Decide on an appropriate unit of production (eg. hectare of growing area, sheds of 20 rows).									
Unit of production used:		hectare							
2 For a typical year or season of production, once the enterprise has been established, estimate all unit costs and revenues by following the instructions under each section below.									
Investment Inputs									
1 Decide on a reasonably sized enterprise, considering machinery and processing capacities, for instance.									
Reasonable size of enterprise:		10 hectares			Year 7				
2 For the reasonably sized enterprise, estimate the first-time cost of all investment items.									
Use extra lines if necessary for other or multiple items; for instance, different items of machinery.									
3 Then estimate the expected useful life of each in years.									
4 Calculate the approximate annualised cost of each, using the embedded formulae.									
5 Note the information source of each line item, and estimate its confidence limits.									
6 Total both the cost and annualised cost columns using the embedded formulae.									
Assumed real interest rate:		7% pa							
		Units	Number	Price	Cost	Useful Life (yrs)	Annualised Cost	Source	Confidence limits
Field Investigations			1	\$2,000	2,000	20	189	H&A	+/-25%
Land			12	\$15,000	180,000	100	12,615	H&A	+/-25%
Buildings			1	\$75,000	75,000	30	6,044	H&A	+/-25%
Seed stock	plants/labour	20,000		\$3.00	60,000	10	6,543	H&A	+/-25%
Machinery		1		\$100,000	100,000	10	14,238	H&A	+/-25%
Establishment	teltes/weedmat	10		\$7,390	73,900	20	6,976	H&A	+/-25% weed mats unusual
	tools	1		\$6,500	6,500	20	614	H&A	+/-25%
	planting costs	10		\$400	4,000	10	570	H&A	+/-25%
	5% replant	1,000		\$3.00	3,000	10	427	H&A	+/-25%
Permits, etc.					0		0		
Other	contingencies	10		\$500	5,000	50	362	H&A	+/-25%
Working capital	Years	1		\$311,760	311,760	7%	21,823	based on interest rate	
TOTAL:					\$821,160		\$72,399		
7 Calculate the total investment cost and total annualised investment cost per production unit using the embedded formulae.									
Total investment cost per unit:					\$82,116	per	hectare		
Total annualised investment cost per unit:					\$7,240	per	hectare		
Recurrent Inputs									
1 For the selected unit of production (eg. hectare of growing area), estimate all input costs.									
Use extra lines if necessary for other or multiple items; for instance, different chemicals.									
2 Note the information source of each line item, and estimate its confidence limits.									
3 Total the cost column using the embedded formula.									
		Costs calculated per: hectare							
		Units	Amount	Price/Unit	Cost			Source	Confidence limits
Seed / Stock					0				
Irrigation / water		1		\$709	709			H&A	+/-25%
Soil preparation					0				
Fertilisers		1		\$200	200			H&A	+/-25%
Chemicals		1		\$1,417	1,417			H&A	+/-25%
Crop protection	weed/slash/spi	1		\$1,250	1,250			H&A	+/-25%
Harvesting	per bunch	24,000		\$0.75	18,000			H&A	+/-25%
Maintenance	pruning/plant	2,000		\$1.00	2,000	2000 plants/ha		H&A	+/-25%
Packaging	boxes	1,200		\$2.00	2,400	20 bunches/box		H&A	+/-25%
Transport	per box	1,200		\$3.00	3,600			H&A	+/-25%
Other	ting/cas.labour	1		\$1,600	1,600			H&A	+/-25%
TOTAL:					\$31,176	per	hectare		

Yield							
1 For the selected unit of production, estimate the anticipated yield for the primary crop.							
2 For the selected unit of production, estimate the anticipated yield for all by-products.							
Use extra lines if necessary for multiple by-products; for instance stubble, husk, degrade product.							
Demand/Revenues							
1 For the selected unit of production, estimate the anticipated farmgate price for the primary crop.							
2 For the selected unit of production, estimate the anticipated farmgate prices for all by-products.							
		Yields estimated per:		hectare			
		Prices estimated per:		per ha			
				Farmgate			
	Crop	per ha	\$/bunch	Price/ha	Income	Source	Confidence limits
	Primary crop	Bunches	24,000	2.25	\$54,000	54,000	H&A +/-25%
	By-product #1				\$0	0	
	By-product #2				\$0	0	
	TOTAL:				\$54,000	per	hectare
FINANCIAL ANALYSIS RESULTS							
Static Analysis:							
For a typical year or season of production, once the enterprise has been established:							
	Revenue		54,000	per	hectare		
	Less Recurrent Inputs		-31,176	per	hectare		
	= Gross Margin		\$22,824	per	hectare		
		=	73.2%	return on recurrent inputs only			
	Less Investment In/annualise		-7,240	per	hectare		
	= Net Margin		\$15,584	per	hectare		Very Favourable Outcome
		=	40.6%	return on investment & recurrent inputs			
Sensitivity Analysis:							
Gross Margin = 0 when:	Revenue is reduced by			42%			Not sensitive
	Recurrent Inputs are increased by			73%			Not sensitive
Net Margin = 0 when:	Revenue is reduced by			29%			Not sensitive
	Recurrent Inputs are increased by			50%			Not sensitive
	Investment Inputs is increased by			215%			Not sensitive
Demand Sensitivity:							
				Y / N			Recommendation
	Is there an established market for the product?			y			(Good - go to next question)
	Is this market readily accessible?			n			Investigate market access further
	Will the produce volume upset market stability?			y			Investigate market stability further
	Will the produce volume affect market price?			y			Check sensitivity to income (above)
	Is the market likely to strengthen with time?			n			Investigate access to existing market further
	Are new markets likely to emerge with time?			n			Be sure of reliance on existing market

Recurrent Inputs																						
Seed / Stock	\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Irrigation / water	-\$141,800	-\$75,112	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	-7090	
Soil preparation	\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fertilizers	-\$40,000	-\$21,190	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	-2000	
Chemicals	-\$282,400	-\$150,117	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	-14170	
Crop protection	-\$250,000	-\$132,420	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	-12500	
Harvesting	-\$1,980,000	-\$987,000	0	0	-80000	-150000	-180000	-180000	-180000	-150000	-120000	-80000	0	0	-80000	-150000	-180000	-180000	-180000	-150000	-120000	
Maintenance	-\$400,000	-\$211,890	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	
Packaging	-\$204,000	-\$121,890	0	0	-6000	-20000	-24000	-24000	-24000	-20000	-16000	-12000	-8000	0	-8000	-20000	-24000	-24000	-24000	-20000	-16000	
Transport	-\$306,000	-\$157,410	0	0	-12000	-30000	-36000	-36000	-36000	-30000	-24000	-18000	-12000	0	-12000	-30000	-36000	-36000	-36000	-30000	-24000	
Other	-\$220,000	-\$100,504	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	-18000	
TOTAL	-\$4,075,200	-\$2,076,311																				
Revenue																						
Primary crop	\$5,940,000	\$2,961,190	0	0	188,888	450,000	540,000	540,000	488,888	380,000	270,000	180,000	0	0	180,000	400,000	540,000	540,000	450,000	300,000	188,888	
By-product #1	\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
By-product #2	\$0	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SUB-TOTAL	\$5,940,000	\$2,961,190																				
Residual Values																						
Field Investigations	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	
Land	\$180,000	\$46,515	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	
Buildings	\$25,000	\$6,460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	
Seed stock	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	
Machinery	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	
Establishment	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	
	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	
	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	
	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	
Permits, etc.	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
Other	\$5,000	\$1,292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,000	
Working capital	\$211,760	\$80,565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	
SUB-TOTAL	\$521,760	\$134,822																			311,760	
NET CASH FLOW	\$1,206,400	\$211,861	-82,320	-71,760	-87,768	58,240	188,248	228,240	178,248	128,240	78,240	28,240	-228,788	-71,788	28,240	170,240	228,240	228,248	178,240	128,240	78,240	588,888
FINANCIAL ANALYSIS RESULTS																						
Cash Flow Analysis:																						
Net Present Value @7%	\$211,861																					
Internal Rate of Return	9.8%																					
Benefit Cost Ratio @7%	1.08																					
Sensitivity Analysis:																						
Net Present Value with:																						
= discount rate of	0% pa	\$424,420																				
= discount rate of	9% pa	\$66,515																				
Internal Rate of Return with:																						
= yield / prices decreased by	10%	0.2%																				
= investment expenditure increased by	10%	8.7%																				
= seasonal inputs increased by	10%	7.1%																				
Threshold Analysis:																						
Net Present Value equals ZERO with:																						
= yield / prices decreased by	7.2%																					
= investment expenditure increased by	28.2%																					
= seasonal inputs increased by	18.2%																					
Break-even Analysis:																						
The Enterprise break even on a cumulative discounted basis in Year 17																						

