INTRODUCTION

In the Queensland beef industry, changes in management practices are difficult to achieve where they involve challenging people’s values or their judgements on how things should be done. There are many constraints leading to the low adoption of technology (MacLeod and Taylor, 1994) but often the most influential one is the inability to predict, in whole-of-enterprise terms, the financial outcomes of changes in management. The Beef Options Analysis (BOA) project provides a step-wise, whole-of-property approach to evaluating and planning changes to the management of a beef enterprise. This approach develops individual producer’s skills, harnesses group knowledge and provides experience in learning about what management changes would influence enterprise profitability. Anticipated successful outcomes from the current BOA project are based on our hypothesis that:

Producers will adopt new practices if they are influenced by a learning experience that can demonstrate, within the constraints of the business, the profitability of the innovation and it’s compatibility with their management objectives.

The goal of the project is to give producers the skills to financially analyse options that may improve enterprise profitability, thus enabling them to make confident decisions on whether or not to implement practices and, if implemented, how best to manage the change.

MATERIALS AND METHODS

Project

The BOA project is a process of enhancing decision making involving five steps: 1) Situation analysis for the enterprise, 2) Testing options to see “what will pay”, 3) Cash flow analysis to test “affordability”, 4) Implementation of practice change, 5) Self-directed learning workshop to enhance skills. The production and financial performance of each beef enterprise was described using the static herd model Stockman (Taylor et al., 1987). Input data on the herd inventory, deaths, reproduction rate, mating and culling policy, cattle sales, asset structure and business income-expenditure were collated and the enterprise model developed through face-to-face interviews with clients. Interactive client group discussions identified practical opportunities for production improvement. The enterprise model was used to test “what if” scenarios by comparing performance indicators derived from “with and without change” computations. The financial feasibility of implementing potentially profitable options was assessed through cash flow budgeting (Makeham and Malcolm, 1993) with dynamic or annual herd and whole farm input/output modelling. These computer-based decision support applications enabled clients to evaluate alternatives and confidently implement management changes.

Evaluation

An evaluation in the second year of the ongoing BOA project was conducted using a logical framework approach to clarify and identify measurable indicators and verification evidence (Dart et al., 1998). A semi-structured interview (SSI) was conducted to record client opinion. Changes in client’s knowledge, attitude, skills and aspirations (KASA) were recorded by client self-assessment of these attributes before and after experience with BOA, against a five-point Likert scale.

RESULTS

Enterprise performance and profitability

Client interviews and group discussions have been held with two producer groups in central Queensland. In this start-up phase, the project has documented 11 herd models, 26 “with and without change” scenarios and nine cash flow budgets with four development plans. Performance indicators or benchmarks are computed for each enterprise: property area (ha), grazing capacity in adult equivalents (AE), breeder numbers, replacement heifer number, weaning rate (%), death rates of breeders and other cattle (%), selling price of each animal class (c/kg), volume of sales by animal class (kg), gross income ($), fixed and variable costs ($), cost of production (c/kg), gross margins ($), operating profit ($), return on capital invested (%).

These indicators are used to assess the sensitivity of the enterprise to, changes in animal growth rates and reproductive performance and to compare “what if”
scenarios for management changes. An example of four scenarios from two case studies is presented in Table 1. Case study 1 has implemented the crossbreeding option because operating profit is projected to increase by 16%. Case study 2 has initiated the pasture development program and expects operating profit to rise by 87%. These examples are only two illustrations of how a thorough whole farm financial analysis of an idea can lead to confident and improved decision making. Members of one producer group, implemented the following changes to their enterprise management as a result of the options identified through the BOA activities:

- Three enterprises have implemented their own crossbreeding programs to improve breeder herd reproductive performance and enhance growth rates of sale cattle.
- Attention has also focused on more sustainable pasture management practices with three enterprises reducing breeder herd numbers. This has been achieved through yearling mating or improved breeder herd management including pregnancy testing and more stringent culling practices.
- All four enterprises have initiated pasture improvement programs to establish a total of 480 ha of leucaena and 1717 ha of other grass and stylo legume pasture. One enterprise has purchased a $20000 implement to undertake further pasture renovation. Another enterprise has focused on a timber development program as well as a pasture management program incorporating pasture burning and spelling to control wiregrass. The pasture improvement and crossbreeding technologies will result in improved cattle growth rates.
- Improved weaner growth rates are targeted on one enterprise while all enterprises aim to increase sale weights of surplus heifers, cull cows and bullocks.
- In all instances, it was markedly more profitable to fatten steers, surplus heifers and cull cows than to sell stores. Pasture improvement was targeted to these paddocks. Retaining stock to fatten meant reduced breeder numbers and generally better breeder performance.
- In all instances, greater enterprise profitability is achieved through the increased weight of sales into higher priced markets.

**Technology adoption**

More than 90% of the clients interviewed have remained committed to the BOA project. Positive feedback from clients has highlighted the usefulness of the information derived from the scenario analyses using herd-models and the testing of the financial feasibility of options through cash flow analyses. During the semi-structured interviews with nine members of one group, the following opinions were expressed:

- The BOA project made me more aware of the major factors affecting beef enterprise profitability; I am more conscious of the unit cost of production.

**DISCUSSION AND CONCLUSIONS**

Our broader goal or project hypothesis regarding technology adoption can be substantiated by the opinions and success stories provide by the clients as well as the documentation of the on-property changes implemented. Pasture development projects covering 2000 ha with leucaena and other improved grass and stylo legumes have been initiated this year. Three properties have adopted improved crossbreeding programs, one an integrated herd management plan and another has targeted poor weaner growth as a weakness in the enterprise. Improved cattle marketing options
have been identified. Opinions expressed by clients have been mainly positive and reflect the benefits they have derived by being involved in the BOA activities. Clients have commented on what they have learnt and how this has improved their decision making and longer term planning. It is concluded that clients have adopted changes as a result of their learning experiences generated by computer aided decision support tools and have confidently implemented new practices after testing options within their current enterprise financial structure.

Clients benefited directly from participating in the BOA project. Results from the semi-structured interviews indicated that clients have experienced substantial changes in knowledge and skills in relation to determining the performance of their enterprises and assessing the profitability and financial feasibility of adopting management changes. Knowledge shifts of two or more points on a five point Lickert scale were recorded by self-assessment. Similar changes were recorded in skills though the ability to identify opportunities was already well established with many clients. The SSI also showed that the clients in this BOA project had a positive attitude towards change and generally aspired to achieving better performance from their enterprises. These findings are consistent with Bennett’s hierarchy of events in agricultural extension (Bennett, 1977). Bennett identifies changes in KASA as precursors to achieving changes in management practices. This evaluation has established that:

- Technology adoption has been enhanced by the successful implementation of the BOA project. The underlying hypothesis with respect to adoption can be substantiated.
- Producers appreciated being involved in this type of extension approach. It was documented in complementary feedback, opinions and success stories of clients.
- The purpose of the BOA project has been verified i.e. to enable producers to evaluate outcomes and be motivated to implement changes. Evidence from the case study data, client interviews and documentation of on-ground activities supports this conclusion.

ACKNOWLEDGEMENTS

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REFERENCES


Email: grahamg@dpi.qld.gov.au
Table 1. An example of some performance indicators or benchmarks used when comparing “without” (base) and “with change” (scenarios A to D) for two case studies.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unit</th>
<th>Case 1 Base</th>
<th>A1</th>
<th>B1</th>
<th>Case 2 Base</th>
<th>C1</th>
<th>D1</th>
</tr>
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<tbody>
<tr>
<td><strong>Production</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grazing Capacity</td>
<td>AE</td>
<td>1748</td>
<td>1744</td>
<td>1744</td>
<td>2105</td>
<td>2105</td>
<td>2114</td>
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<tr>
<td>Breeder No.</td>
<td>No.</td>
<td>700</td>
<td>800</td>
<td>650</td>
<td>900</td>
<td>830</td>
<td>900</td>
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<tr>
<td>Weaning Rate</td>
<td>%</td>
<td>72</td>
<td>72</td>
<td>80</td>
<td>75</td>
<td>85</td>
<td>75</td>
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<tr>
<td><strong>Sales</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Av. Price</td>
<td>c/kg</td>
<td>106</td>
<td>104</td>
<td>107</td>
<td>97</td>
<td>96</td>
<td>105</td>
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<td>Sale Volume</td>
<td>kg/ha</td>
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<td>26</td>
<td>28</td>
<td>39</td>
<td>39</td>
<td>46</td>
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<td>Gross Income</td>
<td>$/AE</td>
<td>151</td>
<td>150</td>
<td>164</td>
<td>143</td>
<td>144</td>
<td>183</td>
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<td><strong>Performance</strong></td>
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<tr>
<td>Gross Margin</td>
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<td>123</td>
<td>133</td>
<td>123</td>
<td>125</td>
<td>162</td>
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<tr>
<td>Operating Profit</td>
<td>$/AE</td>
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<td>33</td>
<td>43</td>
<td>54</td>
<td>56</td>
<td>101</td>
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<tr>
<td>Cost of Productn.</td>
<td>c/kg</td>
<td>80</td>
<td>81</td>
<td>79</td>
<td>60</td>
<td>59</td>
<td>47</td>
</tr>
</tbody>
</table>

Footnote: The following scenarios (A to D) were tested - ¹Turn off all steers as store at 2½ year old; ²Implement a crossbreeding program; ³Improve herd reproductive performance by 10%; ⁴Produce heavier turn-off weights through a pasture development program

Figure 1. The change in client’s knowledge and skills before and after involvement with the BOA project.