

DRIVING COMMERCIALISATION

R & D FORUM

**Australian Prawn and Barramundi Farmers Conference
2 August 2012**

**Facilitated by
Anni Conn - Conn and Associates
Chris Calogeras - C-AID Consultants**

Project No. 2012/733



**AUSTRALIAN
SEAFOOD
COOPERATIVE
RESEARCH CENTRE**



This project was conducted by the:
Australian Prawn Farmers Association
Australian Barramundi Farmers Association

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Australian Government
**Fisheries Research and
 Development Corporation**



An Australian Government Initiative



Non-Technical Summary

Project No. 2012/733

Title: R & D Forum: Driving Commercialisation
Australian Prawn and Barramundi Farmers Conference
2012.

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PROJECT OBJECTIVES:

The aim of the R & D Forum was to extract key information on the limiting issues that Australian prawn and barramundi farmers currently face with regard to making improvements in the identified priority R & D areas of Product Price, Stock Growth and Stock Survival and use this information as a platform to:

- Prioritise the limiting issues determined for each of the three R & D areas.
- Drill down into the priority issues to identify why these limitations exist – what are the root causes to these limiting issues?
- Identify any existing solutions & current R & D.
- Identify key linkages between industry and stakeholders and possible R & D pathways.
- Document the discussion and key findings and disseminate this information to the APFA and ABFA for the associations to drive the process of developing the R & D pathways identified.

The objectives above, if accomplished would assist with the achievement of the main objective of *'identifying and driving commercially viable solutions to prawn and barramundi industry priority R & D issues with a focus on tackling these issues from a farm-up perspective'*.

OUTCOMES ACHIEVED

The forum generated a significant amount of information on the current key limitations faced by prawn and barramundi farmers with regard to making improvements in the areas of Product Price, Stock Growth and Stock Survival,.

The identified key limiting areas were explored as expansively as possible but due to

the large number of forum participants and the short allocated time frame, it proved infeasible on the day to effectively drill down into the root causes of the limiting issues identified.

However the information generated provides a snapshot of the limitations to improvement that are currently faced by prawn and barramundi farmers and an indication of where future industry R & D efforts should be focused.

One important point that was re-iterated throughout the forum was the need for more on-farm trials by technology suppliers to provide proof of concept. A common opinion was that solutions to farmers limitations may be better found through making a shift to supplier oriented R & D where technology suppliers and industry can work closely together via in-situ arrangements to develop farm-ready, commercial solutions. Resourcing for on-farm 'proof of concept' may be a viable option to encourage this type of activity.

It is recommended that the APFA and ABFA executives for the associations drive the next steps in the process by disseminating the key limitations identified to the participating R&D Providers and Technology and Equipment Suppliers.

The aim is for the associations to work with these stakeholders to:

- Determine existing R & D pathways / solutions to the key limitations identified.
- Determine gaps in current R & D focus with regard to the key limitations identified.
- Develop future R & D pathways by identifying and establishing key linkages between industry, researchers and technology suppliers so that projects can be advanced as and when funding becomes available..

ACKNOWLEDGEMENTS

The authors would like to thank Helen Jenkins and Matt West for their input into planning, delivering and driving outcomes from this project.

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1.0 INTRODUCTION

The Australian Seafood CRC and the Fisheries Research and Development Corporation (FRDC) sponsored a 2-hour mini R & D Forum in association with the Australian Prawn Farmers Association (APFA) and the Australian Barramundi Farmers Association (ABFA). The forum was held at the annual prawn and barramundi farmers' conference in Palm Cove, QLD on the 2nd August 2012.

The agenda for the forum was developed to allow cross-industry collaborative discussion around the topic "Driving Commercialisation".

The forum was an open event that represented an opportunity for Australian prawn and barramundi farmers to identify and present current R & D priority issues to key industry research providers and technology suppliers in order to explore commercially viable approaches to tackling these issues from a farm-up perspective. The Participant list is provided at Appendix I.

1.1 Purpose

This R & D Forum was intended to follow on from a previous R & D Forum, held for prawn and barramundi farmers by the Queensland Department of Employment, Economic Development and Innovation (DEEDI) in conjunction with the Australian Institute for Commercialisation (AIC) in Townsville on the 9th June 2011.

The Townsville forum was a one-day event where DEEDI, through a consultative survey process, had identified the common issues of water quality and feeding as being the pressing issues faced by prawn and barramundi farmers.

The Townsville forum allowed members from different solution providers to present their expertise to the farmers and it generated some good R & D action pathways to provide solutions for prawn and barramundi industry issues around water quality and feeding.

The feedback from the Townsville forum was that it was a great opportunity for frank and open discussion of current R & D issues between industry, researchers, technology suppliers and government stakeholders and that farmers appreciated the face-to-face exchange with other farmers with similar problems on other farms and the chance to meet solution providers that could help solve these problems.

It was anticipated that the momentum generated in Townsville and the focus on the prawn and barramundi farming industries R & D needs could be maintained by running another similar event in 2012 and that this second R & D Forum would allow for the APFA and the ABFA to refine the profile of the R & D needs of their members.

The agenda for the 2012 R & D Forum was developed using a slightly different approach. The top three priority R & D areas for prawn and barramundi farmers were determined using farm performance valuation data gathered by the APFA from 2008 – present. The APFA have developed a valuation model that enables the ranking of farm performance areas according to which performance areas will give the greatest financial return to farmers if improved and how each performance area is currently trending. (see section 1.3 for methodology).

The top three farm performance areas for priority R & D focus (out of a total of 21 farm performance areas examined) according to potential financial return upon improvement and current trend in performance were identified as:-

- **Price** (Product)
- **Growth** (Stock)
- **Survival** (Stock)

Although the barramundi farmers do not yet have a similar valuation model, the ABFA concurred that these top three priority R & D areas identified for prawn farmers would most likely be of similar significance to barramundi producers. The ABFA was therefore prepared to focus on these areas during the forum as priority R & D areas common to both industries.

The forum agenda was developed with a focus on:-

- Encouraging farmers to discuss and identify the limitations that they currently face in making improvements in the three priority areas outlined above, and for the root causes to these limitations to be determined.
- For researchers and technology suppliers to listen to the problems that farmers are currently facing and clearly understand farmers needs with regard to the development of practical and commercially viable solutions to these problems.
- For researchers, technology suppliers and other stakeholders to take away the information gained from these open discussions and use it to start generating ideas and pathways towards feasible solutions.

NB. It was determined that, due to time constraints, a discussion on possible R & D solutions would not be feasible during forum itself and that the event should maintain a focus on determining the root causes of current limitations to improvements.

1.2 Objectives

The aim of the R & D Forum was to, as a collective process that engaged all participants (particularly producers), extract key information on the limiting issues

that farmers face with regard to making improvements in the identified priority R & D areas of Price, Growth and Survival and use this information as a platform to:

- Prioritise the limiting issues determined for each of the three R & D areas.
- Drill down into the priority issues to identify why these limitations exist – what are the root causes to these limiting issues?
- Identify any existing solutions & current R & D.
- Identify key linkages between industry and stakeholders and possible R & D pathways.
- Document the discussion and key findings and disseminate this information to the APFA and ABFA for the associations to drive the process of developing the R & D pathways identified.

The objectives above, if accomplished would assist with the achievement of the main objective of *'identifying and driving commercially viable solutions to prawn and barramundi industry priority R & D issues with a focus on tackling these issues from a farm-up perspective'*.

1.3 Methodology

The farm performance areas of Price, Growth and Survival were determined as prawn industry R & D priorities using APFA valuation data collected since 07/08. Input into the APFA valuation model is voluntary so unfortunately not all farms are represented by the data but it is the best measure available of how the industry is performing and in particular, which performance areas are doing well or not so well.

Valuation data has been collected on 21 key performance areas from each participating prawn farm. Examples of performance areas are revenue makers such as Stocking Density, Growth, Price or cost centres such as Labour, Power and Maintenance. The data collected from each farm can then be compared within and between years to create a profile of how the industry is performing.

The financial impact of a 1% improvement to each performance area (in either increased revenue or reduced costs) was calculated. It is possible to rank each performance area according to which will give the biggest financial return or cost saving if performance is improved. Table 1 shows the top 10 key performance areas according to this valuation ranking from the FY 2010/2011 data. *(Data from FY 2011/2012 was not available at the time of valuation data analysis).*

Table 1 shows that Price, Growth and Survival are the top three performance areas that will generate the most return to operators if they can be improved.

The next step was to analyse how the performance areas have been trending over the past few years. If the trend is up, meaning that performance is currently improving then the area is not a priority for R & D. If the trend is down, meaning that performance is decreasing then this area remains a clear priority for R & D.

In the case of Price, Growth and Survival, all three of these performance areas are currently on a downward trend and therefore remain the top three areas on which the prawn industry should be focusing its R & D efforts.

Figure 1 R & D priority ranking of current Australian prawn farming industry key farm performance areas according to financial gain and performance trend.

Key Performance Area 2010-2011	Ranking according to financial gain if improved by 1%	Trend in Performance since 2008	Overall R & D Priority Rank
PRICE (\$/kg)	1	DECREASING	1
GROWTH (g/week)	2	DECREASING	2
SURVIVAL (%)	3	DECREASING	3
STOCKING	4	INCREASING	
DAYS TO HARVEST	5	INCREASING	
No. HECTARES IN CROP/YR	6	INCREASING	
COST OF FEED (\$/kg)	7	DECREASING	4
FCR	8	INCREASING	
FARM LABOUR COST	9	DECREASING	5
POWER COST	10	DECREASING	6

Although the barramundi farmers do not yet have a similar valuation model, the ABFA concurs that these top three priority R & D areas identified for prawn farmers are most likely of similar significance to barramundi producers. The ABFA was therefore prepared to focus on these areas during the forum as priority R & D areas common to both industries.

For the purpose of this R & D Forum the assumption was made that ‘what is good for the industry is good for the farm’. There will obviously be individual farms that through their operating history would generate a different top three priority performance areas but it was presumed that if this was the case these farmers would be able to provide valuable input during the forum.

The forum was facilitated by Chris Calogeras (C-AID Consultants) and Anni Conn (Conn & Associates) and was run over a 2-hour period during the annual Australian Prawn and Barramundi Farmers conference on the 2nd August 2012 at the Novotel, Palm Cove in Queensland.

Participants were split into groups of no more than ten persons, with each group comprising a minimum of two farmers where possible. Each of the three priority R & D areas (Price, Growth and Survival) was discussed sequentially with participants given 10 min to brainstorm within their groups the most pressing limitations that farmers face with regard to improvements in these three areas. Each group then

volunteered their key findings to the rest of the forum participants, focusing on the 2 or 3 limitations that had been determined by each group as being of highest priority. The collective forum discussed these key findings briefly and the results were documented.

The aim of the forum had been to drill down into each limiting issue to determine the root cause of the issue or limitation and to then begin exploring existing solutions or pathways to future R & D projects around these root causes. However, due to the large number of participants, plus the very short time frame allocated to the forum, it was not possible to determine more than just the key limitations to improvements in the three priority R & D areas. It was noted that there would be benefit in any future such forum to allow adequate time to undertake this task

2.0 KEY FINDINGS

The tables below shows the key limitations identified by the Prawn and Barramundi industry to improvement in the current R & D priority performance areas of Price, Growth and Survival.

Each key limitation was discussed by the forum collectively and where possible, the root causes or most pressing issues surrounding each key limitation were discussed and documented.

Table 1 Key limitations to improving PRICE

<u>PRICE</u>	
Product Quality	<ul style="list-style-type: none"> • There is presently significant inconsistency in the quality of product or products described collectively as “good quality” – due in part to different commercial business models, product types and / or business pressures. • There is a need to define that “good quality” is based upon end user characterisation of the product. Then to determine the impacts that these identified end user preferences may have on future pricing and demand if quality improvements can be made. • There is continued support for the development of industry wide quality standards / 1st, 2nd or 3rd party tick of approval / 3 tier quality approach (i.e. good, better, best) but uncertainty on how to achieve whole of industry producer commitment. • Flavour taint in Barramundi is a specific quality issue identified by producers as being limiting to product price. • A consistent approach on what to do with second grade product is also required to not diminish value of ‘first’ grade product. • A unified, cooperative approach to quality is needed throughout the supply chain. This is particularly important when it comes to cold chain. • Producers often find it difficult to predict the quality of the products they are going to produce. It would be extremely useful to better determine arising quality issues pre-harvest to enable strategic planning of harvesting / processing / sales / marketing.

<p>Unified Co-operative Approach Through Entire Supply Chain</p>	<ul style="list-style-type: none"> • It was identified that product price could be improved by industry taking a cooperative approach on common price influencing areas such as: <ul style="list-style-type: none"> ○ Marketing i.e. Encouraging producers to commit to marketing cooperatives and initiatives such as the National Prawn Strategy. ○ Facilitating a shorter supply chain / more direct supply to the end user that, where possible, cuts out middlemen if they don't add value, and to collectively target seasonal and niche markets. ○ Oversupply and dumping – there is presently a lack of coordination in supply. Production is planned independently and leads to inconsistencies in supply, with supply gluts usually resulting in price decreases. ○ Customer service – both industries could improve their bottom line by selecting their customers carefully, maintaining / holding their prices and their payment terms and carrying pride in their product. ○ Understanding the legal ramifications of such a cooperative approach.
<p>Cheaper Imports</p>	<ul style="list-style-type: none"> • It was reiterated that there is an ongoing need to lift the profile of Australian grown products and to positively differentiate these from cheaper overseas product through effective provenance branding and consumer awareness campaigns that reach down the supply chain to the end user. • Wider reaching regulations on country of origin labelling would facilitate increased value to Australian producers and suppliers who market the provenance of homegrown product.

Table 2 Key limitations to improving GROWTH

<u>GROWTH</u>	
Genetics	<ul style="list-style-type: none"> • Producers unanimously identified genetics as one of the limiting factors to improved animal growth rate, uniformity and reducing the time in getting animals to market, with a particular focus on gaps in the following areas: <ul style="list-style-type: none"> ○ Identified need to survey wild prawn stocks to determine the genetic characteristics of broodstock for existing and new domestication programs. ○ Barramundi industry has a genetics plan in place but need to achieve consensus on the approach and source funding. ○ Establishing the link between disease/s and growth rate. ○ Manipulating genetics to tailor the animals to specific diets (e.g. reduced protein). ○ Manipulating genetics to tailor the animals to specific farm environmental / growing conditions.
Feeding and Nutrition	<ul style="list-style-type: none"> • It was identified that there are still knowledge / technology gaps in the field of feeding and nutrition where improvements could result in increased growth rates. Producers specifically mentioned: <ul style="list-style-type: none"> ○ Life cycle nutrition – there are still gains to be made to optimise feed formulation and digestibility for each life cycle stage, e.g. Fish oil and fish meal substitution. It was agreed that there is room for greater interaction between industry and feed companies on animal performance. ○ Feed delivery systems – producers are keen for work to progress on reliable systems for monitoring feeding to demand and optimising feeding efficiency and the feeding environment. Presently, CSIRO and

<u>GROWTH</u>	
	<p>Ridley are underway with this type of research.</p> <ul style="list-style-type: none"> ○ Producers also suggested that the issue of feed stability / shelf life and overall feed quality i.e. reduction in dust content, should be an ongoing focus area for feed companies / researchers.
Infrastructure	<ul style="list-style-type: none"> ● Producers identified infrastructure constraints such as power and aeration as being significant in capping production and growth rates.
Disease and Biosecurity	<ul style="list-style-type: none"> ● There is an identified need for producers to effectively and viably test PL's and broodstock for disease e.g. viral load testing.
Benchmarking and Information Sharing within industry	<ul style="list-style-type: none"> ● It was noted that both industries could benefit from greater sharing of information within and between industries. Also that an industry performance model such as the APFA valuation model be developed by the ABFA.
Decision Support Systems for Animal	<ul style="list-style-type: none"> ● The scarcity of usable / viable decision support systems for animal husbandry (i.e. feed management; water quality management) was identified as a limiting factor to improvements in animal growth.

<u>GROWTH</u>	
Husbandry	
Water Quality	<ul style="list-style-type: none"> • Water quality and water quality management was highlighted as a significant factor in growth performance. Improving or maintaining water quality parameters such as temperature and dissolved oxygen content is critical to improving growth rates. Technology for the effective, accurate, real time monitoring of water quality is an ongoing priority for producers. • Producers noted the effect that algae can have in reducing water quality and therefore on growth rates and identified a need for algal surveys, quick detection technology and a database for information sharing on algal species characteristics, and how to troubleshoot when an undesirable algal species take hold. • It was also noted that further research is needed into the area of algal management with respect to managing pond nutrients to generate desirable algal blooms.
Product Quality	<ul style="list-style-type: none"> • Although perhaps not a direct limitation to animal growth, producers noted that any improvements in animal growth should be made with consideration for maximising product quality and maintaining consumer demand throughout the process.

Table 3 Key limitations to improving SURVIVAL

<u>SURVIVAL</u>	
Pests / Predation	<ul style="list-style-type: none"> • There is a clear need for improvements in the management of pests and predation of stock. e.g. Bird predation is a significant problem for most producers and the control options for minimising bird predation are presently very limited due to environmental legislation, logistics or cost.
Disease	<ul style="list-style-type: none"> • Producers identified disease as a major limitation to survival and noted gaps in areas that could contribute to disease prevention and better disease management including:- <ul style="list-style-type: none"> ○ Ensuring that diseases/pests are prevented from entering the country through a stringent biosecurity model. ○ Improved husbandry techniques to lower animal stress. ○ Disease free seed supply. ○ On farm and between farm biosecurity – an industry wide approach. ○ Development of Specific Pathogen Free / Resistant lines.
Hatchery / Nursery	<ul style="list-style-type: none"> • Improvements in hatchery / nursery systems were identified as having direct benefits to animal survival. Issues highlighted were: <ul style="list-style-type: none"> ○ A need for better counting systems. ○ Better feed management at rearing / nursery stage.

	<ul style="list-style-type: none"> ○ Quality checks before stocking.
<p>Monitoring Real Time Survival</p>	<ul style="list-style-type: none"> ● Producers highlighted the value of real time assessment of survival via automatic monitoring of water temperature, dissolved oxygen, pH, and possible real time monitoring of disease using quick detection technology. This would allow for contingency planning and enable producers to be pro-active with pond and stock management. ● It was also noted that biomass can be difficult to predict and that producers currently have very different systems for calculating survival and biomass with differing levels of accuracy.
<p>Water Quality</p>	<ul style="list-style-type: none"> ● Water quality was identified as a limiting factor in animal survival. Accurate, effective, affordable real time monitoring systems are considered a priority by producers. ● The question was raised - can the industries identify the optimum pond condition for maximising survival and then determine how to achieve this pond condition? ● Producers noted that there are gaps in the knowledge of animal tolerance (and subsequent survival) to rapid variances in water quality, e.g. lower water temperature in Barramundi ponds; and a need for improved management tools / techniques to deal with such variances. ● Refer to “Growth” - the water quality issues limiting animal survival were identified as the same issues that limit animal growth rates.
<p>Herbicide and Pesticide Monitoring</p>	<ul style="list-style-type: none"> ● Producers noted the importance effect that herbicide and pesticide levels can have on animal survival. Improvements to survival could be made through the monitoring of background levels of herbicides or pesticides

Staff Training

- Inadequate staff training was identified as a limiting factor to animal survival. Benefits possible from a series of “apps” with main points of standard operating procedures accessible in-situ at the pond side.

3.0 RECOMMENDATIONS

The forum generated a significant amount of information on the current key limitations faced by prawn and barramundi farmers with regard to making improvements in the areas of Price, Growth and Survival, however due to time constraints, the extent to which these limiting issues could be explored further was significantly restricted.

It is recommended that the key findings from this forum be passed on to the R&D Providers, and the technology and equipment Suppliers who attended the forum, and that the APFA and ABFA executives for the associations drive the process further. The next steps would be to:-

- Determine existing R & D pathways / solutions to the key limitations identified.
- Determine gaps in current R & D focus with regard to the key limitations identified.
- Develop future R & D pathways by identifying and establishing key linkages between industry, researchers and technology suppliers so that projects can be advanced as and when funding becomes available.

One important point that was re-iterated throughout the forum was the need for more on-farm trials by technology suppliers to provide proof of concept. A common opinion was that solutions to farmers limitations may be better found through making a shift to supplier oriented R & D where technology suppliers and industry can work closely together via in-situ arrangements to develop farm-ready, commercial solutions. Resourcing for on-farm 'proof of concept' may be a viable option to encourage this type of activity.

It is hoped that resources will allow for an R & D Forum in 2013 and it is recommended that the approach be of similar style to that taken in 2012 (and with sufficient time to dig down deeper into the issues and to seek R&D and supplier input) with a clear focus on the needs of the farmer and practical, commercially viable R & D that is driven from a farm-up perspective.

4.0 APPENDIX 1 – Participant List

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