Australian Prawn Farmers Association Research & Development Plan

FISHERIES RESEARCH & DEVELOPMENT CORPORATION

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Australian Prawn Farmers Association Inc

Research & Development Plan

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AUSTRALIAN **P**RAWN **F**ARMERS **A**SSOCIATION
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INTRODUCTION

The Australian Prawn Farmers Association (APFA) was formed in 1993 to represent the interests of prawn farmers and to foster the development of the Australian prawn farming industry. The industry now produces over 2,000 tonnes of product with a farm gate value in excess of $40 million and, while one of the smaller volumetric producers in the world, leads the world in yield productivity, with an average yield of 4,000 kg per hectare and provides some 600 direct jobs and 1800 indirect jobs.

The industry's potential economic and environmental contribution to our community is substantial. The industry will conservatively double in size every 5 years for the next two decades and this growth equates to an industry providing 7,000 direct jobs and 21,000 indirect jobs, generating farm gate revenue of some $780 million annually. The value adding opportunities by wholesalers, retailers and exporters will increase these returns by an estimated $400 million.

Equally importantly, successful prawn farming relies on a sustainable environmental resource in the coastal zone and the APFA will proactively contribute to ensure these areas maintain their integrity.

A major problem for the industry has been the serious shortage of scientific data relating to all aspects of prawn farming and the inter-relationship with the environment. Accordingly the APFA has prepared this Five Year Research & Development Plan.

This Research and Development Plan has been prepared by the Australian Prawn Farmers Association as a mechanism to achieve and promote both environmentally and economically sustainable prawn farming. The industry recognises the need for appropriate investment in research and development to maximise returns and to provide a sound base for long term industry sustainability.

This R&D Plan aims to provide the following:

- A basis for ongoing R&D expenditure for the Australian prawn farming industry;
- A mechanism for improved communications between research providers and industry; and,
- An appropriate focus for R&D expenditure.

It aims to achieve these objectives through:

- Outlining general R&D programs;
- Providing up to date industry priorities for R&D expenditure; and,
- The provision of a transparent and acceptable process for the determination of industry support.

CONTENTS

OVERVIEW

Prawn farming is increasingly part of the global food business. Aquaculture is the only way to bridge the gap between the massive growth in seafood demand, and the worldwide decline in wild fisheries. However, managing the mix of resource and technology inputs, and skills to maintain viable and sustainable farming enterprises is increasingly complex.

There are many risks and challenges facing the emergent prawn farming industry. Access to natural resources, disease identification and management, waste flow management, yield optimization through genetics or nutrition, lack of brand power, and Australia's vast geography are just a few.

The creation of a single national body well supported by farmers in 1993 has been the cornerstone from which industry has addressed most of these risks.

The Australian Prawn Farmers Association continues to lead industry development and R&D in such issues as environmental compliance, sustainable production, nutrition, disease control and broodstock supply.

Farmers increasingly see that they can't stand still. New technologies, better practices, and better product presentation will be needed to meet the changing needs of discerning customers and community resource managers. Ongoing R&D is essential. To this end the industry has now confirmed its intention to more actively contribute to and manage its R&D effort. The focus will shift to a broader range of R&D projects, large and small, with greater portfolio balance between scientific "research" and "development" projects. This strategy will enable the industry to more rapidly approach its potential as a valuable and viable contributor to the mainstream food industry.

This R&D Plan draws from industry discussion in August 1998. It build on priorities developed by APFA in September 1995 and subsequently through the APFA R&D Committee and APFA Executive Committee.

MISSION STATEMENT

A profitable and environmentally sustainable Australian farmed prawn industry which maximises returns from R&D investment through programs actively managed to address stakeholder and market priorities.

The Australian Prawn Farmers Association will lead and challenge industry to provide a quality, affordable product in a cost effective and environmentally sustainable manner.

STRATEGIC DIRECTION

- Determination of research priorities.
- Facilitating the development and adoption of best available research, technology and practices.
- Managing funds to ensure R&D continuity and returns to farmers.

STRATEGIC OBJECTIVES

PRIMARY FOCUS

- Economic and environmental sustainability of the Australian prawn farming industry.

SUPPORTING OBJECTIVES

- Sustainable resource use.
- Improved profitability.
- Increased productivity.
- Consistent product quality.
- Professional industry development and management.
- Effective R&D extension.

ACCOUNTABILITY

Upon the formal implementation of the Levy Collection, APFA will form a process of management and control with the FRDC, which in turn derives its functions, powers and objects from the *Primary Industries and Energy Research and Development Act 1989*.

APFA will make this enabling legislation the basis for its accountability to the Australian prawn farming industry, the Australian Government and other stakeholders to secure the necessary returns from R&D programs.

Accountability will be measured against the objectives established in the five year R&D Plan, through Annual Operational Plans implemented by the Executive and reported to all levy contributors, relevant Government bodies and FRDC in an Annual Report.

PRIORITIES

The industry R&D priorities are to be determined on an annual basis and included as a Schedule to this R&D Plan. Priorities result from industry surveys, where farmers are asked to allocate resources, in their order of priority, to various research topics. The averaged results are used to set the priorities, ensuring that the priorities reflect the overall requirements of the entire industry.

PROGRAMS

Based on industry surveys conducted in 1995 and 1998, five programs have been developed for implementation and strategic focus for the industry and the research community. These are:

A) Environment & Sustainability
B) Breeding and Genetics
C) Prawn Health
D) Production Systems
E) Market and Industry Development

PROGRAM A: ENVIRONMENT & SUSTAINABILITY

Background

The prawn farming industry must work within existing and evolving constraints and statutes. Environmental regulation has to date been a major limiting factor to growth of the Australian prawn farming industry. Currently there is a broad, poorly coordinated regulatory and policy approach to development approvals and environmental management of aquaculture throughout Australia at Commonwealth, State and local government levels. There is a critical need for a coordinated national approach to approvals and environmental management, based on sound scientific knowledge and the principles of Ecologically Sustainable Development.

The industry must compete to secure sufficient sites to enable growth potential to be achieved. New technologies will improve environmental

performance and reduce potential conflicts between industry needs and ecological integrity.

Objective

Appropriate protection for the Australian environment and protection of the Australian prawn farming industry from environmental degradation.

Strategies

- In consultation with community groups, government and leading scientists, develop and implement policies which ensure the environmentally sustainable and profitable development of the Australian prawn farming industry.
- Understanding of the environmental influence of farm management practices at a range of scales from molecular to regional.
- Establish a database of appropriate new farming sites in Queensland, Northern Territory and Western Australia in conjunction with appropriate regulatory agencies.
- Increase awareness and utilisation of sustainable farming practices.
- Work collaboratively with upstream catchment users with the potential to effect the Australian prawn farming industry
- Development and implementation of accurate and relevant key indicators for environmental monitoring.

PROGRAM B: BREEDING & GENETICS

Background

Superior breeding and premium livestock quality are the basis of a sustainable intensive livestock industry. Long term productivity gains in a competitive world market must be based on premium stock.

Objective

Australian prawn hatcheries must have year-round access to superior broodstock enabling farmers to stock ponds on demand with high health post larvae.

Strategies

- Development of disease resistant Post Larvae.
- Stabilise and consistently improve survival rates.
- Domestication of culture species.
- Genetic improvement of culture species.
- Improvement of broodstock performance.
- Enhanced access to spawners.

- Increased growth rates.
- Establishment of process control and audit procedures for Post Larvae production.

PROGRAM C: PRAWN HEALTH

Background

Disease identification and management has become one of the most important limiting factors to the sustainable development of prawn culture throughout the world. Australia currently enjoys a freedom from the major transmissible viral diseases occurring throughout South-east Asia, Latin America and the United States.

Objective

To identify potential pathogens, provide management options for diseases and allow sustainable production to occur without overt threats of disease outbreaks.

Strategies

- To ensure that the Australian industry remains free of exotic diseases.
- Identification of potential disease threats.
- Development of appropriate protocols for on farm disease prevention, control and treatment.
- Industry access to affordable diagnostic tools and laboratories.
- Availability of Specific Pathogen Free (SPF) Post Larvae
- Effectively regulate potential sources of exotic pathogens.

PROGRAM D: PRODUCTION SYSTEMS

Background

The central goal of commercial prawn farmers is to efficiently manage the interaction between the prawns and their pond environment during the grow-out phase. This is also the area of greatest risk to farm viability and survival in the Australian prawn farming industry. There are a number of separate farm management systems that must successfully integrate to achieve optimal production and commercial results in both the long and short term; animal health and husbandry, nutrition, water quality and farm design are the main elements.

Objective

Continuing improvement in the operational effectiveness and efficiencies of prawn farms resulting in: improved environmental performance, decreased

cost of production, increased yield per hectare, repeatable yields and improved risk management.

Strategies

- Optimal pond preparation and improved sediment management practices.
- Development of sustainable prawn feeds.
- Improved survival rates.
- Improved Food Conversion Ratios.
- Effective and efficient aeration technology.
- Effective and efficient management information systems.
- Understanding of pond dynamics and identification of key pond stability criteria.
- Identification of key animal performance criteria.
- Lower repairs and maintenance costs.
- Reduced energy consumption.

PROGRAM E: MARKET AND INDUSTRY DEVELOPMENT

Background

The APFA has been established as the industry's peak body to manage common issues for mutual commercial benefit on behalf of the industry. The aim of the APFA must be to secure maximum commercial return for its members in the long term. Strong support for the APFA in the last few years provides a sound base for industry to be proactive for all industry development issues.

Presently, sufficient demand exists in the domestic market to continue to support the existing industry. However as volume of production increases over the next 5 years it is expected that market and industry development issues will become a critical area of R&D. The industry must aim to dispose of all product to competing buyers at prices that enable producers to be commercially viable. In order to develop high value export markets, Australia industry needs to further refine its domestic infrastructure.

Objectives

The Australian prawn farming industry, though its national body must develop and maintain professional and proactive interactions with Local, State and Federal government bodies and community groups, ensuring that the industry is supported at all government levels.

The industry must be managed to provide for an increasing production base, to ensure that maximum benefits flow to members, through research, marketing and administration.

Strategies

- Develop and maintain mutually beneficial relationships with all levels of government, other industry bodies, including domestic and international markets.
- Support and manage appropriate R&D which will lead to increased production of Australian farmed prawns with maximum benefits to industry and the Australian economy.
- To positively influence the development of legislation, policy and regulations which have the potential to impact on the industry.
- Foster support for the APFA R&D Plan within industry, the research community and at all levels of government.
- Increase farmer awareness and adoption of relevant R&D outcomes.
- Encourage widespread adoption of food safety plans for producers and processors.
- Identification and development of available markets and identification of critical factors limiting growth of export markets for Australian farmed prawns.
- Encourage consistent and sustainable growth of the industry through increased investment in the development of prawn farms.
- Through the APFA R&D Plan work toward achieving community acceptance and confidence in the Australian prawn farming as a world leader in sustainable aquaculture.

RESEARCH TYPES

There has been increased recognition in recent times for the APFA to allow for the various types of R&D which could benefit the industry. Typically the APFA recognises two forms of R&D: tactical and strategic.

TACTICAL RESEARCH & DEVELOPMENT

Tactical research is defined as R&D which has a short time horizon, with results available to the industry within 2 years. Tactical projects must provide a deliberate and achievable focus on improved profitability and there must be a high degree of confidence that project objectives can be achieved.

STRATEGIC RESEARCH & DEVELOPMENT

Strategic R&D can best be defined as long term R&D which may or may not improve profitability but will provide benefits to industry. The time frame for strategic research is typically between two and five years with the results being measurable through increased understanding of scientific values, an improved database of scientific information relevant to the industry and for possible use in future tactical R&D.

FUNDING ISSUES

APFA's cash contribution to R&D funding is limited and currently does not meet the target 0.25% of GVP as is required under the *Primary Industries & Energy Research & Development Act* (PIERD Act). Collective cash contributions from industry have traditionally been based on a voluntary system administered by APFA. There is an urgent need to establish an equitable system of R&D contributions from the national industry.

In this regard, APFA is working with the Australian Government and the Fisheries Research and Development Corporation (FRDC) in development and implementation of a compulsory R&D Levy pursuant to the PIERD Act.

The levy will ultimately allow a collective industry contribution of 0.25% GVP specifically for R&D purposes. Administrative mechanisms will be established to ensure that industry has control of prioritisation and decision-making in regard to allocation of project-specific R&D funds, and also to ensure appropriate protection of the collective industry interest in related Intellectual Property and Commercialisation transactions. The APFA R&D Plan is central to this framework.

APFA may not support all projects which meet the R&D Plan requirements. APFA R&D Committee will prioritise R&D projects to provide specific levels of support on a case-by-case basis.

ALTERNATIVE FUNDING

APFA will consider, and where appropriate provide in-kind support, to researchers investigating other funding alternatives for projects on a case-by-case basis. Alternative funding sources may include for example:

- National Heritage Trust
- Greenhouse Challenge
- FRDC
- RIRDC
- Corporate Research Funding Schemes

- State Government Sources
- ABARE
- ACIAR
- Seafood Services Australia
- Coast and Clean Seas
- CSIRO Food Into Asia
- Supermarket to Asia

POLICIES

APFA Research & Development Policy has been developed to ensure consistency in relation to the development and implementation of research and development projects where support and/or funding is requested from the industry.

Researchers or other applicants that are looking to have the APFA endorse or otherwise support their project, through any funding process, but more importantly FRDC funded projects must comply with this policy to receive industry sanction or support for the specific project.

Compliance with the policy will be determined on a project specific basis, no blanket or organisational compliance mechanism is available.

Researchers, whether public or private institutions, applying for industry support MUST provide the following in their submission to the APFA:

- A description of the aim of the project;
- How the project fits with the APFA R&D Plan;
- Is the R&D project tactical or strategic research;
- Which specific Objective the project assists in meeting;
- Which Strategies will be attained through the project;
- Which R&D priority is met by the project;
- What are the key expected outcomes of the project;
- A clear concise strategy for technology transfer and extension describing clearly the “path to market”
- A description of the milestones for the project;
- The time frames for completion of milestones and the final project.
- The expected economic benefits from the project.

TECHNOLOGY TRANSFER & EXTENSION

Communication between industry and research providers is to be promoted through both formal and informal interactions and the discussion of research issues with members of the industry. Researchers are

encouraged to discuss, in detail, any proposed research project with the APFA R&D Committee, prior to the production of a pre-proposal.

Discussion of projects with individual members of the industry is encouraged, however, researchers should be aware that individual farm support does not constitute industry support. In order for a project to receive industry support it must fall within the priorities of the industry for that year and be relevant to one or more of the research programs.

The communication of industry support for a project will be made by the APFA Executive Committee by way of a letter addressed to the Principal Investigator, no other communication of industry support will be made. Funding applicants should avoid quoting discussions or other correspondence with industry members or R&D Committee Members.

Concern has been expressed in the past that some research projects supported by industry have either not been completed, or results have not been made available. The results or partial results of research undertaken with the support of industry should be available at any time to members through APFA. To ensure that communication of results and progress of projects is maintained, submissions to APFA in regard to research projects must incorporate the following:

- Direct communication of results, progress on milestones and outlook for the project to APFA R&D Committee, at six monthly intervals from commencement of project;
- Direct communication of results, progress on milestones and outlook for the project to APFA membership at six monthly intervals via the APFA Newsletter or other means determined in consultation with APFA R&D Committee;
- Annual presentation of data, results and progress to the APFA membership through workshops or conference presentations;
- Publishing research results in appropriate industry, government and scientific journals (this requirement may be waived where intellectual property rights need to be protected for the benefit of industry).

INTELLECTUAL PROPERTY RIGHTS & COMMERCIALISATION

Investment of large sums of money in research, in often ground breaking areas, demands that stakeholders have the ability to patent or otherwise commercialise the technology resulting from the research.

There is a need however to protect the rights of the industry to technology developed with the financial and in-kind support of industry. In this case, support includes:

- the support of applications for funding through government and industry funding bodies (such as FRDC); or,
- where industry members have openly provided in kind support (such as the provision of larvae, prawns or farm access).

In these cases any application for commercialisation, or the potential for it, must be declared in the submission and support will only be provided where agreement is reached as to ownership of the technology and where there is a clear description of the "path to market".

Clearly there is a need for industry to understand that specific projects, funded directly by individual members have the ability to be commercialised by the funding party, but such projects would not require the support of industry or public funding.

APFA Policy requires that research proposals clearly address the following critical issues:

- Discussion and analysis of the potential for commercialisation of technology and/or intellectual property generated by the research project;
- Discussion and process for agreement as to ownership of the technology and/or Intellectual Property generated by the project;
- A clear description of the "path to market";
- Discussion of potential benefits to industry from the commercialisation of the technology.

TIME FRAMES & APFA PROTOCOLS

There is a need for industry to be involved in the project concept and planning stages for research and development proposals and research providers should, as a priority, discuss ideas for research with industry prior to the proposal finalisation and submission. Given that there are various funding time frames, the following can be used as a basis:

- Industry R&D priorities are determined by the results of a Resource Allocation Survey (RAS) issued to all farmers early each year.

- APFA through its R&D and Executive Committees provides list of industry R&D priorities to research providers by July each year as a critical component of an amended R&D Plan.
- Researchers develop draft project proposal for submission to APFA for review by APFA R&D Committee in accordance with the APFA R&D Plan, 8 weeks prior to funding deadline.
- APFA R&D Committee shortlist proposals in accordance with the APFA R&D Priorities for that year, and where appropriate request further information and/or an interview with the researcher/project leader
- APFA R&D Committee refer shortlist of project proposals with recommendations to APFA Executive Committee for consideration
- APFA to provide details and comments to researchers two weeks prior to funding deadline (if applicable).

The final decision in regard to R&D issues rests with the Executive Committee as elected representatives of the industry, although they will consider recommendations of the R&D Committee.

The R&D Committee should meet when appropriate as follows:

January - March

- To develop the RAS for that year.
- To finalise the outcomes of the RAS.

July

- To discuss directly with researchers the results and milestones of approved and funded projects.
- To meet with researchers with new proposals.

November

- To discuss, rank and shortlist proposed projects for recommendation to APFA Executive Committee

R&D Committee meetings should be appropriately minuted, with appropriate feedback available to industry and researchers upon request.

BREACHES OF POLICY

Breaches of Policy may occur from time to time. Where breaches to the Policy are determined by APFA, the Principal Investigator may be requested to provide an explanation within a reasonable time frame. An inadequate or inappropriate explanation, or a second similar breach, will be referred to

APFA Executive Committee for discussion and resolution. Breaches may trigger a notification to the funding body and possible withdrawal of industry support.

SCHEDULE 1

INDUSTRY R&D PRIORITIES 2000-2001

The priority R&D activities for the APFA are detailed in the following table. This table presents the results from industry surveys undertaken in May - July 2000 where farmers were given $100.00 and asked to allocate resources.

Tactical Research

Research Strategy	Weighted Value	R&D Program
1. Improved access to spawners.	76.5	B
2. Improvement of broodstock performance.	28.3	B
3. Genetic improvement.	28.0	B
4. Improved survival rates.	19.3	B/D
5. Industry access to affordable disease diagnostic tools and laboratories.	15.3	C
6. Reduced energy consumption.	14.3	D
7. Increased growth rates.	9.1	B
8. Lower repairs and maintenance costs.	3.1	D
9. Improved effectiveness and efficiencies of aeration technology.	2.5	D
10. Improved Food Conversion Ratios.	2.3	D

Strategic research

Research Strategy	Weighted Value	R&D Program
1. Domestication of culture species.	144.4	B
2. Development of disease resistant Post Larvae.	116.1	B
3. To ensure that the Australian industry remains free of exotic diseases.	60.5	C
4. Influence the development of legislation, policy and regulations which have the potential to impact on the industry.	40.7	A/E
5. Development and implement appropriate environmental policies.	20.0	A
6. Understanding of pond dynamics and identification of key pond stability criteria.	17.1	D
7. Development of sustainable prawn feeds.	12.7	D
8. Identification of potential disease threats.	10.0	C
9. Identification and development of available markets.	9.4	E
10. Establishment of process control and audit procedures for Post Larvae production.	7.8	B